WINTER HAVEN
THE CHAIN OF LAKES CITY

CITY COMMISSION MEETING

DATE: Monday, July 13, 2026, 6:00 p.m.

LOCATION: City Hall - John Fuller Auditorium
451 Third Street NW
Winter Haven, FL 33881

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1. CALL TO ORDER - Brian Yates, Mayor

2. ROLL CALL - Vanessa Castillo, MMC, City Clerk

3. INVOCATION - Elder John Halman, St. Paul Worship Center

4. PLEDGE OF ALLEGIANCE - Vanessa Castillo, MMC, City Clerk

5. PRESENTATIONS

5.A **"Lakes Appreciation Month" Proclamation - Frances Howell-Coleman, Lakes Advisory Committee**

Staff Contact: *Brittany Hart, Public Works Director, bhart@mywinterhaven.com*

Proclamation

5.B **"Parks and Recreation Month" Proclamation - Scott Eilers, Interim Parks, Recreation & Culture Director**

Staff Contact: *Natalie Wilson, Special Events & Initiatives Coordinator, nwilson@mywinterhaven.com*

Proclamation

5.C ***** AGENDA REVIEW ONLY *** South Polk Pathways to Prosperity - Beneshea Frazier, Economic Development Director, Central Florida Regional Planning Council**

Staff Contact: *Eric Labbe, Economic Opportunity & Community Investment Director, elabbe@mywinterhaven.com*

5.D ***** AGENDA REVIEW ONLY *** Strategic Plan Presentation: Environmental Stewardship**

Staff Contact: *T. Michael Stavres, City Manager, mstavres@mywinterhaven.com*

6. DEVELOPMENTS OF NOTE

7. MINUTES

7.A **May 26, 2026, Regular City Commission Meeting Minutes**

Staff Contact: *LaTonya Harris, CMC, FCRM, City Historian & Archivist | Deputy City Clerk , lharris@mywinterhaven.com*

2026-05-26 DRAFT Regular City Commission Meeting Minutes (with Link & Attachments)

7.B **June 3, 2026, City Commission Agenda Review Session Minutes**

Staff Contact: *Vanessa Castillo, MMC, City Clerk, vcastillo@mywinterhaven.com*

2026-06-03 DRAFT Agenda Review Session Minutes (with Link)

7.C **June 8, 2026, Regular City Commission Meeting Minutes**

Staff Contact: *LaTonya Harris, CMC, FCRM, City Historian & Archivist | Deputy City Clerk , lharris@mywinterhaven.com*

2026-06-08 DRAFT Regular City Commission Meeting Minutes (with Link)

7.D **June 17, 2026, City Commission Agenda Review Session Minutes**

Staff Contact: *Vanessa Castillo, MMC, City Clerk, vcastillo@mywinterhaven.com*

2026-06-17 DRAFT Agenda Review Session Minutes (with Link)

7.E **June 22, 2026, Regular City Commission Meeting Minutes**

Staff Contact: *Vanessa Castillo, MMC, City Clerk, vcastillo@mywinterhaven.com*

2026-06-22 DRAFT Regular City Commission Meeting Minutes (with Link)

8. COMMENTS FROM THE AUDIENCE

9. ORDINANCE(S) - SECOND READING - PUBLIC HEARING

10. CONSENT AGENDA

10.A **Assignment of Physicians Partnership Developer's Agreement**

Staff Contact: *Eric Labbe, Director of Economic Opportunity and Community Investment, ELabbe@MyWinterHaven.com*

Summary - Assignment and Assumption of Lease and Contracts Agreement for Development with Physicians Partnership LLP to Coregro 550 Winter Haven, LLC
Assignment of Lease & Contracts - CoreGro 550 Winter Haven, LLC
Consent and Approval of Assignment

10.B **Peace Creek Community Development District Traffic Agreement**

Staff Contact: *Donald Nunnery, Captain, dnunnery@mywinterhaven.com*

Summary - Peace Creek Community Development District CDD Traffic Control Jurisdiction Agreement
Agreement Between The City of Winter Haven and the Peace Creek Community Development District for City exercise of Traffic Control Jurisdiction
Site Plan Approval
City of Winter Haven Standards

10.C **Authorization for Travel & Training - Florida League of Cities (FLC) Annual Conference (Yates, Mercer, Birdsong, Davis, Dollison, Carnevale, and Hill)**

Staff Contact: *T. Michael Stavres, City Manager, mstavres@mywinterhaven.com*

Summary - Travel & Training FLC 2026 Conference
2026 FLC Annual Conference

10.D **First Amendment to Utility's Developer's Agreement with Forestar (USA) Real Estate Group,**

Inc. for Harmony on Lake Eloise

Staff Contact: *Gary M. Hubbard, Water Department Director, ghubbard@mywinterhaven.com*

Summary - First Amendment to Utility Developers Agreement with Forestar USA Real Estate Group, Inc.
First Amendment to Developers Agreement, Forestar (USA) Real Estate Group, Inc.
Forestar (USA) Real Estate Group Inc - Utility Developers Agreement
Lake Eloise Drive,West,alignment

10.E **Badger Meter, Inc., (SmartCover System) Annual Maintenance Agreement Renewal**

Staff Contact: *Gary M. Hubbard, Water Department Director, ghubbard@mywinterhaven.com*

Summary - Badger Meter, Inc., (SmartCover System) Annual Maintenance Agreement Renewal
SmartCover Annual Maintenance Agreement Program
City of Winter Haven - Contract Addendum (Badger Meter)
Badger Meter Inc - Purchasing Affidavit
SmartCover Sewer Monitoring System

10.F **Water and Sewer Connection Fee and Rate Study**

Staff Contact: *Gary M. Hubbard, Water Department Director, ghubbard@mywinterhaven.com*

Summary - Water and Sewer Connection Fee and Rate Study
Water and Sewer Connection Fee and Rate Study - Raftelis
General Piggyback Purchasing Agreement - Raftelis

10.G **Wastewater Treatment Plant #3, Emergency Sludge Dewatering agreement with Synargro South, LLC**

Staff Contact: *Gary M. Hubbard , Water Department Director, ghubbard@mywinterhaven.com*

Summary - WWTP 3 Emergency Sludge Dewatering - Synagro
Synagro, Emergency Justification -WWTP #3
Synagro Proposal Mobile Centrifuge Rental (9-26-2025)

10.H **Purchase of Pipe Fittings and Materials for Lead and Copper Rule Revisions (LCRR) Compliance**

Staff Contact: *Gary M. Hubbard , Water Department Director , ghubbard@mywinterhaven.com*

Summary - Lead and Copper LCRR Pipe Fittings and Materials
Ferguson Waterworks, Bid No B602793

10.I **Cooperative Facilities Use Agreement with Polk County School Board**

Staff Contact: *Scott Eilers, Parks, Recreation, and Culture Interim Director, seilers@mywinterhaven.com*

Summary - Updated and Restated Cooperative Facilities Use Agreement with the School Board of Polk County Florida
Updated and Restated Cooperative Facilities Use Agreement

10.J **Winter Haven Public Library Unit 4 Emergency Replacement & HVAC Unit 3 Emergency Repairs**

Staff Contact: *Scott Eilers, Parks, Recreation & Culture Department Interim Director , seilers@mywinterhaven.com*

Summary - Library Emergency Justification
Emergency Justification - Library HVAC Unit 4 -Temporary Repairs
Emergency Justification - Library HVAC Unit 4 - Replacement
Emergency Justification - Library HVAC Unit 3 - Repairs

10.K **Kimley-Horn Design Services for Old Helena Road and Cypress Gardens Blvd**

Staff Contact: *Brittany Hart, Public Works Director, bhart@mywinterhaven.com*

Summary - Kimley-Horn Design Services for Old Helena Road Complete Street Project
Kimley Horn - Consulting Engineering Agreement for Old Helena Road

11. RESOLUTION(S)

11.A **R-26-19 - Adopting the 2025 Annual Lakes Report**

Staff Contact: *Dustin Everitt, Natural Resources Manager, deveritt@mywinterhaven.com*

Summary - Resolution R-26-19 2025 Annual Lakes Report
R-26-19
Exhibit 'A' -- 2025 Annual Lakes Report
Exhibit 'B' - 2025 Lakes Report in Brief

12. ORDINANCE(S) - FIRST READING

13. NEW BUSINESS

13.A **Discussion on Commissioners Compensation**

Staff Contact: *T. Michael Stavres, City Manager, mstavres@mywinterhaven.com*

Summary - Commission Compensation
Summary of compensation rates

13.B **Appointment of Legal Counsel for matters relating to Blue Line Aviation, LLC**

Staff Contact: *T. Michael Stavres, City Manager, mstavres@mywinterhaven.com*

Summary - Appointment of Legal Counsel for matters relating to Blue Line Aviation, LLC
Letter of Representation between the City of Winter Haven and Campbell Trohn Tamayo & Aranda

14. CITY COMMISSIONERS/LIAISON REPORTS

15. CITY ATTORNEY REPORT

16. CITY MANAGER REPORT

16.A **2026 Florida League of Cities (FLC) Voting Delegate Designation**

Staff Contact: *T. Michael Stavres, City Manager, mstavres@mywinterhaven.com*

Summary - Designation of Voting Delegate
2026 Florida League of Cities Annual Conference Voting Delegate Information

17. DEPUTY CITY MANAGER REPORT

18. CITY CLERK REPORT

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA

20. ADJOURNMENT

If a person decides to appeal any decision made by the Commission with respect to any matter considered at such meeting or hearing, they will need a record of the proceedings, and that, for such purpose, they may need to ensure that a verbatim record of the proceeding is made which record includes the testimony and evidence upon which the appeal is to be based (FS 286.0105). In accordance with the Americans with Disabilities Act and Florida Statutes, Section 286.26, persons with disabilities needing special accommodations to participate in this proceeding, should contact the City Clerk's Office, 451 Third Street, NW, Winter Haven, Florida 33881, in writing, not later than 48 hours prior to the

proceeding; if not in writing, then not later than four (4) days prior to the proceeding at (863) 291-5600. Vision or hearing impaired please call (800) 955-8771 for assistance.

WINTER HAVEN
THE CHAIN OF LAKES CITY

Proclamation

WHEREAS, Winter Haven, Florida is part of a global community that desires to take action to create positive environmental change; and

WHEREAS, 50 lakes are contiguous to the City of Winter Haven including the Northern and Southern Chain of Lakes; and

WHEREAS, lakes are an important part of Winter Haven's way of life, providing social, economic, and ecological benefits; and

WHEREAS, the City of Winter Haven has taken the lead in protecting and restoring water quality to its lakes; and

WHEREAS, in working towards a sustainable future for our children, we must also provide them the tools and experiences they need to solve the environmental problems of the future; and

WHEREAS, through constant and friendly communication about environmental issues, citizens will tend to be more creative, sensitive, experimental, and flexible in resolving the challenges faced; and

WHEREAS, *Lakes Appreciation Month* can draw people together in appreciation of Winter Haven's lakes and recognize the need to protect them for future generations.

NOW, THEREFORE, I, William Brian Yates, Mayor of the City of Winter Haven, Florida, do hereby recognize July 2026, as

"Lakes Appreciation Month"

in the City of Winter Haven and urge all citizens to visit a lake and consider what they can do to contribute to a healthy and sustainable future.

IN WITNESS WHEREOF, I have hereunto set my hand and cause the Seal of the City of Winter Haven, Florida, to be affixed this 13th day of July, 2026.



William B. Yates

William Brian Yates, Mayor

ATTEST:

Vanessa Castillo

Vanessa Castillo, MMC, City Clerk

WINTER HAVEN
THE CHAIN OF LAKES CITY

Proclamation

WHEREAS, *Parks and Recreation Month* has been celebrated nationally since 1985 to recognize the vital role parks and recreation services play in enhancing the quality of life for individuals, families, and communities; and

WHEREAS, the City of Winter Haven's parks, trails, lakes, facilities, and public spaces provide opportunities for recreation, education, and community connection for residents and visitors of all ages; and

WHEREAS, parks and recreation promote physical and mental well-being by encouraging active lifestyles, providing access to nature, and creating welcoming spaces where individuals and families can gather, play, and thrive; and

WHEREAS, the 2026 National Recreation and Park Association Parks and Recreation Month theme, "The Power Of," celebrates the transformative power of parks and recreation to bring people together, foster belonging, and strengthen communities; and

WHEREAS, parks and recreation contribute to Winter Haven's economic vitality, environmental stewardship, and overall quality of life; and

WHEREAS, the dedicated parks and recreation professionals, part-time staff, volunteers, instructors, and community partners who serve Winter Haven work year-round to provide safe, accessible, and high-quality programs, events, and facilities that enrich the lives of our residents.

NOW, THEREFORE, I, William Brian Yates, of the City of Winter Haven, Florida, do hereby proclaim the month of July 2026, as

"Parks and Recreation Month"

in the City of Winter Haven and encourage the entire Winter Haven community to celebrate by visiting a park, participating in a recreation program, and acknowledging the dedicated individuals who make these services possible.

IN WITNESS WHEREOF, I have hereunto set my hand and cause the Seal of the City of Winter Haven, Florida, to be affixed this 13th day of July, 2026.

William Brian Yates, Mayor

ATTEST:

Vanessa Castillo, MMC, City Clerk

WINTER HAVEN
THE CHAIN OF LAKES CITY

REGULAR CITY COMMISSION MEETING MINUTES

DATE: Tuesday, May 26, 2026, 6:00 p.m.

LOCATION: City Hall – John Fuller Auditorium
451 Third Street NW, Winter Haven, FL 33881

NOTE:
PowerPoint slides of certain agenda items were also presented during this meeting. Link to PowerPoint here:
https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:d93a3066-ba32-47fe-bf2b-0058d3229a77
A hard copy of the PowerPoint will be attached to the original signed minutes.

1. CALL TO ORDER - Mayor Yates called the regular meeting to order at 6:00 p.m.

2. ROLL CALL – LaTonya Harris, CMC, FCRM, Deputy City Clerk

Commissioners Present: Mayor William Brian Yates; Mayor Pro Tem Tracy Mercer; Commissioner Nathaniel J. Birdsong, Jr., Commissioner Clifton E. Dollison; and Commissioner Chad Davis.

Staff Present: City Manager T. Michael Stavres; Deputy City Manager Michael "M.J." Carnevale; City Attorney John Murphy; Deputy City Clerk LaTonya Harris; Assistant City Manager of Public Safety Charlie Bird; Economic Opportunity and Community Investment Director Eric Labbe; Interim Parks, Recreation and Culture Director Scott Eilers; Public Affairs and Communications Director Katrina Hill; Police Chief Vance Monroe; Fire Chief Drew Neubrand; Water Director Gary Hubbard; and Chief Financial Officer Chris Reeder.

3. INVOCATION – Rev. Callie Weber, First Presbyterian Church of Winter Haven

4. PLEDGE OF ALLEGIANCE – LaTonya Harris, CMC, FCRM, Deputy City Clerk

5. PRESENTATION(S)

A. "Community Action Month" Proclamation – Tonja Johnson, Executive Office Assistant - The Agricultural and Labor Program, Inc. (ALPI)

City Manager Stavres read aloud a proclamation declaring May 2026 as "Community Action Month" in the City of Winter Haven. Tonja Johnson, Executive Office Assistant for The Agricultural and Labor Program, Inc. (ALPI) accepted the proclamation and thanked the City and Mayor Yates.

B. "National Water Safety Month" Proclamation - Adam Butler, Aquatics Supervisor

City Manager Stavres read aloud a proclamation declaring May 2026 as "National Water Safety Month" in the City of Winter Haven. Aquatics Supervisor Adam Butler accepted the proclamation and thanked the Commission for its support. He spoke about the importance of water safety and noted that drowning is preventable, but Florida continued to lead the nation in child drowning deaths. He also shared information about child drowning statistics in Polk County and stressed the need for ongoing water safety education in the community. He highlighted the Aquatics Department efforts to promote water safety, including providing 880 swim lessons during the previous year. He said the department planned to continue expanding swim lesson opportunities and water safety education programs. He encouraged residents to use multiple layers of protection, including active supervision, swim lessons, life jackets, pool barriers, and cardiopulmonary resuscitation (CPR) training.

DRAFT

C. Chain of Lakes Park Events Update - Scott Eilers, Parks, Recreation & Culture Interim Director

City Manager Stavres introduced the presentation. Interim Parks, Recreation and Culture Director Eilers introduced Neil Duncan, Senior Sales and Events Manager for Visit Central Florida Sports.

Mr. Duncan presented the *Visit Central Florida: City of Winter Haven – Impacts of Sports Tourism* PowerPoint presentation *(see attached)* and discussed the slides in more detail. He gave an overview of the economic impact of sports tourism in Winter Haven, discussed the long-standing partnership between the City and Visit Central Florida Sports, and highlighted the recent completion of the Chain of Lakes Park baseball complex renovations. He reported that from February through April 2026, the RussMatt Central Florida Invitational generated more than $48 million in economic impact throughout Polk County, including approximately $12 million in Winter Haven. He noted that the event could not take place in Polk County without the City investment in the Chain of Lakes Park baseball facilities and reported that the Spring Games at DiamondPlex generated approximately $8 million in economic impact countywide, including about $6 million in Winter Haven.

(Commissioner Davis left the room at 6:13 p.m.)

Mr. Duncan stated that more than 100 sporting event days took place in Winter Haven during the three-month period, resulting in over 100,000 visits to the community. He added that events at the AdventHealth Fieldhouse and Conference Center, Chain of Lakes Park, and DiamondPlex generated an additional $9.3 million in economic impact. Additionally, he noted that the City's aquatic facility and Theatre Winter Haven (TWH) hosted activities during the same period, including 28 performances attended by more than 6,000 guests.

(Commissioner Davis returned at 6:15 p.m.)

He discussed efforts to connect visitors with local businesses through the Playeasy digital platform, which provided event information, local business promotions, hotel information, and visitor discounts. He reported that local businesses used the platform to prepare for increased visitor activity and cited examples of businesses benefiting from sports tourism-related traffic.

Mayor Yates asked if Winter Haven lacked hotel rooms, restaurants, or other amenities needed to support future growth in sports tourism. Mr. Duncan responded that recent hotel development and vacation rental growth had helped meet demand, but continued expansion of visitor opportunities would further benefit the community and support future growth.

City Manager Stavres noted that the combined economic impact from activities at the AdventHealth Fieldhouse, Chain of Lakes Park, and DiamondPlex totaled approximately $27 million during the reporting period. He stated that sports tourism contributed to hotel development, restaurant activity, retail sales, and local employment opportunities. He also emphasized the importance of tourist development tax funding in attracting and supporting sporting events that benefit the community.

Mr. Duncan concluded by emphasizing the importance of continued investment and reinvestment in sports facilities to maintain and grow sports tourism opportunities in Polk County and Winter Haven.

6. DEVELOPMENTS OF NOTE – None

7. MINUTES

A. April 27, 2026, Regular City Commission Meeting Minutes

B. May 6, 2026, City Commission Agenda Review Session Minutes

C. May 11, 2026, Regular City Commission Meeting Minutes

Motion by Commissioner Birdsong to approve the minutes as presented.

Motion carried 5:0.

8. COMMENTS FROM THE AUDIENCE – None

9. ORDINANCE(S) – SECOND READING – PUBLIC HEARING

A. O-26-12 - Request by Beacon Six Holdings, LLC to rezone one parcel from Mixed Use (MX) zoning district to Commercial- Highway (C-3) zoning district (2001 First Street, North)

DRAFT

City Attorney Murphy read Ordinance O-26-12 by title only and City Manager Stavres presented.

Motion by Commissioner Birdsong to approve Ordinance O-26-12 on second reading – public hearing.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Ordinance may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

B. O-26-15 - Amending Ordinance O-25-29; appropriating funds for the fiscal year ending September 30, 2026

City Attorney Murphy read Ordinance O-26-15 by title only and City Manager Stavres presented.

Motion by Commissioner Birdsong to approve Ordinance O-26-15 on second reading – public hearing.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Ordinance may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

10. CONSENT AGENDA

A. Pollard Road Water Production Facility and 4th Street East Extension, Final Design and Construction Manager at Risk Support Services (RFQ-21-24)

B. Cypresswood Water Treatment Facility, Final Design and Construction Manager at Risk Support Services (RFQ-19-21)

C. Jones Edmunds - Supplemental Engineering Services, Harmony MLS (RFQ-18-36)

D. Annual Contract - Gravity Sewer Cured-In-Place-Pipe (CIPP) Lining Services (ITB-25-30)

E. Authorization for Travel & Training: Florida Regional Councils Association (FRCA) Policy Board meeting (Birdsong)

Motion by Commissioner Birdsong to approve the entire Consent Agenda as presented.

Mayor Yates stated anyone wishing to speak to the consent agenda could come to the podium and state their name and address for the record. No one spoke for or against.

Motion carried 5:0.

11. RESOLUTION(S)

A. R-26-15 - Request by Forestar (USA) Real Estate Group Inc. to vacate a 40 to 60 foot wide north/south improved right-of-way consisting of West Lake Eloise Drive, and including a section of a Polk County "Maintained Right-of-Way" map for West Lake Eloise Drive

City Attorney Murphy read Resolution R-26-15 by title only and Economic Opportunity and Community Investment Director Labbe presented.

Motion by Mayor Pro Tem Mercer to approve Resolution R-26-15.

DRAFT

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Resolution may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

B. R-26-17 - Request by KRPC Willowbrook LLC to release the Subdivision Performance Bond and confirming acceptance of the remaining improvements, infrastructure, and dedications in favor of the City of Winter Haven for the Willowbrook North Subdivision

City Attorney Murphy read Resolution R-26-17 by title only and Director Labbe presented.

Motion by Mayor Pro Tem Mercer to approve Resolution R-26-17.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Resolution may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

12. ORDINANCE(S) - FIRST READING – None

13. NEW BUSINESS

A. Grant and Aid Application Review Committee Recommendations for FY27 Grant Awards

City Manager Stavres recognized Grant and Aid Application Review Committee (GAARC) members Tina Summerlin and Melinda Kalogridis for their service and contributions in the grant review process and presented this item as detailed in the summary sheet. He explained that if any Commissioner had a conflict of interest with an organization recommended for funding, the conflict should be disclosed and form [8B Memorandum of Voting Conflict] completed. He also said that any recommendation involving First Missionary Baptist Church would need to be voted on separately due to disclosed conflicts of interest.

Public Affairs and Communications Director Hill reported that the GAARC met twice for several hours and carefully reviewed each application, supporting documents, budgets, and prior-year reports. The GAARC recommended funding all six legacy agencies at the same levels as the previous year, except for Meals on Wheels, which received a recommended increase due to rising food costs. She noted that not all returning agencies were recommended for funding and that fewer than half of the new applicants were recommended and explained that the GAARC closely evaluated applications to ensure funding aligned with Commission priorities and community needs.

City Manager Stavres further explained that the GAARC recommended awarding $358,500 of the available $382,537 budget, leaving a balance of $24,037 and commended them for their careful review and fiscal responsibility.

Commissioner Dollison and Commissioner Birdsong disclosed conflicts of interest related to First Missionary Baptist Church. City Manager Stavres explained that all other funding recommendations could be considered together, while the church funding request would require a separate vote without participation from the affected Commissioners.

Motion by Mayor Pro Tem Mercer to approve Grant and Aid Application Review Committee Recommendations for FY27 Grant Awards for all of the agencies with the exception of the First Missionary Baptist Church

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this item could come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Discussion ensued regarding how grant funds could be used, current grant guidelines, a proposal for usage of gift cards as incentives, and distribution of cooked turkeys for a holiday feeding program.

GAARC member Summerlin thanked the Commission and said she was available to answer any questions regarding the committee process.

Mayor Yates thanked the GAARC for their service. He commented that their review process allowed more detailed evaluation of applications than could be accomplished by the Commission alone and that process had improved over the years, which could continue to be refined.

City Attorney Murphy informed the Commission that recently adopted Senate Bill 1134 would take effect on January 1, 2027, and would prohibit local governments from funding or promoting certain diversity, equity, and inclusion-related activities. He explained that grant recipients would be required to sign an attestation confirming compliance with applicable state requirements.

Commissioner Davis stated that he would vote against the funding recommendations and expressed concerns regarding accountability, oversight, and the use of taxpayer funds for administrative costs and other internal expenses. He also questioned whether some funded activities served the broader public interest and stated that he would like to review and strengthen the grant process in the future.

Motion carried 4:1 with Commissioner Davis voting no.

City Manager Stavres reminded the Commission that a separate vote was still required for the First Missionary Baptist Church funding recommendation due to the disclosed conflicts of interest.

Motion by Mayor Pro Tem Mercer to approve Grant and Aid Application Review Committee Recommendation for FY27 Grant Award for the First Missionary Baptist Church.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this item could come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 2:1 with Commissioner Davis voting no. Commissioner Birdsong and Commissioner Dollison abstained from voting and would fill out *Form 8B Memorandum of Voting Conflict (see attached).*

B. Comprehensive Agreement - Unsolicited Proposal for 292-space Parking Facility

City Manager Stavres presented this item as detailed in the summary sheet and referenced item 13C. He noted that Rick Baker and Bud Strang, members of the Public-Private Partnership (P3) unsolicited proposal team, were present at the meeting along with their legal counsel and said that they were available to answer questions and provide information regarding the proposed project.

Mayor Yates stated that he would refrain from participating in the discussion, expressing an opinion, and voting on the item due to a potential conflict of interest due to his employment with Citizens Bank and Trust. He also noted that Mayor Pro Tem Mercer would sign any required official documents related to the item, regardless of whether the item was approved or denied.

Motion by Commissioner Birdsong to approve Comprehensive Agreement - Unsolicited Proposal for 292-space Parking Facility

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this item could come to the podium and state their name and address for the record. No one spoke for or against.

City Attorney Murphy provided additional information for the record regarding the comprehensive agreement and the City obligations related to the property. He explained that the agreement included a 120-day land inspection period for the City, which would occur at the same time that the private partner worked to obtain permits and construction plan approvals. If the City terminated the agreement during the 120-day land inspection period due to previously disclosed property conditions or new findings, the City could be responsible for certain costs associated with long lead-time materials and equipment ordered by or on behalf of Six/Ten LLC and/or Urban Action LLC to maintain the project cost. He noted that the potential exposure could be up to approximately $1.56 million, but only under specific circumstances. He further explained that environmental reviews had already been conducted

by an environmental consultant on behalf of the current property owner and that additional due diligence would be completed by the City consultant, Kimley-Horn. He stated that a cooperation agreement with Urban Action, LLC would be required before the City would be required to close on the purchase of the Project. He said that it is intended for Urban Action, LLC to remain and be responsible for any future environmental cleanup and closure costs associated with current known environmental conditions, and compliance with existing site access agreement requirements established through the FDEP environmental program associated with the property on which the parking garage is to be built in the referenced yet to be negotiated cooperation agreement. He also noted that because Urban Action, LLC owned additional adjacent property, monitoring wells might need to remain or be installed on that property as part of the environmental closure process. He emphasized that those responsibilities would remain with the property owner and not the City. Finally, he noted that legal counsel for Urban Action, LLC and Six/Ten, LLC was present at the meeting to provide any additional clarification if needed.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Discussion ensued regarding if there would be cost savings, lower cost per parking space, a 2022 report of projected higher costs if the City constructed a garage on its own, and that the proposed garage would be constructed quicker.

Motion carried 4:0 with Mayor Yates abstaining from voting and would fill out *Form 8B Memorandum of Voting Conflict* (see attached).

C. Task Order with Kimley Horn for Magnolia Parking Garage Owners Representative and Technical Advisor Services

Deputy City Manager Carnevale presented this item as detailed in the summary sheet.

Mayor Yates stated that he would refrain from participating in the discussion, expressing an opinion, and voting on the item due to a potential conflict of interest as noted for item 13 B above.

Motion by Commissioner Birdsong to approve Task Order with Kimley Horn for Magnolia Parking Garage Owners Representative and Technical Advisor Services

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this item could come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 4:0 with Mayor Yates abstaining from voting and would fill out *Form 8B Memorandum of Voting Conflict (see attached).*

14. CITY COMMISSIONERS/LIAISON REPORTS

Commissioner Davis reported on/attended the following:

- 2026 Federal Legislative Advocacy Trip, Washington, DC
- 2026 Auburndale High School Graduation
- 2026 Lake Region High School Graduation
- 2026 George Jenkins High School Graduation
- 2026 Winter Haven High School Graduation
- D.A.R.E. (Drug Abuse Resistance Education) Graduation
- 2026 Public Safety Leadership Council Class Graduation Ceremony
- Cypress Gardens Water Ski Show
- Winter Haven Chamber of Commerce Monthly Membership Luncheon Featuring: Melony Bell, Polk County Supervisor of Elections

Commissioner Davis requested that Commissioner compensation be placed on a future Regular City Commission Meeting agenda for discussion and not for specific salary adjustment language to be prepared at that time. He explained that the discussion would provide an opportunity for public input and allow the Commission to consider the matter before taking any further action.

City Attorney Murphy explained that the Mayor had indicated a preference for the Commission to consider a motion to place the topic on a future agenda for discussion and then provide further direction, if appropriate.

Motion by Commissioner Davis to add the Commission salary as a discussion item on a future Regular City Commission Meeting agenda

Discussion ensued regarding the date. Commissioner Davis requested it occur in the near future so it could be considered as part of ongoing budget discussions.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this item could come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Mayor Yates commented about the City being behind other municipalities in the County. He expressed concern about financial uncertainties and potential future legislative changes. He stated that he had never sought public office for financial gain and viewed serving the residents of Winter Haven as an honor. Although he acknowledged that Commission compensation may be lower than in other cities, he said he did not believe it was the right time to move forward with that discussion.

Commissioner Davis responded that Commission compensation had not been reviewed since approximately 2009 and stated that he was not proposing a major increase. He said the purpose of the discussion was to compare Winter Haven compensation levels with those of other municipalities in Polk County and evaluate whether they remained appropriate. He also noted that serving on the Commission required a significant time commitment and emphasized the importance of ensuring that commissioner compensation remained within a reasonable range compared to other cities, particularly as the community continued to grow and the demands on elected officials increased.

Motion carried 3:2 with Mayor Yates and Mayor Pro Tem Mercer voting no.

City Manager Stavres informed that it would be scheduled prior to budget discussions.

Commissioner Dollison reported on/attended the following:

- 2026 Federal Legislative Advocacy Trip, Washington, DC
- Emergency Medical Services (EMS) Appreciation Cookout
- Winter Haven Chamber of Commerce Monthly Membership Luncheon Featuring: Melony Bell, Polk County Supervisor of Elections

Commissioner Birdsong reported on/attended the following:

- 2026 Federal Legislative Advocacy Trip, Washington, DC
- 2026 Public Safety Leadership Council Class Graduation Ceremony
- EMS Appreciation Cookout
- 2026 Winter Haven High School Graduation
- Polk Regional Water Cooperative (PRWC) Board of Directors Meeting: sharing information discussed on potential reduction in expenses for the City for the agreement.

Mayor Pro Tem Mercer reported on/attended the following:

- 2026 Federal Legislative Advocacy Trip, Washington, DC
- 2026 Public Safety Leadership Council Class Graduation Ceremony
- 2026 Winter Haven High School Graduation
- EMS Appreciation Cookout

Mayor Yates reported on/attended the following:

- 2026 Federal Legislative Advocacy Trip, Washington, DC
- D.A.R.E. (Drug Abuse Resistance Education) Graduation
- 2026 Lake Region High School Graduation
- 2026 Winter Haven High School Graduation
- 2026 Public Safety Leadership Council Class Graduation Ceremony

15. CITY ATTORNEY REPORT – None

16. CITY MANAGER REPORT

City Manager reported the following:

- Thanked Director Hill for her outstanding work on the Grant and Aid Program and noted that the second GAARC meeting took place shortly after their return from Washington, D.C., making it a significant workload.
- Recognized Deputy City Manager Carnevale for helping coordinate the 2026 Federal Legislative Advocacy trip and commended both him and Director Hill for their efforts and dedication.

DRAFT

- The State budget had been released and was expected to be voted on by the Legislature on Friday before being sent to Governor Ron DeSantis for review and any potential vetoes. He noted that funding for Willowbrook Road in the amount of $450,000 was included in the budget. He also reported that the Florida Citrus Building was not included and said the City would work with the local legislative delegation to pursue the request again next year. He added that the City would continue monitoring the budget process and any actions taken by the Governor.
- Third Street NW construction project had officially begun and was moving quickly, with Tucker Paving completing major demolition work on sidewalks and curbs on the first day. The City had implemented a strong public outreach campaign to help residents navigate the area and confirmed that the closure affected only Third Street NW from Avenue D NW to the Senior Center, with access to all City facilities remaining available. He noted that the project was expected to be completed in February 2027 and said additional traffic and event coordination information related to the *Rockin' Freedom Fest* would be presented at the June 3, 2026, Agenda Review Session Meeting.
- Thanked everyone who attended the EMS cookout and recognized Safe Neighborhoods Director Tanya Ayers and Assistant City Manager of Public Safety Bird on their involvement with the Public Safety Leadership Council.
- He, along with Deputy City Manager Carnevale and Director Hill would be attending the Florida City and County Management Association (FCCMA) May 27, 2026 through May 29, 2026. He noted that a team member would be designated as a point of contact.

Mayor Yates asked if there was a potential third session in Tallahassee update. City Manager Stavres said that there had been no set date or confirmed topic list yet and that the Governor had held a press conference in Brevard County the previous week and commented on the matter. He expected further information, although details remained unclear.

17. DEPUTY CITY MANAGER REPORT – None

18. DEPUTY CITY CLERK REPORT

Mayor Yates thanked Deputy City Clerk Harris for filling in for the City Clerk Vanessa Castillo and said she did a great job.

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA – None

20. ADJOURNMENT – 7:32 p.m.

ATTEST:

LaTonya Harris, CMC, FCRM
Deputy City Clerk

CITY OF WINTER HAVEN, FLORIDA

William Brian Yates
Mayor

DRAFT

FORM 8B MEMORANDUM OF VOTING CONFLICT FOR COUNTY, MUNICIPAL, AND OTHER LOCAL PUBLIC OFFICERS

LAST NAME—FIRST NAME—MIDDLE NAME	NAME OF BOARD, COUNCIL, COMMISSION, AUTHORITY, OR COMMITTEE
Birdsong, Jr., Nathaniel J.	Regular City Commission
MAILING ADDRESS 451 Third St NW	THE BOARD, COUNCIL, COMMISSION, AUTHORITY OR COMMITTEE ON WHICH I SERVE IS A UNIT OF: ☒ CITY ☐ COUNTY ☐ OTHER LOCAL AGENCY
CITY Winter Haven COUNTY Polk	NAME OF POLITICAL SUBDIVISION: City of Winter Haven
DATE ON WHICH VOTE OCCURRED May 21, 2026	MY POSITION IS: ☒ ELECTIVE ☐ APPOINTIVE

WHO MUST FILE FORM 8B

This form is for use by any person serving at the county, city, or other local level of government on an appointed or elected board, council, commission, authority, or committee. It applies to members of advisory and non-advisory bodies who are presented with a voting conflict of interest under Section 112.3143, Florida Statutes.

Your responsibilities under the law when faced with voting on a measure in which you have a conflict of interest will vary greatly depending on whether you hold an elective or appointive position. For this reason, please pay close attention to the instructions on this form before completing and filing the form.

INSTRUCTIONS FOR COMPLIANCE WITH SECTION 112.3143, FLORIDA STATUTES

A person holding elective or appointive county, municipal, or other local public office MUST ABSTAIN from voting on a measure which would inure to his or her special private gain or loss. Each elected or appointed local officer also MUST ABSTAIN from knowingly voting on a measure which would inure to the special gain or loss of a principal (other than a government agency) by whom he or she is retained (including the parent, subsidiary, or sibling organization of a principal by which he or she is retained); to the special private gain or loss of a relative; or to the special private gain or loss of a business associate. Commissioners of community redevelopment agencies (CRAs) under Sec. 163.356 or 163.357, F.S., and officers of independent special tax districts elected on a one-acre, one-vote basis are not prohibited from voting in that capacity.

For purposes of this law, a "relative" includes only the officer's father, mother, son, daughter, husband, wife, brother, sister, father-in-law, mother-in-law, son-in-law, and daughter-in-law. A "business associate" means any person or entity engaged in or carrying on a business enterprise with the officer as a partner, joint venturer, coowner of property, or corporate shareholder (where the shares of the corporation are not listed on any national or regional stock exchange).

* * * * * * * * * * * * * * * * *

ELECTED OFFICERS:

In addition to abstaining from voting in the situations described above, you must disclose the conflict:

PRIOR TO THE VOTE BEING TAKEN by publicly stating to the assembly the nature of your interest in the measure on which you are abstaining from voting; *and*

WITHIN 15 DAYS AFTER THE VOTE OCCURS by completing and filing this form with the person responsible for recording the minutes of the meeting, who should incorporate the form in the minutes.

* * * * * * * * * * * * * * * * *

APPOINTED OFFICERS:

Although you must abstain from voting in the situations described above, you are not prohibited by Section 112.3143 from otherwise participating in these matters. However, you must disclose the nature of the conflict before making any attempt to influence the decision, whether orally or in writing and whether made by you or at your direction.

IF YOU INTEND TO MAKE ANY ATTEMPT TO INFLUENCE THE DECISION PRIOR TO THE MEETING AT WHICH THE VOTE WILL BE TAKEN:

- You must complete and file this form (before making any attempt to influence the decision) with the person responsible for recording the minutes of the meeting, who will incorporate the form in the minutes. (Continued on page 2)

APPOINTED OFFICERS (continued)

- A copy of the form must be provided immediately to the other members of the agency.
- The form must be read publicly at the next meeting after the form is filed.

IF YOU MAKE NO ATTEMPT TO INFLUENCE THE DECISION EXCEPT BY DISCUSSION AT THE MEETING:

- You must disclose orally the nature of your conflict in the measure before participating.
- You must complete the form and file it within 15 days after the vote occurs with the person responsible for recording the minutes of the meeting, who must incorporate the form in the minutes. A copy of the form must be provided immediately to the other members of the agency, and the form must be read publicly at the next meeting after the form is filed.

DISCLOSURE OF LOCAL OFFICER'S INTEREST

I, Nathaniel J. Birdsong, Jr., hereby disclose that on May 26, _____, 20 26 :

(a) A measure came or will come before my agency which (check one or more)

___ inured to my special private gain or loss;

___ inured to the special gain or loss of my business associate, _____ ;

___ inured to the special gain or loss of my relative, _____ ;

___ inured to the special gain or loss of _____, by whom I am retained; or

___ inured to the special gain or loss of _____, which is the parent subsidiary, or sibling organization or subsidiary of a principal which has retained me.

(b) The measure before my agency and the nature of my conflicting interest in the measure is as follows:

Item 13A under New Business on agenda

If disclosure of specific information would violate confidentiality or privilege pursuant to law or rules governing attorneys, a public officer, who is also an attorney, may comply with the disclosure requirements of this section by disclosing the nature of the interest in such a way as to provide the public with notice of the conflict.

5-26-26
Date Filed

Nathaniel J. Birdsong, Jr.
Signature

NOTICE: UNDER PROVISIONS OF FLORIDA STATUTES §112.317, A FAILURE TO MAKE ANY REQUIRED DISCLOSURE CONSTITUTES GROUNDS FOR AND MAY BE PUNISHED BY ONE OR MORE OF THE FOLLOWING: IMPEACHMENT, REMOVAL OR SUSPENSION FROM OFFICE OR EMPLOYMENT, DEMOTION, REDUCTION IN SALARY, REPRIMAND, OR A CIVIL PENALTY NOT TO EXCEED $10,000.

CE FORM 8B - EFF. 11/2013
Adopted by reference in Rule 34-7.010(1)(f), F.A.C.

FORM 8B MEMORANDUM OF VOTING CONFLICT FOR COUNTY, MUNICIPAL, AND OTHER LOCAL PUBLIC OFFICERS

LAST NAME—FIRST NAME—MIDDLE NAME	NAME OF BOARD, COUNCIL, COMMISSION, AUTHORITY, OR COMMITTEE
Dollison Clifton. E,	City Commission
MAILING ADDRESS	THE BOARD, COUNCIL, COMMISSION, AUTHORITY OR COMMITTEE ON WHICH I SERVE IS A UNIT OF:
2010 Buckeye Rd Winter Haven	☑ CITY ☐ COUNTY ☐ OTHER LOCAL AGENCY
CITY / COUNTY	NAME OF POLITICAL SUBDIVISION:
Winter Haven / Polk	City of Winter Haven
DATE ON WHICH VOTE OCCURRED	MY POSITION IS:
5/24/2024	☒ ELECTIVE ☐ APPOINTIVE

WHO MUST FILE FORM 8B

This form is for use by any person serving at the county, city, or other local level of government on an appointed or elected board, council, commission, authority, or committee. It applies to members of advisory and non-advisory bodies who are presented with a voting conflict of interest under Section 112.3143, Florida Statutes.

Your responsibilities under the law when faced with voting on a measure in which you have a conflict of interest will vary greatly depending on whether you hold an elective or appointive position. For this reason, please pay close attention to the instructions on this form before completing and filing the form.

INSTRUCTIONS FOR COMPLIANCE WITH SECTION 112.3143, FLORIDA STATUTES

A person holding elective or appointive county, municipal, or other local public office MUST ABSTAIN from voting on a measure which would inure to his or her special private gain or loss. Each elected or appointed local officer also MUST ABSTAIN from knowingly voting on a measure which would inure to the special gain or loss of a principal (other than a government agency) by whom he or she is retained (including the parent, subsidiary, or sibling organization of a principal by which he or she is retained); to the special private gain or loss of a relative; or to the special private gain or loss of a business associate. Commissioners of community redevelopment agencies (CRAs) under Sec. 163.356 or 163.357, F.S., and officers of independent special tax districts elected on a one-acre, one-vote basis are not prohibited from voting in that capacity.

For purposes of this law, a "relative" includes only the officer's father, mother, son, daughter, husband, wife, brother, sister, father-in-law, mother-in-law, son-in-law, and daughter-in-law. A "business associate" means any person or entity engaged in or carrying on a business enterprise with the officer as a partner, joint venturer, coowner of property, or corporate shareholder (where the shares of the corporation are not listed on any national or regional stock exchange).

* * * * * * * * * * * * * * * * *

ELECTED OFFICERS:

In addition to abstaining from voting in the situations described above, you must disclose the conflict:

PRIOR TO THE VOTE BEING TAKEN by publicly stating to the assembly the nature of your interest in the measure on which you are abstaining from voting; *and*

WITHIN 15 DAYS AFTER THE VOTE OCCURS by completing and filing this form with the person responsible for recording the minutes of the meeting, who should incorporate the form in the minutes.

* * * * * * * * * * * * * * * * *

APPOINTED OFFICERS:

Although you must abstain from voting in the situations described above, you are not prohibited by Section 112.3143 from otherwise participating in these matters. However, you must disclose the nature of the conflict before making any attempt to influence the decision, whether orally or in writing and whether made by you or at your direction.

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APPOINTED OFFICERS (continued)

- A copy of the form must be provided immediately to the other members of the agency.
- The form must be read publicly at the next meeting after the form is filed.

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DISCLOSURE OF LOCAL OFFICER'S INTEREST

I, Clifton E. Dollison, hereby disclose that on May 26, 2026:

(a) A measure came or will come before my agency which (check one or more)

___ inured to my special private gain or loss;

___ inured to the special gain or loss of my business associate, _____;

___ inured to the special gain or loss of my relative, _____;

___ inured to the special gain or loss of _____, by whom I am retained; or

___ inured to the special gain or loss of _____, which is the parent subsidiary, or sibling organization or subsidiary of a principal which has retained me.

(b) The measure before my agency and the nature of my conflicting interest in the measure is as follows:

Item 13A under New Business on agenda

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5/26/2026
Date Filed

Signature

NOTICE: UNDER PROVISIONS OF FLORIDA STATUTES §112.317, A FAILURE TO MAKE ANY REQUIRED DISCLOSURE CONSTITUTES GROUNDS FOR AND MAY BE PUNISHED BY ONE OR MORE OF THE FOLLOWING: IMPEACHMENT, REMOVAL OR SUSPENSION FROM OFFICE OR EMPLOYMENT, DEMOTION, REDUCTION IN SALARY, REPRIMAND, OR A CIVIL PENALTY NOT TO EXCEED $10,000.

CE FORM 8B - EFF. 11/2013
Adopted by reference in Rule 34-7.010(1)(f), F.A.C.

FORM 8B MEMORANDUM OF VOTING CONFLICT FOR COUNTY, MUNICIPAL, AND OTHER LOCAL PUBLIC OFFICERS

LAST NAME—FIRST NAME—MIDDLE NAME	NAME OF BOARD, COUNCIL, COMMISSION, AUTHORITY, OR COMMITTEE
Yates, William, Brian	Winter Haven City Commission
MAILING ADDRESS	THE BOARD, COUNCIL, COMMISSION, AUTHORITY OR COMMITTEE ON WHICH I SERVE IS A UNIT OF:
451 Third St NW	☑ CITY ☐ COUNTY ☐ OTHER LOCAL AGENCY
CITY / COUNTY	NAME OF POLITICAL SUBDIVISION:
Winter Haven / Polk	City of Winter Haven
DATE ON WHICH VOTE OCCURRED	MY POSITION IS:
May 26, 2026	☑ ELECTIVE ☐ APPOINTIVE

WHO MUST FILE FORM 8B

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For purposes of this law, a "relative" includes only the officer's father, mother, son, daughter, husband, wife, brother, sister, father-in-law, mother-in-law, son-in-law, and daughter-in-law. A "business associate" means any person or entity engaged in or carrying on a business enterprise with the officer as a partner, joint venturer, coowner of property, or corporate shareholder (where the shares of the corporation are not listed on any national or regional stock exchange).

* * * * * * * * * * * * * * * * *

ELECTED OFFICERS:

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PRIOR TO THE VOTE BEING TAKEN by publicly stating to the assembly the nature of your interest in the measure on which you are abstaining from voting; *and*

WITHIN 15 DAYS AFTER THE VOTE OCCURS by completing and filing this form with the person responsible for recording the minutes of the meeting, who should incorporate the form in the minutes.

* * * * * * * * * * * * * * * * *

APPOINTED OFFICERS:

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APPOINTED OFFICERS (continued)

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DISCLOSURE OF LOCAL OFFICER'S INTEREST

I, William B. Yates, hereby disclose that on May 26, 20 26:

(a) A measure came or will come before my agency which (check one or more)

___ inured to my special private gain or loss;

___ inured to the special gain or loss of my business associate, _____;

___ inured to the special gain or loss of my relative, _____;

___ inured to the special gain or loss of _____, by whom I am retained; or

___ inured to the special gain or loss of _____, which is the parent subsidiary, or sibling organization or subsidiary of a principal which has retained me.

(b) The measure before my agency and the nature of my conflicting interest in the measure is as follows:

Item 13B under New Business on agenda

If disclosure of specific information would violate confidentiality or privilege pursuant to law or rules governing attorneys, a public officer, who is also an attorney, may comply with the disclosure requirements of this section by disclosing the nature of the interest in such a way as to provide the public with notice of the conflict.

May 26, 2026
Date Filed

Wm B. Yates
Signature

NOTICE: UNDER PROVISIONS OF FLORIDA STATUTES §112.317, A FAILURE TO MAKE ANY REQUIRED DISCLOSURE CONSTITUTES GROUNDS FOR AND MAY BE PUNISHED BY ONE OR MORE OF THE FOLLOWING: IMPEACHMENT, REMOVAL OR SUSPENSION FROM OFFICE OR EMPLOYMENT, DEMOTION, REDUCTION IN SALARY, REPRIMAND, OR A CIVIL PENALTY NOT TO EXCEED $10,000.

FORM 8B MEMORANDUM OF VOTING CONFLICT FOR COUNTY, MUNICIPAL, AND OTHER LOCAL PUBLIC OFFICERS

LAST NAME—FIRST NAME—MIDDLE NAME	NAME OF BOARD, COUNCIL, COMMISSION, AUTHORITY, OR COMMITTEE
Yates William Brian	Winter Haven City Commission
MAILING ADDRESS: 451 Third St NW	THE BOARD, COUNCIL, COMMISSION, AUTHORITY OR COMMITTEE ON WHICH I SERVE IS A UNIT OF: ☑ CITY ☐ COUNTY ☐ OTHER LOCAL AGENCY
CITY: Winter Haven COUNTY: Polk	NAME OF POLITICAL SUBDIVISION: City of Winter Haven
DATE ON WHICH VOTE OCCURRED: May 26, 2016	MY POSITION IS: ☑ ELECTIVE ☐ APPOINTIVE

WHO MUST FILE FORM 8B

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* * * * * * * * * * * * * * * * *

ELECTED OFFICERS:

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WITHIN 15 DAYS AFTER THE VOTE OCCURS by completing and filing this form with the person responsible for recording the minutes of the meeting, who should incorporate the form in the minutes.

* * * * * * * * * * * * * * * * *

APPOINTED OFFICERS:

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APPOINTED OFFICERS (continued)

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- The form must be read publicly at the next meeting after the form is filed.

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DISCLOSURE OF LOCAL OFFICER'S INTEREST

I, William B. Yates, hereby disclose that on May 26, 20 26:

(a) A measure came or will come before my agency which (check one or more)

___ inured to my special private gain or loss;

___ inured to the special gain or loss of my business associate, _____;

___ inured to the special gain or loss of my relative, _____;

___ inured to the special gain or loss of _____, by whom I am retained; or

___ inured to the special gain or loss of _____, which is the parent subsidiary, or sibling organization or subsidiary of a principal which has retained me.

(b) The measure before my agency and the nature of my conflicting interest in the measure is as follows:

Item 13C under New Business on agenda

If disclosure of specific information would violate confidentiality or privilege pursuant to law or rules governing attorneys, a public officer, who is also an attorney, may comply with the disclosure requirements of this section by disclosing the nature of the interest in such a way as to provide the public with notice of the conflict.

May 26, 2026
Date Filed

William B. Yates
Signature

NOTICE: UNDER PROVISIONS OF FLORIDA STATUTES §112.317, A FAILURE TO MAKE ANY REQUIRED DISCLOSURE CONSTITUTES GROUNDS FOR AND MAY BE PUNISHED BY ONE OR MORE OF THE FOLLOWING: IMPEACHMENT, REMOVAL OR SUSPENSION FROM OFFICE OR EMPLOYMENT, DEMOTION, REDUCTION IN SALARY, REPRIMAND, OR A CIVIL PENALTY NOT TO EXCEED $10,000.

CE FORM 8B - EFF. 11/2013
Adopted by reference in Rule 34-7.010(1)(f), F.A.C.

WINTER HAVEN
THE CHAIN OF LAKES CITY

CITY COMMISSION AGENDA REVIEW SESSION MINUTES

DATE: Wednesday, June 3, 2026, 5:30 p.m.

LOCATION: City Hall – John Fuller Auditorium
451 Third Street NW, Winter Haven, FL 33881

NOTE
PowerPoint slides of certain agenda items were also presented during this meeting. Link to PowerPoint here:
https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:b9e02253-faec-4727-8f56-995a0fe85a8e
A hard copy of the PowerPoint will be attached to the original signed minutes.

1. CALL TO ORDER – Mayor Pro Tem Mercer called the agenda review session meeting to order at 5:30 p.m.

2. ROLL CALL – Vanessa Castillo, MMC, City Clerk

Commissioners Present: Mayor Pro Tem Tracy Mercer; Commissioner Nathaniel J. Birdsong, Jr.; Commissioner Clifton E. Dollison; and Commissioner Chad Davis.

Absent: Mayor Brian Yates

Staff Present: Deputy City Manager Michael "M.J." Carnevale; City Attorney John Murphy; City Clerk Vanessa Castillo; Assistant City Manager of Public Safety Charlie Bird; Economic Opportunity and Community Investment Director Eric Labbe; Public Works Director Brittany Hart; Public Affairs and Communications Director Katrina Hill; Fire Chief Drew Neubrand; Water Director Gary Hubbard; and Interim Parks, Recreation and Culture Director Scott Eilers.

5. PRESENTATION(S)

A. "America 250!" Proclamation - Laura Stokes, Ponce de Leon Chapter Regent - Daughters of the American Revolution (DAR)

B. "Juneteenth Day" Proclamation - 2026 Juneteenth Planning Committee

C. Waste and Recycle Workers Week 2026 Proclamation - Clyde Carson, Solid Waste Superintendent

Mayor Pro Tem Mercer said items 5A, 5B and 5C would be presented at the June 8, 2026, Regular City Commission Meeting.

There were no questions or discussion.

D. * AGENDA REVIEW ONLY *** Strategic Plan Presentation: Quality of Life**

(Note: This item was discussed after Item 11B.)

Deputy City Manager Carnevale reminded the Commission that staff presented a Strategic Pillar every month, went over the elements included for Quality of Life, and gave an overview of what would be presented for this item. PowerPoint slides accompany these presentations (*see attached*)

DRAFT

Kindergarten Swim Program

Recreation Supervisor Chase Hogue reported that the City provided nearly 900 swim lessons through the American Red Cross Learn-to-Swim Program this year. She highlighted a new partnership with Polk County Public Schools that provided water safety education and swim lessons to 92 kindergarten students from Jewett School of the Arts and Snively Elementary School. She said many students gained confidence in the water, and staff were working to expand the program to serve more schools and students in the future.

Summer Camp

Recreation Supervisor Tanisha Duncan reported that Camp Off the Chain expanded from serving 280 campers to 340 campers this year across four locations, including a new site at Lake Shipp Elementary School. The camp, which runs from June 1 through July 24 Monday through Friday from 7:30 a.m. to 5:50 p.m., included swimming twice a week, a weekly field trip, and a volunteer program for teens. She also highlighted partnerships that provide activities, a week-long basketball skills camp hosted by [former professional basketball player in the National Basketball Association] Otis Birdsong, and free meals for campers and youth under age 18 through the Polk County School Board's summer feeding program.

Carillon Bell Tower

Project Lead Katie White shared an update on the Carillon Bell Tower in South Central Park. She explained that longtime resident Tom Oldt donated about $360,000 for the project as a gift to the community and to create a unique downtown attraction. The 24-foot steel tower, installed in April, includes 23 bronze bells cast in the Netherlands and is programmed to ring on the hour and play songs throughout the day. She said staff were completing the site work, receiving training on the system, and planning a ribbon-cutting and concert in the fall.

America 250 & Rockin' Freedom Fest

Public Affairs and Communication Hill shared plans for the City's *America 250* celebration and enhanced Fourth of July festivities. She said the City created themed shirts and hats for staff, and there would be banners and bunting to promote the celebration and create a festive atmosphere downtown. She highlighted plans for *Rockin' Freedom Fest*, which includes live music, activities honoring veterans, fun audience participation activities, giveaways, food vendors, a water ski show by the Cypress Gardens Water Ski Team, and a more robust fireworks finale. Staff is also working on parking, a shuttle service, and inclement weather plans to help visitors safely attend the event.

Commissioner Dollison asked how many people were expected to attend. He noted that the event was already crowded and that the City's growth could create additional traffic and parking challenges. Assistant City Manager of Public Safety Bird said staff estimated attendance at around 5,000 people, but expected it could draw an even larger crowd and were planning accordingly. Discussion ensued.

Commissioner Dollison inquired about summer camp costs and enrollment. Recreation Supervisor Duncan explained that the cost for the eight-week program was $150 for City residents and $300 for non-City residents. All spaces were filled by City residents, so no non-city residents were enrolled.

Commissioner Dollison asked how many were enrolled at the new Winter Haven Recreation and Cultural Center. Recreation Supervisor Duncan said 100 campers. Deputy City Manager Carnevale noted that summer camp was already underway and Recreation Supervisor Duncan shared that campers were visiting Fun Spot that week.

Mayor Pro Tem Mercer asked about restarting the Kiwanis Every Child a Swimmer program. Recreation Supervisor Hogue said she had been working with Dave Browns from Kiwanis who in March brought children to the pool so new instructors could gain teaching experience while providing swim lessons to the children.

Commissioner Dollison asked if the City planned to promote the Carillon Bell Tower as a unique destination and asked about its completion timeline. Project Lead Katie White and Deputy City Manager Carnevale said the project was expected to be completed within the next few weeks, after which promotional efforts would begin, and a formal dedication and outdoor concert were being planned for the fall in line with Mr. Oldt's wishes and nicer weather.

6. DEVELOPMENTS OF NOTE – None

7. MINUTES - None

8. COMMENTS FROM THE AUDIENCE - None

9. ORDINANCE(S) – SECOND READING – PUBLIC HEARING - None

10. CONSENT AGENDA

A. Agreement for Transfer of Public Roads - Avenue K SW from 6th Street SW to 3rd Street SW

Public Works Director Hart gave an overview of this item.

There were no questions or discussion.

B. ITB-26-15 - Roosevelt Drive Complete Street Project - LAP - Award of Contract to Ajax Paving Industries of Florida, LLC

Assistant Public Works Director Todd Gooding gave an overview of this item.

Deputy City Manager Carnevale said the project was a good example of partnering with the state, where the City's share of roadway improvements was about $7,000 while the state contributed about $1.2 million. He added that this approach also allowed the City to complete utility improvements alongside the roadway work.

There were no questions or discussion.

C. Purchase of Autocar ACX64 with 28-yard Heil Half Pack Front-End Refuse Body for Commercial Solid Waste Collection

Public Works Director Hart gave an overview of this item.

Commissioner Birdsong inquired if the units being replaced would be sold. Director Hart said they would be auctioned and proceeds would be used to help fund future commercial vehicle replacements.

D. Developer's Agreement - Dewdney Plaza 2

Economic Opportunity and Community Investment Director Labbe gave an overview of this item.

There were no questions or discussion.

E. Planning Commission Membership - Recommendation for six (6) reappointments and one (1) appointment

Economic Opportunity and Community Investment Director Labbe gave an overview of this item.

There were no questions or discussion.

F. Willowbrook Golf Course Equipment Purchases

Parks and Grounds, Cemetery and Athletics Superintendent Steve Pruitt gave an overview of this item.

There were no questions or discussion.

G. RFQ-24-18 - Water Resource Facility at Pollard Road, Task Order #2

Water Director Hubbard gave an overview of this item.

There were no questions or discussion.

H. East Winter Haven Aquifer Recharge and Wetland Restoration, Consulting Design Services

Water Director Hubbard gave an overview of this item.

Matt Stahman, Director at Resource Environmental Solutions, LLC (RES), gave an *East Winter Haven Aquifer Recharge and Wetlands Restoration Project Technical Suitability Report Overview* PowerPoint presentation *(see link/attached)* and provided an update on the Sapphire Necklace Project, explaining that the project would improve water supply resilience, provide flood and stormwater storage, create wildlife habitat, and offer recreational and ecotourism opportunities. He said the initial Bradco Farms Project had nearly completed its alternative analysis and preliminary engineering reports and they were ready to move into the design phase.

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Angel Wynn, Senior Project Manager at RES, reviewed three proposed project tasks, including the design and construction of a waterline and wellhead system, preliminary design and permitting of the wetland and aquifer recharge system, and boundary surveys and environmental assessments needed to finalize the project area and continue planning efforts.

T.J. LaRoue, Lead Engineer at RES, said project studies showed that water from the Peace Creek Drainage Canal and reclaimed water could be used to support the project. He explained that water would be routed to the center of the site, where the aquifer recharge well was planned, helping the system meet its goal of recharging an average of 2 million gallons of water per day. The design included recreation opportunities, flood protection features, and wetlands that would receive water to stay healthy year-round.

Mr. Stahman shared slides with conceptual images, from a student, showing what the project could look like when completed. He said several project partners would help with the next phase, including landscape design, water quality treatment, construction planning, and habitat design as the project moved forward.

Director Hubbard said the updated project included the Muncy and King properties, which helped the design better match the original vision and provide greater benefits to residents. He noted the City would return later in the fiscal year to seek approval to purchase the Muncy property and obtain an easement over the King property.

Deputy City Manager Carnevale noted that while the total cost of the proposed task orders was about $4.2 million, grant funding and private contributions reduced the City's share to about $1.3 million. He said the project was another example of leveraging local funds with state and private funding to bring improvements to the community.

Mayor Pro Tem Mercer asked about a structure shown on the project map. Director Hubbard clarified it was a pump used to move water between areas. He added that the utility complex nearby would connect closely to the project and said construction is expected to begin around mid-2027, with the recharge well already being drilled and progress moving forward.

I. Auburndale - Polk Regional Water Cooperative Receiving Facility

Winter Haven Water Director Hubbard gave an overview of this item and confirmed that it would be covered under a future reimbursement agreement potentially with the Polk Regional Water Cooperative (PRWC).

City Attorney Murphy added that a reimbursement agreement with the PRWC for utility infrastructure installed as part of the Pollard Road Extension Project was under review and that the project's estimated $2.3 million construction cost allowed the City consistent with applicable Florida law to use Dewberry as a continuing contractor, which should help streamline coordination and reimbursement efforts since the firm also served as the PRWC engineer.

11. RESOLUTION(S)

A. R-26-16 - Acceptance of easement from The Gates of Lake Region Homeowners' Association, Inc.

City Attorney Murphy gave an overview of this item.

There were no questions or discussion.

B. R-26-18 - Capital Asset Policy

Deputy City Manager Carnevale gave an overview of this item.

There were no questions or discussion.

12. ORDINANCE(S) - FIRST READING - None

13. NEW BUSINESS - None

14. CITY COMMISSIONERS/LIAISON REPORTS – None

15. CITY ATTORNEY REPORT

City Attorney Murphy reminded the Commission that, because the property tax reform proposal would appear on the November ballot, state law restricted certain publicly funded communications and expenditures related to the measure. He said staff was already reviewing guidance and would remain mindful of the required protocols and continue updating the Commission to ensure compliance.

Commissioner Davis added that elected officials could share facts about the property tax proposal and its impacts but he felt that they could not support or oppose the measure in their official roles. He encouraged everyone to exercise caution and allow voters to make the final decision.

16. CITY MANAGER REPORT – None

17. DEPUTY CITY MANAGER REPORT – None

18. CITY CLERK REPORT – None

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA – None

20. ADJOURNMENT – 6:36 p.m.

ATTEST:

_____
Vanessa Castillo, MMC
City Clerk

CITY OF WINTER HAVEN, FLORIDA

_____
L. Tracy Mercer
Mayor Pro Tem

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WINTER HAVEN
THE CHAIN OF LAKES CITY

REGULAR CITY COMMISSION MEETING MINUTES

DATE: Monday, June 8, 2026, 6:00 p.m.

LOCATION: City Hall – John Fuller Auditorium
451 Third Street NW, Winter Haven, FL 33881

NOTE:
PowerPoint slides of certain agenda items were also presented during this meeting. Link to PowerPoint here:
https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:e63e2b0d-b3d9-4a6c-95e8-f6bcd7762841
A hard copy of the PowerPoint will be attached to the original signed minutes.

1. CALL TO ORDER - Mayor Yates called the regular meeting to order at 6:09 p.m.

2. ROLL CALL – LaTonya Harris, CMC, FCRM, Deputy City Clerk

Commissioners Present: Mayor William Brian Yates.; Mayor Pro Tem Tracy Mercer; Commissioner Nathaniel J. Birdsong, Jr., Commissioner Clifton E. Dollison; and Commissioner Chad Davis.

Staff Present: City Manager T. Michael Stavres; Deputy City Manager Michael "M.J." Carnevale; City Attorney John Murphy; Deputy City Clerk LaTonya Harris; Assistant City Manager of Public Safety Charlie Bird; Public Works Director Brittany Hart; Interim Parks, Recreation and Culture Director Scott Eilers; Public Affairs and Communication Director Katrina Hill; Police Chief Vance Monroe; Fire Chief Drew Neubrand; and Chief Financial Officer Chris Reeder.

3. INVOCATION – Clifton Dollison, Commissioner

4. PLEDGE OF ALLEGIANCE – LaTonya Harris, CMC, FCRM, Deputy City Clerk

5. PRESENTATION(S)

A. "America 250!" Proclamation - Laura Stokes, Ponce de Leon Chapter Regent - Daughters of the American Revolution (DAR)

City Manager Stavres read aloud a proclamation declaring July 4, 2026 as "America 250!" in the City of Winter Haven. Laura Stokes, of the DAR, accepted the proclamation and extended an invitation to the first public reading of the Declaration of Independence on July 8, 2026 at 6:00 p.m. in Central Park [Winter Haven].

B. "Juneteenth Day" Proclamation - 2026 Juneteenth Planning Committee

City Manager Stavres read aloud a proclamation declaring June 19, 2026 as "Juneteenth Day" in the City of Winter Haven. He also recognized and congratulated Juneteenth Committee scholarship recipients Anaya Laster and Jaden Blocker. Committee member Tammi Heron accepted the proclamation, thanked the Commission, City staff and the community for their support on behalf of the 2026 Juneteenth Planning Committee and congratulated the scholarship recipients. She provided an overview of Juneteenth and invited the public to attend a celebration on June 20, 2026, from 11:00 a.m. to 4:00 p.m. Committee member Brandon Moore noted that Mr. Blocker was the great-nephew of Larry Hardaway, the first Black Attorney for the City of Winter Haven.

C. "Waste and Recycle Workers Week" Proclamation - Clyde Carson, Solid Waste Superintendent

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Deputy City Manager Carnevale read aloud a proclamation declaring the week of June 15, 2026 as "Waste and Recycling Workers Week" in the City of Winter Haven. Solid Waste Superintendent Clyde Carson accepted the proclamation and thanked the Commission for their continued support.

6. DEVELOPMENTS OF NOTE – None

7. MINUTES – None

8. COMMENTS FROM THE AUDIENCE

Jessie Skubna, 10 Lake Link Drive Southeast in Winter Haven, requested that the City consider conducting a charter review due to questions and concerns regarding City policies, including the boards and committees application process and Commission compensation. She also expressed interest in serving on a charter review committee if one were established.

Mayor Yates inquired when the next charter review was scheduled. City Manager Stavres responded that the last review occurred in 2017 and the next was scheduled for 2030.

Mayor Yates asked if a charter review would be expedited if the property tax referendum was approved in November 2026. City Manager Stavres said he could not provide guidance on that at this time, explained that the City Charter provided policy matters, Commissioner compensation to be addressed by ordinance, and noted that term limits resulted from the previous charter review. He also stated that he would provide the Commission with the prior charter review report.

Becky McLachlan, representing The Citrus Tea of Polk County, Florida, discussed the role of social media as a primary news source for many residents and expressed concern that positive community news and municipal events were not receiving sufficient coverage. She provided information about her new free community news publication and expressed her interest in partnering with the City to help inform residents.

Steve Miller, 2232 Heritage Drive in Lakeland, President of the Polk County Builders Association (PCBA), thanked the Commission for their service and commended their community involvement in local government. He requested assistance with communication regarding metered water concerns for construction projects involving the Water Department. He praised New Build Coordinator Maribel Crespo for her assistance and discussed additional costs and hardships experienced by builders.

Mayor Yates said that a City representative would obtain his contact information.

Sean Miller, 3020 South Florida Avenue, Suite 101 in Lakeland, representing Highland Homes yielded his speaking time, stating he no longer needed to address the matter and thanked the Commission.

Mayor Pro Tem Mercer suggested preset meters as a potential solution for new developments.

Ernestine Davis, 3375 South Avenue in Bartow, spoke about the need to address food insecurity among children during the summer months when school was not in session and drug-related issues in the Florence Villa community. She requested grant funding to support a summer food program, emphasized the need for timely action, and encouraged the community to also assist those in need.

9. ORDINANCE(S) – SECOND READING – PUBLIC HEARING – None

10. CONSENT AGENDA

A. Agreement for Transfer of Public Roads - Avenue K SW from 6th Street SW to 3rd Street SW

B. ITB-26-15 - Roosevelt Drive Complete Street Project - LAP - Award of Contract to Ajax Paving Industries of Florida, LLC

C. Purchase of Autocar ACX64 with 28-yard Heil Half Pack Front-End Refuse Body for Commercial Solid Waste Collection

D. Developer's Agreement - Dewdney Plaza 2

E. Planning Commission Membership - Recommendation for six (6) reappointments and one (1) appointment

F. Willowbrook Golf Course Equipment Purchases

G. RFQ-24-18 - Water Resource Facility at Pollard Road, Task Order #2

H. East Winter Haven Aquifer Recharge and Wetland Restoration, Consulting Design Services

I. Auburndale - Polk Regional Water Cooperative Receiving Facility

Motion by Commissioner Birdsong to approve the entire Consent Agenda as presented.

Mayor Yates stated anyone wishing to speak to the consent agenda could come to the podium and state their name and address for the record. No one spoke for or against.

Motion carried 5:0.

11. RESOLUTION(S)

A. R-26-16 - Acceptance of easement from The Gates of Lake Region Homeowners' Association, Inc.

City Attorney Murphy read Resolution R-26-16 by title only and City Manager Stavres presented.

Motion by Commissioner Birdsong to approve Resolution R-26-16.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Resolution may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

B. R-26-18 - Capital Asset Policy

City Attorney Murphy read Resolution R-26-18 by title only and Chief Financial Officer Reeder presented.

Motion by Commissioner Mayor Pro Tem Mercer to approve Resolution R-26-18.

Mayor Yates closed the Regular City Commission Meeting and opened a Public Hearing stating anyone wishing to speak to this Resolution may come to the podium and state their name and address for the record. No one spoke for or against.

Mayor Yates closed the Public Hearing and reopened the Regular Commission Meeting.

Motion carried 5:0.

12. ORDINANCE(S) - FIRST READING – None

13. NEW BUSINESS – None

14. CITY COMMISSIONERS/LIAISON REPORTS

Commissioner Birdsong reported on/attended the following:

- Professional Services Committee (PSC) Meeting – Oral presentations for RFQ-26-26 Design Build Services for the Utility Administration Facility, Water Education Center, and Operations Facility (Re-Bid)

City Manager Stavres noted that the item had been publicly posted with a recommendation for award and was currently within the protest period, which would remain open until the afternoon of June 11, 2026.

Commissioner Davis reported on/attended the following:

- Polk Vision Youth Leadership as a guest speaker

- Planning Commission Meeting

City Manager Stavres reported that a request for a De Novo hearing had been filed following the denial of a special use request. City Attorney Murphy explained that there were applicable code provisions, including the applicant's right to request the De Novo hearing, a 60-day timeline, public notice requirements, ability to request briefs, and scheduling of hearing dates. He said that additional information would be provided, anticipated the hearing would take place in July and recommended holding a special meeting to consider the matter. He noted that the case involved a large-scale drinking establishment and would be conducted as a quasi-judicial proceeding. He advised the Commission not to discuss the case with the applicant or others outside the hearing process and instructed that any information should be presented at the public hearing or submitted through City Staff inclusion in the official record. He also reminded the Commission to disclose any ex parte communications they may have had at the public meeting on the de novo hearing prior to a vote so they could be properly addressed and to ensure due process and a fair and impartial hearing for all parties involved.

Commissioner Davis asked if other parties that may have an opinion or be affected be considered ex parte communications. City Attorney Murphy clarified that communications with anyone other than City staff regarding the matter could constitute ex parte communications and encouraged those with opinions or concerns to present them at the public hearing.

Discussion ensued regarding disclosure of contact, reminder to avoid discussing the case outside the public hearing process, encouragement to share information at the hearing, and that De Novo hearings were quasi-judicial.

Commissioner Dollison reported on/attended the following:
- Affordable Housing Advisory Committee (AHAC) Elected Officials Region 3 Workshop: Round 11 for 2026
- AHAC Meeting
- City's Summer Camp - Otis Birdsong basketball camp

Mayor Pro Tem Mercer reported on/attended the following:
- Coastal & Heartland National Estuary Partnership (CHNEP) Policy Committee Meeting and that the City received a sediment activation grant on Lake Idyl.

Mayor Yates reported on/attended the following:
- Watched the May 26, 2026 Regular City Commission Meeting via City YouTube livestream and thanked Mayor Pro Tem Mercer for presiding in his absence.

Discussion ensued regarding statewide property tax reform and its potential impacts on local governments. City Manager Stavres shared notes from his testimony at the Senate Appropriations and House State Affairs committees, which included changes in several provisions in the proposed amendment, such as the removal of school district property taxes, a proposed trust fund, restrictions on how property tax revenues could be used, and potential reduction to City revenue. Also discussed were potential impacts on counties, special districts, and other local agencies throughout the state. Further discussion was held on the legal limitations related to public communications regarding the proposed ballot measure and clarification of the prohibitions on local government in Section 106.113, Florida Statutes which is part of Florida's Election Code. A workshop will be held to review possible budget impacts to our City.

15. CITY ATTORNEY REPORT – None

16. CITY MANAGER REPORT

City Manager Reported the following:
- Trip to Tallahassee where he provided testimony before the Senate Appropriations Committee and House State Affairs Committees.
- Ridge League of Cities (RLC) Dinner Meeting - June 11, 2026, 6:00 p.m., Davenport
- Main Street Winter Haven (MSWH) Great American Beer & Wine Tasting - June 11, 2026, 5:30 p.m., Downtown Winter Haven
- Deputy City Manager Carnevale would oversee City operations and present at the June 22, 2026, Regular City Commission Meeting during his absence
- Mayor Yates would not be in attendance at the June 22, 2026, Regular City Commission Meeting.

17. DEPUTY CITY MANAGER REPORT

Deputy City Manager reported the following:
- Update on continued efforts to establish quiet zones at rail crossings within the City. Staff was working with a specialized consultant to evaluate next steps following recent setbacks.

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18. CITY CLERK REPORT – None

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA – None

20. ADJOURNMENT – 7:35 p.m.

ATTEST:

LaTonya Harris, CMC, FCRM
Deputy City Clerk

CITY OF WINTER HAVEN, FLORIDA

William Brian Yates
Mayor

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WINTER HAVEN
THE CHAIN OF LAKES CITY

CITY COMMISSION AGENDA REVIEW SESSION MINUTES

DATE: Wednesday, June 17, 2026, 5:30 p.m.

LOCATION: City Hall – John Fuller Auditorium
451 Third Street NW, Winter Haven, FL 33881

NOTE
PowerPoint slides of certain agenda items were also presented during this meeting. Link to PowerPoint here:
https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:dcc0e7df-e13a-4ce2-90ad-0bafeb053b99
A hard copy of the PowerPoint will be attached to the original signed minutes.

1. CALL TO ORDER – Mayor Yates called the meeting to order at 5:30 p.m. He also noted that he would not be in attendance at the June 22, 2026, Regular City Commission Meeting.

2. ROLL CALL – Vanessa Castillo, MMC, City Clerk

Commissioners Present: Mayor William Brian Yates; Mayor Pro Tem Tracy Mercer; Commissioner Nathaniel J. Birdsong, Jr.; and Commissioner Clifton E. Dollison.

Commissioner Absent: Commissioner Chad Davis

Staff Present: City Manager Stavres; Deputy City Manager Michael "M.J." Carnevale; City Attorney John Murphy; City Clerk Vanessa Castillo; Assistant City Manager of Public Safety Charlie Bird; Interim Parks, Recreation and Culture Director Scott Eilers; Water Director Gary Hubbard; Economic Opportunity and Community Investment Director Eric Labbe; Public Affairs and Communication Director Katrina Hill; Police Chief Vance Monroe; Fire Chief Drew Neubrand; and Chief Financial Officer Chris Reeder.

5. PRESENTATION(S)

A. * AGENDA REVIEW ONLY *** Citrus Connection / Lakeland Area Mass Transit District (LAMTD) Update - Erin Killebrew Kinlaw, Director of External Affairs**

City Manager Stavres noted that Erin Killebrew Kinlaw would present the annual update from Citrus Connection / Lakeland Area Mass Transit District (LAMTD), with an overview of transit services for Winter Haven and upcoming cost projections for Fiscal Year 2026–2027.

Mrs. Killebrew Kinlaw gave a *Transit Service* PowerPoint presentation *(see link/attached)*. She discussed ridership trends, explained that fixed-route ridership trends varied over time, and noted that fiscal year 2024–2025 numbers appeared lower due to a system overhaul and a pause in ridership tracking beginning in mid-March, meaning the figures did not reflect a full year of data. She stated that ridership is expected to exceed 100,000 rides by the end of the current fiscal year.

She clarified that the data shown represented only City-limit ridership within Winter Haven and not school-related rides or other contracted service categories. She also reviewed American Disabilities Act (ADA), transportation disadvantaged (TD) services, ADA eligibility requirements and its connection to fixed-route service.

She reported that Citrus Connection had not increased the City's municipal contribution for several years and proposed a 4% increase for fiscal year 2026–2027, with a possible phased approach over two years. She explained that the increase reflected rising operating costs such as fuel and vehicle maintenance. She also presented maps

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showing service coverage within Winter Haven and explained funding responsibilities among the City, County, and grant sources.

Mayor Yates asked when the Commission would discuss the one-year versus two-year funding option. City Manager Stavres said the 4% increase had already been built into the FY 2026–2027 budget based on prior discussions with Citrus Connection. He explained that ridership demand remains strong and noted the City also funds expanded transit services, including the Sunday route serving the LEGOLAND area and nearby hotels. He said rising fuel and maintenance costs contributed to the increase. He added that the City included year one in the budget but would revisit year two closer to implementation depending on legislative and funding conditions.

Mayor Yates said the issue would likely be discussed further at the upcoming work session and noted transportation was an important service for residents who relied on it, even if other budget priorities were considered. Discussion ensued.

Commissioner Dollison asked whether the 4% increase was being requested from other cities as well and how it had been received. Mrs. Killebrew Kinlaw confirmed they were requesting this from all municipalities. She noted that Haines City and Davenport had not reached prior funding targets from earlier agreements, so their adjustments looked different and had been handled in smaller increments. She added that most cities understood the need for an increase since there had not been one in several years, especially following COVID-related delays. She also said recent legislative changes had shifted discussions from multi-year to one-year planning cycles, and that Citrus Connection had not yet had preliminary discussions with the County regarding potential funding impacts or reductions.

City Manager Stavres inquired how much funding Citrus Connection receives from Polk County. Mrs. Killebrew Kinlaw responded that it was about $4.3 million annually and noted funds were also used as match dollars, effectively leveraging a larger total investment. Commissioner Dollison said the proposed increase appeared reasonable due to population growth and increased use of transit services.

6. DEVELOPMENTS OF NOTE – None

7. MINUTES

A. May 20, 2026, City Commission Agenda Review Session Minutes

There were no questions or discussion.

8. COMMENTS FROM THE AUDIENCE - None

9. ORDINANCE(S) – SECOND READING – PUBLIC HEARING - None

10. CONSENT AGENDA

A. RFQ-26-22 - North Lake Shipp Drive Complete Street Project Engineering Services - Award of Contract to Kimley-Horn and Associates, Inc

City Manager Stavres gave an introduction to this item.

Public Works Director Hart gave an overview of this item.

City Manager Stavres added that the project had been in the works for a long time and was glad to see it moving forward. He added that the City remained hopeful that Congressman [Scott] Franklin would secure congressional funding for this project and the Willowbrook Road project.

There were no questions or discussion.

B. Kimley-Horn 30% Design Consulting Agreement for E. Lake Howard Drive SW Complete Street Project

City Manager Stavres gave an introduction to this item.

Public Works Director Hart gave an overview of this item.

Mayor Yates asked how much of the Lake Howard Drive project remained. City Manager Stavres said one remaining segment, from 15th Street SW past the South Lake Howard Nature Park, already had federal funding. The final

section, from Avenue C SW to Avenue G SW along the west side of the lake, would be the most challenging because of limited right-of-way, even though it had the greatest need for pedestrian improvements.
Mayor Yates inquired when the entire Lake Howard Drive project could be completed. Deputy City Manager Carnevale said the timeline would depend on available funding, but estimated the remaining work could be finished within five to ten years if grant funding and other resources became available. Discussion ensued.

C. Kimley-Horn Transportation Consulting Services for the development of a Transportation Safety Action Plan

City Manager Stavres gave an introduction of this item.

Public Works Director Hart gave an overview of this item.

There were no questions or discussion.

D. Authorization for Travel & Training - Winter Haven Chamber Board of Directors Strategic Planning Retreat (Stavres)

City Manager Stavres gave an overview of this item.

There were no questions or discussion.

E. Authorization for Travel & Training - Legislative Special Session (Stavres)

City Manager Stavres gave an overview of this item.

There were no questions or discussion.

F. Authorization for Travel & Training - International City/County Manager's Association (ICMA) Annual Conference (Stavres & Carnevale)

City Manager Stavres gave an overview of this item.

There were no questions or discussion.

G. Lake Maude Nature Park Docks & Boardwalk Repairs and Lake Hartridge Nature Park Dock Replacement

Interim Parks, Recreation and Culture Director Eilers gave an overview of this item.

There were no questions or discussion.

H. Rueben Williams Playground Pour in Place Rubber Safety Surfacing Renovation

Interim Parks, Recreation and Culture Director Eilers gave an overview of this item.

Mayor Yates asked if the park was getting high use. Interim Director Eilers confirmed it was. City Manager Stavres noted that Trailhead Park was one of the City's busiest parks and would likely need major playground improvements sooner because of its high level of activity. Interim Director Eilers added that the new Winter Haven Recreation and Cultural Center (WHRCC) was expected to help reduce some of the demand, especially at the splash pad.

I. Workforce Housing Agreement - Gault Construction, LLC

City Manager Stavres gave an introduction to this item.

Economic Opportunity and Community Investment Director Labbe gave an overview of this item and thanked Melinda Kalogridis, who was in the audience, for helping with the agreement.

Mayor Yates asked whether the agreement provided stronger protections for the City than past agreements. Director Labbe agreed. City Manager Stavres explained that, because the City was providing funding, the agreement allowed the City to place a lien on the property and require the affordable housing units to remain available for households earning 80% to 120% of the Area Median Income (AMI) for seven years. City Attorney Murphy added that the agreement also required annual certifications to verify compliance and said it could serve as a template for future workforce housing projects.

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Mayor Yates asked about meetings with Blue Sky and noted that, if the current project and two other potential affordable housing projects moved forward, the City could add about 250 housing units, bringing it closer to the affordable housing goals established in 2020. He said future discussions would be needed about how to continue funding affordable housing programs if the proposed property tax changes is approved by voters, which will result in reduced City revenues. He also expressed support for a mix of smaller and larger affordable housing developments.

Commissioner Dollison asked about the difference between affordable and workforce housing. Director Labbe said affordable housing generally served households earning below 80% of the Area Median Income (AMI), while workforce housing serves households earning between 80% and 120% of AMI. Commissioner Dollison said rising rents continued to make housing difficult for many families, expressed appreciation for the project, and noted it was a good use of City funds to help provide more housing options.

J. Purchase of Neptune Mach 10 Potable Water Meters

City Manager Stavres gave an introduction to this item.

Water Director Hubbard gave an overview of this item.

There were no questions or discussion.

K. Orchid Springs Development Corporation, Assignment and Assumption Agreement

Water Director Hubbard gave an overview of this item.

City Attorney Murphy explained that the agreement would allow the Orchid Springs Development Corporation to assign its utility agreement to Central States Water Resources (CSWR)-Florida Utility Operating Company. He said the City's emergency water interconnect and wastewater service agreements would remain in place, and the only significant change would be the new utility operator taking over the existing contractual obligations.

Mayor Pro Tem Mercer asked if the Orchid Springs water system had improved. Director Hubbard said staff had not maintained the system for about four years, so he could not speak to any improvements, but noted the City was no longer responsible for its maintenance, which had previously required significant staff time due to ongoing issues.

L. Badger Meter, Inc., (SmartCover System) Annual Maintenance Agreement Renewal

Water Director Hubbard gave an overview of this item and noted that this was the City's fourth year of using smart covers.

There were no questions or discussion.

11. RESOLUTION(S) - None

12. ORDINANCE(S) - FIRST READING - None

13. NEW BUSINESS - None

14. CITY COMMISSIONERS/LIAISON REPORTS – None

15. CITY ATTORNEY REPORT

(This item occurred after Item 16)

City Attorney Murphy introduced Owens Parker, a law student at Stetson University College of Law and the son of his law partner, Sean Parker, who was the City Attorney for the City of Bartow, who was serving as a summer law clerk with his office. He said Mr. Parker was attending the meeting to learn more about local government and observe the City's public meeting process. Mayor Yates welcomed the interns and said he hoped they would enjoy their time in Winter Haven.

16. CITY MANAGER REPORT

City Manager Stavres reported the following:

- Thanked Police Chief Monroe for hosting the Governor's [Ron DeSantis] visit [at the Police Department] and also Public Affairs and Communication Director Hill and her team.
- He would be out of the office through Wednesday, June 24 and that Deputy City Manager Carnevale would serve as Acting City Manager in his absence. He added that staff would ensure Mayor Pro Tem Mercer was kept informed and prepared for her leadership of the Monday, June 22, 2026 Commission meeting.
- Extended well wishes to Commissioner Davis, who was ill.
- Introduced Ethan Cajuste, who was in the audience and would serve as a summer intern in the City Manager's Office. Additional interns would serve in the Public Works and Public Affairs and Communication departments.

17. DEPUTY CITY MANAGER REPORT – None

18. CITY CLERK REPORT – None

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA – None

20. ADJOURNMENT – 6:26 p.m.

ATTEST:

Vanessa Castillo, MMC
City Clerk

CITY OF WINTER HAVEN, FLORIDA

William Brian Yates
Mayor

DRAFT

WINTER HAVEN
THE CHAIN OF LAKES CITY

REGULAR CITY COMMISSION MEETING MINUTES

DATE: Monday, June 22, 2026, 6:00 p.m.

LOCATION: City Hall – John Fuller Auditorium
451 Third Street NW, Winter Haven, FL 33881

NOTE:
PowerPoint slides of certain agenda items were also presented during this meeting. Link to PowerPoint here:
https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:22f4635c-4091-4a58-887f-201c1d8375f1
A hard copy of the PowerPoint will be attached to the original signed minutes.

1. **CALL TO ORDER** – Mayor Pro Tem Tracy Mercer called the regular meeting to order at 6:00 p.m.

2. **ROLL CALL** – Vanessa Castillo, MMC, City Clerk

   Commissioners Present: Mayor Pro Tem Tracy Mercer; Commissioner Nathaniel J. Birdsong, Jr.; Commissioner Clifton E. Dollison; and Commissioner Chad Davis.

   Absent: Mayor William Brian Yates

   Staff Present: Deputy City Manager Michael "M.J." Carnevale; City Attorney John Murphy; City Clerk Vanessa Castillo; Assistant City Manager of Public Safety Charlie Bird; Human Resources Director Shawn Dykes; Economic Opportunity and Community Investment Director Eric Labbe; Interim Parks, Recreation and Culture Director Scott Eilers; Public Works Director Brittany Hart; Police Chief Vance Monroe; Fire Chief Drew Neubrand; Public Affairs & Communications Director Katrina Hill; and Chief Financial Officer Chris Reeder.

3. **INVOCATION** – Dr. Steve Harness, First Baptist Church

4. **PLEDGE OF ALLEGIANCE** – Vanessa Castillo, MMC, City Clerk

5. **PRESENTATION(S)** – None

6. **DEVELOPMENTS OF NOTE** – None

7. **MINUTES**

   A. May 20, 2026, City Commission Agenda Review Session Minutes

   Motion by Commissioner Birdsong to approve the minutes as presented.

   Motion carried 4:0.

8. **COMMENTS FROM THE AUDIENCE**

   Tim Steorts, 208 E. Lake Howard Drive in Winter Haven, expressed concern about the number of speed bumps on Westside roadways, said that they limited his ability to travel efficiently around Winter Haven, and had caused wear and tear on vehicles. He requested that the City stop installing additional speed bumps and consider removing some

existing ones so residents could better access local streets. Deputy City Manager Carnevale said that staff would obtain his contact information and follow up with him.

9. ORDINANCE(S) – SECOND READING – PUBLIC HEARING – None

10. CONSENT AGENDA

A. RFQ-26-22 - North Lake Shipp Drive Complete Street Project Engineering Services - Award of Contract to Kimley-Horn and Associates, Inc.

B. Kimley-Horn 30% Design Consulting Agreement for E. Lake Howard Drive SW Complete Street Project.

C. Kimley-Horn Transportation Consulting Services for the development of a Transportation Safety Action Plan.

D. Authorization for Travel & Training - Winter Haven Chamber Board of Directors Strategic Planning Retreat (Stavres).

E. Authorization for Travel & Training - Legislative Special Session (Stavres).

F. Authorization for Travel & Training - International City/County Manager's Association (ICMA) Annual Conference (Stavres & Carnevale).

G. Lake Maude Nature Park Docks & Boardwalk Repairs and Lake Hartridge Nature Park Dock Replacement.

H. Rueben Williams Playground Pour in Place Rubber Safety Surfacing Renovation.

I. Workforce Housing Agreement - Gault Construction, LLC.

J. Purchase of Neptune Mach 10 Potable Water Meters.

K. Orchid Springs Development Corporation, Assignment and Assumption Agreement.

Motion by Commissioner Birdsong to approve the entire Consent Agenda as presented.

Mayor Pro Tem Mercer stated anyone wishing to speak to the consent agenda could come to the podium and state their name and address for the record. No one spoke for or against.

Commissioner Davis said he had been absent during the Agenda Review Session due to illness but wanted to comment on Item 10.I, he thanked Mr. Gault for bringing the project to the City and noted it was not something the City had gone out seeking but it addressed a significant need for affordable housing. He also thanked City staff for working with Mr. Gault to bring the agreement forward and that he looked forward to voting in support of the item.

Motion carried 4:0.

11. RESOLUTION(S) – None

12. ORDINANCE(S) - FIRST READING – None

13. NEW BUSINESS – None

14. CITY COMMISSIONERS/LIAISON REPORTS

Commissioner Davis reported on/attended the following:

- Community Redevelopment Agency (CRA) Board Training
- Grand opening for the Publix on Ruby Lake Drive

Commissioner Dollison reported on/attended the following:

- CRA Board Training
- Friendship [Missionary Baptist] Church Community [Marketplace] Event
- Governor [Ron DeSantis] Press Conference at the Police Department

- Polk County All Sports Awards Banquet
- 5th Annual Juneteenth Event

Commissioner Birdsong reported on/attended the following:
- Attended some of the events already mentioned
- Chaired the Polk Transportation Planning Organization (TPO) - Transportation Disadvantaged Local Coordinating Board (TD-LCB) Meeting
- TPO Meeting
- Rode in a seaplane at Jack Brown's Seaplane Base, prior to touring the airport with a student summer camp group
- 5th Annual Juneteenth Event
- Publix Grand Opening
- [National Coalition of] 100 Black Women, Inc. (NCBW) Salute to Women Awards Luncheon in at the Bartow Civic Center

Mayor Pro Tem Mercer reported on/attended the following:
- Attended some of the events already mentioned
- Polk County All Sports Awards Banquet
- 5th Annual Juneteenth Event
- Governor DeSantis Press Conference
- Ridge League of Cities (RLC) Dinner Meeting hosted by [the City of] Davenport

15. CITY ATTORNEY REPORT – None

16. CITY MANAGER REPORT – None

17. DEPUTY CITY MANAGER REPORT

Deputy City Manager Carnevale reported the following:
- The recent rainfall had led the County to lift the burn ban ahead of the Fourth of July holiday.
- Thanked City staff and the Juneteenth committee for planning and organizing the Juneteenth event, which was reimagined this year with strong resident involvement. A debrief would be held with staff and committee members to review what worked well and identify improvements for future events.

18. CITY CLERK REPORT – None

19. EMERGENCY MATTERS NOT RECEIVED FOR THE AGENDA – None

20. ADJOURNMENT – 6:22 p.m.

ATTEST:

_____
Vanessa Castillo, MMC
City Clerk

CITY OF WINTER HAVEN, FLORIDA

_____
Tracy Mercer
Mayor Pro Tem

DATE: June 26, 2026

TO: Honorable Mayor Yates and City commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Eric Labbe, Director of Economic Opportunity and Community Investment

SUBJECT: Consent and Approval of Assignment and Assumption of Lease and Contracts for the Agreement for Development with Physicians Partnership, LLP

BACKGROUND

On December 9, 2013, Physicians Partnership, LLP a Florida general partnership, entered into an Agreement for Development with the Winter Haven Community Redevelopment Agency and the City of Winter Haven.

On December 29, 2023 the property was sold to CoreGro 550 Winter Haven, LLC.

Section 10.9 of the Agreement for Development states, "This Agreement shall be binding upon and inure to the benefit of the parties hereto and their respective heirs, personal and legal representatives, successors, successors in title, and lawful assigns. Neither party may assign this Agreement, or delegate its responsibilities hereunder, without the express written consent of the other party."

CRA staff has not issued reimbursement payments pursuant to the Agreement for Development for tax years 2024 or 2025, as an assignment of the Agreement for Development had not been provided or approved by the CRA Board or the City Commission.

On March 3, 2026 representatives of CoreGro 550 Winter Haven, LLC delivered an Assignment and Assumption of Lease and Contracts to City Staff. The City Attorney has reviewed the document.

FINANCIAL IMPACT

Upon consent and approval of the assignment by the CRA Board and the City Commission, CRA staff will process reimbursement payments to CoreGro 550 Winter Haven, LLC for tax years 2024 and 2025 in the amounts of $16,931.69 and $17,455.45 respectively, and will be payable from the Economic Development line of the Downtown CRA budget. Future payments will be budgeted accordingly until the reimbursement incentive defined in the Agreement for Development is satisfied.

CRA BOARD

The CRA Board, at their June 8, 2026, meeting unanimously voted to consent to, and approve, the Assignment of Development Agreement between Physicians Partnership, LLC and CoreGro 550 Winter Haven, LLC.

STRATEGIC PLAN ALIGNMENT

This request is an acknowledgement of an assignement of a development agreement and is not specifically defined as a goal or strategy in the Strategic Plan. However, it aligns with the Economic Sustainability and Quality of Life Pillars.

RECOMMENDATION

Staff recommends the City Commission consent to, and approve, the Assignment and Assumption of Lease and Contracts, which assigns the Agreement for Development with Physicians Partnership, LLC to CoreGro 550 Winter Haven, LLC. and authorize the Mayor and other City Officials to execute the Consent and Approval of Assignment and the City Manager, or his designee, to take any further necessary actions related thereto.

ATTACHMENTS

- Assignment and Assumption of Lease and Contracts
- Consent and Approval of Assignment

ASSIGNMENT AND ASSUMPTION OF LEASE AND CONTRACTS

THIS ASSIGNMENT AND ASSUMPTION OF LEASE AND CONTRACTS ("**Assignment**") is made by and between PHYSICIANS PARTNERSHIP, LLP, a Florida limited liability partnership ("**Assignor**") and COREGRO 550 WINTER HAVEN, LLC, a Delaware limited liability company ("**Assignee**").

RECITALS

1. Concurrently with the execution and delivery of this Assignment, Assignor is conveying to Assignee, by Special Warranty Deed ("**Deed**") that certain tract of land ("**Real Property**") more particularly described on **Schedule 1** attached hereto and made a part hereof for all purposes, together with the improvements located thereon ("**Improvements**") and the personal property owned by Assignor upon the Real Property or within the Improvements ("**Personal Property**").

2. Assignor desires to assign, transfer and convey to Assignee, and Assignee desires to obtain, all of Assignor's right, title and interest in and to the Lease and Contracts (as hereinafter defined), subject to the terms and conditions set forth herein.

NOW, THEREFORE, for and in consideration of the receipt of Ten and No/100 Dollars ($10.00) and other good and valuable consideration to Assignor in hand paid by Assignee to Assignor, the receipt and sufficiency of which are hereby acknowledged, Assignor does hereby SELL, ASSIGN, CONVEY, TRANSFER, SET OVER, and DELIVER unto Assignee all of Assignor's right, title and interest, if any, in and to the following, free and clear of all liens and encumbrances:

(a) Lease Agreement dated effective May 1, 2020, by and between Physicians Partnership, LLP, as Landlord, and Saltzman, Tanis, Pittell, Levin & Jacobson, LLC, d/b/a Pediatric Partners of Winter Haven, as Tenant;

(b) Lease Agreement dated effective June 1, 2020, and First Amendment thereto dated effective October 1, 2021, by and between Physicians Partnership, LLP, as Landlord, and Trinity Medical Acquisition, LLC, as Tenant;

(c) Lease Agreement dated effective September 29, 2014, by and between Physicians Partnership, as Lessor, and Health Care Advocates, LLC, as Lessee; and

(d) Agreement for Development effective December 9, 2013 between The City of Winter Haven, a Florida municipal corporation and The Winter Haven Community Redevelopment Agency, and PHYSICIANS PARTNERSHIP, LLP, a Florida limited liability partnership, their successors or assigns (the "**Agreement for Development**").

Note: Pursuant to the Fourth Amendment to the Agreement of Purchase and Sale dated September 26, 2023 between Assignor, as Seller, and Assignee, as Purchaser, Seller/Assignor shall be entitled to and shall receive any and all payments, sums and amounts received, in accordance with or stemming from the Agreement for Development, from the City and/or CRA which are attributable to the time period of Seller's ownership

of the Real Property prior to the Closing Date, December 29, 2023. Purchaser shall be entitled to and shall receive any and all payments, sums and amounts received in accordance with or stemming from the Agreement for Development, from the City and/or CRA which are attributable to the time period of Purchaser's ownership of the Real Property commencing as of the Closing Date, December 29, 2023.

By execution of this Assignment, Assignee assumes and agrees to perform all of the covenants, agreements and obligations under the Lease and Contracts binding on Assignor or the Real Property, Improvements, or Personal Property (such covenants, agreements and obligations being herein collectively referred to as the "**Contractual Obligations**"), as such Contractual Obligations shall first arise or accrue from and after the date of this Assignment. Without limiting the generality of the preceding sentence, Assignee acknowledges the responsibility for all Prepaid Rent and Security Deposits described in the Lease to the extent transferred to Assignee and agrees to apply same in accordance with the terms of the Lease. Assignee hereby agrees to indemnify, hold harmless and defend Assignor from and against any and all third-party obligations, liabilities, costs and claims (including reasonable attorney's fees) arising as a result of or with respect to any of the Contractual Obligations that are attributable to the period of time from and after the date of this Assignment.

Assignor agrees to indemnify, hold harmless and defend Assignee from and against any and all third party obligations, liabilities, costs and claims (including reasonable attorney's fees) arising as a result of or with respect to any of the Contractual Obligations that are attributable to the period of time up to the date of this Assignment.

This Assignment may be executed in multiple counterparts and by electronic (PDF) transmission, each of which shall, for all purposes, be deemed an original, but which together shall constitute one and same instrument.

ASSIGNEE ACKNOWLEDGES THAT IT HAS INSPECTED THE LEASE AND CONTRACTS AND THAT THIS ASSIGNMENT IS MADE BY ASSIGNOR AND ACCEPTED BY ASSIGNEE WITHOUT REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS, IMPLIED OR STATUTORY, AND WITHOUT RECOURSE AGAINST ASSIGNOR, EXCEPT AS EXPRESSLY SET FORTH HEREIN.

[*Signatures Pages Follow*]

ASSIGNOR SIGNATURE PAGE TO
ASSIGNMENT AND ASSUMPTION OF LEASE AND CONTRACTS

EXECUTED to be effective as of the 29th day of December, 2023.

ASSIGNOR:

PHYSICIANS PARTNERSHIP, LLP,
a Florida limited liability partnership

By: _____
Dane V. Parker, Partner

By: _____
Dorothy J. Ray, Partner

ASSIGNEE SIGNATURE PAGE TO
ASSIGNMENT AND ASSUMPTION OF LEASE AND CONTRACTS

EXECUTED to be effective as of the 29th day of December, 2023.

ASSIGNEE:

COREGRO 550 WINTER HAVEN, LLC,
a Delaware limited liability company

By: CoreGro CFL Holding, LLC,
a Delaware limited liability company,
its sole member

By: CoreGro Real Estate, LLC,
a Delaware limited liability company,
its Manager

By: _____
Jordan M. Fishfeld, Manager

Schedule 1
Legal Description

Parcel 1:

Lots 1, 2, 3, 4, 6, 7, 10, 11, 16, 17, 18, and 19, Block 3, Tier 4, Original Town of Winter Haven, according to the plat thereof, as recorded in Deed Book M, Page 160, of the Public Records of Polk County, Florida.

Less and except the West 10 feet of said Lots 2, 3, 6, 7, 10, 11, and 19.

and

Lots 12, 14, 15, and 16, Block 2, Tier 4, Original Town of Winter Haven, according to the plat thereof, as recorded in Deed Book M, Page 160, of the Public Records of Polk County, Florida.

Less and except the West 10 feet of said Lots 14, 15, and 16.

Together with that portion of closed alley lying between Lots 1, 2, 3, and 4, of said Block 3.

Parcel 2:

Lots 8 and 13, Block 2, Tier 4, Original Town of Winter Haven, according to the plat thereof, as recorded in Deed Book M, Page 160, of the Public Records of Polk County, Florida.

Less and except that portion conveyed to the State of Florida Department of Transportation, in Deed recorded in Official Records Book 8737, Page 2224, of the Public Records of Polk County, Florida.

CONSENT AND APPROVAL OF ASSIGNMENT

The undersigned expressly consent to and approve the assignment by PHYSICIANS PARTNERSHIP, LLC, a Florida Limited Liability Company, of that Agreement for Development dated December 9, 2013, to COREGRO 550 WINTER HAVEN, LLC, a Delaware Limited Liability Company, authorized to do business in the State of Florida.

BY:

CITY:

THE CITY OF WINTER HAVEN, FLORIDA,
a Florida corporation

By: _____
Printed Name: William Brian Yates
As Its: Mayor

ATTEST WITH SEAL:

Dated: July 13, 2026.

By: _____
Vanessa Castillo, MMC, City Clerk

Approved as to correctness and form:

By: _____
Frederick J. Murphy, Jr., City Attorney

CRA:

THE WINTER HAVEN COMMUNITY
REDEVELOPMENT AGENCY,
a public body created pursuant to
Chapter 163, Florida Statutes

By: _____
Printed Name: William Brian Yates
As Its: Chairman

Signed, sealed and delivered
in the presence of:

Dated: June 8, 2026.

By: _____

DATE: June 24, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager
Charles Bird, Assistant City Manager – Public Safety
Vance Monroe, Police Chief

FROM: Donald Nunnery, Police Captain

SUBJECT: Agreement to provide Traffic Control and Enforcement of private roads owned and under the control of Peace Creek Community Development District.

BACKGROUND

The Peace Creek Community Development District (CDD), by a majority vote of its Board of Supervisors, desires for the City of Winter Haven to exercise jurisdiction for traffic control and enforcement over the roads that are owned and controlled by the CDD within the subject residential subdivision/community. These roads are owned and controlled by the CDD, an independent special district, created under the provisions of Chapter 190 of the Florida Statutes and City Ordinance. Section 316.006(2)(b) of the Florida Statutes authorizes the City to exercise traffic control and enforcement jurisdiction over any roads owned and controlled by a special district such as the CDD. The CDD's Board of Supervisors will be required to execute a written agreement with the City of Winter Haven in order for the City to exercise traffic control jurisdiction within the lands that are under the ownership and control of the CDD. These types of agreements are generally intended to enhance traffic safety within residential subdivisions/communities.

The CDD will be responsible, at its own expense, for complying with all applicable requirements for signage and traffic control as mandated by Florida law. The CDD will also reimburse the City for the actual cost of any speed study and/or inspections conducted to determine whether existing signage meets or exceeds the standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD) of the Florida Department of Transportation. Additionally, the CDD will be responsible for installing and maintaining all required signage.

Both the CDD and the City acknowledge that the City's exercise of traffic control and enforcement jurisdiction under the terms and conditions of the Agreement proposed to be entered into between the

Parties will be consistent with the level of service provided by the Winter Haven Police Department in similar geographic areas within the City.

The proposed Agreement between the City and the CDD for the City to exercise traffic control jurisdiction within the CDD lands has been reviewed and approved as to form by the City Attorney.

FINANCIAL IMPACT

There will not be any fiscal impact to the City of Winter Haven.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Community Safety
- **Goal:** Strengthen how safe every citizen, business, and visitor feels within Winter Haven.

RECOMMENDATION

Staff recommends the City Commission approve the Agreement between the City and the CDD, for the City to exercise traffic control jurisdiction within the subject CDD lands and authorize the City Manager or his designee to take any additional action necessary thereto.

ATTACHMENTS

- Agreement Between The City of Winter Haven and the Peace Creek Community Development District for City exercise of Traffic Control Jurisdiction
- Site Plan Approval
- City of Winter Haven Standards

AGREEMENT BETWEEN THE CITY OF WINTER HAVEN AND THE PEACE CREEK COMMUNITY DEVELOPMENT DISTRICT FOR CITY EXERCISE OF TRAFFIC CONTROL JURISDICTION

THIS AGREEMENT ("**Agreement**") is made and entered into by and between the **CITY OF WINTER HAVEN**, a Florida municipal corporation (hereinafter referred to as "**CITY**") and **PEACE CREEK COMMUNITY DEVELOPMENT DISTRICT**, a local unit of special purpose government established pursuant to City Commission of the City of Winter Haven ("**City Commission**") Ordinance No. O-22-15, as amended by City Commission Ordinance No. O-22-36, acting by and through its Board of Supervisors (hereinafter referred to as the "**CDD**").

WITNESSETH

WHEREAS, the CDD is a local unit of special-purpose government, and an independent special district of the State of Florida, created under and pursuant to Chapter 190, Florida Statutes, and

WHEREAS, the CDD is the owner of certain roads lying entirely within the CDD's boundaries (the "**Roads**"); and

WHEREAS, the CDD desires for the CITY to exercise jurisdiction for traffic control over the Roads within the CDD; and

WHEREAS, Section 316.006(2)(b), *Florida Statutes*, provides that the CITY may exercise jurisdiction over roads owned by the CDD (as a special district of the State of Florida) located in the incorporated area within the CITY's boundaries if the CITY and the CDD provide, by an approved written agreement, that the CITY has traffic control jurisdiction over the roads encompassed by such agreement; and

WHEREAS, the CDD is located within the incorporated area of the City of Winter Haven, and the Roads within the communities of the CDD are owned or controlled by the CDD; and

WHEREAS, the CDD has experienced numerous traffic control problems, such as motorists' failure to obey traffic regulations; and

WHEREAS, the CITY has consulted with the Chief of the Winter Haven Police Department regarding traffic control and enforcement within the CDD pursuant to the terms of this Agreement.

NOW, THEREFORE, in consideration of the premises set forth herein above, the terms of which are incorporated herein, the mutual promises hereinafter set forth, the sufficiency and adequacy of which are hereby acknowledged, the parties hereto, intending to be legally bound hereby, agree as follows:

1. **Recitals.** The above recitals are true and correct, and are incorporated herein by reference and form a material part of this Agreement.

2. **Traffic Control.** The CITY will exercise traffic control jurisdiction which regulates, warns, or guides traffic over the Roads within the CDD known as Peace Creek that are located within the municipal limits of the CITY.

3. **Enforcement.** The CITY and the CDD understand and acknowledge that traffic control and enforcement shall be accomplished by the Chief of the Winter Haven Police Department (hereinafter referred to as "**Chief**") under terms and conditions consistent with the level of service provided by the Chief in similar geographic areas of the City of Winter Haven, Florida.

4. **Jurisdictional Authority.** The exercise of jurisdiction provided for herein shall be in addition to jurisdictional authority presently exercised by the CITY, if any, under the law and nothing in this Agreement shall be construed to limit or remove any such jurisdictional authority, if any. Similarly, nothing herein shall be construed to obligate the CITY in any way beyond said traffic control and enforcement.

5. **Supervision.** The planning, scheduling, organization, direction, and supervision of law enforcement officers in all matters incidental to the delivery of traffic control or enforcement shall be solely determined by and at the discretion of the Chief.

6. **Disbursement of Fines and Reimbursement of Costs.** All fines collected from traffic citations issued by the Chief or his officers for violation of traffic laws on the Roads that are located within the CITY's municipal limits shall be transferred to the CITY and/or appropriate governmental entity and disbursed as any other traffic fines collected absent this Agreement consistent with applicable rules, regulations, ordinances and laws. In the event the CDD requests, and as a result the Chief in fact provides, traffic control and enforcement services over the Roads within the CDD at a level greater than those services provided in similar geographic areas of the City of Winter Haven, Florida, the CDD shall reimburse the CITY, if deemed necessary by either the CITY or the Chief or both, for actual costs attributed to only those additional traffic control and enforcement services provided hereunder.

7. **Signage.** The CDD agrees, at its own expense, to comply with all applicable requirements for signage and traffic control and enforcement as required by Florida law, CITY ordinances, and Florida Department of Transportation standards. Specifically, the CDD agrees to comply with Section 316.0745, *Florida Statutes*, Uniform Signals and Devices and the Manual on Uniform Traffic Control Devices. The CDD agrees to comply with said requirements for all future installations and to maintain all current installations in accordance with said requirements. The CDD agrees to comply with any warrant studies performed by the CITY. The CDD agrees, within thirty (30) days of the date of notice from the CITY, to remove any multi-way stops or other installations that a study finds not to be warranted. The CDD agrees not to install any new multi-way stop or other installation without prior approval of the CITY. The CITY agrees to conduct, if necessary, speed studies on the Roads that are located within the CITY's municipal limits to determine the appropriate speed limit to be posted. The CDD shall

reimburse the CITY for the actual cost of the speed study and/or the inspection to determine if existing signage meets or exceeds the standards set forth in the Manual of Uniform Traffic Control Devices (MUTCD). The CDD shall be responsible for installing and maintaining all posted signage.

8. **Term.** This Agreement will be for an initial term of one (1) year and shall be automatically renewed on an annual basis, unless otherwise terminated as provided herein.

9. **Termination.** This Agreement may be terminated by either party without cause or liability upon thirty (30) days written notice to the other party. It is explicitly noted that should the Chief request that the CITY terminate this Agreement, the CITY will honor that request pursuant to this paragraph.

10. **Non-Agent Status.** This Agreement shall not be construed to constitute that the CITY and/or the Chief, or any of their respective agents, employees, law enforcement officers or representatives are agents or employees of the CDD, or vice versa.

11. **Severability.** It is declared to be the intent of the parties hereto that if any section, subsection, sentence, clause, or provision of this Agreement is held invalid, the remainder of this Agreement shall be construed as not having contained said section, subsection, sentence, clause, or provision and shall not be affected by such holding.

12. **Entire Agreement.** This Agreement including all exhibits attached hereto contains the sole understanding between the parties relating to the matters set forth herein and no modification hereof may be made except by an instrument in writing and executed in the same manner as this Agreement.

13. **Assignment.** This Agreement shall not be assigned, or other responsibilities herein transferred, delegated, or conveyed in any manner, without the express written consent of CITY. The CITY will not provide such written consent prior to consulting with the Chief.

14. **Successors.** This Agreement shall be binding upon the parties, their heirs, permitted assigns, and successors in interest.

15. **Notice.** Any notices required by this Agreement ("**Notices**") shall be in writing and shall be either delivered in person, sent by overnight courier such as United Parcel Service or Federal Express, or mailed by United States Mail, certified with return receipt requested and all postage charges prepaid. Except as otherwise provided in this Agreement, any Notice shall be deemed received only upon actual delivery at the address set forth below. Notices delivered after 5:00 p.m. (at the place of delivery) or on a non-business day, shall be deemed received on the next business day. If any time for giving Notice contained in this Agreement would otherwise expire on a non-business day, the Notice period shall be extended to the next succeeding business day. Saturdays, Sundays, and legal holidays recognized by the United States government shall not be regarded as business days. Notices shall be given in the following manner, or in such other manner as may be directed by the parties to this Agreement, in writing from time to time, to the following persons as follows:

As to CITY:	City of Winter Haven Attn: T. Michael Starves, City Manager 451 Third Street NW Winter Haven, Florida 33881
Copy to: (which shall not constitute notice)	Frederick J. Murphy, Jr., Esquire, City Attorney Boswell & Dunlap LLP 345 South Central Avenue Bartow, Florida 33830
As to Chief:	Winter Haven Police Department Attn: Vance Monroe 125 North Lake Silver Drive NW Winter Haven, Florida 33881
As to CDD:	Peace Creek Community Development District c/o Governmental Management Services – Central Florida, LLC 219 East Livingston Street Orlando, Florida 32801 Attn: District Manager
Copy to: (which shall not constitute notice)	Kilinski | Van Wyk PLLC 517 East College Avenue Tallahassee, Florida 32301 Attn: Peace Creek CDD, District Counsel

16. **Indemnification.** In consideration for making and entering into this Agreement and for other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged and to the fullest extent permitted by law, but as limited by applicable Florida law and the CDD's sovereign immunity, the CDD shall indemnify, defend, and hold harmless the CITY and/or the Chief and all of their respective agents, employees, law enforcement officers or representatives, from any claim, loss, damage, cost, charge, or expense, including attorney's fees and costs, arising out of any act, action, neglect, or omission during the performance of this Agreement or work performed thereunder, whether direct or indirect, and whether or not due to or caused by negligence of the CITY and/or the Chief and/or all of their respective agents, employees, law enforcement officers or representatives, except that the CDD will not be liable under this provision for damages arising out of the injury or damage to persons or property directly caused or resulting from the sole negligence, any intentional action or any omission of the CITY and/or the Chief and/or all of their respective agents, employees, law enforcement officers or representatives. The CDD's obligation to defend and indemnify shall not be excused because of the CDD's inability to evaluate liability, or because the CDD evaluates liability and determines that the CDD is not liable, or determines that the CITY and/or the Chief is solely negligent. Only a final adjudication or judgment finding the CITY or the Chief solely negligent shall excuse performance of this provision by the CDD. If a judgment finding the CITY or the Chief solely negligent is appealed, and the finding of sole negligence is reversed, the CDD will, to the extent permitted by law, be obligated to indemnify the CITY and the Chief for the cost of the appeal(s).

The CDD shall pay all costs including but not limited to attorney's fees related to this obligation and its enforcement by the CITY or the Chief. This provision shall also pertain to any claims brought against the CITY or the Chief by any employee of the CDD, subcontractor, or anyone directly or indirectly employed by any of them. The CDD's obligation under this provision shall not be limited in any way to the agreed upon contract price, if any, as shown in this Agreement or the CDD's limit of or lack of sufficient insurance protection.

Nothing herein is intended to act as a waiver of the CITY's sovereign immunity and/or the limits of liability set forth in Section 768.28, *Florida Statutes*, regardless of whether any such obligations are based in tort, contract, statute, strict liability, and negligence, product liability or otherwise.

Furthermore, nothing herein shall cause or be construed as a waiver of the CDD's sovereign immunity or limitations on liability granted pursuant to Section 768.28, *Florida Statutes*, or other law, and nothing in this Agreement shall inure to the benefit of any third party for the purpose of allowing any claim which could otherwise be barred under the Doctrine of Sovereign Immunity or by operation of law.

17. **Governing Law and Venue.** This Agreement shall be governed by and construed in accordance with the laws of the State of Florida. Venue for any actions arising out of this Agreement shall be exclusively in the State Court with competent jurisdiction in and for Polk County, Florida.

18. **Effective Date.** The effective date of this Agreement shall be the date on which the CITY's governing body approves this Agreement.

19. **Counterpart Signature Pages.** To facilitate execution of this Agreement, the parties hereto hereby agree that this Agreement may be executed in as many counterparts as may be required and it shall not be necessary that the signature of, or on behalf of, each party appear on each counterpart; it shall be sufficient that the signature of, or on behalf of, each party appear on one or more of such counterparts. All counterparts shall, when taken collectively, constitute a single agreement.

[CONTINUED ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the parties have caused these premises to be executed by their duly authorized representatives on this _____day of _____2025.

CITY OF WINTER HAVEN,
a Florida municipal corporation

By: _____

_____

_____
_____, City Clerk

APPROVED AS TO LEGAL FORM AND
SUFFICIENCY BY THE CITY ATTORNEY

_____
Frederick John Murphy, Jr., City Attorney

[Signature page to Agreement between the City of Winter Haven and the Peace Creek Community Development District/or City Exercise of Traffic Control Jurisdiction]

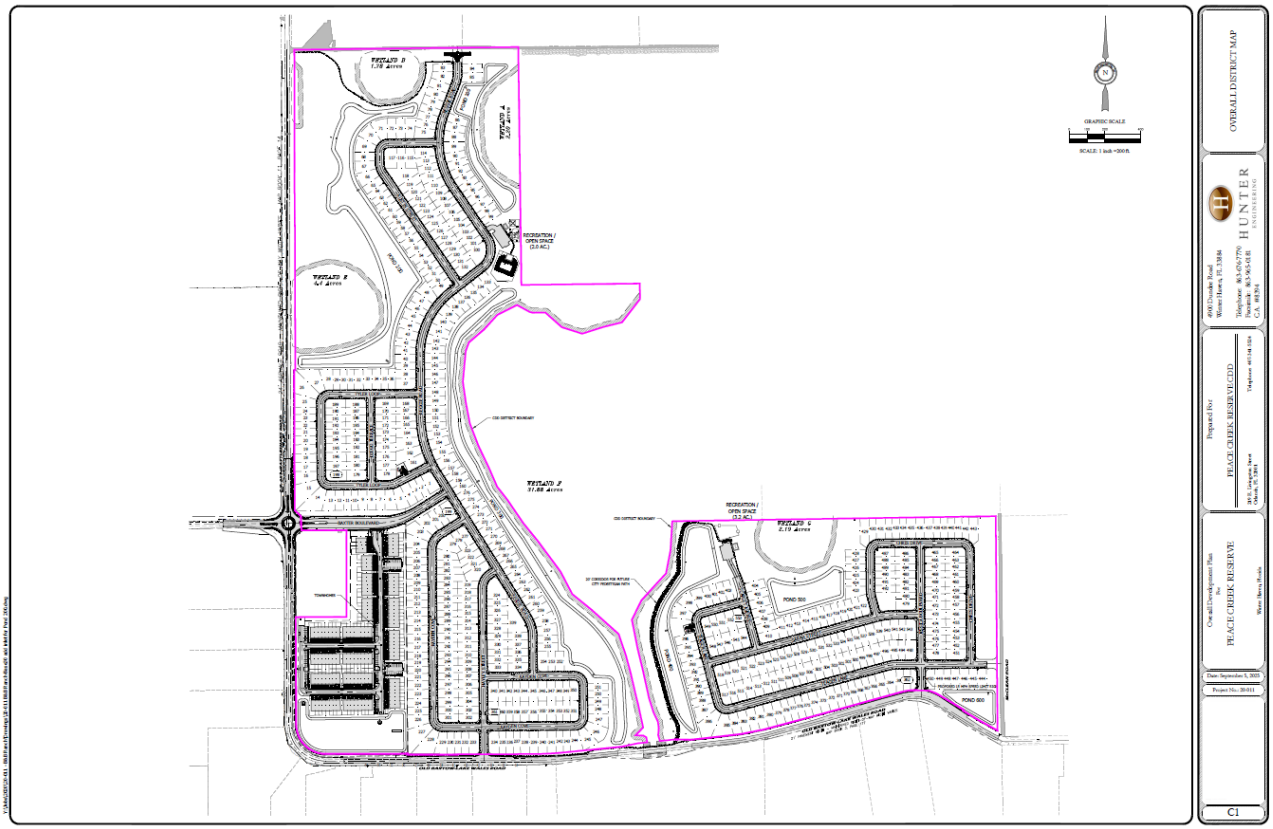
PEACE CREEK COMMUNITY DEVELOPMENT DISTRICT,
a Florida community development district

By: _____
Adam Morgan
Chairperson, Board of Supervisors

STATE OF FLORIDA
COUNTY OF LAKE

SWORN TO AND SUBSCRIBED before me [ ] physical presence of [ ] remote notarization by Adam Morgan, as Chairperson of the Board of Supervisors of the Peace Creek Community Development District, who is personally known to me or who produced _____ as identification this ____ day of_____, 2025.

_____
Notary Public


OVERALL DISTRICT MAP
PEACE CREEK RESERVE CDD
PEACE CREEK RESERVE
C1

SION

ISION

CITY OF WINTER HAVEN
APPROVED PLANS FOR
Peace Creek Reserve (fka: B & B Subdivision)
Engineering Project #SP-21-41

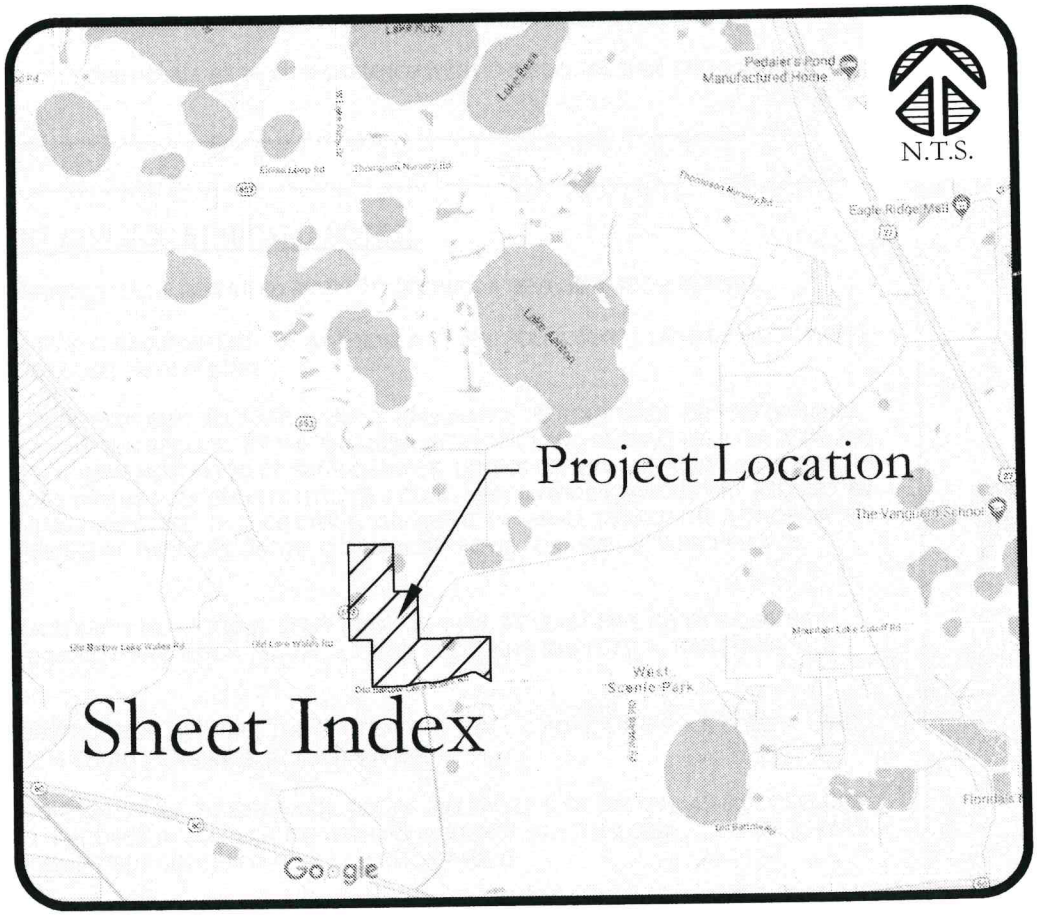
DATE: 11/1/2021 **BY:**
DATE: 11/1/2021 **BY:**

NOTE:

- This approval is valid for one (1) year from signature date.
- This approval does not cover Structural Design.
- Notify Engineering Division a minimum of 48 hours prior to the start of construction at 863.291.5851.
- A copy of these approved drawings must be on the site at all times.
- Submit a written request for approval of any proposed changes from these plans to the City Engineering Division and Planning Division.
- **Failure to comply maybe subject to an issuance of a stop-work order.**
- City approval does not constitute release from other agencies' requirements. Where requirements conflict the most stringent shall govern.
- **All other applicable state or federal permits shall be obtained prior to commencement of development.**

OTHER REQUIRED PERMITS

X	SWFWMD PERMIT	___	FDOT PERMIT
X	COUNTY PERMIT	X	FDEP PERMIT
X	HEALTH DEPT PERMIT	X	NPDES (NOI)



Location Map

CITY OF WINTER HAVEN STANDARDS
SECTION 9
ROADWAY DESIGN AND CONSTRUCTION

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9.1 GENERAL

Florida Statutes (the Florida Transportation Code) establishes the responsibilities of the State, Counties, and Municipalities for the planning and development of the transportation systems serving the public. The Code's purpose is to protect the safety and welfare of the public. The State of Florida Department of Transportation (FDOT) has developed and adopted uniform minimum standards and criteria for the design, construction, maintenance and operation of public roads. The City of Winter Haven has adopted the FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways as a manual that provides the basic guidelines for developing street and highway facilities with reasonable operating characteristics with a minimum number of hazards.

The purpose of this section of the City of Winter Haven Engineering Standards Manual is to provide uniform minimum standards and criteria for design, specifications and construction of public and private streets, highways, bridges, sidewalks, driveways, curbs, curb ramps, bicycle paths, drainage and stormwater management facilities, water, electric and wastewater utilities. These standards provide basic guidelines for developing these facilities in order to maintain uniform and reasonable operating characteristics and shall be applied to all new construction projects and on all reconstruction projects to the extent that economic and environmental considerations and existing development will allow. Where this Manual refers to guidelines and design standards given by reference in other manuals, those guidelines and standards shall be considered as minimum criteria and are to be considered as the requirements within the authority of this Manual. In those instances where a design criteria, specification or method of testing or construction is not specifically addressed in this manual, then the governing authority will be that contained in these other manuals cited and referenced in this Manual. The City or CITY shall mean the CITY or his designated representative with respect to this Manual.

9.2 ENGINEER OF RECORD/DUTIES AND RESPONSIBILITIES

9.2.1 DESIGN STAGE

The Engineer of Record for a project is responsible for the design of the construction plans and specifications for those roadways, drainage and utility facilities, and other structures, as they may apply. The Engineer of Record is responsible for the conformance with the minimum requirements set forth in this Manual and with other applicable statutory rules, regulations or policies that would affect the design and operation of the constructed project. Construction plans and specifications submitted to the City shall include design data and calculations necessary for the City to provide adequate review of the submittal. These plans, specifications and calculations shall be certified by the Engineer of Record.

9.2.2 CONSTRUCTION AND INSPECTION STAGE

The Engineer of Record for a project shall make periodical reviews and inspections from time to time, as required, in order that he can be reasonably assured that the project is

substantially constructed in accordance with the plans and specifications that have received approval by the City. The Engineer of Record shall not solely rely on project inspection from individuals who are not directly under his responsible charge unless, the Certification of the "As-Built" or "As-Built/Record Drawing" is to be made by another Registered Engineer who shall accept responsibility for project review and inspection.

9.2.3 "AS-BUILT" or "AS-BUILT/RECORD DRAWING"

The Engineer of Record, or other such Registered Engineer as may apply, shall submit to the City the required number of certified "As-Built" or "As-Built/Record Drawings" on the media required by the particular Department or Departments within the City of Winter Haven, or as required by other governmental regulatory or permitting agencies requiring such drawings. This "As-Built/Record Drawing" shall contain a certification from an Engineer registered in the State of Florida that indicates that the project has been substantially completed in accordance with the approved plans and specifications, or that the deviations noted on the Record Drawings will not prevent the project from complying with the design function of the project.

In order to effectively comply with this requirement, it would be necessary for the certifying Engineer to have provided periodic review and inspection of the installation of those facilities within the project. The Engineer may supplement his review and inspection of the project by utilizing information taken from a valid survey. The "As-Built/Record Drawing" shall provide information on project facilities that indicates sufficient horizontal and vertical dimensional data so that the constructed improvements may be located and delineated. All dimensions both horizontal and vertical that differ from the approved plans shall be placed on the "As-Built/Record Drawing" and certified by a Professional Surveyor and Mapper and Professional Engineer before submitting to the City.

"As-Built/Record Drawings" that contain disclaimers that essentially render the Professional Engineer's certification meaningless will not be accepted.

9.3 ROADWAY DESIGN AND CONSTRUCTION CRITERIA

Roadway design and construction criteria shall conform to the criteria contained within this Manual and, as referenced in criteria contained in the following publications and other applicable publications:

(a) FDOT – Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition.
(b) FDOT – Roadway Plans Preparation Manual, latest edition.
(c) FDOT – Standard Specifications for Road and Bridge Construction, latest edition.
(d) FDOT – Procedures Manual for Flexible Pavement Design, latest edition.
(e) FDOT – Utility Accommodation Guide, latest edition.
(f) FDOT – Roadway and Traffic Design Standards, latest edition.
(g) FDOT – Drainage Manual, latest edition.
(h) FDOT – Bicycle Facilities Planning & Design Manual, latest edition.
(i) AASHTO – A Policy on Geometric Design of Highways and Streets, latest edition.
(j) AASHTO – Standard Specifications for Highway Bridges, latest edition.

(k) AASHTO – Guide for Development of New Bicycle Facilities, latest edition.
(l) Transportation Research Board, Special Report 209, Highway Capacity Manual.
(m) ITE - Traffic Calming reference
(n) OSHA-All OSHA Safety Regulations, current edition
(o) USDOT, FHWA – Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition (MUTCD).

Publications listed above shall be considered as an integral part of this Manual.

9.4 STANDARD DETAILS & TYPICAL ROADWAY SECTIONS

9.4.1 STANDARD DETAILS

Construction shall conform to the Standard Details and Specifications contained in Section 9 of this Manual or as otherwise approved by the CITY. These Standard Details and Specifications may be updated from time to time. They are intended to serve as uniform standards, which represent minimum requirements and are supplemented by the standard details, design criteria and specifications contained in the other manuals and texts that were referenced in Section 9.3 of this Manual.

9.4.2 TYPICAL ROADWAY SECTIONS

The roadway typical sections for both public and private streets proposed for construction within the City of Winter Haven shall conform to the minimum criteria, guidelines and standards set forth in this Manual. These may be updated from time to time. These typical roadway sections are intended to serve as uniform standards which represent minimum requirements and may be supplemented by more stringent criteria, guidelines and standards that may be contained in the referenced manuals, as specific conditions may dictate.

9.4.3 TYPICAL ROADWAY SECTIONS LOCAL STREETS

The minimum pavement width shall be twenty-four (24) feet and the minimum right of way width shall be fifty (50) feet. In those instances where a Developer proposes to develop a local public or private street that does not conform to the adopted typical sections, the proposed typical section will require the approval of the CITY and the minimum standards and criteria prescribed in the aforementioned FDOT Manuals shall apply.

9.4.4 MODIFIED TYPICAL SECTIONS/REDUCED PAVEMENT WIDTH

The City also recognizes that certain types of local public and private streets may warrant consideration of a reduced pavement width. The following are examples of situations that may warrant such consideration:

(1) Local cul-de-sac streets of no greater length than 900 linear feet and having no intersecting side streets and having a cul-de-sac radius of forty-four (44) feet to the face of curb. The minimum width of pavement shall be no less than twenty (20) feet. All cul-

de-sac streets greater than six hundred (900) feet shall have a minimum width of twenty-four (24) feet. This minimum pavement shall meet the structural requirements of a local street. Where the reduced pavement width is authorized, the minimum right-of-way width shall not be less than forty (40) feet.

(2) Private internal roads in mobile home parks and multifamily developments shall have a minimum width of pavement of no less than twenty (20) feet. The minimum private right-of-way reservation may vary on a case by case basis.

9.4.5 COLLECTOR STREETS

The geometric design and roadway typical section of a collector road will be determined by the design operating conditions of the facility pursuant to criteria contained in other Manuals referenced in Section 9.3.

The minimum pavement width for collector streets shall be twenty-four (24) feet. The roadway sections and geometric design features required at a site shall be dependent on the operating conditions of the facility. The CITY shall determine the minimum design criteria of the proposed collector street or modifications required to an existing collector street that is impacted by a development.

9.5 PUBLIC RIGHT-OF-WAY AND UTILITY/DRAINAGE EASEMENTS

Minimum right-of-way widths are listed below. Additional right-of-way may be required to provide for adequate drainage facilities and to accommodate public drainage and utilities. Public utility and/or drainage easements may be substituted in lieu of actual dedicated right-of-way where the minimum right-of-way widths are consistent with the requirements contained in this manual, or as approved by the CITY.

Roadway Classification	Urban Section	Rural Section
Alleys	10’ min.	Not applicable
Local Street	50’ min.	As required
Collector Street	60’ min.	As required
Arterial Streets & Highway	100-300’	As required

9.6 CLEARING AND GRUBBING

All roadway rights-of-way shall be cleared and grubbed in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Selective clearing and grubbing is prohibited unless approved by the CITY.

9.7 SUBSOIL INVESTIGATION FOR ROADWAYS

A subsoil investigation report shall be submitted with road, drainage and utility plans and shall include:

- Seasonal high and existing groundwater elevation data.

- Borings to a minimum of 5.0 feet below the profile grade at no more than five hundred (500) foot intervals to determine the soil classification in accordance with AASHTO M 145-73. Additional borings may be made as necessary to determine limits of unsuitable material. Depth and horizontal extent of muck, or other unsuitable materials shall be determined. The Engineer of Record shall determine handling of unsuitable material, subject to the approval of the CITY.

- The extreme high water table shall be at least two (2) feet below the bottom of road base course. The use of underdrains within the public rights-of-way of the City is not allowed.

9.8 DESIGN CRITERIA FOR ROADWAY SUBGRADE

9.8.1 REQUIREMENTS

Roadway subgrade shall not have a thickness, bearing ratio, or density less than the following:

Type of Roadway	Compacted Stabilized Subgrade Thickness	Florida Bearing Value	Limerock Bearing Ratio	Minimum Density AASHTO T-180
Local	12”	60	40	98% Proctor
Collector	12”	60	40	98% Proctor

9.8.2 CONSTRUCTION

The construction of the stabilized subgrade shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The use of a reinforcing geofabric may be considered for application below the subgrade to help obtain the required compaction, subject to the approval of the CITY. The fabric shall meet the specifications of FDOT, Standard Specifications for Road and Bridge Construction.

9.8.3 TESTING

Test points for the subgrade bearing capacity and compaction shall be located no more than four hundred (400) feet apart and shall be staggered to the left, right, and on the centerline of the roadway. The test results shall be submitted by the Engineer of Record to the CITY. When, in the judgment of the CITY, conditions warrant additional testing, the Engineer of Record will be advised that additional tests will be required and the extent of such additional tests. Such tests shall be in accordance with the provisions of the FDOT Standard Specifications for Road and Bridge Construction or other applicable testing requirements.

9.9 BASE COURSES FOR FLEXIBLE PAVEMENTS

9.9.1 REQUIREMENTS

Base course material normally used is limerock. Other alternate base course materials may be considered for use for special design conditions with the approval of the CITY. These alternate materials include any FDOT approved base course. All materials and construction shall conform to FDOT Standard Specifications for Road and Bridge Construction, latest edition. If limerock base material is approved for construction, the thickness and density shall not be less than the following:

Type of Development	Compacted Base Depth	Minimum Density AASHTO T-180
Local	6”	98% Proctor
Collector	8”	98% Proctor

If an alternate base material is approved for use, equivalent minimum densities must be achieved.

Base materials and plant mixes including plant, methods & equipment shall be certified in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Base materials and plant mix certifications shall be submitted to the CITY by the Engineer of Record for review.

Soil cement base shall have a seven (7) day compressive strength of a minimum of 150 psi. In no case shall soil cement base thickness be less than six (6) inches for residential development and eight (8) inches for industrial development. Test cores shall be taken at twenty-one (21) days, have a strength of a minimum of 300 psi, and be taken at locations of high groundwater and other locations as deemed necessary by the Engineer of Record. Only a plant mixed soil cement base will be allowed; mixed in place soil cement base will not be allowed. Soil cement base shall have a seven (7) day minimum curing time prior to paving.

9.9.2 TESTING

Tests for base thickness and density shall be located no more than four hundred (400) feet apart and shall be staggered to the left, right, and on the centerline of the roadway. Test reports for thickness and density shall be submitted to the CITY by the Engineer of Record. When, in the judgment of the CITY, conditions warrant additional testing, the Engineer of Record will be advised in writing that additional tests will be required and the extent of such additional tests.

9.9.3 PRIME AND TACK COATS

All bases shall be primed in accordance with the FDOT Standard Specifications for Road and Bridge Construction, latest edition. Tack coats shall not be required on primed bases, except on areas, which have become excessively dirty and cannot be cleaned or in areas

where the prime has cured and lost all bounding effect. Tack coat material and construction methods shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition.

9.10 SURFACE COURSE FOR FLEXIBLE PAVEMENTS

9.10.1 REQUIREMENTS

Hot bituminous mixtures – plant, methods, & equipment shall conform to FDOT Standard Specifications for Road & Bridge Construction. Surface courses for flexible pavements shall be Asphaltic Concrete Type S and shall meet the following minimum thickness requirements.

Roadway Classification	Asphaltic Concrete Surface Course
Local Street	1 ¼"
Collector Street	1 ½"

9.10.2 MATERIALS AND CONSTRUCTION

Asphaltic Concrete Type S, including prime and tack coats, shall conform to the FDOT Standard Specifications for Road and Bridge Construction, latest edition, for materials and method of construction. The asphalt shall contain no more than 20 percent reclaimed asphalt pavement (RAP).

The method of determining the roadway sub-base and pavement thickness has been calculated by the structural number criterion as set forth in the "Flexible Pavement Design Manual" prepared by FDOT. An example of the structural layer coefficients defined in that manual are provided in TABLE 1 in this section. These structural layer coefficients are then extended in one-inch equivalent layers in the calculations of the structural number of the combined structural layers of the roadway section.

Using these criteria the minimum structural number allowable for any roadway section design for Local Street shall be 2.59. This structural number considers a roadway with a Type S asphaltic pavement of 1 ¼" thickness, a limerock base of 6" thickness and a stabilized subgrade of 12" thickness. The minimum structural number of a collector street shall be 3.06. This structural number considers a roadway with a Type S asphaltic pavement of 1 ½" thickness, a limerock base of 8" thickness and a stabilized subgrade of 12" thickness.

Where the Developer desires to present an alternate combination of roadway subgrade, base and pavement design typical section, the structural number of the alternate roadway section shall meet the structural number criteria established above. The CITY reserves the right to either approve or disapprove such alternate roadway typical section.

Plant mix design certification and/or coring tests of base and pavement will be required on all public and private streets. The frequency of coring tests will be, at a minimum, as

established in the FDOT Specifications, for Road and Bridge Construction, latest edition, or as specified by the CITY. The expense of all required tests shall be that of the developer.

Control strip testing may be required in accordance with FDOT Standards for Road and Bridge Construction, latest edition, or as specified by the CITY.

TABLE 1
STRUCTURAL COEFFICIENTS FOR DIFFERENT PAVEMENT LAYERS

Specification Section	Layer Coefficient	Layer
337	0.20	FC-1 or FC-4
331	0.44	Type S
333	0.30	Type III
332	0.20	Type II
280	0.30	ABC-3 (Marshall – 1000)
280	0.25	ABC-2 (Marshall - 750)
280	0.20	ABC-1 (Marshall - 500)
272	0.25	Econocrete (1100 psi)
272	0.22	Econocrete (800 psi)
270	0.20	Soil Cement (500 psi)
270	0.15	Soil Cement (300 psi)
335	0.15	SAHM (Marshall – 300)
204	0.15	Graded Aggregate (LBR-100)
250	0.18	Cemented Coquina Shell (LBR-100)
200	0.18	Limerock (LBR-100)
250	0.16	Bank Run Shell (LBR-100)
230	0.12	Limerock Stab. (LBR-75)
240	0.12	Sand Clay (LBR-70)
250	0.12	Shell (LBR-70)
260	0.10	Shell Stab. (LBR-70)
290	0.18	Limerock Sub-base*
160-3	0.10	Stabilized Sub-base
180	0.08	Stabilized Sub-base
160-5,9	0.08	Type A, B Stabilization (LBR-40)
160-5,9	0.06	Type A, B Stabilization (LBR-30)
160-7	0.06	Type C Stabilization
170	0.12	Cement Treated Subgrade (300 psi)
165	0.08	Lime Treated Subgrade
165	0.08	Hydrate Lime Treated Subgrade

* See Optional Base and Pavement Chart in FDOT Flexible Pavement Manual for thickness limitations. Updated layer coefficients as specified by the current FDOT Flexible Pavement Manual may be used for determining layer thickness. Friction courses will be approved on a case by case basis.

9.11 CONCRETE PAVEMENT

Concrete pavement may only be used with the specific approval of the CITY. Concrete pavement must conform to the FDOT Standards for Road and Bridge Construction, latest edition, the requirements of the American Concrete Paving Association Guide Specifications and Design Standards contained in the "Municipal Concrete Paving Manual", or an equivalent specification approved by the CITY.

9.12 INTERSECTION CORNER RADII

For commercial and industrial development the minimum radii shall be 50 feet where large trucks are expected to use the intersection.

9.13 TRAFFIC CONTROL DEVICES

9.13.1 REQUIREMENTS

All traffic control devices including those signs and pavement markings on private property when the public is invited must conform to standards adopted by the Florida Department of Transportation pursuant to Florida Statute, Section 316.0747.

Any nonconforming traffic control device in use by a nongovernmental entity prior to January 1, 1980 may be used for the remainder of its useful life, but no longer than January 1, 1992 after which any replacement device shall conform to the uniform system of traffic control devices adopted by the Department of Transportation.

The "Manual on Uniform Traffic Control Devices" (MUTCD) published by the U.S. Department of Transportation is the national standard for Traffic Control Devices. The Florida Department of Transportation has adopted the MUTCD as the State standard by Rule 14-15.10.

The City of Winter Haven has adopted Section 316 of the Florida Statutes, the Florida Uniform Traffic Control Law, relating to the use and regulations of streets and highways within the territorial limits of the City of Winter Haven, Florida (Ord. No. 1791).

The MUTCD states that:

Parking space striping must be white (Sec. 3B-19)
Lane Lines between traffic in the same direction, must be white (Sec. 3B-2).
Centerlines between traffic in opposing directions, must be yellow (Sec. 3B-1).
Arrows on the pavement must be white (Sec. 3B-20)
Crosswalks must be white (Sec. 3B-18)
Stop lines must be white (Sec. 3B-17).
Street Name Signs should have 4" high lettering (Sec. 2D-39).

9.13.2 SIGN INSTALLATION

In business, commercial or residential districts where parking and/or pedestrian movement is likely, the clearance to the bottom of a sign shall be at least seven 7 feet.

Lateral clearance for regulatory and warning signs or small directional signs should be 6 to 12 feet from the edge of the pavement or traveled way in rural areas, signs are generally mounted alongside the roadway in the space between the curb and the sidewalk. Although 2 feet is recommended as a working urban minimum, a clearance of 1 foot from the curb face is permissible where sidewalk width is limited.

STANDARD SIZES OF SIGNS:

Stop:	30” (Octagon)
Yield:	36” (Equilateral Triangle)
No Turn (Symbol):	24” X 24” (Square)
Do Not Enter:	30” X 30” (Square)
Regulatory Speed Limit, Keep Right:	24”X30” (Rectangle)
Warning (Right or Left Curve, No Outlet):	30” X 30” Or 36” X 36” (Diamond)
Street Name:	6” Blade Height with 4” High Lettering Rectangle)
Handicapped Parking:	12” X 18”
One Way:	36” X 12” Or 18” X 24” (Rectangle)

Street name sign for a public road, a street that will be maintained by the City of Winter Haven, shall use a blade with green background with white borders and letters. Street name sign for a private street shall be white blank blade with green letters. Street name signs shall be mounted on 3-1/16” x 1-15/32” (2 lb/ft) U-channel hot dipped galvanized post with galvanized color and 3/8” holes. The street name sign at the entrance road shall have a blade height at 9 inches with the street name composed of combination initial upper-case letters at least 6 inches in height and lower-case letters at least 4.5 inches in height. Interior road street name sign may be 6 inches blade height with the street name composed of combination initial upper-case letters at least 4 inches in height and lower-case letters at least 3 inches in height. The street name sign blade shall be flat, high intensity prismatic reflective aluminum, with 0.081 gauge thickness. The street name blade shall be double sided**.** Use a street name sign mount (180 degrees) for U-channel post and a cross blade holder at least 12 inches in length. The street name sign assembly shall be installed meeting MUTCD.

9.13.3 SIGNALIZATION

During the review of the development plan, the CITY will review the need for signalization. The developer shall be responsible for submitting any traffic studies required to determine signalization requirements, or requests for additional traffic controls. This determination will be based upon traffic warrants as identified in the "Manual of Uniform Traffic Control Devices”.

9.13.4 COSTS

All costs for the design and installation of required traffic control devices and street name signage's including but not limited to design, permitting, construction and installation of signalization shall be borne by the developer.

9.13.5 TEMPORARY ROAD CLOSURES

The temporary closure of public streets located within the City of Winter Haven for the purposes of a special event, roadway or utility construction, reconstruction, maintenance, or emergency purposes may be authorized through the issuance of a Permit by the CITY. An additional permit will be required on those roads within the City of Winter Haven maintained by Polk County or the Florida Department of Transportation.

9.13.6 STREET NAME SIGNS

Streets shall be named in accordance with the method set forth by the E-911 Street Addressing, and shall be the size and shape above described.

9.13.7 TRAFFIC CONTROL AND WORK SAFETY

Construction, maintenance and utility operations within public right-of-ways shall require that a plan be submitted to the CITY traffic control around and through the work site. This work site safety and traffic control plan shall conform to the FDOT Manual on Traffic Controls and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations and the FDOT Roadway and Traffic Design Standards.

9.14 TRAFFIC CALMING ZONES

Traffic calming and traffic calming zones are strategies to regulate the excessive speed of "pass through" vehicular traffic on certain local residential streets where traffic volumes, speed, and high accident rates have been determined by the City to be disruptive to the quality of life within the neighborhood. Generally, traffic calming measures consist of the introduction of structural features or special street design features that discourage vehicles from traveling of speeds higher than posted speed limits. Traffic calming zones have limited application and any proposed location must be first recommended for consideration by the CITY, then approved for funding and implementation by the City Commission.

9.15 DRIVEWAYS

Driveways installed within the public right-of-way within the City of Winter Haven shall be constructed in accordance with the provisions of this Manual, and no driveway shall be constructed until a Right of Way Use Permit has been obtained from the City for such construction.

The materials and specifications for commercial and industrial driveways will be according to intersection design standards and be approved on a site-specific case that

provides for moving traffic off the road as quickly as possible without impeding traffic on the main road. This class of driveway shall typically include a wide radius capable of handling vehicles that will be utilizing the entrance and be concrete. The FDOT Roadway and Traffic Design Standards, latest edition and FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition shall be used as a minimum for driveway design when intersection criteria is required.

The property owner shall maintain private driveways. The City will only maintain public access roads and intersections.

Driveways that connect to the State Highway System or County Road System must obtain a driveway permit from the governing agency prior to receiving approval of the site plan by the CITY.

Driveways installed within private property may be of any material that provides a "dust-free" surface and are to be constructed in accordance with the specifications deemed appropriate for the type of construction proposed.

9.16 SIDEWALKS

Sidewalks installed within the public right-of-way within the City of Winter Haven shall be constructed in accordance with the provisions of the Winter Haven City Code and Standard Detail S/W 101. No sidewalk therein shall be constructed until a permit has been obtained for such construction. In an urban design road, sidewalks shall be located a minimum distance of thirty (30) inches behind the back of curb and the sidewalk shall have a minimum width of five (5) feet in commercial areas and four (4) feet in residential areas. When constructed along the back of the curb, sidewalks shall have a minimum width of five (5) feet wide. Sidewalks constructed along the road with no curb shall have a minimum distance of six (6) feet from the driving lane or outside the roadside clear zone whichever is greater.

Unless specified herein the material and specifications for the installation of standard sidewalk are shown on the details contained in FDOT Standard Details 304 and 515. Refer to FDOT Index 304 for handicap ramps.

Any request to vary from the criteria for sidewalk construction set forth in the Winter Haven City Code will be considered on a case by case basis by the CITY. Such requests may be granted provided the CITY determines that specific restrictive conditions preclude conformance to approved standards and the proposed sidewalk construction is warranted.

9.17 ACCELERATION – DECELERATION LANES

Acceleration-deceleration lanes shall be provided, if warranted, under the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition and the FDOT Road and Traffic Design Standards, or as required by the CITY due to special conditions.

9.18 BRIDGES

Bridges shall be constructed of pre-cast concrete, pre-stressed concrete or cast in place concrete, unless otherwise approved by the CITY.

Bridge design shall conform to the design criteria of the AASHTO Standard Specifications for Highway Bridges, latest edition, FDOT Standard Specifications for Road and Bridge Construction, latest edition and other applicable design standard specifications relevant to the approved construction material and construction practices.

The design truck loading shall be HS 20-44. Four (4) sets of signed, sealed, and dated bridge design calculations shall be submitted by the Engineer of Record to the CITY.

Foundation investigation and design reports and testing are required and shall be in accordance with FDOT and AASHTO Standard practices, and shall be submitted to the CITY by the Engineer of Record for review.

All engineering design revisions shall be reviewed and approved by the CITY prior to construction.

9.19 ROADWAY ALIGNMENT

9.19.1 VERTICAL ALIGNMENT

A minimum grade of 0.30% is required for all urban design sections. The grade of a rural design section will be dependent upon the specific topographic features of the area. Vertical curves shall be provided where appropriate. The roadway grade in both urban and rural design sections shall conform to the criteria set forth in the FDOT Manual of Minimum Standards for Design, Construction and Maintenance for Streets and Highways, latest edition. Refer to the following table for maximum change in grade without using vertical curve.

DESIGN SPEED (MPH)	20	30	40	50	60	65	70
Maximum Change in Grade in percent	1.20	1.00	0.80	0.60	0.4	0.30	0.20

9.19.2 HORIZONTAL ALIGNMENT

The standard alignment of a particular section of road should extend throughout the entire section. “Broken back” arrangements of curves should be avoided. Horizontal curvature shall conform to the criteria set forth in the FDOT Manual of Minimum Standards for Design, Construction and Maintenance for Streets and Highways.

9.19.3 ALIGNMENT COORDINATION

Horizontal and Vertical alignment should not be designed independently. Curvature and grades should be in proper balance and stopping sight distance should also be included in

the design decision. All alignment consideration should be in conformance with the FDOT Manual of Standards for Design, Construction and Maintenance for Streets and Highways.

9.20 ROADSIDE CLEAR ZONE WIDTH

The width of the clear zone should be as wide as practical. The minimum permitted widths as shown in the following table, are minimum values measured from the face of curb and should be increased whenever feasible.

DESIGN SPEED (MPH)	30 and below	35	40	45	50 and above
Rural (ft)	6	8	11	14	30
Urban (ft)	4	4	4	4	14

Guardrails may be utilized in lieu of the clearance with minimum requirements under certain circumstances. Refer to FDOT Roadway and Traffic Design Standards for minimum installation details.

9.21 SIGHT DISTANCE CRITERIA

The design of street and highway vertical and horizontal alignments and intersection design shall consider stopping sight distance and obstructions to sight distance. Refer to the criteria set forth in Section 212.11.1 of the FDOT Design Manual and the FDOT Manual of Uniform Minimum Standards for Design Construction and Maintenance for Streets and Highways (Green Book).

9.22 MEDIANS, ISLANDS AND PARKWAYS

Medians, islands, and parkways may be authorized and in some cases required within the public right-of-way by the CITY. The plat dedication or other legal authority must clearly stipulate that the maintenance, including vegetative maintenance of the area is to be the sole responsibility of a private individual, group or association and that proof is provided that the maintenance of the improvements will be perpetual. The maintenance of the median, islands and parkways must insure that their presence does not become a site obstruction.

Medians shall be curbed and conform to requirements of the FDOT Standards. All median turn lanes shall be developed in accordance with the applicable Florida Department of Transportation's Standard Indexes for Roadway and Traffic Design Standards and shall provide sufficient clear unobstructed sight distance consistent with the requirements contained herein.

9.23 OTHER STRUCTURAL IMPROVEMENTS WITH PUBLIC RIGHTS-OF-WAY

No private structural improvements, including but not limited to walls, posts, fences, gate houses, private identification signs, or other encroachments shall be constructed or placed

within the public right-of-way unless approved by the City Commission. Public or quazi-public improvements such as utilities, bus shelters, telephone booths, newspaper racks, or benches will be considered, providing they do not create a traffic or pedestrian hazard and do not limit site distance at intersections. Mailboxes are exempt from permitting and may be placed in the right of way providing they meet all United States Postal Service requirements and comply with the FDOT Roadway and Traffic Design Standards, latest edition. Typically mailboxes should be mounted on a breakaway type post. When constructing congregate or multiple mailboxes, or a mailbox on a non break away pedestal they shall be constructed in conformance with FDOT roadway safety requirements including maintaining a roadside clear zone as specified in this manual. A building permit may be required for the installation of certain structural improvements. This permit must be obtained from the Building Department.

ROAD DRAINAGE

Road drainage pipe and inlet spacing design and construction plans shall meet the 25 year storm event criteria. Minimum drainage pipe shall be 15 inches in diameter or equivalent elliptical pipe. When drainage pipe is sized using full flow conditions the hydraulic gradient shall be at least one foot below the gutter profile. When the design is based on partial depth flow the depth flow shall not be over the 2/3 pipe diameter at velocities exceeding 15 feet per second (fps). Pipes will have a physical slope sufficient for a minimum flow velocity of two and one half (2.5) feet per second.

The improved road right of way shall be free of wetlands and floodplain.

9.24 SODDING OR GRASSING AND MULCHING

All right-of-way other than the roadway area shall be sodded or seeded and mulched in order to prevent erosion within the project limits. All sodding or seeding and mulching shall be in accordance with the materials and construction practices set forth in the FDOT Standard Specifications for Road and Bridge Construction, latest edition. The final decision as to the requirement for sodding versus seeding and mulching will be that of the CITY.

9.25 BICYCLE FACILITIES

Transportation facilities and recreational trails for bicycles shall be developed in accordance with the criteria set forth in the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, The FDOT Bicycle Facilities Planning and Design Manual and as adopted by the American Association of State Highway and Transportation Officials (AASHTO) in the Guide for Development of New Bicycle Facilities, latest edition.

In the development of new streets and highways and in the reconstruction of existing streets and highways, bicycle facilities in the form of either of the following shall be considered and evaluated as to the applicability of incorporating such features into the design of the street and highway.

1. Rural design sections – five (5) foot width paved shoulders
2. Urban design sections – fifteen (15) foot width curb lanes
   (alternate) – five (5) foot width exclusive dedicated bicycle lane

9.26 EROSION CONTROL

9.26.1 REQUIREMENTS

The developer shall take all practicable and necessary effort to control and prevent erosion and sediment transport during the construction of a project to surface waters of the State or to adjoining properties. The design of erosion control systems applies common sense planning, scheduling and control actions that will minimize the adverse impacts of soil erosion, transport and deposition. The design and maintenance of erosion and sediment control shall utilize Best Management Practices (BMP) in accordance with the required National Pollutant Discharge Elimination System (NPDES) permit.

9.26.2 INSTALLATION OF CONTROLS

No clearing, grading, cutting or filling shall commence until erosion and sedimentation control devices have been properly installed, in accordance with an approved plan between the area to be disturbed and adjacent property, water bodies, water courses and wetlands. Clearing and excavation required for installation of erosion and sedimentation control devices is allowed provided no activity occurs beyond five feet of the control devices as specified on the approved plan.

9.26.3 METHOD OF CONTROL

Erosion shall be minimized and sediment retained on the site through application of Best Management Practices (BMP) approved as part of the NPDES permit. Methods of control shall be suitable for site size, vegetative cover, soil type, slope, design features and proposed construction sequence and activities.

a. Methods:
   1. Limiting amount of clearing.
   2. Staging clearing activities to minimize the length of time and area is left un-stabilized and to minimize the total area cleared at any one time.
   3. Temporary gravel construction entrances.
   4. Straw bale barriers.
   5. Silt fences.
   6. Storm drain inlet protection.
   7. Temporary diversion dikes.
   8. Temporary sediment traps.
   9. Temporary sediment basins.
   10. Temporary stream crossing.
   11. Seeding to establish an appropriate vegetative ground cover.
   12. Sodding.

13. Erosion control and seeding mats.
14. Other suitable methods.

9.26.4 MAINTENANCE OF CONTROLS

Once properly installed, erosion and sediment controls must be maintained until a permanent vegetative ground cover is established. Any site or portion thereof where work is not being performed as part of the current phase of development and which remains cleared for over thirty (30) days, shall be stabilized. All disturbed areas shall be permanently stabilized through the establishment of appropriate vegetative ground cover upon completion of development activities on the site.

9.26.5 EROSION & SEDIMENT CONTROL NOTES

1. All practicable and necessary efforts will be taken during construction to control and prevent erosion and transport of sediment to surface drains, surface waters, or on to adjoining properties.

2. All site grading shall direct stormwater runoff to the detention and/or retention areas.

3. Revegetation and stabilization of disturbed ground surfaces will be accomplished as rapidly as possible to prevent erosion from occurring and reduce the sediment load into the discharge waters of the State or USA. All areas disturbed during construction shall be grassed and mulched, or sodded.

4. All areas subject to erosion shall be regraded and property maintained with protective measures such as vegetation, turfing, mulch, hay bales, stabilizing, fibrous materials riprap, etc. to control erosion with a minimum maintenance and to reduce dust conditions.

5. Filter fabric or hay bales will be installed around the construction site perimeter to prevent siltation of adjacent properties and any such materials shall be removed from off-site. The filter fabric and or hay bales will remain in place until all exposed surfaces are stabilized.

6. The down stream turbidity screening will remain in place for the duration of the project construction.

9.26.6 DRAINAGE FACILITIES OPERATIONS & MAINTENANCE

1. Bank side slopes, no steeper than 4:1 (horizontal:vertical) slope, shall be maintained against rill, washout and erosion.

2. All silt and other materials that accumulate in the pond bottom, underdrains, exfiltration beds, swales, ditches, pipes, etc. shall be removed.

3. All retention areas and adjacent areas shall be mowed and kept clean of all trash and debris. All grass cuttings; trimmings and other organic sediment shall be raked and removed.

4. Retention area bottoms and side slopes are to be cleaned and regraded by the Owner as required to maintain the effective depth and volume and rate of percolation.

5. Provide ingress/egress access easement, minimum 15 feet wide, from a road to the drainage facility; and a 5 feet wide maintenance berm around the retention area facility that is relatively flat for access by maintenance vehicles and equipment and performance of maintenance of the drainage facility. A minimum 15 feet wide drainage easement, which shall be centered on the drainage pipe, shall be provided for operation and maintenance of a drainage pipe that is located outside of the road right of way.

9.27 UTILITY INSTALLATIONS WITHIN PUBLIC RIGHT-OF-WAYS

In addition to obtaining a Right of Way Use Permit, anyone working within the right of way shall maintain traffic, and use BMP's as needed to provide erosion control.

9.27.1 GENERAL (CITY-MAINTAINED STREETS)

Where it is necessary for utilities to locate or relocate within the public right-of-way, the placement and location shall not be inconsistent with the requirements of this the Manual. Utility poles and above ground utility structures are not generally permitted in medians or within roadside recovery areas. Underground utilities should not be buried under the pavement when other space is available within the right-of-way. Unavoidable crossings of the street should be designed to allow for repairs and modifications without unnecessary disruption or hazard to traffic. Work site safety shall conform to Part VI of the MUTCD and to the criteria set forth in the FDOT Roadway and Traffic Design Standards.

9.27.2 INSTALLATIONS CROSSING UNDER STREETS

Underground utility crossing of paved City-maintained streets are to be by the "Jack and Bore or Directional Bore" methods meeting the FDOT Utility Accommodation Manual. No other methods will be allowed. Where extraordinary circumstances preclude the use of the "Jack and Bore" or Directional Bore methods of utility crossing, the CITY may authorize an open cut trench across the paved street. The casing of the underground utility shall maintain a minimum of thirty-six (36) inches of cover from the crown of the roadway pavement to the outside diameter of the casing. The casing shall extend three (3) feet past the back of curb in an urban design section and a minimum of three (3) feet past the edge of pavement in a rural design section. All methods of installation are subject to the review, approval and inspection by the City of Winter Haven. Traffic control at the project site shall be maintained during all stages of the operation and such traffic control shall conform to the criteria set forth in this section.

9.27.3 UTILITY INSTALLATIONS (COUNTY AND STATE MAINTAINED RIGHT-OF-WAY)

Utility installations within County and State maintained right-of-way requires that the City of Winter Haven file a permit with those agencies for the installation and maintenance of that utility installation. It will also require that the Contractor performing the actual installation of the utility file with the City of Winter Haven proof of insurance that sufficiently protects the City, as determined by the City's CITY. The Contractor shall be responsible for maintaining traffic control and work site safety during the entire installation.

9.28 CITY, COUNTY, STATE, AND FEDERAL PERMITS

The developer, his agent or assign, prior to the development of a site, shall obtain all necessary City, County, State, and Federal permits for the construction of the project. The Engineer of Record shall submit copies of the approved permits to the CITY at the time a request for pre-construction meeting is submitted to construct road, bridge, utility and/or drainage facilities. In certain circumstances, conditional approval of the construction plans may be granted upon receipt of satisfactory evidence that applications for permit have been furnished to the City. This conditional approval shall be subject to the actual issuance of the required permit. Conditional approval does not grant authorization to start construction unless specifically authorized by the CITY.

Polk County and Florida Department of Transportation issue permits for driveway connections to their roadways, utility installations and other general uses of their right-of-ways. Florida Department of Environmental Protection (FDEP) issues permits for construction activity in or affecting the water quality of waters of the State and potable water systems and wastewater systems. Southwest Florida Water Management District (SWFWMD) issues permits for stormwater management systems. The Florida Department of Environmental Protection issues NPDES exemptions and permits for development, which require erosion control measures. Other permit applications may also be issued by the afore-referenced agencies.

9.29 CONSTRUCTION PLANS/PUBLIC AND PRIVATE STREETS

9.29.1 REQUIREMENTS

Construction plans and specifications prepared by and certified by a professional engineer registered in the State of Florida must be submitted to and approved by the City of Winter Haven for all proposed public and private street construction. These plans and specifications shall include the minimum information:

(a) Topographic map of the site with elevations based on North American Vertical Datum of 1988 (NAVD) elevations, contour lines and other features that would influence the drainage pattern (existing or modified) of the site. If a reference datum other than the NAVD is used, e.g., National Geodetic Vertical Datum of 1929 (NGVD), the map and plans shall include a conversion factor.

(b) A layout plan of the proposed development, showing all necessary existing and proposed elevations, grades and treatment of intersections.

(c) Typical roadway sections showing all necessary elevations, grades and intersection treatment, including special profiles are required to define design requirements of site specific locations.

(d) Drainage map, including the entire area to be developed and adjacent areas affecting or affected by the development.

(e) Plan and profile sheets for all public and private streets that are proposed for construction. These plans shall include existing topography and proposed elevations of roadway sections and method of connection to existing roads, which may include special profiles of intersections.

(f) If variable width right-of-ways are proposed, roadway and ditch cross sections shall be shown to describe site conditions. In any instance, the maximum interval of cross sections shall be one hundred (100) feet.

(g) The construction plans shall include the location of all existing and proposed utilities and, where applicable, a utility relocation plan. Existing and proposed drainage facilities shall also be included in the plans. All afore-referenced facilities shall be located in plan and profile view and in most instances, be shown in cross-sectional views.

(h) Benchmarks shall be shown on the construction plans at an interval not to exceed five hundred (500) feet.

(i) Soil survey data indicating all soil classifications and seasonal high water table elevations shall be provided. Soil classifications shall be in accordance with AASHTO soil classifications. Soil classifications shall be prepared and certified by a qualified engineer registered in the State of Florida.

9.29.2 ADDITIONAL REQUIREMENTS

The construction plans shall also include the minimum requirements:

1. The location of all existing and proposed development lot lines; if applicable.

2. The location of and width of all utility and drainage easements. If easements are to accommodate both drainage and utilities, sufficient separation or width should be provided to avoid conflict.

3. Title of the proposed subdivision or site development and address, where applicable.

4. Location and width of proposed outfall ditch easements or right-of-way, where applicable. This requirement shall include details of typical section and their relationship to cross-sections. Special details may be required that would provide adequate depiction of a proposed facility.

5. Identification of adjoining development, including: right-of-way, roadway widths, and names of roads impacted by the proposed development.

6. All plans shall contain a note, requiring conformance with the guidelines and criteria set forth in this Manual and with current FDOT Specifications for Road and Bridge Construction. Compliance with the guidelines and criteria set forth in other applicable manuals referenced in Section 9.3 of this Manual may be applicable. In any instance the plans and specifications shall conform to acceptable engineering practice. All engineering construction plans and specifications shall be prepared under the supervision of and shall be certified by an engineer registered in the State of Florida.

9.30 APPROVAL OF ENGINEERING PLANS

Prior to the start of construction, engineering plans must be approved by the CITY. Prior to the CITY authorizing construction to begin, approval of utility work must be received from the CITY. Approval of such plans shall expire twelve (12) months after the date of original written approval by the City of Winter Haven's authorized representative unless substantial construction has been achieved, or a developer furnished construction schedule has been received prior, to extend the construction completion date. The determination of completion of substantial construction shall be made by the CITY prior to the expiration of the twelve-month approval period. If construction has not commenced within the initial twelve (12) month time period, the plans must be resubmitted and must comply with current criteria. After construction has commenced, work shall be continuous until complete. If the developer suspends the construction for a period of six (6) months or more, plans shall be resubmitted and construction may not continue until the plans are reapproved. Approval by the CITY of engineering plans or the plat of a subdivision or minor variances does not constitute approval of anything at variance with the Subdivision Regulations, unless a variance has been granted by the City's Planning and Zoning Board.

Any deviance from the City's Subdivision Regulation must receive a variance from the City's Planning and Zoning Board. If the deviance from the Subdivision Regulations results in a change in roadway design criteria, neither approval of the construction plans nor authorization to commence construction will be given until the variance is received from the City's Planning and Zoning Board.

9.31 INSPECTIONS OF PROJECT

The CITY shall inspect all permitted projects to assure the construction of infrastructure to be maintained by the City is in compliance with the approved plans. When actual field conditions differ from the approved plans the Engineer of Record shall notify the City so that a determination can be made if modifications to the plans are necessary. If substantial changes are to be made the Engineer of Record shall submit plans reflecting the changes and receive approval of the modifications from the CITY before proceeding with work at variance to the previously approved construction plans.

9.32 CERTIFIED "AS-BUILT" CONSTRUCTION PLANS

Two sets of certified "As-Built/Record Drawing" (Blueprint), and one set on electronic media in AutoCad format compatible with City systems shall be provided to the CITY for all roadway, drainage and all underground utilities within the development upon completion of the project. The "As-Built/Record Drawing" shall be certified by a Professional Engineer based upon information provided by a Professional Surveyor & Mapper as described in Section 9.2 of this Manual.

9.33 PUBLIC ACCEPTANCE AND MAINTENANCE OF FACILITIES

The City of Winter Haven shall accept for maintenance only those public streets and drainage facilities which are constructed in accordance with the requirements referenced in this Manual and which have been approved for acceptance by the City.

9.34 WARRANTY PERIOD FOR CITY-MAINTAINED IMPROVEMENTS

Prior to the acceptance by the City of City-maintained street or drainage, the City shall inspect the construction improvements and if the improvements have been determined by the City to have been satisfactorily completed in accordance with the approved plans and specifications the City shall accept the improvements with a 1-year warranty period. The developer or contractor shall submit a properly executed and notarized letter of warranty.

DATE: June 26, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Amanda-Jo Nicholson, Assistant to the City Manager

SUBJECT: Authorization for Travel & Training

BACKGROUND

In April 2011, the City Commission amended the City's Policy Relating to the Travel and Training Expenses for Both Officials, Employees, and City-Sponsored Boards and Committees. As part of the amended policy, any travel and training for the City Manager and City Commissioners must be presented to the City Commission for pre-authorization prior to attending a convention, conference or training program.

In accordance with the City Commission's Policy, authorization is requested for the following:

Event: Florida League of Cities Annual Conference
Location: Hollywood, FL
Dates: August 12-16, 2026
Attendees: Mayor Yates, Mayor Pro Tem Mercer, Commissioners Birdsong, Davis, Dollison, Deputy City Manager Carnevale and Public Affairs and Communication Director Hill

FINANCIAL IMPACT

Conference registration $650, plus hotel, mileage, & per diem costs. Expenses associated with the travel and training outlined above will be accounted for within the Commission, City Manager's, and Public Affairs and Communication cost centers.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Responsible Government
- **Goal:** 6.2 – Engage and participate in legislative matters (State & Federal) and advocate for Home Rule and local priorities.
- **Strategy:** 6.2.1 – Strategically engage in local, State and national professional organizations and coalitions.

RECOMMENDATION

Staff recommends the City Commission authorize travel for the participants listed above.

ATTACHMENT

- FLC Conference Information



FLC
FLORIDA LEAGUE OF CITIES

Florida League of Cities

2026 **ANNUAL CONFERENCE**

August 13-15, 2026

The Diplomat • Hollywood, FL

REGISTRATION INFORMATION

Paid registration is required to receive housing information, so sign up early!
See page 9 for details.

Hotel Reservation Deadline: July 14, 2026

Conference Registration Deadline: July 31, 2026

#FLCities2026



GENERAL INFORMATION

The Florida League of Cities (FLC) 2026 Annual Conference will be held August 13-15, 2026, at The Diplomat in Hollywood.

The conference is an opportunity for municipal officials and senior staff to enhance leadership skills, learn from municipal experts, share ideas with peers, discuss strategies for Florida's future, and discover the latest products and services for municipal governments.

This year's conference will include breakout sessions, committee meetings, keynote presentations, awards, and more. Don't miss this opportunity to learn, network, and share.

Location/Dates

The Diplomat – Hollywood, FL
Thursday, August 13 - Saturday, August 15, 2026

Registration Hours

Wednesday, August 12: 12:00 p.m. - 4:30 p.m.
Thursday, August 13: 7:00 a.m. - 7:00 p.m.
Friday, August 14: 7:30 a.m. - 5:00 p.m.
Saturday, August 15: 7:30 a.m. - 2:30 p.m.

Registration Fees

City/County/Government ($650), **Corporate** ($750), and **Guest** ($175): These fees cover your name badge, admission to all conference sessions and the exhibit hall, refreshment breaks, Friday's membership networking event, Saturday's Past Presidents' Luncheon and Installation, and the Inaugural Celebration on Saturday night.



NOTE: Registrants are defined as any elected government official or any employee of governments, organizations, or corporations. **Guests** are defined as spouses, partners, or other nonprofessional relations of conference delegates. Guest registration **may not** be used for other elected government officials, staff, or company representatives.

Teen Guest 13-18 years ($20) and **Child Guest 3-12 years** ($15): These fees cover your name badge, admission to the exhibit hall, Friday's membership networking event, and refreshment breaks. **Teen and child guest registrations do not include Saturday's Past Presidents' Luncheon or the Inaugural Celebration.**

Registration Procedures

Online Registration – Credit Cards Only

Visit *flcities.com/annualconference* to access online registration and pay with your Visa, Mastercard, or American Express. You will receive your conference confirmation immediately via email. Conference confirmations include your registration information, totals, and housing instructions. Please check your confirmation carefully to verify that all information is correct and inform the League immediately of any errors.

Mail Registration – Checks Only

To pay via check, fill out the registration form on page 10, attach your check for the appropriate fee, and mail it to the League office by **Friday, July 31, 2026**. Name badges and other information can be picked up at the conference registration desk.



Deadlines

Registration – Conference registrations must be received no later than **Friday, July 31, 2026**. If you are unable to meet this deadline, please register on-site. **NOTE: Registration fees will increase to $680 for government and $780 for corporate registrants for all registrations done on-site**, so we encourage you to register in advance.



Hotel Reservations – The cutoff date for reservations at The Diplomat is **July 14, 2026**. Reservations must be made via an FLC-provided registration link only; no one will receive housing information until **after** their **paid** registration is received. Please see page 9 for more details.

Cancellation Policy

Conference registration cancellation requests must be sent in writing via email to *mhowe@flcities.com*. All cancellations received in the FLC office by 5:00 p.m. **Friday, July 31, 2026**, will receive refunds, minus a **$50.00** cancellation fee. Refunds will be issued after the conference. **No refunds can be made after July 31 or for early departure from the conference.**

Hotel reservations must be canceled no later than **three days** prior to the scheduled arrival date to avoid a penalty of one night's room and tax.

Special Needs

If you are physically challenged and require special services or if you have special dietary needs (i.e., allergies or kosher or vegetarian meals), please attach a written description to your registration form. Contact the hotel directly if you need any special accommodations in your room.



Certification Credit

This conference qualifies for 10 points in our **Certified Elected Municipal Official** program. Visit *flcities.com/certificate* for details or contact Christen Dangro at *cdangro@flcities.com* for more details.

Live Feeds via Social Media

The League posts real-time updates and photos via Facebook, Instagram, and LinkedIn during the conference. Follow @FLCities on all major platforms. Connect with the conversation or pose questions by using the hashtag **#FLCities2026** in all your conference-related posts.

Thursday is City Shirt Day!

We encourage all of you to show your city spirit by wearing your city shirt on **Thursday, August 13**.

Contact Information

For additional information, please contact Melanie Howe at *mhowe@flcities.com* or 850.222.9684.



FLC
FLORIDA LEAGUE OF CITIES

TENTATIVE PROGRAM

Following is a tentative schedule of conference events. Be sure to check our website for updates!

Wednesday, August 12, 2026

12:00 p.m. - 4:30 p.m.
Registration Desk Open

1:30 p.m. - 2:00 p.m.
Florida League of Mayors Nominating Committee Meeting

2:15 p.m. - 3:15 p.m.
Florida League of Mayors Business Meeting
For more information, contact flm@flcities.com.

3:30 p.m. - 4:30 p.m.
Florida League of Mayors Workshop
Additional registration required through the Florida League of Mayors; contact flm@flcities.com for more details.

5:00 p.m. - 6:30 p.m.
Florida League of Mayors Reception
Additional registration required through the Florida League of Mayors; contact flm@flcities.com for more details.

Thursday, August 13, 2026

7:00 a.m. - 7:00 p.m.
Registration Desk Open

8:00 a.m. - 12:00 p.m.
Continuing Education in Ethics: Have You Completed Your Hours?
Florida's municipal elected officers are required to take four hours of specific continuing education in ethics per year. If you haven't completed your hours yet, this is your opportunity! The four-hour session includes two hours on the Florida Ethics Law (Chapter 112, Florida Statutes), one hour of public meetings (Chapter 286, Florida Statutes), and one hour of public records (Chapter 119, Florida Statutes). If you have completed your hours, this class is a good refresher.

NOTE: Registration is limited to the first 175 people and will be on a first-come, first-served basis.

8:30 a.m. - 10:00 a.m.
Florida League of Mayors Board of Directors Meeting

10:00 a.m. - 7:30 p.m.
Exhibit Hall Open

10:15 a.m. – 11:30 a.m.
Workshop

1:00 p.m. - 2:30 p.m.
Workshop

1:00 p.m. - 3:00 p.m.
"Cities 101" Workshop
If you are newly elected or newly appointed, this "crash course" is designed for you. Details about Florida municipalities, the services they provide, and governing challenges will be discussed. This course is a prequel to the popular Institute for Elected Municipal Officials (IEMO), but it is not a substitute for the two-day IEMO class.

3:15 p.m. - 4:30 p.m.
Workshops

3:15 p.m. - 4:45 p.m.
Florida League of Cities Nominating Committee Meeting

4:45 p.m. - 5:45 p.m.
Connect, Collaborate, and Caffeinate: Speed Networking for Conference Attendees
Get ready for a dynamic networking experience! Fuel up with coffee and snacks as you engage in fun, fast-paced conversations and make meaningful connections with fellow leaders in local government. Don't forget your business cards.

6:00 p.m. - 7:30 p.m.
President's Welcome Reception in the Exhibit Hall

Friday, August 14, 2026

7:00 a.m. - 8:30 a.m.
Florida Black Caucus of Local Elected Officials Breakfast
Additional registration required through the Florida Black Caucus of Local Elected Officials; contact Caressa Andrews-Moye at candrewsmoye@flcities.com for more details.

7:30 a.m. - 8:30 a.m.
FREE Sunrise Yoga
Join us for a **sunrise yoga class**. Flow with grace in a variety of postures designed to open up your mind, body, and heart. This relaxing class will be led by a certified personal trainer and is great for individuals at all fitness levels. You don't need to bring a yoga mat, but be sure to wear comfortable clothing. There is no charge for the event, **but pre-registration is required**, and the class is limited to the **first 40 participants**.

7:30 a.m. - 9:00 a.m.
Continental Breakfast in the Exhibit Hall

7:30 a.m. - 1:15 p.m.
Exhibit Hall Open

7:30 a.m. - 5:00 p.m.
Registration Desk Open

9:15 a.m. - 10:30 a.m.
Workshops

▸ ▸ ▸

Doris Kearns Goodwin



Doris Kearns Goodwin is a world-renowned presidential historian, public speaker, Pulitzer Prize-winning and #1 *New York Times* best-selling author, and a partner in Pastimes Productions.

Goodwin is often called upon by the news media, late-night TV hosts, and hundreds of companies, educational institutions, government agencies, and nonprofits to share her vast leadership knowledge and provide historical context for current-day events, especially as our democracy is challenged, international wars rage, and we continue to struggle in a divided and polarized country.

Her eighth book, *An Unfinished Love Story: A Personal History of the 1960s*, was published in Spring 2024, became an instant #1 *New York Times* bestseller, and is being developed as a feature film by Playtone partners Tom Hanks and Gary Goetzman, Eon Productions' Barbara Broccoli, and Goodwin's own Pastimes Productions. Artfully weaving together biography, memoir, and history, this new book takes readers on the emotional journey Doris and her husband, Richard Goodwin, embarked upon in the last years of his life as they delved into more than 300 boxes of letters, diaries, documents, and memorabilia that Dick had saved for more than 50 years. The Goodwins quickly realized they had before them an unparalleled personal time capsule of the 1960s of the events and pivotal figures of the decade—John Kennedy, Jacqueline Kennedy, Martin Luther King Jr., Robert Kennedy, Eugene McCarthy, and especially Lyndon Johnson, who greatly impacted both their lives.

KEYNOTE SPEAKER

10:45 a.m. - 12:15 p.m.
Opening General Session
Featuring the presentation of the E. Harris Drew Award and a keynote presentation by presidential historian and Pulitzer Prize-winning author **Doris Kearns Goodwin**.

12:15 p.m. - 1:15 p.m.
Sidewalk Café in Exhibit Hall (Cash Sales)

1:30 p.m. - 2:45 p.m.
Special Issues General Session: Property Tax Amendment

3:00 p.m. - 4:00 p.m.
Workshops

4:15 p.m. - 5:15 p.m.
Workshops

6:00 p.m. - 7:00 p.m.
Membership Networking Event

Evening Open

KEYNOTE SPEAKER

Their voyage of remembrance brought unexpected discoveries, forgiveness, and the renewal of old dreams, reviving the hope that the youth of today will carry forward this unfinished love story with America.

In Fall 2024, Goodwin's first book for young readers, *The Leadership Journey: How Four Kids Became President*, was published. Especially tailored for educational use, Goodwin brings to this middle-grade book decades of rich research combined with deep knowledge of Presidents Abraham Lincoln, Theodore Roosevelt, Franklin Roosevelt, and Lyndon Johnson.

In 2020, Goodwin and Laski's Pastimes Productions executive produced its first documentary miniseries, Washington for the History Channel. Miniseries on Abraham Lincoln, Theodore Roosevelt and Franklin Roosevelt followed and are all slated to debut on Netflix in May 2026. Pastimes also executive produced an eight-part docuseries, "Kevin Costner's The West" for the History Channel last year.

Goodwin is the author of nine critically acclaimed and bestselling works, including *Team of Rivals: The Political Genius of Abraham Lincoln*, which served in part as the basis for Steven Spielberg's Academy Award®-winning film *Lincoln*. The film earned 12 Academy Award® nominations, including the Best Actor Oscar for Daniel Day-Lewis' portrayal of the 16th president. *Team of Rivals* has been widely cited as an inspiration for political and business leaders, including former President Barack Obama, and received the prestigious Lincoln Prize and the inaugural Book Prize for American History. In 2016, Goodwin became the first historian awarded the Lincoln Leadership Prize from the Abraham Lincoln Presidential Library Foundation.

Goodwin was awarded the Pulitzer Prize in History for *No Ordinary Time: Franklin and Eleanor Roosevelt: The Home Front in World War II*. Her book *The Fitzgeralds and The Kennedys* was adapted into an award-winning ABC television miniseries.

Saturday, August 15, 2026

7:30 a.m. - 8:30 a.m.
Various Local/Regional League Breakfast Meetings
Contact your local league for more information. ***Note that an RSVP is required by July 31 in order to guarantee a seat at a breakfast***.

7:30 a.m. - 2:30 p.m.
Registration Desk Open

9:00 a.m. - 9:45 a.m.
Annual Business Meeting

10:00 a.m. - 11:45 a.m.
Second General Session
Featuring recognition of the Years of Service awards and a keynote address by **Jefferson Fisher**.

12:00 p.m. - 1:45 p.m.
Past Presidents' Luncheon and Installation of New President

2:00 p.m. - 3:00 p.m.
Workshop

6:15 p.m. - 11:00 p.m.
Inaugural Celebration
America is observing its 250th birthday this year, and what's a better way to celebrate than through song? Join us for **FLASHBACK Americana**, a journey through the decades of our greatest music.

Schedule and speakers are subject to change.



Jefferson Fisher

Jefferson Fisher is the *New York Times* bestselling author of *The Next Conversation: Argue Less, Talk More*, host of the Jefferson Fisher Podcast, and founder of the Jefferson Fisher School of Communication. As a trial lawyer, writer, and speaker, Jefferson's purpose is simple: improve people's lives by improving their conversations.

With practical videos and an authentic presence, Jefferson has earned the trust of more than 13 million followers, making him one of the most-followed attorneys in the world. What began in the driver's seat of his truck now reaches Fortune 500 companies, global leaders, government agencies, and hundreds of thousands of podcast and newsletter subscribers each week. Beyond his communication work, Jefferson is a husband, dad, and founder of Fisher Firm, helping people across the country connect with trusted legal services. No matter where he's teaching or speaking, his mission stays the same: to bring more clarity, calm, and connection back into how we talk to each other, one conversation at a time.

KEYNOTE SPEAKER



CONFERENCE HOUSING INFORMATION

The Diplomat will serve as the conference hotel. It is located at 3555 S. Ocean Drive in Hollywood. The hotel's phone is 954.602.6000. (**NOTE:** Reservations may be made via an FLC-provided reservation link only. Please **do not** call The Diplomat to make reservations until you receive this code.) FLC has secured the reduced rate of **$44.00** per day for self-parking and **$52.00** per day for valet parking.

Visit the hotel's website at *diplomatresort.com* for more details. **The Diplomat is a smoke-free property.**



Room Reservations – IMPORTANT – PLEASE READ

In order to protect our room blocks for conference registrants, it is our policy that no one will receive housing information **until we have received your PAID registration**. Once your registration is paid, you will be sent housing information via email.

Please note that the reservation cutoff date at The Diplomat is **July 14, 2026**, and the rate is **$205/night**. It is important that you register for the conference early so you have plenty of time to make your reservations. **Availability is on a first-come, first-served basis, and the hotel may sell out BEFORE the cutoff date**.

Remember that we are unable to guarantee reservations for anyone or the exact date on which the hotel block will sell out, **so please register early.**

FLC
FLORIDA LEAGUE OF CITIES

FLC
FLORIDA LEAGUE OF CITIES

Florida League of Cities

2026 ANNUAL CONFERENCE

August 13-15, 2026
The Diplomat • Hollywood, FL

Florida League of Cities | P.O. Box 1757 | Tallahassee, FL 32302 | 850.222.9684 | Fax 850.222.3806 | *mhowe@flcities.com*

Return completed form with check payment to Florida League of Cities, P.O. Box 1757, Tallahassee, FL 32302-1757, or visit the League website, *flcities.com/annualconference*, to access online registration. **NOTE: Credit card payments may be made online only.**

DELEGATE INFORMATION

Name: _____ | _____ | _____
First *M.I.* *Last*

First Name or Nickname: _____
As You Wish to Appear on Badge

Title: _____ Affiliation: _____
City, County, Government or Company

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone Number: _____ Fax Number: _____

Email Address (for confirmations): _____
Please provide the address of the person who should receive the confirmation.

First-Time Attendee? ☐ Yes ☐ No

Will you be attending Saturday night's Inaugural Celebration? ☐ Yes ☐ No

GUEST INFORMATION (PLEASE COMPLETE ONLY IF REGISTERING A GUEST FOR THE CONFERENCE.)

Guest's Name: _____ First Name: _____
As You Wish to Appear on Badge

Teen/Child's Name: _____ Age: _____ First Name: _____
As You Wish to Appear on Badge

Teen/Child's Name: _____ Age: _____ First Name: _____
As You Wish to Appear on Badge

REGISTRATION FEES	NO.	FEE	TOTAL FEE
City/County/Government	____ @	$650.00*	$ _____
Corporate	____ @	$750.00*	$ _____
Guest	____ @	$175.00	$ _____
Teen Guest (13-18 years)	____ @	$20.00	$ _____
Child Guest (3-12 years)	____ @	$15.00	$ _____

OPTIONAL ACTIVITIES	NO.	FEE	TOTAL FEE
Friday, August 14			
Sunrise Yoga	____ @	$0.00	$ _____
Saturday, August 15			
Extra Luncheon Ticket	____ @	$50.00	$ _____
Extra Inaugural Celebration Ticket	____ @	$75.00	$ _____
		Total	**$** _____

***NOTE: Registration fees will increase to $680 for government and $780 for corporate for all registrations done on-site.**

SPECIAL NEEDS

If you require special services or have special dietary needs, please attach a written description to your registration form.

REGISTRATION

Registration form must be accompanied by payment made payable to **Florida League of Cities**. Mail this form to: Florida League of Cities, P.O. Box 1757, Tallahassee, FL 32302-1757.

Registration forms must be postmarked by **July 31, 2026. Remember:** You will not receive housing information until we have received your **PAID** registration.

CANCELLATION POLICY

All cancellations received in writing via email to *mhowe@flcities.com* and received by 5:00 p.m. **July 31, 2026,** will receive refunds, minus a **$50.00** cancellation fee. Refunds will be issued after the conference. **No refunds can be made after July 31 or for early departure from the conference.**

DATE: June 15, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Gary M. Hubbard, Water Department Director

SUBJECT: First Amendment to Utility Developer's Agreement with Forestar (USA) Real Estate Group, Inc. for Harmony on Lake Eloise

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BACKGROUND

On November 22, 2022, Forestar (USA) Real Estate Group, Inc. (Forestar) and the City entered into a Utility Developer's Agreement in conjunction with the development and construction of the residential subdivision known as Harmony on Lake Eloise. The planned unit development (PUD) was to be constructed in phases, with the City and Forestar working in partnership on portions of the utility infrastructure construction. This agreement includes provisions for the dedication of lands for the City's Master Lift Station (MLS) , temporary wastewater collection during construction of the MLS, connections of reuse water to the development, upsizing and extending the sewer forcemain through the initial phases of development for future transmission, and construction of the proposed multi-purpose trail along the westerly side of the development.

This First Amendment to the Developer's Agreement incorporates upsizing and extending the City's proposed 12-inch transmission sewer forcemain through the subsequent phases of the development included in the realignment of Lake Eloise Drive West, from Eloise Loop Road to Shell Road. The 2,600 feet of 12-inch transmission main, which is connected to the MLS, is an integral part of the transfer of wastewater flow from Wastewater Treatment Plant #2 to the new Water Resource Facility (WRF) at Pollard Road (Wastewater Treatment Plant #3).

FINANCIAL IMPACT

The work was completed in spring of 2025 and the total reimbursement cost for the upsizing and extending the City's newly installed 12" transmission sewer forcemain is $315,281.80 . Sufficient funds are available in FY26 in account 402-08-305-6301 and 402-08-305-6301-UTL-2608 for the reimbursement.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Infrastructure
- **Goal:** 3.3 – Ensure an actionable strategy is in place for the future of water resources.
- **Strategy:** 3.3.1 – Adopt, implement, and maintain the One Water Master Plan to ensure sufficient capacity for potable, reuse and wastewater needs.

RECOMMENDATION

Staff recommends the City Commission approve the First Amendment to Utility Developer's Agreement with Forestar (USA) Real Estate Group, Inc. for Harmony on Lake Eloise, and authorize the City Manager or his designee to take all further actions necessary thereto.

ATTACHMENTS

- First Amendment to Utility Developer's Agreement with Forestar (USA) Real Estate Group, Inc. for Harmony on Lake Eloise
- Forestar (USA) Real Estate Group, Inc. – Utility Developer's Agreement for Harmony on Lake Eloise
- Lake Eloise Drive, West, alignment

FIRST AMENDMENT TO UTILITY DEVELOPER'S AGREEMENT

This First Amendment to Utility Developer's Agreement (the "First Amendment") is made this 15 day of June, 2026, by and between the **CITY OF WINTER HAVEN, a Florida municipal corporation** ("City"), whose address is 451 Third Street, N.W., Winter Haven, Florida 33881, and **FORESTAR (USA) REAL ESTATE GROUP INC.**, a Delaware corporation ("Owner"), whose address is 1064 Greenwood Blvd Suite 200 Lake Mary Florida 32746, hereinafter referred to collectively as the "Parties."

WHEREAS, The City and the Owner entered into a Utility Developer's Agreement ("Agreement") on November 22, 2022 which was duly recorded on December 27, 2022 in Official Records Book 12531 Pages 0155-0169, of the Public Records of Polk County, Florida, relating to among other things, costs of materials, construction, and other related costs for the Harmony Master Lift Station, Temporary Service for wastewater, Supply of Reuse Water, Utility Upsizing Force Main Extension and Multi-Purpose Trail in conjunction with the development of the Harmony on Lake Eloise residential subdivision on the Property as more specifically referred to below.

WHEREAS, the City and Owner desire to enter into this First Amendment to the Agreement with respect to the subject Property known as Harmony on Lake Eloise PUD within the City of Winter Haven, Florida described and depicted on **Exhibit "A"** attached to and incorporated in this First Amendment (hereafter referred to as the "Property") in order to finalize and complete the reimbursements to the Owner as contemplated in the Agreement and this First Amendment.

WHEREAS, the Owner received certain approvals from the City on the Property and has commenced development of the Property consistent with that "Planned Unit Development (PUD)" Zoning District as set forth in Ordinance No. O-16-12-Revised with a future land use designation on the City of Winter Haven Future Land Use Map of "Residential Low Density" (2.01-10 du/ac).

WHEREAS, Owner represents that it is the sole legal owner of the Property and that it has the full power and authority to make, deliver, enter into, and perform pursuant to the terms and conditions of this First Amendment and has taken all necessary action to authorize the execution, delivery, and performance of the terms and conditions of this First Amendment.

WHEREAS, City recognizes there is a need of water, and wastewater and reclaimed/reuse utility services and other necessary utility infrastructure for development and other City initiatives in the area; and

WHEREAS, as all of the Owner's Property is within the City's municipal limits and utility service area, the City will provide water and wastewater and re-use water utility services; and

WHEREAS, the Owner acknowledges and agrees that it will be required to pay the costs of the water and wastewater lines and related infrastructure within the Harmony on Lake Eloise PUD and to serve the Harmony on Lake Eloise PUD project, and other related charges, costs, and fees in accordance with applicable Florida law and the City's Code of Ordinances and land development regulations regarding development on the Property; and

WHEREAS, the Owner and the City have agreed to a proportionate share of the costs and for reimbursements and cooperation in facilitating the utilities for the development on the Property in accordance with the Agreement and which this First Amendment addresses more specifically;

WHEREAS, this First Amendment is entered into pursuant to general and home rule powers of the City and is not a Development Agreement pursuant to Chapter 163 of Florida Statutes. Moreover, both parties enter into this First Amendment as an arm's length transaction.

ACCORDINGLY, in consideration of the mutual benefits and the public interest and other good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Recitals. The above recitals are true and correct, are hereby incorporated herein by reference, and form a material part of this First Amendment. All exhibits to this First Amendment are hereby deemed a part thereof.

2. Harmony Master Lift Station.

   a. The City designed, permitted and has constructed the new Harmony Master Lift Station which is located within an easement granted by the Owner to the City on December 17, 2020.
   b. The Owner also dedicated an easement parcel to the City during platting of the development on the Property.
   c. The Owner has granted ingress and egress access easement to and from the Master Lift Station through the development for the operation and maintenance of the Master Lift Station.
   d. The City received the Harmony Master Lift Station Florida Department of Environmental Protection (FDEP) final permit clearance on September 22, 2025 to put the Master Lift Station into service.
   e. The City has made the final connection from the development's terminus gravity manhole (MH #40) located within the Property to the Harmony Master Lift Station and accepts ownership of the gravity sewer collection system as installed by the Owner, and the Owner shall assume no future maintenance responsibilities for said utility infrastructure.

3. Utility Upsizing

   a. The City agreed to pay for the actual cost associated with upsizing and extensions of the water mains, force mains, reuse mains and lift stations as set forth herein and as may be requested in writing by the City and approved by the City Engineer. The City has requested the Owner to upsize the new force main along West Lake Eloise Drive from six (6) inches to twelve (12) inches to accommodate future flows to the new Harmony Master Lift Station in the amount of $159,953.81 as reflected in Exhibits #1 and #2 attached hereto.

4. Force Main

   a. The City agreed to pay for 100% of the costs to install the future 12" sewage Force Main along the proposed West Eloise Lake Drive through Phase 1 of the development of the Property. The City has contracted with the Owner's consultant, Dewberry/Hydro for the design and permitting of this infrastructure.
   b. The Owner has agreed to extend the Force Main along West Eloise Lake Drive through the subsequent phases of construction of the development on the Property and will submit reimbursement requests to the City under the same requirements of the Agreement and this First Amendment.
   c. The City shall reimburse the Owner for the costs of construction of the temporary six (6) inch force main and bypass pump to provide a reliable sewage transmission from existing developments to the terminus gravity manhole (MH#40) during construction of the Harmony Master Lift Station as approved by the City Engineer, in the amount of $155,327.99 as reflected in Exhibits #3 and #4.

5. Reimbursement

   a. The reimbursement to the Owner for the sum of $315,281.80 for the Harmony Master Lift Station and the Utility Upsizing and Force Main Extensions referred to above shall be made to the Owner within 14 days of the Effective Date of this First Amendment.
   b. The Developer will submit reimbursement requests on a monthly basis for work completed and

verified by the City. Payments shall be made by the City to Forester (USA) Real Estate Group, Inc. within thirty (30) days of verification by the City. All payments will be cleared funds and not in the form of connection fee credits for a total amount of not to exceed $315,281.80 from the total of paragraphs 3 and 4 above.

6. Notice. Any notice to be given shall be in writing and shall be sent by certified mail, return receipt requested, to the party being noticed at the following addresses or such other address as the parties shall provide from time to time:

As to City:	T. Michael Stavres, City Manager City of Winter Haven 451 Third Street NW Winter Haven, Florida 33881 863-291-5600 Telephone
Copy to *(which shall not constitute notice)*:	Frederick J. Murphy, Jr., Esquire City Attorney Boswell & Dunlap LLP 245 South Central Avenue Bartow, Florida 33830 863-533-7117 Telephone
As to Owner:	Chris Tyree 1064 Greenwood Blvd. Suite 200 Lake Mary, FL 32746 407-750-7723 Telephone
Copy to ***(which shall not constitute notice)*:**	Scott Cookson, Esq. Shuffield, Lowman & Wilson, P.A. 1000 Legion Place, Suite 1700 Orlando, FL 32801 407-581-9715 Telephone

Each such notice shall be deemed delivered on the date of delivery if by personal delivery; and if the notice is mailed, on the earlier of: (a) the date upon which the Return Receipt is signed; (b) the date upon which delivery is refused; (c) the date upon which notice is designated by the postal authorities as not delivered; or (d) the third business day after mailing. Notwithstanding the foregoing, service by personal delivery delivered, shall be deemed to have been made on the next day that is not a Saturday, Sunday or legal holiday recognized by the City.

a.

7. All other provisions of the Agreement between the City and Owner not expressly amended herein shall remain in full force and effect and the Parties shall comply with the Agreement and this First Amendment.

[Signature Pages to Follow]

IN WITNESS WHEREOF, the parties have set their hands and seals this _____ day of _____, 2026.

CITY OF WINTER HAVEN, FLORIDA

By: _____
William Brian Yates, Mayor

ATTEST:

_____
Vanessa Castillo, MMC
City Clerk

Approved as to Form:

_____
Frederick J. Murphy, Jr., Esquire
City Attorney

WITNESSES:

Printed Name: Anthony Thomason

Printed Name: Lincoln Varsher

FORESTAR (USA) REAL ESTATE GROUP INC., a Delaware corporation

By: _____

Printed Name: Craig McIntosh

As its: VP of Development

STATE OF Florida)
COUNTY OF Seminole)

Before me personally appeared, by means of ☒ physical presence or ☐ online notarization, Craig McIntosh, as Vice President of FORESTAR (USA) REAL ESTATE GROUP INC., a Delaware corporation, who is ☒ personally known to me, or ☐ produced a driver's license as identification, and who executed the foregoing instrument, and acknowledged to and before me that (s)he executed said instrument for the purposes therein expressed.

WITNESS my hand and seal on this 15 day of June, 2026.

_____
NOTARY PUBLIC, STATE OF Florida

ROGER LEE VANAUKER
MY COMMISSION # HH 689654
EXPIRES: September 28, 2029

Exhibit "A"

Legal Description of the Property

LEGAL DESCRIPTION:

HARMONY ON LAKE ELOISE CDD

A PORTION OF SECTIONS 4 AND 9, TOWNSHIP 29 EAST, RANGE 26 EAST, ALSO A PORTION OF GOVERNMENT LOTS 1 AND 2, ALSO A PORTION OF LOTS 4, 5 AND 8, LAKE ELOISE SUBDIVISION ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGE 57 OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA, ALSO ALL OF LOTS 1, 2, 3, 6, 7, 9, 10, 11, 12, 13, 14, 15 AND 16 OF SAID LAKE ELOISE SUBDIVISION, ALSO A PORTION OF LOTS 66, 67, 88 AND 90, WANNETA FARMS SUBDIVISION, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 1, PAGES 826-828 OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCE AT THE NORTHWEST CORNER OF THE SOUTHEAST 1/4 OF SAID SECTION 4; THENCE N89°49'54"E ALONG THE NORTH LINE OF THE SOUTHWEST 1/4 OF SAID SECTION 4, A DISTANCE OF 197.19 FEET TO THE POINT OF BEGINNING; THENCE CONTINUE ALONG SAID NORTH LINE N89°49'54"E, A DISTANCE OF 1223.34 FEET TO A POINT ON THE WEST MAINTAINED RIGHT OF WAY LINE WEST LAKE ELOISE DRIVE (VARIABLE WIDTH) PER POLK COUNTY MAINTAINED RIGHT OF WAY MAP BOOK 3, PAGES 306-308; THENCE S73°50'39"E, A DISTANCE OF 56.89 FEET TO A POINT ON THE EAST MAINTAINED RIGHT OF WAY OF SAID WEST LAKE ELOISE DRIVE; THENCE N89°59'40"E ALONG THE CENTERLINE OF A 30 FOOT WIDE PLATTED RIGHT OF WAY, SAID RIGHT OF WAY CLOSED PER OFFICIAL RECORDS BOOK 2089, PAGE 2057 OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA, A DISTANCE OF 950.03 FEET; THENCE DEPARTING SAID CENTERLINE RUN S00°09'14"E, A DISTANCE OF 331.74 FEET TO A POINT ON THE NORTH MAINTAINED RIGHT OF WAY LINE OF LAKE ELOISE TERRACE (50 FOOT COUNTY MAINTAINED RIGHT OF WAY); THENCE DEPARTING SAID NORTH RIGHT OF WAY LINE, RUN S52°49'09"E, A DISTANCE OF 62.71 FEET TO A POINT ON THE WEST MAINTAINED RIGHT OF WAY LINE OF SAID LAKE ELOISE TERRACE; THENCE S00°08'01"E ALONG SAID WEST RIGHT OF WAY LINE, A DISTANCE OF 340.93 FEET; THENCE DEPARTING SAID WEST MAINTAINED RIGHT OF WAY LINE, RUN S89°52'16"E, A DISTANCE OF 281.39 FEET TO A POINT ON THE WESTERLY SAVE UPLAND LINE FOR LAKE ELOISE AS DETERMINED BY THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION HAVING AN ELEVATION OF 130.63 FEET (NORTH AMERICAN VERTICAL DATUM 1988); THENCE RUN ALONG SAID SAVE UPLAND LINE THE FOLLOWING TWENTY-EIGHT (28) COURSES: THENCE

S32°14'09"E, A DISTANCE OF 64.35 FEET; THENCE S18°30'20"E, A DISTANCE OF 56.77 FEET; THENCE S31°08'18"E, A DISTANCE OF 186.28 FEET; THENCE S32°12'09"E, A DISTANCE OF 340.69 FEET; THENCE S06°04'58"W, A DISTANCE OF 68.51 FEET; THENCE S32°59'06"E, A DISTANCE OF 87.87 FEET; THENCE S15°18'28"E, A DISTANCE OF 200.47 FEET; THENCE S88°30'06"W, A DISTANCE OF 21.67 FEET; THENCE S00°25'00"W, A DISTANCE OF 21.96 FEET; THENCE S15°26'58"E, A DISTANCE OF 28.46 FEET; THENCE S37°54'46"W, A DISTANCE OF 94.77 FEET; THENCE S04°28'35"E, A DISTANCE OF 106.45 FEET; THENCE S05°11'27"W, A DISTANCE OF 92.74 FEET; THENCE S15°50'44"E, A DISTANCE OF 218.51 FEET; THENCE S22°15'23"E, A DISTANCE OF 87.49 FEET; THENCE S21°29'23"E, A DISTANCE OF 109.05 FEET; THENCE S14°21'09"E, A DISTANCE OF 109.59 FEET; THENCE S85°09'22"E, A DISTANCE OF 129.33 FEET; THENCE S05°55'07"E, A DISTANCE OF 15.02 FEET; THENCE S79°42'46"W, A DISTANCE OF 111.09 FEET; THENCE S38°15'21"W, A DISTANCE OF 40.47 FEET; THENCE S70°50'31"E, A DISTANCE OF 21.17 FEET; THENCE N81°35'55"E, A DISTANCE OF 57.26 FEET; THENCE S85°35'50"E, A DISTANCE OF 82.27 FEET; THENCE S36°12'43"E, A DISTANCE OF 111.11 FEET; THENCE S56°45'09"E, A DISTANCE OF 121.69 FEET; THENCE S32°29'10"W, A DISTANCE OF 50.19 FEET TO A POINT ON THE NORTH LINE OF VALHALLA ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 67, PAGE 34 OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA; THENCE S89°47'37"W ALONG SAID NORTH LINE, A DISTANCE OF 1387.21 FEET TO A POINT ON THE WEST MAINTAINED RIGHT OF WAY LINE OF WEST LAKE ELOISE DRIVE (VARIABLE WIDTH RIGHT OF WAY) PER POLK COUNTY MAINTAINED RIGHT OF WAY MAP BOOK 2, PAGES 306-308; THENCE RUN ALONG SAID WEST RIGHT OF WAY LINE THE FOLLOWING SIX (6) COURSES: THENCE S50°07'26"W, A DISTANCE OF 7.03 FEET; THENCE S00°06'38"E, A DISTANCE OF 200.00 FEET; THENCE S00°35'35"W, A DISTANCE OF 200.00 FEET; THENCE S00°05'11"E, A DISTANCE OF 200.00 FEET; THENCE S01°50'01"E, A DISTANCE OF 55.70 FEET; THENCE S00°49'57"E, A DISTANCE OF 49.56 FEET; THENCE DEPARTING SAID WEST RIGHT OF WAY LINE, RUN N89°43'55"E ALONG THE SOUTH LINE OF HIDDEN OAKS LANE (50 FOOT RIGHT OF WAY) FOR HIDDEN OAKS OF LAKE ELOISE ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 109, PAGES 32-35, OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA AND ITS WESTERLY EXTENSION, A DISTANCE OF 702.96 FEET TO A POINT ON THE WEST LINE OF SAID HIDDEN OAKS OF LAKE ELOISE; THENCE RUN ALONG SAID WEST LINE THE FOLLOWING TWO (2) COURSES: S00°29'47"E, A DISTANCE OF 1137.97 FEET;

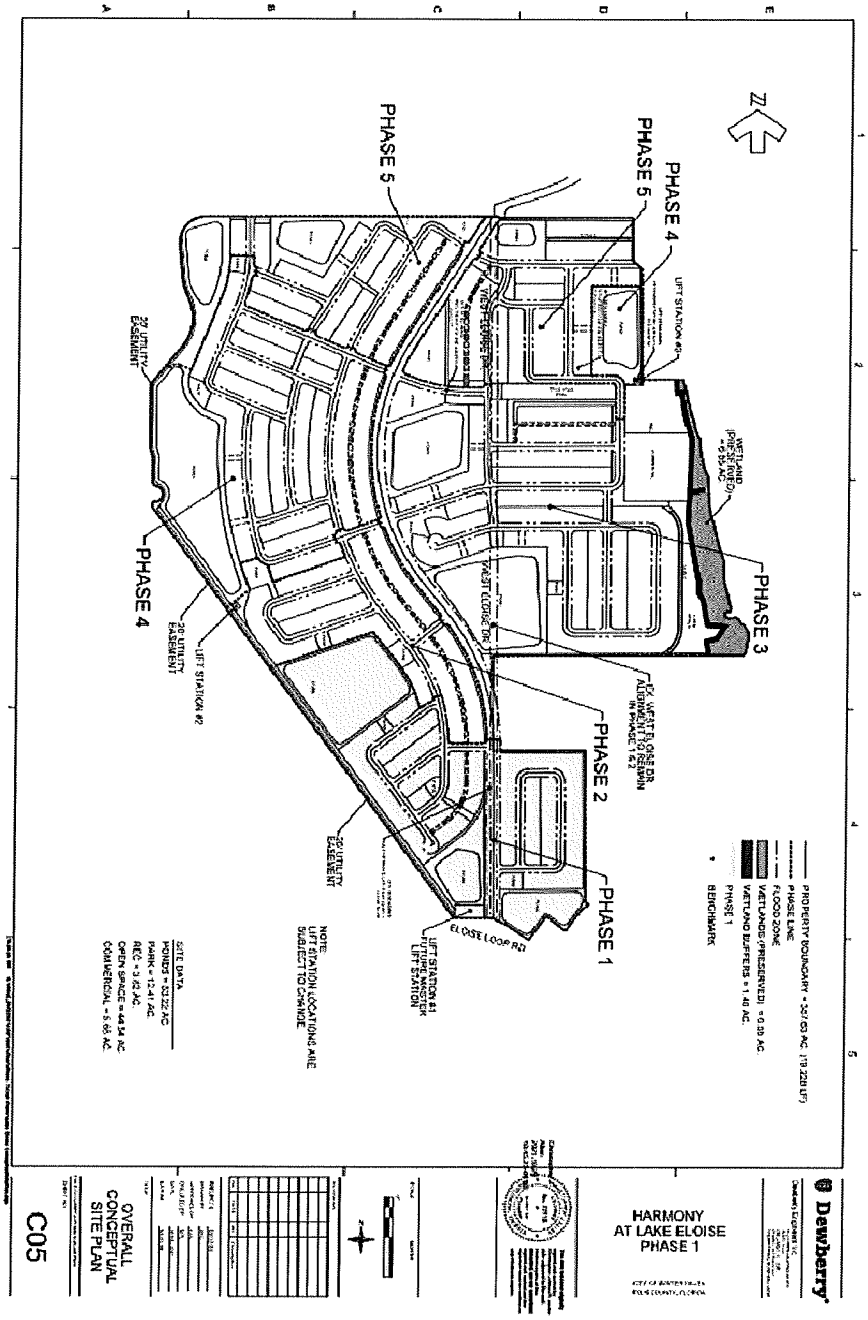
LEGAL DESCRIPTION:

THENCE S52°48'47"E, A DISTANCE OF 54.29 FEET TO THE NORTHWEST CORNER OF LOT 97, GAINES COVE, ACCORDING TO THE PLAT THEREOF AS RECORDED IN PLAT BOOK 65, PAGE 4, OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA; THENCE RUN ALONG THE NORTHWEST LINE OF SAID GAINES COVE THE FOLLOWING FOUR (4) COURSES: S35°32'25"W, A DISTANCE OF 63.17 FEET; THENCE S37°10'26"W, A DISTANCE OF 323.96 FEET; THENCE N52°15'17"W, A DISTANCE OF 139.03 FEET; THENCE S37°10'26"W, A DISTANCE OF 320.00 FEET TO A POINT ON THE NORTH-ERLY MAINTAINED RIGHT OF WAY LINE OF ELOISE LOOP ROAD; THENCE N52°51'20"W ALONG SAID NORTHERLY RIGHT OF WAY LINE, A DISTANCE OF 297.11 FEET A POINT ON THE EAST RIGHT OF WAY LINE OF THE AFORESAID WEST LAKE ELOISE DRIVE; THENCE S74°06'15"W, A DISTANCE OF 56.79 FEET; THENCE N89°58'38"W, A DISTANCE OF 781.87 FEET TO THE NORTHEASTERLY RIGHT OF WAY LINE OF CSX RAILROAD (200 FOOT RIGHT OF WAY) PER VALUATION MAP W15209 & W15211 (CSX-FLA. 1-27, 16 & 168); THENCE N36°58'23"W ALONG SAID NORTH-EASTERLY RIGHT OF WAY LINE, A DISTANCE OF 1850.63 FEET TO A POINT ON THE EASTERLY MAINTAINED RIGHT OF WAY LINE OF EROTON ROAD (VARIABLE RIGHT OF WAY WIDTH) PER MAP BOOK 14, PAGE 25 & 27) OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA; THENCE RUN ALONG SAID EASTERLY MAINTAINED RIGHT WAY LINE THE FOLLOWING SEVEN (7) COURSES: N00°09'53"W, A DISTANCE OF 37.70 FEET; THENCE S89°51'45"E, A DISTANCE OF 201.16 FEET; TO A POINT OF CURVATURE OF A CURVE CONCAVE WESTERLY, HAVING A RADIUS OF 40.00 FEET, A CENTRAL ANGLE OF 68°35'16", A CHORD BEARING OF N00°28'37"E AND A CHORD DISTANCE OF 119.49 FEET; THENCE RUN NORTHERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 127.43 FEET TO A POINT OF REVERSE CURVATURE OF A CURVE CONCAVE NORTHEASTERLY, HAVING A RADIUS OF 40.00 FEET, A CENTRAL ANGLE OF 68°00'55", A CHORD BEARING OF N45°18'24"W AND A CHORD DISTANCE OF 44.74 FEET; THENCE RUN NORTHWESTERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 47.48 FEET TO THE END OF SAID CURVE; THENCE N00°29'05"W, A DISTANCE OF 189.38 FEET; THENCE N38°40'45"W, A DISTANCE OF 23.45 FEET TO A POINT ON THE WEST LINE OF THE SOUTHWEST 1/4 OF SAID SECTION 4; THENCE N00°10'44"W ALONG SAID WEST LINE, A DISTANCE OF 446.93 FEET TO A POINT ON THE EASTERLY RIGHT OF WAY LINE OF SHELL ROAD (VARIABLE WIDTH RIGHT OF WAY) PER DEED BOOK 949, PAGE 327, OF THE PUBLIC RECORDS OF POLK COUNTY, FLORIDA; THENCE RUN ALONG SAID EASTERLY RIGHT OF WAY LINE THE FOLLOWING NINE (9) COURSES: N01°06'02"E, A DISTANCE OF 40.45 FEET, TO A POINT OF CURVATURE OF A CURVE CONCAVE NORTHWESTERLY, HAVING A RADIUS OF 1388.86 FEET, A CENTRAL ANGLE OF 01°31'00", A CHORD BEARING OF N40°37'35"E AND A CHORD DISTANCE OF 36.67 FEET; THENCE RUN NORTHEASTERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 36.67 FEET TO THE POINT OF TANGENCY; THENCE N39°57'07"E, A DISTANCE OF 406.17 FEET, TO A POINT OF CURVATURE OF A CURVE CONCAVE WESTERLY, HAVING A RADIUS OF 355.37 FEET, A CENTRAL ANGLE OF 41°09'00", A CHORD BEARING OF N00°17'07"E AND A CHORD DISTANCE OF 249.85 FEET; THENCE RUN NORTHERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 255.24 FEET TO THE POINT OF TANGENCY; THENCE N39°07'07"W, A DISTANCE OF 56.39 FEET, TO A POINT OF CURVATURE OF A CURVE CONCAVE EASTERLY, HAVING A RADIUS OF 765.51 FEET, A CENTRAL ANGLE OF 16°45'00", A CHORD BEARING OF N31°42'53"W AND A CHORD DISTANCE OF 227.11 FEET; THENCE RUN NORTHERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 227.91 FEET TO THE POINT OF TANGENCY; THENCE N00°22'53"W, A DISTANCE OF 197.64 FEET, TO A POINT OF CURVATURE OF A CURVE CONCAVE SOUTHEASTERLY HAVING A RADIUS OF 185.37 FEET, A CENTRAL ANGLE OF 65°37'23", A CHORD BEARING OF N32°15'45"E AND A CHORD DISTANCE OF 201.00 FEET; THENCE RUN NORTHEASTERLY ALONG THE ARC OF SAID CURVE, A DISTANCE OF 213.39 FEET TO THE POINT OF TANGENCY; THENCE N65°34'33"E, A DISTANCE OF 58.00 FEET, TO THE POINT OF BEGINNING.

CONTAINING 15,436,272 SQUARE FEET OR 354.37 ACRES, MORE OR LESS.

Exhibit "B"

SITE PLAN



BLUE OX Enterprises, LLC.

500 NORTH WAY
SANFORD FL. 32773
PH 339-4800 FAX 339-4839

PROPOSAL #2023-057-03-ALT

COST EXHIBIT FOR: HARMONY ON LAKE ELOISE PH-3A
SANITARY UPSIZING EXHIBIT
FORESTAR

Date: 1/12/2024

Phase		Description	Qty	Units	Price	Total
UPSIZED SANITARY	1	6" PVC FORCEMAN	140	LF	$ 27.60	$ 3,864.00
	2	12" PVC FORCEMAIN	2600	LF	$ 70.48	$ 183,248.00
	3	FORCEMAIN FITTINGS	1	LS	$ 84,047.90	$ 84,047.90
	4	6" CHECK VALVE	1	EA	$ 10,385.27	$ 10,385.27
	5	12" GATE VALVE	1	EA	$ 5,076.14	$ 5,076.14
	6	TEST FORCEMAIN LINES	2740	LF	$ 1.96	$ 5,370.40
	7	TIE TO EXISTING	1	EA	$ 3,598.67	$ 3,598.67
	8	AIR RELEASE VALVE	1	EA	$ 9,182.82	$ 9,182.82
					UPSIZED SANITARY TOTAL	**$ 304,773.20**

Phase		Description	Qty	Units	Price	Total
6" SANITARY	1	6" PVC FORCEMAN	2740	LF	$ 27.60	$ 75,624.00
	2	FORCEMAIN FITTINGS	1	LS	$ 45,174.80	$ 45,174.80
	3	6" CHECK VALVE	1	EA	$ 10,385.27	$ 10,385.27
	4	6" GATE VALVE	1	EA	$ 2,189.15	$ 2,189.15
	5	TEST FORCEMAIN LINES	2740	LF	$ 1.96	$ 5,370.40
	6	TIE TO EXISTING	1	EA	$ 3,421.56	$ 3,421.56
	7	AIR RELEASE VALVE	1	EA	$ 9,182.82	$ 9,182.82
					6" SANITARY TOTAL	**$ 151,348.00**

UPSIZED SANITARY TOTAL	**$ 304,773.20**
6" SANITARY TOTAL	**$ 151,348.00**
UPSIZING COST INCREASE ***City Reimbusement Cost***	**$ 153,425.20**

Notes:

1 **The pricing shown above reflects the forcemain upsizing cost increase.**

EXHIBIT #1

FORESTAR

Change to Contract

Change Order No: **13** Project: **Lake Eloise Ph 3**

Professional: **Blue Ox Enterprises LLC**

Change Type:

☑ Change of Scope ☑ Change of Contract Value ☐ Change of Duration

Contract #144880

Original Contract Sum	**$5,918,053.98**
Net Change from Previous Change Orders	**$665,764.18**
Contract Sum Prior to Current Change Order	**$6,583,818.16**
Current Change Order will change the Contract Sum by	**$6,528.61**
New Contract Sum including this Change Order	**$6,590,346.77**

Coding: 430679103.1520.23080

Reason/Scope of Change Order:

Scope:

See Exhibit A

Total Change Duration:

This is a change order only in value or duration to the previously executed:

☐ Florida Independent Contractor Agreement ☐ Florida Independent Contractor

☐ Florida Independent Contractor Agreement for Professionals Services ☑ Florida Independent Contractor Agreement for Land Development

Dated: **February 6, 2025**

Mathew Lembrich
Mathew Lembrich (Feb 10, 2025 10:57 EST)

M. Lembrich - Owner

Forestar Manager (or Third Party)/Printed Name/Title

Craig McIntosh
Craig McIntosh (Feb 10, 2025 11:15 EST)

Craig McIntosh - Development Director

FORESTAR

Exhibit A

BLUE SKY
SOUTHEAST, LLC.

503 NORTH WAY
SANFORD FL 32773
PH 330-4800 FAX 330-4835

HARMONY PHASE 3A
FORESTAR

Date 02/04/2025

UTILITY REVISIONS

Phase	Description	Qty	Units	Price	Total
REUSE	1 6" PVC	140	LF	$ 26.91	$ 3,767.40
	2 RECLAIM FITTINGS	1	EA	$ 784.97	$ 784.97
	3 6" GATE VALVE	1	EA	$ 1,976.24	$ 1,976.24
				REUSE TOTAL	$ 6,528.61

REUSE TOTAL	$	6,528.61

CM
CM

EXHIBIT #2

PROPOSAL #2022-146-01

500 NORTH WAY
SANFORD FL. 32773
PH 339-4800 FAX 339-4839

PROPOSAL FOR: HARMONY ON LAKE ELOUISE PH-2
BYPASS PUMP/TEMP FORCEMAIN C.O.
FORESTAR

Date: 01/18/2024

Phase		Description	Qty	Units	Price	Total
TEMP FORCEMAIN	1	6" PVC FORCEMAN	480	LF	$ 42.39	$ 20,347.20
	2	FORCEMAIN FITTINGS	1	LS	$ 17,584.54	$ 17,584.54
	3	6" GATE VALVE	3	EA	$ 2,393.54	$ 7,180.62
	4	TEST FORCEMAIN LINES	480	LF	$ 1.98	$ 950.40
	5	TAP 24" X 6"	1	EA	$ 10,515.16	$ 10,515.16
	6	AIR RELEASE VALVE	1	EA	$ 10,386.57	$ 10,386.57
	7	DEMO 6" PVC FM (INSTALLED)	50	LF	$ 18.55	$ 927.50
	8	DEMO 6" PVC FM (FUTURE)	420	LF	$ 22.87	$ 9,605.40
					TEMP FORCEMAIN TOTAL	**$ 77,497.39**

Phase		Description	Qty	Units	Price	Total
Pump Upgrade	1	Supply New Pumps 17HP/3PH/460	2	EA	$ 26,265.80	$ 52,531.60
					BYPASS PUMP UPGRADE TOTAL	**$ 52,531.60**

Phase		Description	Qty	Units	Price	Total
MISC.	1	SURVEY	1	LS	$ 1,167.25	$ 1,167.25
	2	ASBUILTS	1	LS	$ 2,575.35	$ 2,575.35
					MISC. TOTAL	**$ 3,742.60**

TEMP FORCEMAIN TOTAL	$ 77,497.39
BYPASS PUMP UPGRADE TOTAL	$ 52,531.60
MISC. TOTAL	$ 3,742.60
TOTAL City Reimbusement Cost	$ 133,771.59

Notes:

1 **This change order reflects installation of the temporary forcemain Haven and the upgraded lift station pumps.**

EXHIBIT #3

FORESTAR

Change to Contract

Change Order No: **12** Project: **Lake Eloise Ph 3**

Professional: **Blue Ox Enterprises LLC**

Change Type:

☑ Change of Scope ☑ Change of Contract Value ☐ Change of Duration

Contract #144880

Original Contract Sum	**$5,918,053.98**
Net Change from Previous Change Orders	**$644,207.78**
Contract Sum Prior to Current Change Order	**$6,562,261.76**
Current Change Order will change the Contract Sum by	**$21,556.40**
New Contract Sum including this Change Order	**$6,583,818.16**

Coding: 430679103.1520.21005

Reason/Scope of Change Order:

Scope:

See Exhibit A

Total Change Duration:

This is a change order only in value or duration to the previously executed:

☐ Florida Independent Contractor Agreement ☐ Florida Independent Contractor

☐ Florida Independent Contractor Agreement for Professionals Services ☑ Florida Independent Contractor Agreement for Land Development

Dated: **February 6, 2025**

Mathew Lembrich
Mathew Lembrich (Feb 10, 2025 10:57 EST)

M. Lembrich - Owner

Forestar Manager (or Third Party)/Printed Name/Title

Craig McIntosh
Craig McIntosh (Feb 10, 2025 11:15 EST)

Craig McIntosh - Development Director

FORESTAR

Exhibit A

501 NORTH WAY
SANFORD FL 32773
PH 333-4820 FAX 333-4833

HARMONY PHASE 3A
FORESTAR

Date: 12/04/2025

UTILITY REVISIONS

Phase	Description	Qty	Units		Price		Total
SANITARY	1 12" PVC FORCEMAIN	140	LF	$	70.45	$	9,867.30
	2 FORCEMAIN FITTINGS	1	LS	$	6,613.06	$	6,613.06
	3 12" GATE VALVE	1	EA	$	5,076.14	$	5,076.14
					SANITARY TOTAL	$	21,556.40
					TOTAL	$	21,556.40

CM

EXHIBIT #4

UTILITY DEVELOPER'S AGREEMENT

This Utility Developer's Agreement (the "Agreement") is made this 22 day of November, 2022, by and between the CITY OF WINTER HAVEN, a Florida municipal corporation ("City"), whose address is 451 Third Street, N.W., Winter Haven, Florida 33881, and FORESTAR (USA) REAL ESTATE GROUP INC., a Delaware corporation ("Owner" or "Developer"), whose address is 1064 Greenwood Blvd Suite 200 Lake Mary Florida 32746, hereinafter referred to collectively as the "Parties."

WHEREAS, Owner desires to enter into this Agreement with respect to the subject property known as Harmony on Lake Eloise PUD within the City of Winter Haven, Florida described and depicted on Exhibit "A" attached to and incorporated in this Agreement (hereafter referred to as the "Property").

WHEREAS, the Developer received certain approvals from the City on the Development Property within the municipal limits of the City and has commenced development of the Property in accordance with the provisions of its current zoning of "Planned Unit Development (PUD)" Zoning District as set forth in Ordinance No. O-16-12-Revised with a future land use designation on the City of Winter Haven Future Land Use Map of "Residential Low Density" (2.01-10 du/ac) (hereafter referred to as "Development" or "Development on the Property" or "Property") in accordance with a site plan which is attached hereto as Exhibit "B" and incorporated herein by reference.

WHEREAS, Owner represents that it is the sole legal owner of the Property and that it has the full power and authority to make, deliver, enter into, and perform pursuant to the terms and conditions of this Agreement and has taken all necessary action to authorize the execution, delivery, and performance of the terms and conditions of this Agreement.

WHEREAS, City recognizes there is a need of water, and wastewater and reclaimed/reuse utility services and other necessary utility infrastructure for the Development and other City initiatives in the area; and

WHEREAS, as all of the Developer's Property is within the City's municipal limits and utility service area, the City will provide water and wastewater and re-use water utility services in accordance with applicable Florida laws, and the City's Code of Ordinances and land development regulations; and

WHEREAS, the Developer acknowledges and agrees that it will be required to pay the costs of the water and wastewater and reclaimed/reuse lines and related infrastructure within the Development of the Property Harmony on Lake Eloise PUD and to serve the Development on the Property project, and other related charges, costs, and fees in accordance with applicable Florida law and the City's Code of Ordinances and land development regulations; and

WHEREAS, the Developer and the City have agreed to a proportionate share of the costs for other Municipal Utility Improvements and a Multi-Purpose Trail as more specifically described herein and for reimbursements and cooperation in facilitating the design, permitting and construction of said Municipal Utility Improvements and Multi-Purpose Trail for the Development as set forth in this Agreement;

WHEREAS, this Agreement is entered into pursuant to general and home rule powers of the City and is not a Development Agreement pursuant to Chapter 163 of Florida Statutes. Moreover, both parties enter into this Agreement as an arm's length transaction.

ACCORDINGLY, in consideration of the mutual benefits and the public interest and other good and valuable considerations, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. Recitals. The above recitals are true and correct, are hereby incorporated herein by reference, and form a material part of this Agreement. All exhibits to this Agreement are hereby deemed a part thereof.

2. Costs of Construction

The City shall reimburse the Developer the costs of materials, construction, and other related costs approved in writing by the City Engineer for the identified Municipal Improvements and Multi-Purpose Trail as follows:

A. Eloise Master Lift Station.

a. The City will design, permit and construct a new Eloise Master Lift Station to be located within portions of those easements granted by the Developer to the City and recorded on December 21, 2020, in Official Records Book 11505, Pages 512-515 and 878-881, Public Records of Polk County, Florida, and on the lands as described and depicted on Exhibit "C" attached hereto and incorporated herein by reference (hereinafter "Lift Station Lands") for a not to exceed amount of $10,750,000.00.
b. The Developer will at no cost to the City convey fee simple interest to the Lift Station Lands as referenced on Exhibit "C" on which the subject Eloise Master Lift Station is planned to be constructed free and clear of all liens and encumbrances to the City at the time of platting of Phase 1 of the Development in a form of a Quit Claim Deed that is reasonably acceptable to the City.
c. The Developer will also grant an ingress and egress access easement in a form and manner reasonably acceptable to the City to and from the Lift Station Lands through the Development on the Property for the operation and maintenance of the Eloise Master Lift Station.
d. The City will make the final connection from the Development's terminus gravity manhole (MH #40) to the Eloise Master Lift Station when permit clearance from the Florida Department of Environmental Protection is issued for both the Eloise Master Lift Station and the Development site.
e. The Developer is not responsible for design, permitting and construction costs associated with this Municipal Improvement.

B. Temporary Service.

a. The City will provide temporary wastewater collection service during construction of the above referenced Eloise Master Lift Station.
b. The Developer shall install a gravity sewer collection system included in Phase 1 of the Development in accordance with applicable City Standards and as approved by the City Engineer.
c. The City will utilize, operate and maintain the Developer installed sanitary sewer gravity Manhole #40 as a temporary lift station until the above referenced City constructed Eloise Master Lift Station is permitted, constructed and online and operational.
d. The Developer is not responsible for design, permitting and construction costs associated with this Municipal Improvement.

C. Reuse Water

a. The City will supply reuse water to the development via the 24" reuse transmission main, to be located along the westerly boundary of the Development in accordance with applicable Florida law and the City's Code of Ordinances and Land Development Regulations.
b. The Developer will connect to the reuse transmission main for irrigation of residential, commercial and common areas in the Development and pay all fees, charges and costs for such service as required by applicable City Code of Ordinances.

D. Utility Upsizing

a. The City agrees to pay for the actual costs associated with upsizing and extensions of the water mains, force mains, reuse mains and lift stations as set forth herein and as may be requested in writing by the City in an amount not to exceed $192,812.74.
b. The City shall reimburse the Developer for the upsizing or extensions requested in writing by the

City as approved by the City Engineer, in a budgeted amount not to exceed: $192,812.74.

E. Force Main

a. The City agrees to pay for all costs to install the future 12" sewage Force Main along the proposed West Eloise Lake Drive in a not to exceed amount as set forth below. On December 13, 2021, via RFQ-20-01, the City procured and contracted with Dewberry Engineers, Inc., d/b/a Dewberry/Hydro who is performing the design and permitting for this Force Main Improvement.
b. The Developer will incorporate the Force Main Improvement into the construction of the Development and will submit reimbursement requests to the City for costs incurred for construction of this Force Main Project.
c. The City shall reimburse the Developer for the costs of construction of the 12" sewage Force Main that are approved by the City Engineer, in a budgeted amount not to exceed: $167,358.37.

F. Multi-Purpose Trail

a. The Developer and the City agree to share the costs for the design and the construction of a 10 foot Multi-Purpose Trail along the westerly boundary of the Development in an area as agreed to by the City and Developer. The asphalt surface for such a Multi-Purpose Trail is to be a minimum of one (1) inch thick.
b. The City will pay 100% of the costs for the material and installation of the base for the Multi-Purpose Trail.
c. The Developer agrees to pay for 80% (eight feet) for the asphalt required for the Multi-Purpose Trail.
d. The City agrees to pay for 20% (two feet) for the asphalt required for the Multi-Purpose Trail.
e. The City agrees to pay 100% of the costs of the base required for the Multi-Purpose Trail.
f. If the Developer undertakes the design, permitting and construction of the Multi-Purpose Trail, then the City shall reimburse the Developer 100% of the costs of the base and 20% of the asphalt surface of the Multi-Purpose Trail as approved by the City Engineer, in a budgeted amount not to exceed: $211,259.40 which includes a 10% contingency. The City must approve in writing any amount over $211,259.40 in order for it to be reimbursed to the Developer under this Agreement for the Multi-Purpose Trail.

The total budgeted costs for the improvements set forth in subparagraphs D and E above is $396,188.22, which includes a 10% contingency, so long as same is approved by the City Engineer. The City must approve in writing any amount over $396,188.22 for the matters set forth in subparagraphs D and E above in order for it to be reimbursed to the Developer under this Agreement.

2. Reimbursement
The Developer will submit reimbursement requests on a monthly basis for work completed and verified by the City for the matters set forth in subparagraphs 2 D, E and F above. Payments shall be made by the City to Forester (USA) Real Estate Group Inc. within thirty (30) days of verification by the City. All payments will be made in cleared funds and not in the form of connection fee credits.

3. Water, Wastewater, and Reuse Water. Subject to the terms herein, Owner and its successors and assigns agree to obtain water, reuse water, irrigation water, and wastewater services (hereafter, "Utilities") exclusively through purchase from the City when available in accordance with applicable Ordinances, laws, rules and regulations. Owner covenants and the warrants to City that it will not engage in the business of providing such Utilities to the Property or within City's F.S. Chapter 180 utility service area and/or the areas within the City's municipal limits.

Owner shall prepare and submit a Master Utility Plan ("MUP") to the City in connection with Phase 1 of the Development of the Property. The MUP shall incorporate the City's future water and sewer expansion plans as provided in writing by the City to the Owner. Owner will work in cooperation with the City's utility department to provide the necessary land for a master lift station located along the south side of the Property (Lift Station Lands) that is acceptable to the City. The design and construction of this Eloise Master Lift Station shall be the responsibility

of the City. The Eloise Master Lift Station shall provide a gravity connection for the Property, shall provide adequate screening matching the architectural style of the proposed Development, and odor reduction measures to ensure no residential homes are adversely impacted by the subject Master Lift Station. Any additional lift stations that are needed to serve the Property shall be designed and built by the Owner subject to City review and approval. In the event the City requests that Owner construct utility lines in excess of the size needed to serve the Property beyond those set forth in this Agreement, City and Owner shall negotiate in good faith to enter into a separate utility upsizing agreement to the extent not addressed in this Agreement.

4. Water and Wastewater Connection Fees. Owner shall be required to pay connection fees as established by the City from time to time, including City water and wastewater connection/impact fees. The amount to be paid shall be the adopted connection/impact fee rate schedule at the time of building permit issuance and/or connection of service. No reservation of utility capacity shall exist until applicable City water and wastewater connection/impact fees are actually paid and received by the City.

5. Easements. At no cost to the City, Owner shall provide the City such easements or rights of way in a form and manner acceptable to the City's City Attorney and the City Engineer, as the City deems reasonably necessary for the installation and maintenance of utility services, including but not limited to sewer, water, and reclaimed water services.

6. Environmental Considerations. The Owner agrees to comply with all federal, state, county, and city laws, rules and regulations regarding any environmental issues affecting the Property.

7. Default. In the event of a breach, default, or violation of one or more of the provisions herein by the Owner or the City, the violating party shall be given thirty (30) days to cure such violation upon receipt of written notice of the violation from a non-violating party. In the event such violation is not cured within said period, the City or Owner, as the case may be, shall have the right to pursue any and all such legal and equitable remedies available as provided by law, including the right to seek specific performance of this Agreement. Notwithstanding the foregoing, the City shall be permitted to withhold the issuance of certificates of occupancy or building permits associated with the Development in the event Owner is in violation of any provision of this Agreement. Additionally, notwithstanding the foregoing:

IN NO EVENT, SHALL THE CITY BE LIABLE TO OWNER FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OF ANY KIND OR NATURE, INCLUDING LOSS OF PROFIT, WHETHER FORESEEABLE OR NOT, ARISING OUT OF OR RESULTING FROM THE NONPERFORMANCE OR BREACH OF THIS AGREEMENT BY THE CITY WHETHER BASED IN CONTRACT, COMMON LAW, WARRANTY, TORT, STRICT LIABILITY, CONTRIBUTION, INDEMNITY OR OTHERWISE; and

IN NO EVENT, SHALL OWNER BE LIABLE TO THE CITY FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OF ANY KIND OR NATURE, INCLUDING LOSS OF PROFIT, WHETHER FORESEEABLE OR NOT, ARISING OUT OF OR RESULTING FROM THE NONPERFORMANCE OR BREACH OF THIS AGREEMENT BY THE OWNER WHETHER BASED IN CONTRACT, COMMON LAW, WARRANTY, TORT, STRICT LIABILITY, CONTRIBUTION, INDEMNITY OR OTHERWISE.

The City is a sovereign home rule municipal government of the State of Florida. Nothing herein shall be deemed a waiver of the City's sovereign immunity or of the statutory limits of liability of the City announced in Section 768.28 of the Florida Statutes to a single claimant, which the parties expressly agree shall be the maximum amount of any monetary liability owed by the City to Owner under this Agreement, regardless of whether the theory of recovery or cause of action sounds in contract, common law, warranty, tort, strict liability, contribution, indemnity or otherwise.

8. Title Opinion. Owner shall provide to City, in advance of the City's execution of this Agreement, a title

opinion of an attorney licensed in the State of Florida, or a certification by an abstractor or title company authorized to do business in the State of Florida, showing marketable title to the Property to be in the name of the Owner and showing all liens, mortgages, and other encumbrances not satisfied or released of record.

9. Compliance with City Laws and Regulations. Except as expressly modified herein, all development of the Property shall be subject to compliance with the City Land Development Regulations and City Code provisions, as amended, including but not limited to Ordinance O-16-12-Revised as well as regulations of county, state, local, and federal agencies. All improvements and infrastructure shall be constructed to City standards.

10. Due Diligence and Municipal Services. The City and Owner further agree that they shall commence all reasonable actions necessary to fulfill their obligations hereunder and shall diligently pursue the same throughout the existence of this Agreement. The City shall further provide all other municipal services to the Property as are needed by Owner from time to time in accordance with the City's applicable policies for the provision of said services and in the same manner as are afforded to all other similar property owners within the City.

11. Enforcement/Effectiveness. A default by either party under this Agreement shall entitle the other party to all remedies available at law. This is a non-statutory development agreement which is not subject to or enacted pursuant to the provisions of Sections 163.3220 – 163.3243, Florida Statutes.

12. Governing Law. This Agreement shall be construed in accordance with the laws of the State of Florida and venue for any action hereunder shall be exclusively in the Circuit Court of Polk County, Florida.

13. Binding Effect; Assignability. This Agreement, once effective, shall be binding upon and enforceable by and against the parties hereto and their permitted assigns. This Agreement shall be assignable by the Owner to successive owners only upon prior written consent from the City which shall not be unreasonably conditioned, withheld or delayed. The rights and obligations set forth in this Agreement shall run with the land and be binding on all successors and/or permitted assignees. Owner consents to the placement of a claim of lien on the Property upon default in payment of any obligation herein without precluding any other remedies of City. The parties hereby covenant that they will enforce this Agreement and that it is a legal, valid, and binding agreement.

14. Waiver; Remedies. No failure or delay on the part of either party in exercising any right, power, or privilege hereunder will operate as a waiver thereof, nor will any waiver on the part of either party or any right, power, or privilege hereunder operate as a waiver of any other right, power, privilege hereunder, nor will any single or partial exercise of any right, power, or privilege hereunder preclude any other further exercise thereof or the exercise of any other right, power, or privilege hereunder.

15. Exhibits. All exhibits attached hereto are hereby incorporated in and made a part of this Agreement as if set forth in full herein.

16. Notice. Any notice to be given shall be in writing and shall be sent by certified mail, return receipt requested, to the party being noticed at the following addresses or such other address as the parties shall provide from time to time:

As to City:	Mike Herr, City Manager City of Winter Haven 451 Third Street NW Winter Haven, Florida 33881 863-291-5600 Telephone

Copy to *(which shall not constitute notice)*:	Frederick J. Murphy, Jr., Esquire City Attorney Boswell & Dunlap LLP 245 South Central Avenue Bartow, Florida 33830 863-533-7117 Telephone
As to Owner:	Chris Tyree 1064 Greenwood Blvd. Suite 200 Lake Mary, FL 32746 407-750-7723 Telephone
Copy to *(which shall not constitute notice)*:	Scott Cookson, Esq. Shuffield, Lowman & Wilson, P.A. 1000 Legion Place, Suite 1700 Orlando, FL 32801 407-581-9715 Telephone **Robert Metz** **Vice President & Florida Region Counsel** 4042 Park Oaks Blvd., Suite 200 Tampa, Florida 33610 O: 813.517.0168

Each such notice shall be deemed delivered: on the date of delivery if by personal delivery; and if the notice is mailed, on the earlier of: (a) the date upon which the Return Receipt is signed; (b) the date upon which delivery is refused; (c) the date upon which notice is designated by the postal authorities as not delivered; or (d) the third business day after mailing. Notwithstanding the foregoing, service by personal delivery delivered, shall be deemed to have been made on the next day that is not a Saturday, Sunday or legal holiday recognized by the City.

17. Entire Agreement. This Agreement sets forth all of the promises, covenants, agreements, conditions, and understandings between the parties hereto, and supersedes all prior and contemporaneous agreements, understandings, inducements or conditions, express or implied, oral or written, except as herein contained. However, the failure of this Agreement to address a particular permit, condition, term, or restriction shall not relieve Owner from complying with the law governing said permitting requirements, conditions, terms or restrictions.

18. Term of Agreement. The term of this Agreement shall commence on the date this Agreement is executed by both the City and Owner and shall terminate twenty (20) years thereafter; provided, however, that the term of this Agreement may be extended by mutual written consent of the City and the Owner and as approved by the City's governing body.

19. Amendment. Amendments to the provisions of this Agreement shall be made by the parties only in writing by formal amendment and approved by the City's governing body.

20. Severability. If any part of this Agreement is found invalid or unenforceable in any court, such invalidity or unenforceability shall not affect the other parts of this Agreement, if the rights and obligations of the parties contained herein are not materially prejudiced and if the intentions of the parties can be effected. To that end, this Agreement is declared severable.

21. No Partnership or Joint Venture. Nothing in this Agreement shall be construed to create a partnership or joint venture between the Parties.

22. Miscellaneous.

a. Any number of counterparts of this Agreement may be signed and delivered, each of which shall be considered an original and admissible into evidence, and all of which together shall constitute one and the same instrument. Further, any facsimile or electronic signature shall be deemed an original signature for purposes of this Agreement.

b. No member, official or employee of the City shall be personally liable to Owner or to any person with whom Owner shall have entered into any contract, or to any other person in the event of any default or breach by the City, or for any amount which may become due to Owner or any other person under this Agreement.

c. Neither this Agreement nor the obligations imposed upon the City hereunder shall be or constitute an indebtedness or general obligation of the City or other Governmental Authority within the meaning of any constitutional, statutory or charter provisions requiring the City or other Governmental Authority to levy ad valorem taxes nor a lien upon any Property or funds of the City or other Governmental Authority. Owner agrees that the obligation of the City to make any payments or provide any reimbursements by the City to Owner pursuant to this Agreement shall be subordinate to the obligations of the City to pay debt service on any bonds issued by the City prior to the Effective Date. Except as otherwise set forth herein, this Agreement shall not constitute an agreement to appropriate funds by the City in any fiscal year while this Agreement is in effect.

d. Nothing contained herein shall be deemed, construed or applied to cause any Governmental Authority, specifically including the City, to waive its right to exercise its governmental power in any manner other than that which is customary for the exercise of such governmental powers.

e. By entering into this Agreement, the City has not and does not intend to contract away any of its police powers or legislative functions relating to land use and zoning.

f. Construction. The parties acknowledge that this Agreement has been fairly negotiated by each party's respective legal counsel and at arm's length; and, as such, this Agreement shall be interpreted in strict accordance with the terms, covenants and conditions set forth herein.

g. Duty to Cooperate and Act in Good Faith. The parties acknowledge and agree that it is in their best interests and the best interests of the public that this Agreement be performed in strict accordance with the terms, covenants and conditions contained herein; and the parties shall, in all instances, cooperate and act in good faith in complying with all of the terms, covenants and conditions contained herein.

h. PUBLIC RECORDS. To the extent that this Agreement is construed to be a contract for services with a public agency and that Developer is acting on behalf of City as contemplated in Section 119.0701(1) of the Florida Statutes, then Developer agrees to:

1. Keep and maintain public records required by the City to perform the service contemplated in this Agreement.

2. Upon request from the City's custodian of public records, provide the City with a copy of the requested records or allow the records to be inspected or copied within a reasonable time at a cost that does not exceed the cost provided in Chapter 119 of the Florida Statutes or as otherwise provided by law.

3. Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the Agreement term and following completion of the Agreement if Developer does not transfer the records to the City.

4. Upon completion of the Agreement, transfer, at no cost, to the City all public records in possession of Developer or keep and maintain public records required by the City to perform the service. If Developer transfers all public records to the City upon completion of the Agreement, Developer shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If Developer keeps and maintains public records upon completion of the Agreement, Developer shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City, upon request from the City's custodian of public records, in a format that is compatible with the information technology systems of the City.

IF DEVELOPER HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO DEVELOPER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT WINTER HAVEN'S CUSTODIAN OF PUBLIC RECORDS AT 863-291-5600, records@mywinterhaven.com, 451 THIRD STREET, N.W., WINTER HAVEN, FLORIDA 33881.

If Developer does not comply with a public records request, City shall enforce the Agreement which may include immediate termination of this Agreement.

[Signature Pages to Follow]

IN WITNESS WHEREOF, the parties have set their hands and seals this 13th day of December, 2022.

CITY OF WINTER HAVEN, FLORIDA

By: _____
Bradley T. Dantzler, Mayor

ATTEST:
Vanessa Castillo
Vanessa Castillo, MMC
City Clerk

Approved as to Form:
12-12-22
Frederick J. Murphy, Jr., Esquire
City Attorney

WITNESSES:

Printed Name: Roger Van Auken

Printed Name: Lauren Martin

FORESTAR (USA) REAL ESTATE GROUP INC., a Delaware corporation

By:

Printed Name: Alex Madison

As its: V.P Real Estate & Development

STATE OF Florida)
COUNTY OF Seminole)

Before me personally appeared, by means of ☐ ✓ physical presence or ☐ online notarization, Alex Madison, as VP RE Inv + Dev. of FORESTAR (USA) REAL ESTATE GROUP INC., a Delaware corporation, who is ☑ personally known to me, or ☐ produced a driver's license as identification, and who executed the foregoing instrument, and acknowledged to and before me that (s)he executed said instrument for the purposes therein expressed.

WITNESS my hand and seal on this 22nd day of November 2022.

NOTARY PUBLIC, STATE OF Florida

Notary Public State of Florida
Robin A Bronson
My Commission GG 955726
Expires 02/15/2024

Exhibit "A"

Legal Description of the Property



Exhibit "B"

SITE PLAN

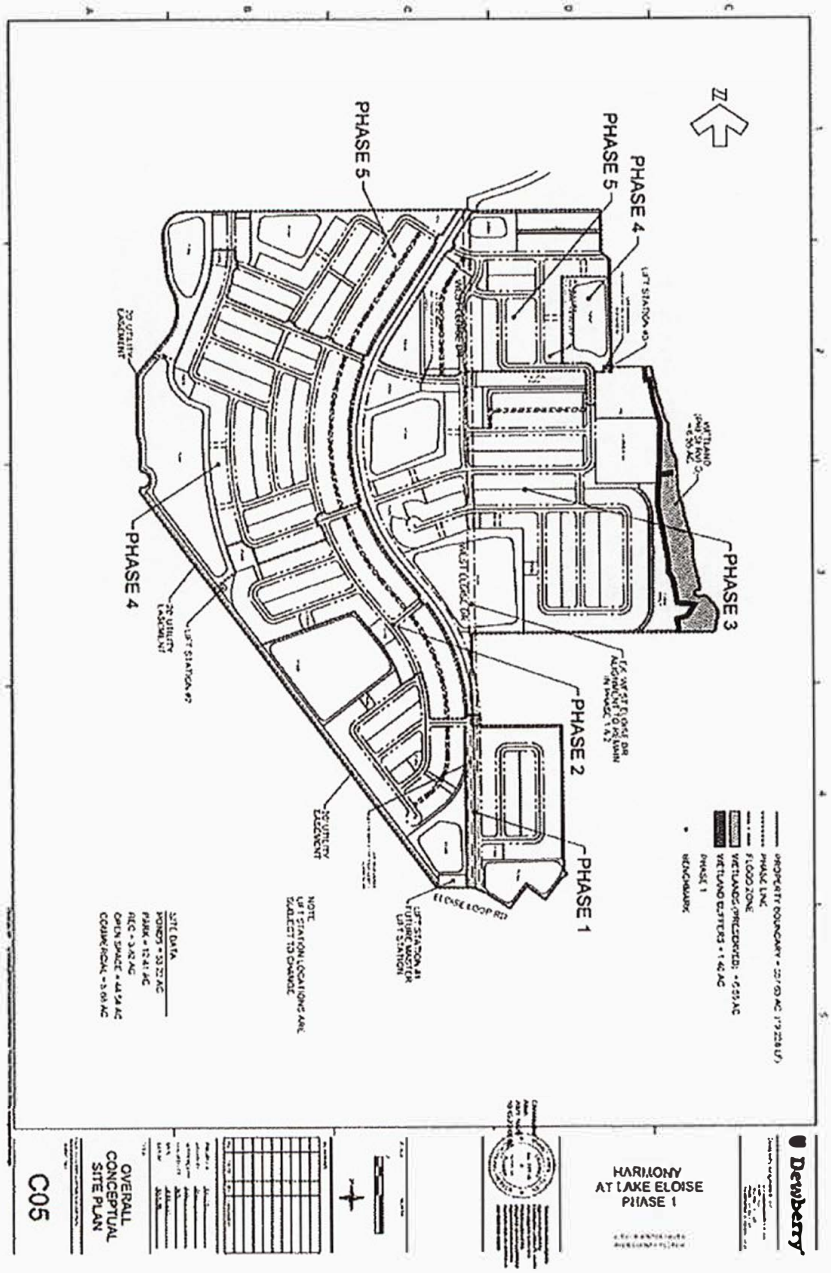
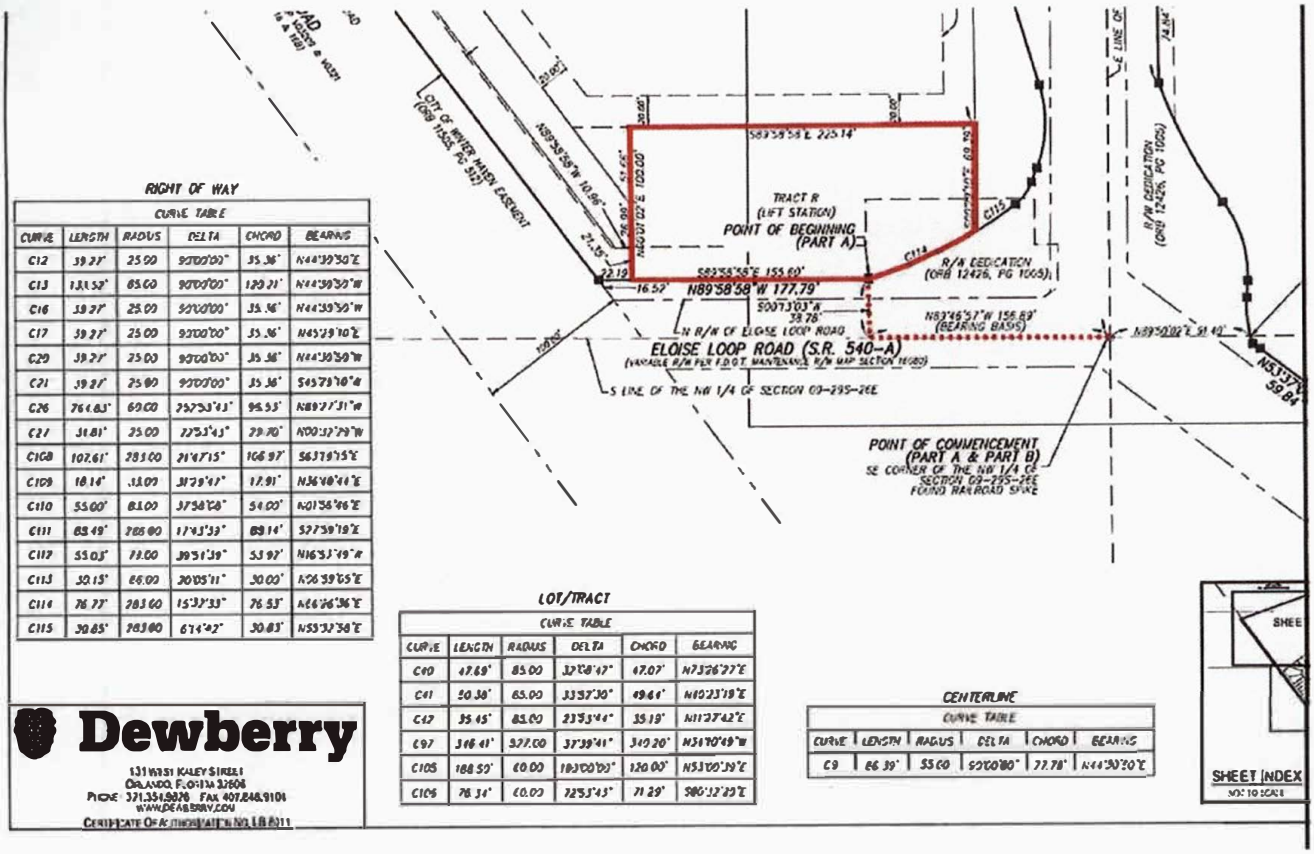


Exhibit "C"
(Legal Description of the Lift Station Lands and Depiction)

Being a parcel of land located within Section 9, Township 29 South, Range 26 East, and being within the corporate limits of the City of Winter Haven, Polk County, Florida and being a portion of land described in deed to Forestar (USA) Real Estate Group Inc., recorded OR 11483 PGS 957-965 of the Public Records of Polk County, Florida, being more particularly described as:
Commencing at the Southeast corner of the Northwest ¼ of Section 9, Township 29 south, Range 26 East, thence N89°46'57"W a distance of 156.89 feet, thence N00°13'03"E a distance of 38.78 feet to the Point of Beginning, thence N89°58'58"W a distance of 155.60 feet, thence N00°01'02"E a distance of 100.00 feet, thence S89°58'58"E a distance of 225.14 feet, thence S00°29'10"E a distance of 69.39 feet, thence a curve to the right having a radius of 283.00 feet, an interior angle of 15°32'33", a cord which bears S66°26'36"W a distance 76.53 feet, and having an arc length of 76.77 feet to the Point of Beginning.
Said parcel containing 21479.96 Square Feet (0.493 Acres) of land, more or less.



RIGHT OF WAY

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C12	39.27'	25.00	90°00'00"	35.36'	N44°39'30"E
C13	131.52'	85.00	90°00'00"	120.21'	N44°39'30"W
C16	39.27'	25.00	90°00'00"	35.36'	N44°39'30"W
C17	39.27'	25.00	90°00'00"	35.36'	N45°29'10"E
C20	39.27'	25.00	90°00'00"	35.36'	N44°39'30"W
C21	39.27'	25.00	90°00'00"	35.36'	S45°29'10"W
C26	764.83'	60.00	729°53'43"	96.55'	N89°27'31"W
C27	31.81'	25.00	72°53'43"	29.70'	N00°32'29"W
C108	107.61'	283.00	21°47'15"	106.97'	S63°19'15"E
C109	18.14'	13.00	31°59'47"	17.91'	N36°48'44"E
C110	55.00'	83.00	37°58'28"	54.00'	N01°56'46"E
C111	85.49'	283.00	17°43'33"	89.14'	S27°39'19"E
C112	55.03'	73.00	39°51'39"	53.92'	N16°53'49"W
C113	32.15'	85.00	20°05'11"	30.00'	N26°39'55"E
C114	78.77'	283.00	15°57'33"	78.53'	N6°26'36"E
C115	30.85'	283.00	6°14'42"	30.83'	N53°32'58"E

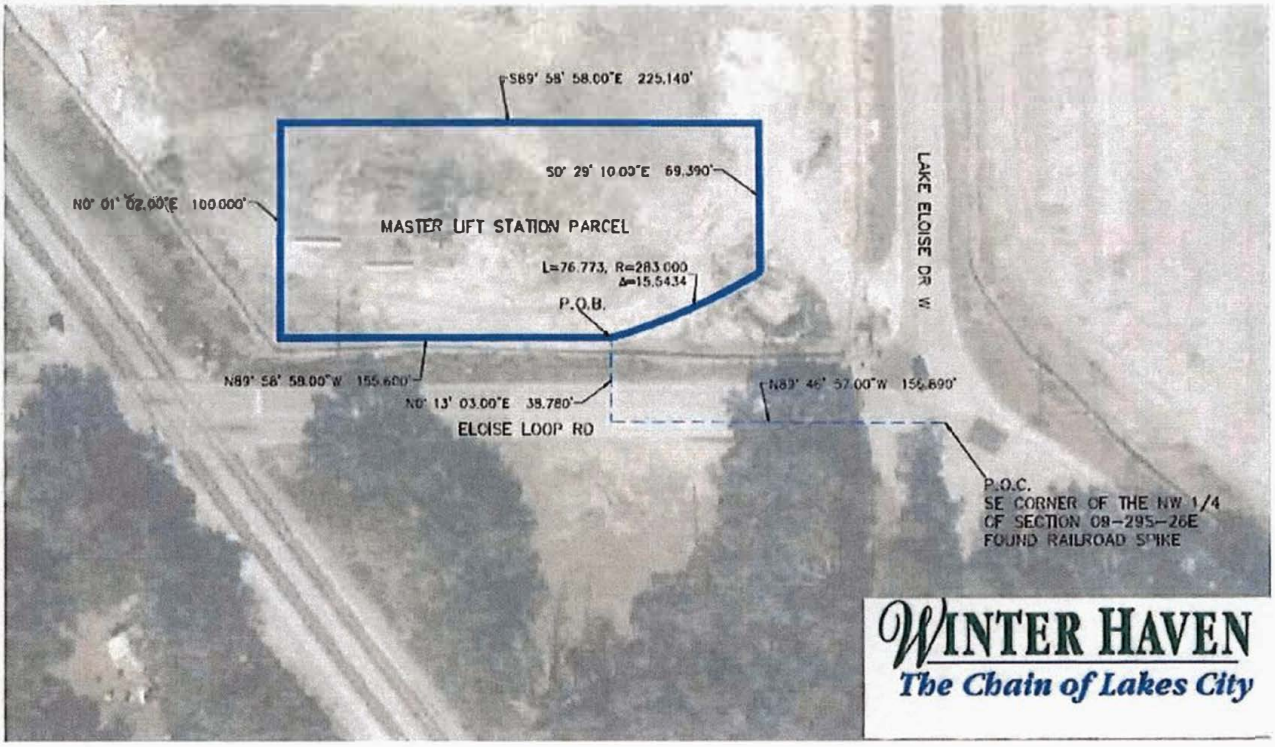
LOT/TRACT

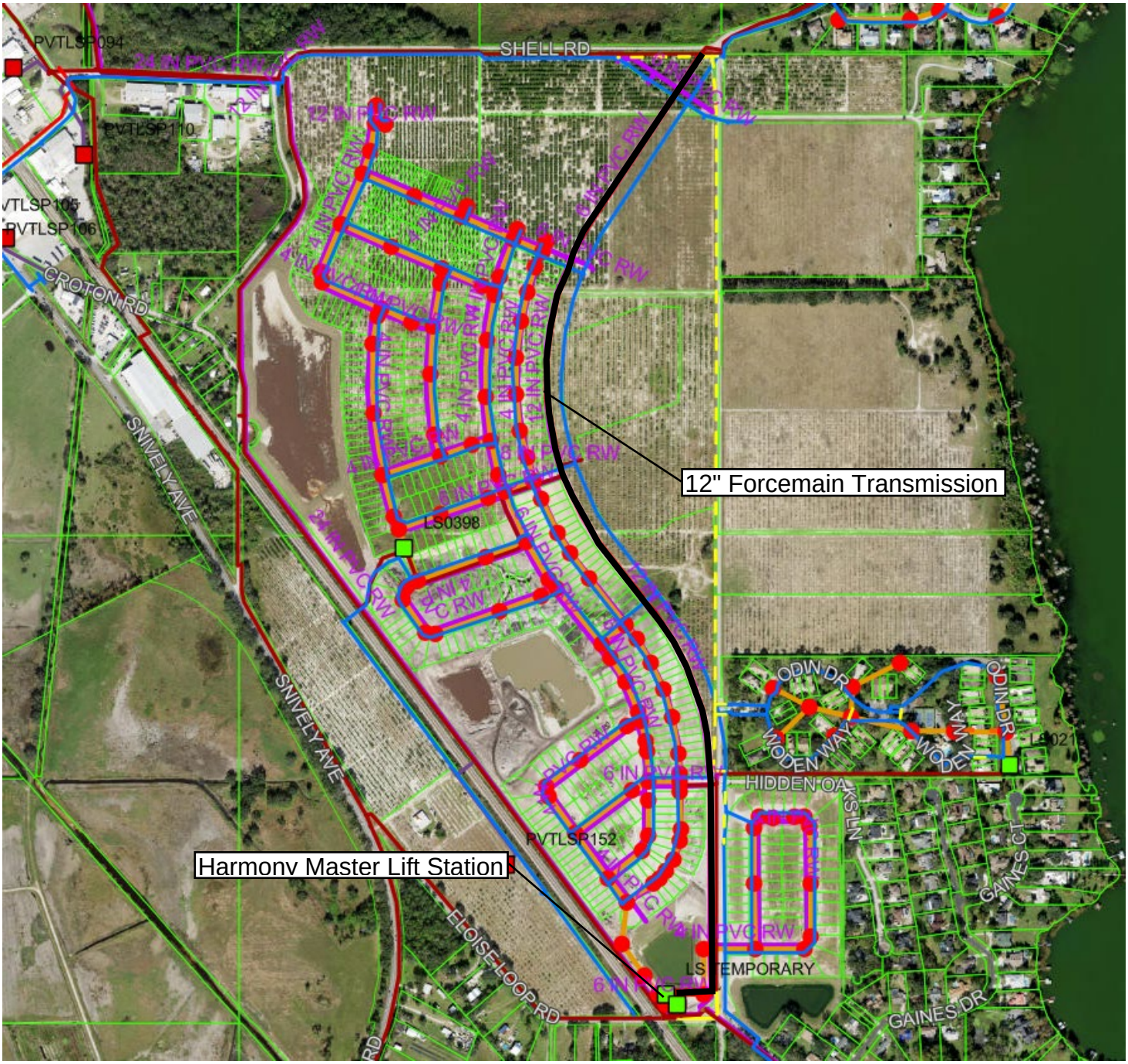
CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C10	47.69'	85.00	32°08'47"	47.07'	N73°26'27"E
C41	50.38'	65.00	33°57'30"	49.64'	N10°23'19"E
C47	35.45'	85.00	23°53'44"	35.19'	N11°27'42"E
C97	346.41'	527.00	37°39'41"	340.20'	N34°10'49"W
C105	188.50'	60.00	180°00'00"	120.00'	N53°00'39"E
C106	78.54'	60.00	75°53'43"	71.29'	S80°32'29"E

CENTERLINE

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	BEARING
C9	86.39'	55.00	90°00'00"	77.78'	N44°30'20"E

Dewberry
131 WEST KALEY STREET
ORLANDO, FLORIDA 32806
PHONE: 321.354.9828 FAX: 407.648.9104
WWW.DEWBERRY.COM
CERTIFICATE OF AUTHORIZATION NO. LB 8011


S89° 58' 58.00"E 225.140'
S0° 29' 10.00"E 69.390'
N0° 01' 02.00"E 100.000'
MASTER LIFT STATION PARCEL
L=76.773, R=283.000
Δ=15.543'
P.O.B.
LAKE ELOISE DR W
N89° 58' 59.00"W 155.600'
N0° 13' 03.00"E 38.780'
ELOISE LOOP RD
N89° 46' 57.00"W 156.690'
P.O.C.
SE CORNER OF THE NW 1/4
OF SECTION 09-29S-26E
FOUND RAILROAD SPIKE
WINTER HAVEN
The Chain of Lakes City



HARMONY AT LAKE ELOISE

12” Force Main Transmission on Lake Eloise Drive, West

DATE: June 4, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Gary M. Hubbard, Water Department Director

SUBJECT: Badger Meter, Inc., (SmartCover System) Annual Maintenance Agreement Renewal

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BACKGROUND

The Water Department initiated the gravity sewer level monitoring system, patented by SmartCover, in May 2021. The "Smart Level" system provides satellite monitoring of sewage levels in gravity sewer collection systems, notifying Water Department staff in real time of rising water levels. Winter Haven Water currently utilizes 74 SmartCovers and 20 SmartRain sensors throughout the sewer collection system to provide:

- Sanitary Sewer Overflows (SSO) Prevention
- Inflow and Infiltration (I&I) Correlation
- Stormwater Management
- Entry Detection
- Cleaning Optimization
- Combined Sewer Overflow (CSO) Management
- H2S Monitoring
- Rain Fall Monitoring

The annual maintenance agreement provides at least a 48-hour response time for system troubleshooting, routine maintenance, battery and part replacement, storm damage repairs, equipment adjustments and calibrations, alongside a 24-hour SmartCover Technician monitoring service.

The City currently has a sole source agreement with Badger Meter, Inc. (formerly Hadronex, Inc., DBA SmartCover Systems) to provide these patented sewer level monitoring and maintenance systems.

FINANCIAL IMPACT

The SmartCover Annual Maintenance Agreement renewal is budgeted in FY 26 under account 402-08-323-5402 for the amount of $125,314.10.

STRATEGIC PLAN ALIGNMENT

- **Pillar: Environmental Stewardship**
- **Goal:** 4.4 – Integrate the elements of the ONE water philosophy to ensure a balance between water supply and nature.
- **Strategy:** 4.4.3 – Explore and implement the best management practices and innovative approaches to water resource infrastructure that further protects the natural environment.

RECOMMENDATION

Staff recommends the City Commission approve the SmartCover Annual Maintenance Agreement renewal and authorize the City Manager, or his designee, to execute the agreement and take any and all actions necessary thereto.

ATTACHMENTS

- SmartCover Annual Maintenance Agreement Program
- City of Winter Haven – Contract Addendum (Badger Meter, Inc)
- Badger Meter, Inc – Purchasing Affidavit
- SmartCover Sewer Monitoring System

Budget Quote

Badger Meter, Inc. 4545 West Brown Deer Road Milwaukee, Wisconsin 53223 P: 760-291-1980 F: 760-291-1982	Due Date	Period Covered	Quote Number
	07/31/2026	08/01/2026-07/31/2027	00005273
	Remit PO to orders@badgermeter.com or return this quote signed with PO number. Scan of PO is preferred.		

Bill To:	Ship To:	Date	03/02/2026
City of Winter Haven Accounting Department P.O. Box 2277 Winter Haven, FL 33883, USA	City of Winter Haven 401 6th St SW Winter Haven, FL 33880, USA		

#	Product	Description	Qty	Mo	Rate	Total
1	ASM-SC1R	Renewal: SmartLevel – REQUIRED for system to function. 1 Year rate. 68886-959 Date Covered: 8/1/2026-7/31/2027 8723 Ave C SW 8724 N Lake Shipp 8725 Lake Shipp Dr 8726 Pope Ave 8727 MLS 1 8728 Lift Station #376 8729 Ave O NE 8730 Riverwood Dr 8731 Ave F NW 9002 1st St. South - Sonic 9003 Sears Ave 9004 Ave Q NE 9005 Ave S NE 9006 4th St SE Alley 9007 10th St SE 9008 N Lake Otis Dr SE 9009 Rose Lawn St SW 9010 Ware Ave NE 9860 AVE C Alley 9861 Camelot Ct SW 9862 MLS 2 9863 Ave U NE 9864 Ave G SW 9865 CWM 355 10902 Lift Station# 117 10903 High Point 10904 Lift Station# 123 10905 1562 Lake Howard Dr. 10906 Lift Station #133 10907 Lift Station #109 10908 Lift Station #135 10909 Lift Station #304 10910 Lift Station #182 10911 Lift Station #326 10912 Silverado Terr 10913 1657 17th St NW 10914 Lift Station #120 10915 Lift Station #101 10916 Lift Station# 136	54	12	$443.00	$23,922.00

		10917 Harmony Lift Station 12743 Winter Haven Hospital 12744 Clubhouse Rd. and Wexford 12745 3107 Post Oak Ct. 12746 Idylwild Dr. and Trinity Circle 12747 Sunfish Dr. and Highfin Dr. 12748 21st St. SW and Ave D SW 12749 Cody Caleb Dr and Dakota Blvd 12750 Lift Station #147 12751 7th St SW and AVE O SW 12753 Bayou Ct 12754 220 AVE O SE 12755 Audubon Rd. 12756 Terranova Ln. and Terranova Ave. 12757 Fire Restaurant				
2	PW-5C1R	Renewal: Power Warranty: PARTS ONLY. 1 year rate. 70928-002 Date Covered: 8/1/2026-7/31/2027 8723 Ave C SW 8724 N Lake Shipp 8725 Lake Shipp Dr 8726 Pope Ave 8727 MLS 1 8728 Lift Station #376 8729 Ave O NE 8730 Riverwood Dr 8731 Ave F NW 9002 1st St. South - Sonic 9003 Sears Ave 9004 Ave Q NE 9005 Ave S NE 9006 4th St SE Alley 9007 10th St SE 9008 N Lake Otis Dr SE 9009 Rose Lawn St SW 9010 Ware Ave NE 9860 AVE C Alley 9861 Camelot Ct SW 9862 MLS 2 9863 Ave U NE 9864 Ave G SW 9865 CWM 355 10902 Lift Station# 117 10903 High Point 10904 Lift Station# 123 10905 1562 Lake Howard Dr. 10906 Lift Station #133 10907 Lift Station #109 10908 Lift Station #135 10909 Lift Station #304 10910 Lift Station #182 10911 Lift Station #326 10912 Silverado Terr 10913 1657 17th St NW 10914 Lift Station #120 10915 Lift Station #101 10916 Lift Station# 136	54	12	$251.00	$13,554.00

		10917 Harmony Lift Station 12743 Winter Haven Hospital 12744 Clubhouse Rd. and Wexford 12745 3107 Post Oak Ct. 12746 Idylwild Dr. and Trinity Circle 12747 Sunfish Dr. and Highfin Dr. 12748 21st St. SW and Ave D SW 12749 Cody Caleb Dr and Dakota Blvd 12750 Lift Station #147 12751 7th St SW and AVE O SW 12753 Bayou Ct 12754 220 AVE O SE 12755 Audubon Rd. 12756 Terranova Ln. and Terranova Ave. 12757 Fire Restaurant				
3	EW-SC1R	Renewal: System Warranty- Covers all systems parts except PowerPack- PARTS ONLY. 1 year rate. 70928-001 Date Covered: 8/1/2026-7/31/2027 8723 Ave C SW 8724 N Lake Shipp 8725 Lake Shipp Dr 8726 Pope Ave 8727 MLS 1 8728 Lift Station #376 8729 Ave O NE 8730 Riverwood Dr 8731 Ave F NW 9002 1st St. South - Sonic 9003 Sears Ave 9004 Ave Q NE 9005 Ave S NE 9006 4th St SE Alley 9007 10th St SE 9008 N Lake Otis Dr SE 9009 Rose Lawn St SW 9010 Ware Ave NE 9860 AVE C Alley 9861 Camelot Ct SW 9862 MLS 2 9863 Ave U NE 9864 Ave G SW 9865 CWM 355 10902 Lift Station# 117 10903 High Point 10904 Lift Station# 123 10905 1562 Lake Howard Dr. 10906 Lift Station #133 10907 Lift Station #109 10908 Lift Station #135 10909 Lift Station #304 10910 Lift Station #182 10911 Lift Station #326 10912 Silverado Terr 10913 1657 17th St NW 10914 Lift Station #120 10915 Lift Station #101	54	12	$503.00	$27,162.00

		10916 Lift Station# 136 10917 Harmony Lift Station 12743 Winter Haven Hospital 12744 Clubhouse Rd. and Wexford 12745 3107 Post Oak Ct. 12746 Idylwild Dr. and Trinity Circle 12747 Sunfish Dr. and Highfin Dr. 12748 21st St. SW and Ave D SW 12749 Cody Caleb Dr and Dakota Blvd 12750 Lift Station #147 12751 7th St SW and AVE O SW 12753 Bayou Ct 12754 220 AVE O SE 12755 Audubon Rd. 12756 Terranova Ln. and Terranova Ave. 12757 Fire Restaurant				
4	Extended Warranty Labor	Labor services for onsite visits during coverage period. Level,FLOE, Vault. SmartCare. 70932-001 Date Covered: 8/1/2026-7/31/2027 8723 Ave C SW 8724 N Lake Shipp 8725 Lake Shipp Dr 8726 Pope Ave 8727 MLS 1 8728 Lift Station #376 8729 Ave O NE 8730 Riverwood Dr 8731 Ave F NW 9002 1st St. South - Sonic 9003 Sears Ave 9004 Ave Q NE 9005 Ave S NE 9006 4th St SE Alley 9007 10th St SE 9008 N Lake Otis Dr SE 9009 Rose Lawn St SW 9010 Ware Ave NE 9860 AVE C Alley 9861 Camelot Ct SW 9862 MLS 2 9863 Ave U NE 9864 Ave G SW 9865 CWM 355 10902 Lift Station# 117 10903 High Point 10904 Lift Station# 123 10905 1562 Lake Howard Dr. 10906 Lift Station #133 10907 Lift Station #109 10908 Lift Station #135 10909 Lift Station #304 10910 Lift Station #182 10911 Lift Station #326 10912 Silverado Terr 10913 1657 17th St NW 10914 Lift Station #120 10915 Lift Station #101	55	12	$900.00	$49,500.00

		10916 Lift Station# 136 10917 Harmony Lift Station 12743 Winter Haven Hospital 12744 Clubhouse Rd. and Wexford 12745 3107 Post Oak Ct. 12746 Idylwild Dr. and Trinity Circle 12747 Sunfish Dr. and Highfin Dr. 12748 21st St. SW and Ave D SW 12749 Cody Caleb Dr and Dakota Blvd 12750 Lift Station #147 12751 7th St SW and AVE O SW 12753 Bayou Ct 12754 220 AVE O SE 12755 Audubon Rd. 12756 Terranova Ln. and Terranova Ave. 12757 Fire Restaurant 15580 Lift Station #324 14 Meadow Lake Ct. 15581 SMH 0326036 Cypresswood Blvd. 15582 SMH 0179101 4150 Country Club Rd. S. 15583 SMH 0312001 3952 Cypress Landing W. 15584 Lift Station #94 Hill Nissan 15585 Lift Station #202 1409 Cooley Rd. 15586 SMH 0109031 203 8th St. NE 15587 SMH 0102065 1804 Ave Q SW 15588 SMH 0102070 201 Evergreen Pl. 15589 SMH 0104070 250 3rd St. NW				
5	ASM-RD-1R	Renewal: SmartRain™ - Rain data service. Provides continued rain data per site 1 year rate. 68886-962 Date Covered: 8/1/2026-7/31/2027 8732 Ave C Rain 8733 Ave H 9011 6th St Rain 9012 Nottingham Rain 9013 Cypress Gardens Smart Rain 9014 Lake Elbert Rain 9866 Lake Smart Cir SmartRain 9867 Walmart SmartRain 10897 Lake Cannon SmartRain 10898 Cypresswood SmartRain 10899 Walmart Distribution SmartRain 10900 Lake Howard SmartRain 10901 Dundee Rd SmartRain 12740 Lake Howard West SmartRain 12741 Eloise Loop Rd SmartRain 12742 Havendale Rd SmartRain	16	12	$121.00	$1,936.00
6	ASM-SC1R	Renewal: SmartLevel – REQUIRED for system to function. 1 Year rate. 68886-959 Date Covered: 4/3/2027-7/31/2027 15580 Lift Station #324 14 Meadow Lake Ct. 15581 SMH 0326036 Cypresswood Blvd. 15582 SMH 0179101 4150 Country Club Rd. S. 15583 SMH 0312001 3952 Cypress Landing W. 15584 Lift Station #94 Hill Nissan 15585 Lift Station #202 1409 Cooley Rd. 15586 SMH 0109031 203 8th St. NE 15587 SMH 0102065 1804 Ave Q SW	10	4	$147.67	$1,476.70

		15588 SMH 0102070 201 Evergreen Pl. 15589 SMH 0104070 250 3rd St. NW				
7	PW-5C1R	Renewal: Power Warranty: PARTS ONLY. 1 year rate. 70928-002 Date Covered: 4/3/2027-7/31/2027 15580 Lift Station #324 14 Meadow Lake Ct. 15581 SMH 0326036 Cypresswood Blvd. 15582 SMH 0179101 4150 Country Club Rd. S. 15583 SMH 0312001 3952 Cypress Landing W. 15584 Lift Station #94 Hill Nissan 15585 Lift Station #202 1409 Cooley Rd. 15586 SMH 0109031 203 8th St. NE 15587 SMH 0102065 1804 Ave Q SW 15588 SMH 0102070 201 Evergreen Pl. 15589 SMH 0104070 250 3rd St. NW	10	4	$83.67	$836.70
8	EW-SC1R	Renewal: System Warranty- Covers all systems parts except PowerPack- PARTS ONLY. 1 year rate. 70928-001 Date Covered: 4/3/2027-7/31/2027 15580 Lift Station #324 14 Meadow Lake Ct. 15581 SMH 0326036 Cypresswood Blvd. 15582 SMH 0179101 4150 Country Club Rd. S. 15583 SMH 0312001 3952 Cypress Landing W. 15584 Lift Station #94 Hill Nissan 15585 Lift Station #202 1409 Cooley Rd. 15586 SMH 0109031 203 8th St. NE 15587 SMH 0102065 1804 Ave Q SW 15588 SMH 0102070 201 Evergreen Pl. 15589 SMH 0104070 250 3rd St. NW	10	4	$167.67	$1,676.70
9	Notes	Details regarding order. 10 below units: ASM, Power and parts is covered till December 2027 per original purchase. 17113 Lift Station #185 Enterprise 17114 Lift Station #90 Lake Shipp Park 17115 HDXE SatAuto 4674850 17116 SMH-012105 (Walmart district)1151-1281 Lucerne Loop Rd 17117 SMH-0155006 1746 Terry Cir. NE 17118 SMH-0182007 5600 State Rd. 544 17119 HDXE SatAuto 4577780 17120 SMH 0135009 2000 15th Ct NW 17121 Lift Station #366 Traditions 17122 SMH-0104111 6TH ST SW and Ave G SW	1		$0.00	$0.00
10	Extended Warranty Labor	Labor services for onsite visits during coverage period. Level,FLOE, Vault. SmartCare. 70932-001 Date Covered: 12/16/2026-7/31/2027 17113 Lift Station #185 Enterprise 17114 Lift Station #90 Lake Shipp Park 17115 HDXE SatAuto 4674850 17116 SMH-012105 (Walmart district)1151-1281	10	7	$525.00	$5,250.00

Budget Quote

		Lucerne Loop Rd 17117 SMH-0155006 1746 Terry Cir. NE 17118 SMH-0182007 5600 State Rd. 544 17119 HDXE SatAuto 4577780 17120 SMH 0135009 2000 15th Ct NW 17121 Lift Station #366 Traditions 17122 SMH-0104111 6TH ST SW and Ave G SW				

Budget Quote

Terms and Conditions for this transaction:

1. Invoices shall be paid within thirty (30) days of the invoice date.
2. All applicable taxes must be added to prices offered.
3. Prices are FOB Factory. Shipping costs can be calculated and added to the offer.
4. All paid warranties and Active Site Management (ASM) services begin on the date of shipment.
5. Returns are accepted only with a valid Return Material Authorization (RMA) number. Please contact SmartCover Customer Service for an RMA number.
6. Loss of Communications: Customer acknowledges that SmartCover is not responsible for the loss of wireless communication, internet communications, or any communications used in the operation of this system.
7. Advisory Only: SmartCover is an advisory service only. As such, SmartCover is not responsible for any damage of any kind or from any cause whatsoever that may result from, in relation to, in connection with, due to, or as a result of the installation or operation of the system, including without limitation, equipment failure, or any consequential damages caused by, or resulting from, the use or installation of the SmartCover system.
8. Traffic Control: SmartCover does not provide traffic control. The customer must provide traffic control for the installation and servicing of all units.
9. This offer is subject to the terms and conditions available here. Please ensure that you set the filter to your applicable region. https://www.badgermeter.com/legal-and-compliance/

Signature for Approval _____

P.O. No.

We appreciate your business!

Subtotal	$125,314.10
Tax	$0.00
Total	$125,314.10

CITY OF WINTER HAVEN CONTRACT ADDENDUM

This *City of Winter Haven Contract Addendum* ("Addendum") is agreed upon by the parties and appended to the agreement(s), purchase(s), order(s), form(s), service(s), package(s), term(s), and contract(s) identified below by reference by title (together collectively the "Contract" or the "Contract Documents"), between the City of Winter Haven, Florida, a Florida municipal corporation (the "City") and the following Vendor (collectively, the "Parties"):

Name of Vendor: Badger Meter, Inc., a Wisconsin corporation, authorized to do business in the State of Florida
4545 W. Brown Deer Road
Post Office Box 245036
Milwaukee, WI 53224-9536

Name of Contract: Badger Meter Terms and Conditions of Sale of Professional Services; Purchase Order – General Terms and Conditions; Badger Meter Terms and Conditions of Sale of Goods; and SmartCover Budget Quote

§ 1. Initial Provisions and Fact Findings.

The Parties agree upon the following initial provisions and factual findings:

(a) The City is authorized to enter into the Contract and this Addendum as a matter of home rule under Section 2(b) of Article VIII of the Florida Constitution and Chapter 166 of the Florida Statutes. The resulting contract, articulated by the Contract Documents as a whole, is subject to all budgeting and legal requirements of the *Code of Ordinances of the City of Winter Haven, Florida*, the *Charter of the City of Winter Haven, Florida* and the Florida Statutes.

(b) Copies of the Badger Meter Terms and Conditions of Sale of Professional Services; Purchase Order – General Terms and Conditions; Badger Meter Terms and Conditions of Sale of Goods; and SmartCover Budget Quote are made a part hereof by reference.

(c) Notwithstanding anything in the Contract, Vendor and the City acknowledge and agree that the Effective Date of the Contract and this Addendum is the date that the governing body of the City approves and enters into the Contract and this Addendum at a duly called open public meeting.

(d) Vendor represents that it is authorized to transact business in the State of Florida.

(e) Vendor and the City acknowledge and represent that certain amendments to the Contract are desirable and necessary in order to comply with applicable Florida

law.

(f) Vendor acknowledges and agrees that the Contract and this Addendum are governed by Florida law.

(g) Vendor and the City acknowledge that the City's entry into the Contract, remission of payments, and performance thereunder, is contingent upon the terms and conditions set forth in this Addendum.

(h) Vendor acknowledges and represents that, in consideration for the City's entry into the Contract and this Addendum, and the City's performance thereunder, Vendor has agreed to provide and perform its obligations and services in strict accordance with Florida law, including by way of explanation, but not limitation, Chapters 119, 267, and 668 of the Florida Statutes.

(i) Vendor represents that, prior to executing this Addendum, it has reviewed this Addendum with its legal counsel and fairly negotiated this Addendum at arm's length.

(j) The City acknowledges that the Contract and this Addendum are in the best interest of the City of Winter Haven and its citizens and residents, and execution of the Contract and this Addendum will promote the health, safety and welfare of the citizens and residents of the City of Winter Haven, Florida.

(k) Vendor and the City acknowledge, represent, and agree that mutual consideration has been given, receipt of which is duly acknowledged, in consideration and exchange for entry into this Addendum.

§ 2. <u>Definitions.</u>

Words used in the Contract and Addendum, as well as any and all attachments and exhibits incorporated therein and made a part of the Contract Documents, shall possess their everyday and ordinary meanings, *provided however*, that where one of the following listed terms is used, such term shall possess its corresponding meaning, as follows:

Contract Documents shall mean the Badger Meter Terms and Conditions of Sale of Professional Services; Purchase Order – General Terms and Conditions; Badger Meter Terms and Conditions of Sale of Goods; and SmartCover Budget Quote; and this City of Winter Haven Contract Addendum.

Day(s) means calendar day(s) unless specifically stated otherwise.

Business Day(s) means that (or those) calendar day(s) which is (or are) not a Saturday, a Sunday, or a holiday where the City's City Hall is closed for the transaction of ordinary business (a "City Holiday").

Calendar Day(s) means any day(s) in a 365-day calendar year.

Effective Date means the date on which the City Commission of the City of Winter Haven approves the Contract and this Addendum.

§ 3. Primacy of Addendum.

This Addendum contains specific terms and conditions that are applicable to purchases of goods and services made by the City of Winter Haven, Florida, a Florida municipal corporation. Notwithstanding anything in the Contract Documents to the contrary, whether expressly made or determined to exist by implication, the terms of this Addendum shall be primary and shall control over any conflicting term, condition, duty, and implication found in the Contract Documents.

§ 4. Calculation of Time.

Unless expressly specified otherwise in the Contract Documents, the calculation of any time period expressed in days or the determination of the number of days that have passed between events or occurrences shall be based on calendar days and every calendar day of the period shall be counted including intermediate Saturdays, Sundays and City Holidays. Unless expressly specified otherwise specified in the Contract Documents, any time period expressed in days that is prescribed in or by the Contract Documents shall commence on the day immediately following the event triggering such time period and shall expire at midnight on the last day of the same, provided that if the last day of the period is a Saturday, Sunday, or City Holiday, the period continues to run until the next day that is not a Saturday, Sunday, or City Holiday. Time periods expressed in the Contract Documents that are not contingent upon an action or event shall commence on the day immediately following the Effective Date.

§ 5. Governing Law; Home Venue Privilege.

The Contract and this Addendum are made in the City of Winter Haven, County of Polk, State of Florida, and shall be governed solely by the internal laws of the State of Florida. The Parties agree that venue for any litigation, suit, action, counterclaim, or proceeding, whether at law or in equity, which arises out of, concerns, or relates to the Contract, the Addendum, the Contract Documents, any and all transactions contemplated thereunder, the performance thereof, or the relationship created hereby, whether sounding in contract, tort, strict liability, or otherwise, shall lie exclusively in courts with geographic jurisdiction over Polk County, Florida, which, as of the Effective Date, are the County Court in and for Polk County, Florida, the Circuit Court of the Tenth Judicial Circuit in and for Polk County, Florida and the United States District Court for the Middle District of Florida, Tampa Division. The Parties waive any objection to jurisdiction and venue in such courts.

§ 6. Financial Matters; City Performance Subject to Appropriation; Invoices; Applicability of the Florida Local Government Prompt Payment Act

(a) The City's obligation to perform under the Contract Documents and furnish payment to Vendor is expressly subject to appropriation of sufficient public funds by the City Commission of the City of Winter Haven, Florida. In the event the City Commission of the City of Winter Haven, Florida, fails to appropriate sufficient funds to satisfy the City's payment obligations to Vendor of any kind or type, the City or the Vendor may immediately terminate the Contract and this Addendum and be released from any future responsibility or liability thereunder.

(b) Invoices for services shall be sent to: City of Winter Haven – Finance Dept., P.O. Box 2277, Winter Haven, Florida 33883-227, or preferably, emailed to finance-AP@mywinterhaven.com, or at such other address as may be directed by the City to the Vendor in writing from time to time.

(c) The provisions of the *Local Government Prompt Payment Act*, §§ 218.70, *et seq.*, Florida Statutes (2024), are incorporated herein as if set forth in full, and shall control all payments made by the City to the Vendor required by the Contract Documents. To the extent there is conflict between the text of the Contract Documents and the text of the *Local Government Prompt Payment Act*, the text of the *Local Government Prompt Payment Act* shall control.

§ 7. Public Records Compliance.

Pursuant to Section 119.0701(1)(a) of the Florida Statutes, Vendor agrees to:

(a) Keep and maintain Public Records required by the City to perform the Services specified herein.

(b) Upon request from the City's custodian of Public Records, provide the City with a copy of the requested Public Records or allow the Public Records to be inspected or copies within a reasonable time at a cost that does not exceed the cost provided in Chapter 119 of the Florida Statutes or as otherwise provided by law.

(c) Ensure that Public Records that are exempt or confidential and exempt from Public Records disclosure requirements are not disclosed except as authorized by law for the duration of the term and following completion of the contracted work or service if Vendor does not transfer the Public Records to the City.

(d) Upon completion of the contracted work or service, transfer, at no cost, to the City all Public Records in possession of Vendor or keep and maintain Public Records required by the City to perform the service. If Vendor transfers all Public Records to the City upon completion of the contracted work or service, Vendor shall destroy any duplicate Public Records that are exempt or confidential and exempt from Public Records disclosure

requirements. If Vendor keeps and maintains Public Records upon completion of the contracted work or service, Vendor shall meet all applicable requirements for retaining Public Records. All Public Records stored electronically must be provided to the City upon request from the City's custodian of Public Records, in a format that is compatible with the City's information technology systems.

IF VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 863-291-5600, RECORDS@MYWINTERHAVEN.COM, 451 THIRD STREET NW, WINTER HAVEN, FL 33881.

If Vendor does not comply with a public records request, the City shall enforce this contract provision, which may include immediate termination.

§ 8. Sovereign Immunity; Limitations of City's Liability.

(a) City is a sovereign Florida municipal government. The Parties agree that nothing contained in the Contract Documents shall be construed to waive the City's sovereign immunity. With respect to the matter of compensation for work performed, or the price of goods sold, the Parties agree that the total potential liability of the City to the Vendor shall not exceed the agreed-upon price established in the Contract Documents, or any related purchase order, subject to annual appropriation performance contingencies. For all other matters, the Parties agree that the total potential liability of the City to the Vendor shall not exceed the limits of the City's potential liability as determined by the State of Florida's waiver of sovereign immunity set forth in the version of § 768.28(5) of the Florida Statutes in effect as of the Effective Date, regardless of whether any such obligations are based in tort, contract, statute, strict liability, or negligence, product liability or otherwise. The Parties also agree that the City shall not be liable to the Vendor for any indirect, incidental, consequential, special, exemplary, or punitive damages of any kind or nature or interest for the period before judgment.

(b) The Parties agree that the maximum value and monetary limits of any individual express City indemnification and all collective express City indemnifications found in the Contract Documents, if any exist, shall not exceed the limits of the City's potential liability as determined by the State of Florida's waiver of sovereign immunity set forth in the version of § 768.28(5) of the Florida Statutes in effect as of the Effective Date, regardless of whether any such obligation to indemnify or the underlying cause for indemnity is based in tort, contract, statute, strict liability, or negligence, product liability or otherwise. Notwithstanding anything in the Contract Documents to the contrary, to the extent that the City has agreed to an express indemnification, the Parties agree that no City indemnity shall require the City to defend Vendor and no City indemnity shall indemnify Vendor from and against attorneys' fees and costs, fees and costs for experts

and witnesses, costs of suit, or any indirect, incidental, consequential, special, exemplary, or punitive damages of any kind or nature or interest for the period before judgment. This limitation provision shall not be construed to create a duty for the City to indemnify the Vendor in the absence of an independent express indemnification clause.

(c) This Section shall survive termination of the Contract and this Addendum.

§ 9. Required Clauses.

Pursuant to Florida Statutes, the following provisions are added to the Contract Documents:

(a) *Convicted Vendor List.* A person or affiliate who has been placed on the State of Florida Convicted Vendor List, following a conviction for a public entity crime, may not submit a bid on a contract to provide any goods or services to a public entity; may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work; may not submit bids on leases of real property to a public entity; may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity; and may not transact business with any public entity, in excess of $35,000.00, for a period of thirty-six (36) months from the date of being placed on the Convicted Vendor List. Vendor acknowledges that it is not on the State of Florida Convicted Vendor List and that it is eligible to enter into the Contract, this Addendum, the Contract Documents, and the resulting contract with the City.

(b) *Scrutinized Companies.* Section 287.135, Florida Statutes, prohibits the City from contracting with companies for goods or services in any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, F.S. or is engaged in a boycott of Israel; and contracting with companies for goods or services over $1,000,000.00 that are on either the Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, created pursuant to s. 215.473, or are engaged in business operations in Cuba or Syria. Vendor acknowledges that it is not on the State of Florida Scrutinized Companies that Boycott Israel list, is not presently engaged in a boycott of Israel, is not on the State of Florida Scrutinized Companies with activities in the Iran Petroleum Energy Sector List, and is not engaged in business operations in Cuba or Syria.

(c) *E-Verify.* By contracting with the City, the Vendor becomes obligated under Florida law to comply with the provisions of Section 448.095(5)(a), Florida Statutes, to register with and use the E-Verify system to verify the work authorization status of all new employees of the Vendor and any subcontractor hired by the Vendor. If the Vendor enters into a contract with a subcontractor, the subcontractor must provide the Vendor with an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply will lead to termination of the Contract, this Addendum, the Contract Documents, and all purchase orders if a subcontractor knowingly violates the statute, the subcontract must be terminated immediately. Any

challenge to termination under this provision must be filed in the Circuit Court no later than twenty (20) calendar days after the date of termination. If this Agreement is terminated for a violation of the statute by the Vendor, the Vendor may not be awarded a public contract for a period of one (1) year after the date of termination.

(d) *No Consideration of Social, Political, and Ideological Interests.* The provisions of Section 287.05701 of the Florida Statutes prohibit local governments from giving preference to a prospective contractor based on the prospective contractor's social, political or ideological interests or requesting documentation from, or considering, a prospective contractor's social, political, or ideological interests when determining if the prospective contractor is a responsible vendor.

(e) *Contracting with Foreign Entities.* By executing this Contract, Vendor certifies that it is not owned by the government of the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic (collectively "Foreign Countries of Concern"), nor is it owned by any agency of or any other entity of significant control of any such government. Further, Vendor certifies that no government of a Foreign Country of Concern has a "controlling interest" in Vendor as the term is defined in Section 287.138(1)(a) of the Florida Statutes, nor is the Vendor organized under the laws of a Foreign Country of Concern, nor does the Vendor have its principal place of business located in a Foreign Country of Concern. If this Contract permits the Vendor to access the personal identifying information of any individual, Vendor agrees to notify the City in advance of any contemplated transaction that would cause Vendor to be disqualified from such access under Section 287.138 of the Florida Statutes. Vendor agrees to furnish the City with an affidavit signed by an officer or representative of the Vendor under penalty of perjury at any time and upon request that the statements in this paragraph are true and correct.

(f) *No Coercion for Labor or Services.* By executing this Contract, Vendor certifies, pursuant to Section 787.06(13), Florida Statutes under penalty of perjury, that it does not obtain labor or services by the use of coercion, by using or threatening to use physical force against any person; by restraining, isolating, or confining or threatening to restrain, isolate, or confine any person without lawful authority and against her or his will; by using lending or other credit methods to establish a debt by any person when labor or services are pledged as a security for the debt, if the value of the labor or services as reasonably assessed is not applied toward the liquidation of the debt, the length and nature of the labor or services are not respectively limited and defined; by destroying, concealing, removing, confiscating, withholding, or possessing any actual or purported passport, visa, or other immigration document, or any other actual or purported government identification document, of any person; by causing or threatening to cause financial harm to any person; by enticing or luring any person by fraud or deceit; or by providing a controlled substance as outlined in Schedule I or Schedule II of Section 893.03, Florida Statutes, to any person for the purpose of exploitation of that person. Vendor agrees to furnish the City with an affidavit signed by an officer or representative of the Vendor under penalty of perjury at any time and upon request that the statements

in this paragraph are true and correct.

10. Force Majeure.

Delays in performance due to fire; flood; hurricane; tornado; earthquake; windstorm; unavailability of materials or equipment; war; declaration of hostilities; terrorist act; civil strife; strike; labor dispute; epidemic; pandemic; or act of God, shall be deemed events of "Force Majeure" and such delays shall be excused in the manner herein provided. If a Party is delayed in any work or performance pursuant to the Agreement due to the occurrence of an event of Force Majeure, the date for action required or contemplated by the Agreement shall be extended by the number of days equal to the number of days such party is delayed. The party seeking to be excused based on an event of Force Majeure shall give written notice of the delay indicating its anticipated duration. Each party shall use its best efforts to rectify any conditions causing the delay and will cooperate with the other party, except for the incurrence of unreasonable additional costs and expenses, to overcome any loss of time that has resulted.

§ 11. Compliance with Laws.

Vendor agrees to comply with any and all applicable statutes, laws, rules, regulations, charter provisions, ordinances and resolutions of general applicability of the United States of America, of the State of Florida, of Polk County, of City of Winter Haven, and of any and all other public authority which may be applicable.

§ 12. Assignment by Vendor.

The contract expressed by the Contract, this Addendum, and the Contract Documents shall not be assigned by the Vendor, or any successor thereto, in whole or in part without the prior written consent of the City, which shall not be unreasonably withheld.

IN WITNESS WHEREOF, the parties have set their hands hereto on the date indicated:

[*Signatures Follow on Pages 9 and 10*]

City of Winter Haven Contract Addendum
to:
Badger Meter Terms and Conditions of Sale of Professional Services; Purchase Order – General Terms and Conditions; Badger Meter Terms and Conditions of Sale of Goods; and SmartCover Budget Quote

Signature Page for Vendor

Vendor: BADGER METER, INC.

Executed this 25th day of June, 2026

By: 

Name: Colin Middaugh

Title: Sr. Director – Sales, SmartCover

City of Winter Haven Contract Addendum
to:
Badger Meter Terms and Conditions of Sale of Professional Services; Purchase Order – General Terms and Conditions; Badger Meter Terms and Conditions of Sale of Goods; and SmartCover Budget Quote

City of Winter Haven, Florida:

Executed this ____ day of _____, 2026

By: _____
City Manager

Attest:

_____
City Clerk

Approved as to Form and Legal Sufficiency:

_____
City Attorney

City of Winter Haven - Contract Addendum (Badger Meter)

Final Audit Report 2026-06-25

Created:	2026-06-25
By:	David Miller (dmiller@badgermeter.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAA-B9Bq-Mcnbgoa3A3D-Fm6OC5K6MOVUVn

"City of Winter Haven - Contract Addendum (Badger Meter)" History

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2026-06-25 - 2:57:39 PM GMT

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2026-06-25 - 2:58:21 PM GMT- IP address: 104.47.55.126

Document e-signed by Colin Middaugh (cmiddaugh@badgermeter.com)
Signature Date: 2026-06-25 - 2:58:57 PM GMT - Time Source: server- IP address: 98.118.128.218 - Signature Appearance Selected: IMAGE

Agreement completed.
2026-06-25 - 2:58:57 PM GMT

Affidavit Regarding the Use of Coercion for Labor and Services

State of Wisconsin
County of Milwaukee

Name of Vendor: Badger Meter, Inc.
Address: 4545 W. Brown Deer Road, Post Office Box 245036, Milwaukee, WI 53224-9536
Phone Number: _____
Authorized Representative's Name: Colin Middaugh
Authorized Representative's Title: Sr. Director – Sales, SmartCover

Effective July 1, 2024, Section 787.06(13), Florida Statutes, requires all nongovernmental entities executing, renewing, or extending a contract with a governmental entity to provide an affidavit signed by an officer or representative under penalty of perjury attesting that the nongovernmental entity does not use coercion for labor or services.

As the person authorized to sign on behalf of the vendor, I certify that the vendor identified above does not:

- Use or threaten to use physical force against any person;
- Restrain, isolate, or confine or threaten to restrain, isolate, or confine any person without lawful authority and against her or his will;
- Use lending or other credit methods to establish a debt by any person when labor or services are pledged as a security for the debt, if the value of the labor or services as reasonably assessed is not applied toward the liquidation of the debt, the length and nature of the labor or services are not respectively limited and defined;
- Destroy, conceal, remove, confiscate, withhold, or possess any actual or purported passport, visa, or other immigration document, or any other actual or purported government identification document, of any person;
- Cause or threaten to cause financial harm to any person;
- Entice or lure any person by fraud or deceit; or
- Provide a controlled substance as outlined in Schedule I or Schedule II of Florida Statute 893.03 to any person for the purpose of exploitation of that person.

Under penalties of perjury, I declare that I have read the foregoing document and that the facts stated in it are true.

Badger Meter, Inc.

_____
By: Colin Middaugh
Its: Sr. Director – Sales, SmartCover

The foregoing instrument was acknowledged before me by means of ☒ physical presence, or ☐ online notarization, this 25 day of June, 2026, by Colin Middaugh, as Sr. Director-Sales of Badger Meter, Inc., a Wisconsin corporation, authorized to do business in the State of Florida, on behalf of the said Badger Meter, Inc., who is ☒ personally known to me or ☐ produced _____ as identification.

_____
Notary Public, State of Wisconsin

DAKOTA M. COLLOFELLO NOTARY PUBLIC STATE OF WISCONSIN

Affidavit Regarding Foreign Countries of Concern

State of Wisconsin
County of Milwaukee

Name of Vendor: Badger Meter, Inc.
Address: 4545 W. Brown Deer Road, Post Office Box 245036, Milwaukee, WI 53224-9536
Phone Number: _____
Authorized Representative's Name: Colin Middaugh
Authorized Representative's Title: Sr. Director – Sales, SmartCover

Effective January 1, 2024, Section 287.138, Florida Statutes, prohibits a Florida governmental entity from entering into a contract that may grant or allow access to any individual's personal identifying information unless the contracting entity furnishes an affidavit signed by an officer or representative under penalty of perjury concerning foreign countries of concern.

As the person authorized to sign on behalf of the vendor, I certify that:

- The vendor is not owned by the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic, or by any agency of or any other entity of significant control of any of such foreign country of concern.
- The government of the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic does not have a controlling interest in the vendor.
- The vendor is not organized under the laws of and does not have its principal place of business in the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic.

Under penalties of perjury, I declare that I have read the foregoing document and that the facts stated in it are true. Badger Meter, Inc.

_____
By: Colin Middaugh
Its: Sr. Director – Sales, SmartCover

The foregoing instrument was acknowledged before me by means of ☒ physical presence, or ☐ online notarization, this 25 day of June, 2026, by Colin Middaugh, as Sr. Director-Sales of Badger Meter, Inc., a Wisconsin corporation, authorized to do business in the State of Florida, on behalf of the said Badger Meter, Inc., who is ☐ personally known to me or ☐ produced _____ as identification.

_____
Notary Public, State of Wisconsin

DAKOTA M. COLLOFELLO NOTARY PUBLIC STATE OF WISCONSIN

City of winter Haven - Form Purchasing Affidavits

Final Audit Report 2026-06-25

Created:	2026-06-25
By:	David Miller (dmiller@badgermeter.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAiBF5FLq9y1cZaMMmn3gKJXy_fYRGKICJ

"City of winter Haven - Form Purchasing Affidavits" History

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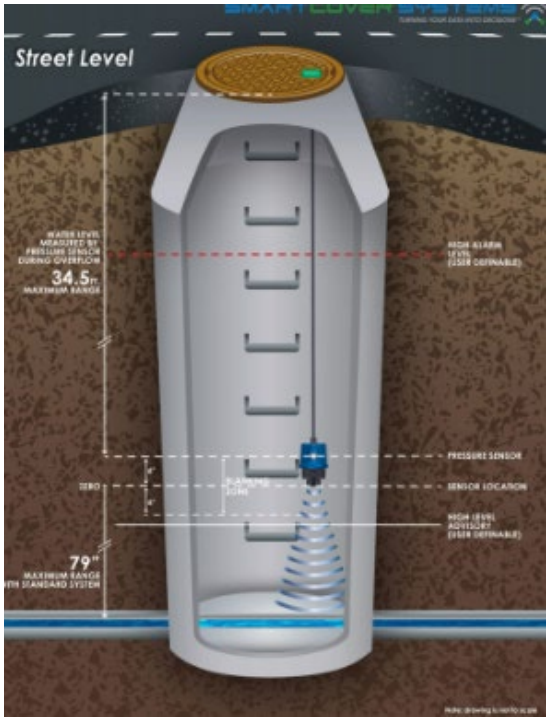
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2026-06-25 - 4:34:16 PM GMT- IP address: 104.47.70.126

Document e-signed by Colin Middaugh (cmiddaugh@badgermeter.com)
Signature Date: 2026-06-25 - 4:34:44 PM GMT - Time Source: server- IP address: 98.118.128.218 - Signature Appearance Selected: IMAGE

Agreement completed.
2026-06-25 - 4:34:44 PM GMT







Smart Cover Sewer Monitoring System

DATE: June 15, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Gary M. Hubbard, Water Department Director

SUBJECT: Water and Sewer Connection Fee and Rate Study

BACKGROUND

On September 10, 2024, the City Commission adopted Ordinances O-24-41, amending water, wastewater, and reclaimed water rates, and O-24-42, amending water and sewer connention fees. These rates and fees were based on recommendations by Raftelis Financial Consultants, Inc. in the "City of Winter Haven 2024 Utility Rate Study" dated August 15, 2024.

The Water Department has requested that Raftelis Financial Consultants, Inc. evaluate the current ordinances, O-24-41 and O-24-42, and complete a comprehensive review of the water and sewer user rates and connection fees while considering the requirements of CS/CS/HB 1451 (2026 Legislative Session). An update to the revenue sufficiency forecast of water and sewer user rates and connection fees to provide funding for operations and capital improvements was also requested. The primary study objectives include:

a. Water and Sewer Connection Fee Report
b. Water, Sewer, and Reuse Rates Report
c. Net Revenue Requirements
d. Preparation and presentations of report findings and conclusions

Raftelis Financial Consultants, Inc. will enter into a General Piggyback Purchasing Agreement based on qualifications submitted to and awarded on February 7, 2026, by the City of West Palm Beach, FL in RFQ No. 25-25-217 MK, Utility Rate and Financial Consulting Services.

FINANCIAL IMPACT

The total cost for the connection fee and rate study is $80,000 and will be completed within 150 days of the issuance to proceed. Sufficient funds are available in FY 2025/2026 in account 402-08-310-3105 to complete the scope of work.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Infrastructure
- **Goal:** 3.3 – Ensure an actionable strategy is in place for the future of water resources.
- **Strategy:** 3.3.2 – Secure financial and technical resources needed to modernize and expand the City's wastewater infrastructure in consideration of projected growth and regulatory changes.

RECOMMENDATION

Staff recommends the City Commission approve the Water and Sewer Connection Fee and Rate Study Proposal by Raftelis Financial Consultants, Inc., and authorize the City Manager or his designee to take all further necessary actions necessary thereto.

ATTACHMENTS

- Water and Sewer Connection Fee and Rate Study – Raftelis
- General Piggyback Purchasing Agreement - Raftelis

PROJECT UNDERSTANDING

The City has requested that Raftelis prepare a comprehensive review of the water and sewer connection fees, as well as an update to the revenue sufficiency forecast of water and sewer user rates to provide funding for operations and capital improvements. The Connection Fee and Rate Study will utilize the City's current assets, budgets, capital improvement plans, along with a cost of service methodology and approach to conduct the reviews, investigations and analyses necessary to identify the fiscal requirements and customer determinants concerning appropriate establishment of connection fees and rates for just and equitable recovery of water and sewer service costs. Furthermore, the approach will include a five-year forecast of probable future activities and recommendation of annual rate adjustments if necessary.

MUNICIPAL ADVISOR DISCLOSURE

As a registered Municipal Advisor under the Dodd-Frank Act, Raftelis is required to inform our clients of any existing or potential conflicts of interest that may be relevant to the proposed scope of services. As of the date of this engagement letter, no conflicts of interest are known to exist. In addition, the services to be provided by Raftelis will be limited to the scope of work and tasks described in this proposal, and will not include other services sometimes provided by Municipal Advisors or independent Financial Advisors. By signing this proposal indicating its approval and acceptance of the proposed scope of work and fees, the City is also explicitly acknowledging that Raftelis has provided the necessary disclosures addressing conflicts of interest and any limitations on the scope of Municipal Advisory services to be provided by Raftelis as part of this engagement.

SCOPE OF SERVICES

Task A. Connection Fee and Rate Study

We propose the following tasks will be necessary to complete the study.

Task 1: Project Initiation and Management

This task will involve working with staff to establish the financial and rate objectives, project schedule, and overall data needs and constraints. This task will include a web-based meeting (Teams, Zoom, etc.) to initiate the project.

Task 2: Data Collection and Review

For the utility connection fees Raftelis will provide the City with a data request identifying relevant study information and data including but not limited to existing and projected: i) population and land use estimates; ii) level of service standards for each service; iii) equipment and facility inventory through fixed asset depreciation records; iv) capital improvement plans and cost estimates for each service; v) master plans; vi) grant and other funding sources; and vii) loan agreements, interlocal agreements, developer agreements, or other similar obligations of the City for relevant services.

Raftelis will also collect and review relevant financial, operating, engineering, and legal information pursuant to the rate study. This task involves collecting and evaluating financial and operating data for recent fiscal years and budget information for Fiscal Year 2026 and Fiscal Year 2027. Information related to capital costs; revenues from rates, fees, and other sources; the number and types of utility customers; and the usage levels for each utility will be collected and reviewed. Additional information related to utility characteristics, customer demographics, and a

description of the utility projects will be developed by City staff. This information will provide the basis for developing the customer billing statistics, financial forecast, debt service coverage ratios, bill impact information, documenting forecast assumptions and relevant operating characteristics. Subtasks are as follows:

2.1 Prepare data collection request list.
2.2 Review customer billing reports prepared by the City.
2.3 Review revenues from rates, fees, and other sources.
2.4 Review and evaluate relevant O&M and capital costs, including available PRWC information.
2.5 Review existing and future large user agreements and anticipated demands.
2.6 Evaluate amount and uses of reserve funds.
2.7 Review existing connection and service availability policies.

Task 3: Water and Sewer Connection Fee Analysis

The City's existing water and sewer connection fees will be reviewed and updated recognizing the cost to provide treatment, pumping, transmission, and disposal to new customers. Master Plan and capital improvement costs along with major expansion and/or upgrade projects will be considered. In addition to this background information, this task will consider the following:

- Analysis of water supply, treatment, storage, and major transmission fixed assets available for growth;
- Analysis of sewer collection, treatment, and disposal fixed assets available for growth;
- Analysis of capital improvements and allocation between existing customers and growth;
- Update to the PRWC water capacity and cost incorporated into the fee calculation;
- Design water and sewer connection fee unit cost;
- Identification of appropriate impact fee credits;
- Develop water and sewer connection fee schedules;
- Connection fee comparisons; and
- Web meeting with City staff to review preliminary results.

Task 4: Customer Billing Analysis

In order to provide a detailed revenue forecast, the existing customer billing profile must be updated and understood. The City is experiencing growth and will continue to experience significant growth in the near future. Raftelis will coordinate with the City's billing department to obtain detailed billing statistics in order to evaluate recent consumption by various water usage levels. This data will be used to review both historical usage and revenue patterns, but also to project revenue under existing and proposed rates. The City has indicated that a review of the residential tiered water rates is desired and this billing data will be used to evaluate potential changes to the tiered rate structure. Raftelis will evaluate the Fiscal Year 2025 and year-to-date Fiscal Year 2026 billing statistics and provide a five (5) year projection of customers, sales, and revenue under existing rates.

Task 5: Net Revenue Requirements

This task involves the detailed projections of utility operating expenses, capital funding including involvement in the PRWC, existing and future debt service, and other utility income and expenditures. The projections will include the five-year projection period beginning with the City's current budget year FY 2026 through FY 2031. This task includes the projection of utility reserves available at the beginning of the projection period and throughout the forecast. The projected net revenue requirements will be compared to projected revenue under existing rates for each

utility system in order to determine the sufficiency of existing rates. Based on a review of revenue sufficiency with City staff, system-average rate adjustments will be calculated if necessary to meet the projected net revenue requirements. Subtasks are as follows:

5.1 Allocated O&M expenses among individual utilities.
5.2 Project O&M expenses by utility.
5.3 Develop capital improvement funding analysis.
5.4 Project and allocate debt service for existing and future debt.
5.5 Project other utility transfers and obligations.
5.6 Update R&R and PRWC charges.
5.7 Consideration of a new Environmental Fee.
5.8 Review of potential drought surcharge rates.
5.9 Project miscellaneous utility revenue and offsets.
5.10 Project revenue deficiencies over the five-year period, if any.
5.11 Establish rate phasing strategy, if necessary.
5.12 Prepare debt service coverage ratio analysis.
5.13 Meet with staff to review results (may be combined with meeting in Task 3).

Task 6: Report and Presentation

Connection fee and rate study draft reports will be prepared for staff review. The draft reports will include a description of the approach to developing the connection fees as well as the financial forecast and rate recommendations, if any. The assumptions utilized in the analysis will be documented in the reports. The draft reports will be provided to staff in electronic format for review and comment. After receiving comments, final reports will be prepared in electronic format. In addition, this task includes one presentation to the City Commission. A PowerPoint presentation will be prepared in order to facilitate the presentation to the City Commission. Subtasks as listed in our cost proposal are as follows:

6.1 Draft connection fee report.
6.2 Draft rate study report.
6.2 Final connection fee report.
6.4 Final rate study report.
6.3 Preparation of presentation materials.
6.4 Presentation to City Commission.

Task B. Additional Services

Pursuant to Task A of the above Scope of Services, Raftelis will respond to requests by the City for additional services. The additional services may include, but are not limited to: verification of customer data at City level; requests for development of alternative rate structures and/or customer classes; additional meetings not identified above including any one-on-one meetings with City officials or large users; preparation of draft ordinance/resolution; implementation assistance; negotiations with other entities relative to bulk services; development of funding program(s) for capital improvements, utility strategic planning and other related matters not specifically address in Task A.

Additional Services will be provided based on verbal requests from the City's Representative unless it is Raftelis' opinion that cost for each individual request will exceed ten percent of original contract amount stated herein,

whereby Raftelis will notify the City's Representative prior to commencing of activities. In either case Raftelis will provide a Change Order for approval by the City specifying the additional services and estimated fee.

ITEMS TO BE FURNISHED AT NO EXPENSE TO RAFTELIS: The City will assist Raftelis by furnishing, at no cost to Raftelis, all available pertinent information as set forth in Task 1 and any other data relative to performance of the above services for the project. It is agreed and understood that the accuracy and veracity of said information and data may be relied upon by Raftelis without independent verification of the same.

SECTION II – TIME OF PERFORMANCE

Tasks 1 through 6 of the Scope of Services will be completed within 150 days from receipt of Notice to Proceed except for delays beyond the reasonable control of Raftelis.

Additional Services to the Scope of Services will be completed as mutually agreed.

SECTION III – COMPENSATION

1. The Cost for Task A of the Scope of Services will be established as a lump sum amount of $80,000. This estimate includes all personnel time and anticipated expenses. Monthly invoices will be submitted based on the percentage completion of the project.

Winter Haven 2026 Utility Connection Fee and Rate Study

Tasks	Web Meetings	Number of Meetings	Hours					Total Fees & Expenses
			JW	MG	SC	Admin	Total	
1. Project Initiation and Management	1		2	4			6	$1,820
2. Data Collection and Review				4	8		12	$2,660
3. Water and Sewer Connection Fee Analysis	1		12	30	40		82	$20,510
4. Customer Billing Analysis			8	22	28		58	$14,470
5. Net Revenue Requirements	1	1	20	30	48		98	$25,315
6. Rate Study Report and Presentation	1	1	16	24	12	2	54	$15,225
Total Estimated Meetings / Hours	4	2	58	114	136	2	310	
Hourly Billing Rate			$370	$255	$190	$100		
Total Professional Fees			$21,460	$29,070	$25,840	$200	$76,570	

Total Fees	$76,570
Total Expenses	$3,430
Total Fees & Expenses	$80,000

JW - Joe Williams
MG - Michelle Galvin
SC - Staff Consultants
Admin - Administrative Staff

2. The cost for Task B of the Scope of Services shall be as mutually agreed.

SECTION IV – CITY REPRESENTATIVE

Mr. Gary Hubbard, Winter Haven Water Director

RAFTELIS FINANCIAL CONSULTANTS, INC.	**CITY OF WINTER HAVEN, FLORIDA**
By: Joe Williams	By:
Print: Joe Williams	Print: T. Michael Stavres
Title: Vice President	Title: City Manager
Date: June 15, 2026	Date: July 13, 2026

GENERAL PIGGYBACK PURCHASING AGREEMENT

This *General Piggyback Purchasing Agreement* (the "*Agreement*") is made by and between the City of Winter Haven, Florida, a Florida municipal corporation, whose address is 451 Third Street NW, Winter Haven, FL 33881 (the "City"), and:

Raftelis Financial Consultants, Inc.
341 N. Maitland Avenue, Suite 300
Maitland, FL 32751
tboveri@raftelis.com or (407) 628-2600

(the "Vendor").

WITNESSETH:

WHEREAS, on **February 7, 2026, City of West Palm Beach, FL** (the "Original Procuring Government") awarded **RFP No. 24-25-217 MK, Utility Rate and Financial Consulting Services** to Vendor for the performance of services and/or the sale and purchase of goods as described therein, a copy of which is on file with the City's Procurement office and incorporated herein by reference (the "Original Procurement Bid and Contract"); and

WHEREAS, the City is in need of a similar performance of services and/or is in need to purchase a similar set of goods as described in the Original Procurement Bid and Contract; and

WHEREAS, the Vendor is willing to provide "piggyback" services and/or goods to the City on the same terms and conditions as those offered to Original Procuring Government, as outlined in the Original Procurement Bid and Contract documents;

NOW THEREFORE, in exchange for the mutual promises contained herein, the sufficiency of which is acknowledged, the City and Vendor agree as follows:

§ 1. Incorporation of Recitals.

The foregoing recitals, deemed by the parties to be true and correct, are incorporated herein by reference.

§ 2. Terms of Agreement; Purchasing Authority.

(a) This is a piggyback purchasing *Agreement*. The terms and conditions of this *Agreement* shall be the same as those specified in the Original Procurement Bid and Contract documents, specifically including:

(1) All instructions to bidders and general information in the Original Procurement Bid and Contract Documents;
(2) All special conditions of the Original Procurement Bid and Contract Documents;
(3) All definitions of terms contained in the Original Procurement Bid and Contract Documents;

(4) All specifications, scopes of services, and/or descriptions of goods to be sold contained in the Original Procurement Bid and Contract Documents;
(5) All addenda to the Original Procurement Bid and Contract Documents;
(6) All insurance requirements outlined in the Original Procurement Bid and Contract Documents;
(7) All safety requirements outlined in the Original Procurement Bid and Contract Documents; and
(8) All responses of the Vendor in the Original Procurement Bid and Contract Documents, including all affidavits and statements of the Vendor required by law, which the Vendor: (A) affirms to continue to be true and correct as of the date of this *Agreement*; or (B) has updated with supplemental information and provided the same to the City in advance of this *Agreement*, in a form which the City finds acceptable;

unless such terms are expressly modified herein to conform to City-specific standards and requirements. All references to the Original Procuring Government, the Original Procuring Government's governing body, specific departments of the Original Procuring Government and the like or equivalent shall be replaced with the "City of Winter Haven, Florida," the "City Commission of the City of Winter Haven, Florida," specific City Departments, and the like or equivalent.

(b) The City is authorized to enter into this purchasing *Agreement* as a matter of home rule under Section 2(b) of Article VIII of the Florida Constitution and Chapter 166 of the Florida Statutes. This purchasing *Agreement* is subject to all budgeting and legal requirements of the *Code of Ordinances of the City of Winter Haven, Florida*, the *Charter of the City of Winter Haven, Florida* and the Florida Statutes. The City ratifies the bidding process performed by the Original Procuring Government as being full, fair and representative of the quantity and quality of bids that would be received by the City if written quotations were obtained or an advertisement for bids was published.

(c) To the extent there is any conflict between this *Agreement* and the Original Procurement Bid and Contract, (1) the text of this *Agreement* shall control and (2) the text of the Original Procuring Government's contract with the Vendor shall control over the solicitation issued by the Original Procuring Government and the bid documents submitted to the Original Procuring Government.

§ 3. Period of Performance; Renewal Periods.

The period of performance of this *Agreement* is from the date of execution by both parties through the end of the initial term of the Original Procurement Bid and Contract, **February 5, 2029**. This *Agreement* may be renewed for **up to two (2) additional years** as provided for in the Original Procurement Bid and Contract at the option of the City.

§ 4. Invoices.

Invoices for services shall be sent to: City of Winter Haven – Finance Dept., P.O. Box 2277, Winter Haven, Florida 33883-227, or preferably, emailed to finance-AP@mywinterhaven.com . Payments shall be made to the Vendor in accordance with the *Florida Local Government Prompt Payment Act*, §§ 218.70, *et seq.*, Florida Statutes.

§ 5. Price for Services.

The City reserves the right to increase/decrease prices after this *Agreement* has been in place for the initial period when it is in the best interest of the City of Winter Haven. Increases/decreases may be determined utilizing an appropriate price index, if a price index is used in the customary transaction of business in the Vendor's industry and/or the customary transaction of government purchases in the City of Winter Haven, Polk County, or the State of Florida. Vendor agrees to notify the City if the Original Procuring Government takes an increase or decrease on prices for work performed or goods sold under the Original Procurement Bid and Contract and the basis for such increase or decrease.

§ 6. Sovereign Immunity; Limitation of Liability.

City is a sovereign Florida municipal government. Nothing contained in this *Agreement*, nor any City indemnification made herein, if any such indemnification exists, is intended or shall be construed to waive the City's sovereign immunity. With respect to the matter of compensation for work performed, or the price of goods sold, the parties agree that the total liability of the City to the Vendor shall not exceed the agreed-upon price established in each order issued hereunder. For all other matters, the parties agree that the total liability of the City to the Vendor shall not exceed the City's limits of liability as set forth in § 768.28(5) of the Florida Statutes in effect as of the date of this *Agreement*, regardless of whether any such obligations are based in tort, contract, statute, strict liability, or negligence, product liability or otherwise.

§ 7. Public Records.

Pursuant to Florida law, if the Vendor is a "contractor" as defined in § 119.0701(1)(a), Florida Statutes, Vendor must comply with Florida's public records laws, specifically to:

(a) Keep and maintain public records that ordinarily and necessarily would be required by the City in order to perform the services herein.

(b) Provide the public with access to public records on the same terms and conditions that the City would provide the records and at a cost that does not exceed the cost provided in Chapter 119, Florida Statutes, or as otherwise provided by law.

(c) Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as

authorized by law.

(d) Meet all requirements for retaining public records and transfer, at no cost, to the City all public records in possession of the Vendor upon termination of the contract and destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. All records stored electronically must be provided to the City agency in a format that is compatible with the City's information technology systems.

Notice Required by F.S. § 119.0701:

IF VENDOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO VENDOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 863-291-5600, RECORDS@MYWINTERHAVEN.COM, 451 THIRD STREET NW, WINTER HAVEN, FL 33881.

§ 8. Insurance and Indemnification.

The City's standard contract terms for insurance and indemnification as set forth in Exhibit 'A' are incorporated into this *Agreement* as if set forth herein in full. Conflicts between the City's standard contract terms for insurance and indemnification and the Original Procurement Bid and Contract shall be resolved as follows:

(a) *Insurance.* All provisions of this *Agreement* shall be construed harmoniously to provide the City with the maximum amount of insurance for the identified peril to be covered on the terms most favorable to the City. If a specific form, endorsement, basis or agreed-upon interpretation is identified in Exhibit 'A', that form, endorsement, basis or interpretation shall control. To the extent of any conflict between a particular minimum insurance amount identified in Exhibit 'A' to this *Agreement* and the minimum insurance amount required by the Original Procurement Contract for the same peril, the requirement which provides greater coverage to the City shall control.

(b) *Indemnification.* The indemnification provided by Vendor to the City in Exhibit 'A' to this *Agreement* shall be in addition to, and not in lieu of, any other remedy available to the City under this *Agreement*.

§ 9. E-Verify, Chapter 2023-40, Laws of Florida.

By entering into this *Agreement*, the Vendor becomes obligated to comply with the provisions of Section 448.095(5)(a), Florida Statutes, to register with and use the E-Verify system to verify the work authorization status of all new employees of the Vendor and any subcontractor hired by the Vendor. If the Vendor enters into a contract with a subcontractor, the subcontractor must provide the Vendor with an affidavit attesting that the subcontractor does not employ, contract with, or subcontract with, an unauthorized alien. Failure to comply will lead to termination of this *Agreement*, or if a subcontractor

knowingly violates the statute, the subcontract must be terminated immediately. Any challenge to termination under this provision must be filed in the Circuit Court no later than twenty (20) calendar days after the date of termination. If this *Agreement* is terminated for a violation of the statute by the Vendor, the Vendor may not be awarded a public contract for a period of one (1) year after the date of termination.

IN WITNESS WHEREOF, the parties have set their hands hereto on the date indicated:

Vendor:

Executed this 9th day of June, 2026

By: _____
Name: Peiffer Brandt
Title: President & CEO

City of Winter Haven, Florida:

Executed this ____ day of _____, 2026

By: _____
T. Michael Stavres, City Manager

Attest:

_____
Vanessa Castillo, City Clerk

Approved as to Form and Legal Sufficiency:

_____
Frederick J. Murphy, Jr., City Attorney

EXHIBIT 'A'
STANDARD INSURANCE AND INDEMNIFICATION EXHIBIT

Insurance Requirements – City of Winter Haven

The Consultant/Contractor/Vendor shall, at its own expense, procure and maintain, with insurers acceptable to the City (Owner), the types and amounts of insurance conforming to the minimum requirements set forth herein. The Consultant/Contractor/Vendor shall not commence work until the required insurance is in force and evidence of insurance acceptable to the Owner has been provided to and approved by the Owner. As evidence of compliance with the insurance required herein, Consultant/Contractor/Vendor shall furnish Owner with:

(a) a fully completed satisfactory Certificate of Insurance (ACORD Form 25 or equivalent) evidencing all coverage required herein, with a copy of the actual notice of cancellation endorsement(s) as issued on the policies and a copy of the actual additional insured endorsement as issued on the Commercial General Liability policy, signed by an authorized representative of the insurer(s) verifying inclusion of Owner's officials, officers and employees as Additional Insureds in the Commercial General Liability coverage;

(b) the original of the policy(ies); or

(c) other evidence satisfactory to Owner. Such evidence shall include thirty (30) days written notice of cancellation to the Owner for all coverage. With respect to Property Insurance, an appropriate Evidence of Property Insurance form (ACORD Form 28 or equivalent), or a copy of the policy itself shall be satisfactory evidence of insurance. Until such insurance is no longer required by this Contract, the Consultant/Contractor/Vendor shall provide the Owner with renewal or replacement evidence of insurance at least thirty (30) days prior to the expiration or termination of such insurance.

Type I - Workers' Compensation Insurance

(a) Such insurance shall be no more restrictive than that provided by the Standard Workers' Compensation Policy, as filed for use in Florida by the National Council of Compensation Insurance, without restrictive endorsements. In addition to coverage for the Florida Workers' Act, where appropriate, coverage is to be included for the Federal Employer's Liability Act and any other applicable Federal or State law. The policy must be endorsed to provide the Owner with thirty (30) days' notice of cancellation. The minimum amount of coverage (inclusive of any amount provided by an umbrella or excess policy) shall be:

(i) Part One: "Statutory"

(ii) Part Two: $1,000,000 Each Accident
$1,000,000 Disease-Policy Limit
$1,000,000 Disease-Each Employee

Type II - General Liability Insurance

(a) Such insurance shall be no more restrictive than that provided by the standard Commercial General Liability Form (ISO Form CG 00 01) as filed for use in the State of Florida without any restrictive endorsements other than those required by ISO or the State of Florida or those described below. The policy must be endorsed to provide the Owner with thirty (30) days' notice of cancellation. The coverage may include restrictive endorsements which exclude coverage for liability arising out of:

(i) Mold, fungus, or bacteria
(ii) Terrorism
(iii) Sexual molestation

(b) The Owner and the Owner's officials, officers and employees shall be included as an "Additional Insured" on a form no more restrictive than ISO Form (CG 20 10), Additional Insured - Owners, Lessees, or Contractors. The minimum limits (inclusive of amounts provided by an umbrella or excess policy) shall be:

(i) $1,000,000 General Aggregate
(ii) $1,000,000 Products/Completed Operations Aggregate
(iii) $1,000,000 Personal and Advertising Injury
(iv) $1,000,000 Each Occurrence

Type III - Automobile Liability Insurance

(a) Such insurance shall be no more restrictive than that provided by Section II (Liability Coverage) of the most recent version of the standard Business Auto Policy (ISO Form CA 00 01) without restrictive endorsements, including coverage for liability contractually assumed, and shall cover all owned, non-owned, and hired autos used in connection with the performance of the work. The policy must be endorsed to provide the Owner with thirty (30) days' notice of cancellation. Such insurance shall not be subject to any aggregate limit and the minimum limits (inclusive of any amounts provided by an umbrella or excess policy) shall be:

(i) $1,000,000 Each Occurrence - Bodily Injury and Property Damage Combined

Type IV - Professional Liability Insurance

(a) Such insurance shall be on a form acceptable to the Owner and shall cover the Consultant/Contractor/Vendor for those sources of liability arising out of the rendering or failure to render professional services in the performance of the services required in the agreement. Coverage must either be on an occurrence basis; or, if on a claim made basis, the coverage must respond to all claims reported within three (3) years following the period for which coverage is required and which would have covered had the coverage been on an occurrence basis. The policy must be endorsed to provide the Owner with thirty (30) days' notice of cancellation. The minimum limits (inclusive of any amount provided by an umbrella or excess policy) shall be:

(i) $1,000,000 Each Claim/Occurrence
(ii) $1,000,000 Annual Aggregate

The Professional Liability Insurance may be subject to a deductible not to exceed $5,000 per claim.

Additional Requirements

(a) All insurance policies provided by the Consultant/Contractor/Vendor shall be endorsed to provide that the Insurer waives its rights against the Owner and Owner's officials, officers and employees.

(b) Compliance with these insurance requirements shall not limit the liability of the Consultant/Contractor/Vendor or its Subcontractors. Any remedy provided to the Owner by the insurance provided by the Consultant/Contractor/Vendor and its Subcontractors shall be in addition to and not in lieu of any other remedy (including, but not limited to, as an indemnitee of the Consultant/Contractor/Vendor) available to the Owner under this Contract or otherwise.

(c) Neither approval nor failure to disapprove insurance furnished by the Consultant/Contractor shall relieve the Consultant/Contractor/Vendor from responsibility to provide insurance as required by this Contract.

(d) The insurance provided by Consultant/Contractor/Vendor shall apply on a primary basis. Any insurance, or self-insurance, maintained by the City of Winter Haven shall be excess of, and shall not contribute with, the insurance provided by Consultant/Contractor/Vendor.

(e) Except where prior written approval has been obtained hereunder, the insurance maintained by Consultant/Contractor/Vendor shall apply on a first dollar basis without application of a deductible or self-insured retention. Consultant/Contractor/Vendor shall pay on behalf of the Owner and Owner's officials, officers and employees any deductible or self-insured retention

applicable to a claim against the Owner and Owner's officials, officers and employees.

(f) Certificates of Insurance must be completed as follows:

1. Certificate Holder:
   City of Winter Haven
   451 Third Street, N.W.
   Winter Haven, FL 33881

2. Additional Insured for General Liability:
   City of Winter Haven and its officials, officers and employees

INDEMNIFICATION BY CONSULTANT/CONTRACTOR/VENDOR

(a) The Consultant/Contractor shall indemnify and hold harmless the City (Owner), and its elected and appointed officials, officers, and employees, from liabilities, damages including but not limited to personal injury, death, or property damages, losses, and costs including, but not limited to, reasonable attorneys' fees, to the extent caused by the negligence, recklessness or intentionally wrongful conduct of the Consultant/Contractor/Vendor and persons employed or utilized by the Consultant/Contractor/Vendor in the performance of this Contract.

(b) The remedy provided to an indemnitee by Paragraph (a), shall be in addition to and not in lieu of any other remedy available under this Contract or otherwise.

(c) The remedy provided to an indemnitee by this Contract shall survive this Contract and shall not be limited in any manner by acceptance, final completion or final payment.

(d) A claim for indemnity pursuant to this Contract shall be commenced within the period established under Florida law for commencement of an action founded on the design, planning or construction of an improvement to real property.

(e) The provisions herein are severable and if, for any reason, any one or more of such provisions shall be held by a court of competent jurisdiction to be invalid, illegal, against public policy or unenforceable in any respect, the invalidity, illegality, being against public policy or unenforceability shall not affect any other provision herein which shall remain in effect and be construed as if the invalid, illegal, against public policy or unenforceable provision had never been contained herein.

EXHIBIT B

TAB 6: FEE STRUCTURE

Our billing philosophy and value commitment is centered on delivering exceptional service to the ECR/City through efficiency, responsiveness, and the quality of our work. Our deep institutional knowledge of the ECR/City-gained through years of experience-means we can work effectively with minimal ramp-up time. This has consistently allowed us to deliver under budget and limit billing to meaningful, productive work effort. While hourly rate comparisons can be misleading in isolation, we believe it's important to share how our pricing and delivery model ensures both transparency and value:

1. **Top-of-License Approach**
   We strategically assign work to the most appropriate team members based on their expertise. Senior consultants focus on high-level strategy and complex tasks, while more routine work is handled by team members with lower billing rates. This maximizes efficiency and reduces overall project costs.
2. **Value-BasedBilling**
   We only bill for time that adds value. If our work is not substantively contributing to the quality of the final deliverable, we do not charge for it. This approach ensures alignment between our efforts and your expectations.
3. **Budget-Conscious Delivery**
   From the outset, we collaborate with you to align scope and budget. Throughout the engagement, we manage work proactively to stay within budget, adjusting as necessary while maintaining quality and focus.
4. **Responsive, Accessible Team**
   Our commitment extends beyond typical hours. You have direct access to our team throughout the project, with quick response times and a hands-on approach that our clients value highly.

We have successfully applied this model to other Florida counties and municipal engagements resulting in high levels of client satisfaction as evidenced by our ability to retain many of our clients over 20+ year horizons. Project team hours and expenses will be billed on the same invoice. Expenses related to travel will be billed at cost. Additional services outside the agreed-upon scope of work will be billed on a time and materials basis. Raftelis' billing rates can be found below. These rates will be in effect for calendar year 2025 and will then increase annually by 3% unless specified otherwise by contract.

Executive Vice President/Senior Principal	$410
Senior Vice President	$400
Vice President	$370
Senior Manager	$330
Manager	**$290**
Senior Consultant	$255
Consultant	$230
Associate	$190
Analyst	$160
Administration	$100
Technology Charge*	$10

**Technology/Communications Charge: This is an hourly fee charged monthly for each hour worked on the project to recover telephone, facsimile, computer, postage/overnight delivery, conference calls, electronic/ computer webinars, photocopies, etc.*

***For services related to the preparation for and participation in deposition and trials/hearings, the standard billing rates listed above will be increased by an amount up to 50 percent.*

REQUIRED FORM AFFIDAVITS

Affidavit of Prime Bidder (if applicable)

Non-Collusion: The Contractor is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid; such Bid is genuine and is not a collusive or sham Bid; neither the said Bidder nor any of his officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or has refrained from bidding in connection with such Contract; nor in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder; nor has fixed any overhead, profit or cost element of the Bid price, or the Bid price of any other Bidder; nor has secured through any collusion, conspiracy, connivance or unlawful agreement, any advantage against the City of Winter Haven or any person interested in the proposed Contract; and the price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Drug-Free Workplace: The Contractor certifies that it is a drug-free workplace and has a substance abuse policy in accordance with and pursuant to Section 440.102, Florida Statutes.

Affidavit Certification Immigration Laws: City of Winter Haven will not intentionally award City contracts to any contractor/consultant who knowingly employs unauthorized alien workers, constituting a violation of the employment provisions contained in 8 U.S.C. Section 1324 a(e) {Section 274a(e) of the IMMIGRATION AND NATIONALITY ACT ("INA"). City of Winter Haven may consider the employment by any contractor of unauthorized aliens a violation of Section 274a(e) of the INA. **SUCH VIOLATION BY THE RECIPIENT OF THE EMPLOYMENT PROVISIONS CONTAINED IN SECTION 274A(e) OF THE INA SHALL BE GROUNDS FOR UNILATERAL CANCELLATION OF THE CONTRACT BY CITY OF WINTER HAVEN.** The contractor/vendor attests that they are fully compliant with all applicable immigration laws (specifically to the 1986 Immigration Act and subsequent amendments).

Affidavit Regarding Foreign Countries of Concern

Effective January 1, 2024, Section 287.138, Florida Statutes, prohibits a Florida governmental entity from entering into a contract that may grant or allow access to any individual's personal identifying information unless the contracting entity furnishes an affidavit signed by an officer or representative under penalty of perjury concerning foreign countries of concern.

As the person authorized to sign on behalf of the vendor, I certify that:

- The vendor is not owned by the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic, or by any agency of or any other entity of significant control of any of such foreign country of concern.
- The government of the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic does not have a controlling interest in the vendor.
- The vendor is not organized under the laws of and does not have its principal place of business in the People's Republic of China, the Russian Federation, the Islamic Republic of Iran, the Democratic People's Republic of Korea, the Republic of Cuba, the Venezuelan regime of Nicolás Maduro, or the Syrian Arab Republic.

Affidavit Regarding the Use of Coercion for Labor and Services

Effective July 1, 2024, Section 787.06(14), Florida Statutes, requires all nongovernmental entities executing, renewing, or extending a contract with a governmental entity to provide an affidavit signed by an officer or representative under penalty of perjury attesting that the nongovernmental entity does not use coercion for labor or services.

As the person authorized to sign on behalf of the vendor, I certify that the vendor identified above does not:

- Use or threaten to use physical force against any person;
- Restrain, isolate, or confine or threaten to restrain, isolate, or confine any person without lawful authority and against her or his will;
- Use lending or other credit methods to establish a debt by any person when labor or services are pledged as a security for the debt, if the value of the labor or services as reasonably assessed is not applied toward the liquidation of the debt, the length and nature of the labor or services are not respectively limited and defined;
- Destroy, conceal, remove, confiscate, withhold, or possess any actual or purported passport, visa, or other immigration document, or any other actual or purported government identification document, of any person;
- Cause or threaten to cause financial harm to any person;
- Entice or lure any person by fraud or deceit; or
- Provide a controlled substance as outlined in Schedule I or Schedule II of Florida Statute 893.03 to any person for the purpose of exploitation of that person.

Scrutinized Companies Certification

Section 287.135, Florida Statutes states that a company is ineligible to, and may not, bid on, submit a proposal for, or enter into or renew a contract with the City for goods or services:

(a) In any amount if at the time of bidding on, submitting a proposal for, or entering into or renewing a contract if the company is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, F.S. or is engaged in a boycott of Israel; or

(b) For One Million Dollars ($1,000,000.00) or more if, at the time of bidding on submitting a proposal for, or entering into or renewing a contract, the company is on the Scrutinized Companies with Activities in Sudan List, the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to s. 215.473, or is engaged in business operations in Cuba or Syria.

As the person authorized to sign on behalf of the firm, I certify that the firm identified below does not:

1. Does not participate in a boycott of Israel; and

2. Is not on the Scrutinized Companies that Boycott Israel List; and

3. Is not on the Scrutinized Companies with Activities in Sudan List; and

4. Is not on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List; and

5. Is not engaged in business operations in Cuba or Syria.

I understand that pursuant to section 287.135, Florida Statutes, the submission of a false certification may subject the company to civil penalties, attorney's fees, and costs.

I further understand that any contract with the City for goods or services may be terminated at the option of the City if the company is found to have submitted a false certification or has been placed on the Scrutinized Companies that Boycott Israel List, has been placed on the Scrutinized Companies with Activities in Sudan list, has been placed on the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or is engaged in a boycott of Israel.

Submitting a false certification shall be deemed a material breach of contract. The City of Winter Haven shall provide notice, in writing, to the Contractor of the City's determination that the Contractor provided a false certification. The Contractor shall have ninety (90) days following receipt of the notice to respond in writing and demonstrate that the determination of false certification was made in error. If the Contractor does not demonstrate within 90 days following receipt of the notice that the City's determination of false certification was made in error then the City shall have the right to terminate the contract and bring a civil action against the company pursuant to § 287.135, Florida Statutes.

Under penalties of perjury, I declare that I have read the foregoing document and that the facts stated in it are true:

P/ C. BA 6/9/26

Proposer's signature & date

Name of Vendor: Raftelis Financial Consultants, Inc.

Address: 227 West Trade Street, Suite 1400

Phone Number & Email: 407-628-2600 jwilliams@raftelis.com

Authorized Representative's Name: Peiffer Brandt

Authorized Representative's Title: President & CEO

STATE OF North Carolina **COUNTY OF** Mecklenburg

The foregoing instrument was acknowledged before me by means of ☒ physical presence or ☐ online notarization, this (date) 6-9-2026 by (name of person acknowledging) Peiffer Brandt, who is personally known to me or who has produced (type of identification) (personally known) as identification.

Melanie Marie Sepulveda Vega
NOTARY PUBLIC
Mecklenburg County, NC
My Commission Expires June 13, 2029

Notary Public – Signature

Melanie Marie Sepulveda Vega
Name typed, printed or stamped

My Commission Expires: June 13, 2029



DATE: June 16, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Gary Hubbard, Water Department Director

SUBJECT: Wastewater Treatment Plant #3, Emergency Sludge Dewatering agreement with Synagro South, LLC

BACKGROUND

The City of Winter Haven's wastewater treatment plants use a belt press system to process biosolids for disposal at a composting facility. The mechanical device is a dewatering belt press that uses gravity and pressure to squeeze water from wastewater sludge between two tensioned filter belts. This process transforms the sludge from a liquid into a solid "cake" material suitable for shipping to a qualified landfill.

Wastewater Treatment Plant #3 (WWTP #3) took Aeration Basin #2 offline on June 2, 2026, to drain the tank and perform inspections and repairs on damaged air headers and diffusers. During the inspection, staff discovered that an abandoned Internal Mixed Liquor Recycle (IMLR) pipe had collapsed into the basin. The collapsed pipe damaged several diffusers and associated air piping. In addition, excessive grit accumulation was identified within both the anoxic and aeration zones.

As a result of operating with only two aeration basins in service, the Mixed Liquor Suspended Solids (MLSS) concentration at WWTP #3 increased significantly, which was anticipated under these conditions. However, the situation was further complicated when Wastewater Treatment Plant #2 (WWTP #2) experienced a failure in its gravity belt thickener/dewatering equipment. This failure necessitated the transportation of digester sludge from WWTP #2 to WWTP #3 using City tanker trucks, raising the WWTP #3 MLSS to levels higher than previously anticipated.

WWTP #3 is currently operating with excessively high MLSS concentrations while simultaneously having limited ability to waste solids due to the digester being at capacity. In addition, the existing filter belt presses do not have sufficient capacity to process the quantity of sludge necessary to reduce MLSS concentrations to normal operating levels within the required timeframe.

To address this operational emergency, the City has contracted with Synagro to provide a temporary emergency dewatering centrifuge. The centrifuge will be used to reduce sludge levels within the digester, thereby restoring the plant's ability to waste excess solids and lower MLSS concentrations to safe operating ranges. The emergency dewatering operation is tentatively scheduled to begin on June 11, 2026, and continue for approximately two weeks.

The purpose of this action is to ensure that WWTP #3 maintains stable biological treatment operations, reduces MLSS concentrations to safe operational levels, and remains in compliance with all permit requirements.

FINANCIAL IMPACT

The estimated total cost for two weeks of dewatering by Synagro is $116,328. The unanticipated cost is not budgeted in Fiscal Year 2025-2026, and will be accounted for by operational savings within Wastewater Treatment Plant #3 cost center.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Infrastructure
- **Goal:** 3.3 – Ensure an actionable strategy is in place for the future of water resources.

RECOMMENDATION

Staff recommends the City Commission retroactively approve the Emergency Purchase Justification to Synagro South, LLC and authorize the City Manager or his designee to take any further actions necessary and related thereto.

ATTACHMENTS

- Synagro, Emergency Purchase Justification-WWTP #3
- Synagro Proposal Mobile Centrifuge Rental (9-26-2025)

EMERGENCY PURCHASE JUSTIFICATION

If the emergency requires **immediate** action the user Department/Division is authorized to proceed and advise Procurement of action taken. This form must be submitted with the related paperwork (sales ticket, bill, delivery slip receipts, etc.) by the close of business of the next business day following the emergency. The emergency purchase of goods and/or services is defined as **any purchase made in response to a requirement for goods and/or services in which a delay would adversely affect the public health or safety of the citizens of the City as well as any immediate repairs that are needed to prevent further damage to public property, machinery, or equipment.**

Department/Division: Water / Wastewater Treatment Plants

Date and Location of **Emergency**: June 10, 2026 - WWTP#3

Emergency Purchase vendor: Synagro

Describe **Emergency** and action taken: Please see attached memo

The total amount is dependant on the gallons of sludge processed and is only an estimate at this time.

Staff will prepare a fact sheet for City Commission ratification

Subsequent repairs needed: Synago to supply a centrifuge for dewatering services and hauling sevices.

Total cost or estimated cost of **Emergency Purchase** $ 116,328.00

Charge to ACCOUNT CODE: 402-08-316-4601

Additional Quotes (if any):

David Nicholson 6/10/26
Requestor Name - printed Date

Mark W. Bombard Digitally signed by Mark W. Bombard Date: 2026.06.11 11:58:09 -04'00' 06/11/2026
Division/Department Director Approval Date

Procurement Approval Date

Finance/Budget Approval Date

City Manager Approval Date

435 Williams Court, Suite 100
Baltimore, MD 21220
www.synagro.com

SYNAGRO

JUNE 10, 2026

City of Winter Haven
2746 Motor Pool Rd.
Winter Haven, FL 33880 via email:dnicholson@mywinterhaven.com
Attn: Mr. David Nicholson

Re: City of Winter Haven Mobile Centrifuge Dewatering Pricing Plant #3

Dear Mr. Nicholson,

Synagro South, LLC (Synagro) is pleased to offer the City of Winter Haven the following proposal to centrifuge dewater your wastewater sludge from the City's wastewater treatment plant #3.

Synagro is uniquely positioned to work with the City of Winter Haven as the only biosolids management company in Florida who operates a fleet of mobile centrifuge dewatering trailers to handle the volume of wastewater sludge processing along with composting facilities to sustainably repurpose the dewatered cake. Synagro has been in business for over 30 years and is the largest municipal biosolids management company in the country with over 700 municipal customers in 48 states. This includes over 35 contracts with municipalities throughout the State of Florida. We provide various residual management services, including sludge holding tanks cleaning, retention pond and lagoon dredging and mobile centrifuge dewatering of sludge. We offer these services to water and wastewater treatment plants and have extensive equipment and personnel resources to perform the City's needs for biosolids management.

Mobile Centrifuge Scope of Work:

Synagro will provide the following resources to accomplish this work:

- One Mobile Centrifuge and Operator (as many days needed, 10 hours/day)
- One Road Tractor and CDL Driver
- Sufficient Polymer for sludge solidification
- Pumps, hoses, fittings and safety equipment to conduct dewatering
- Power for running centrifuge 250 kW portable generator, if needed, if power not provided by plant
- Sufficient end dump trailers for conveying cake into throughout dewatering event
- Hauling and disposal of dewatered cake to Cedar Trail landfill

We ask the City to provide the following;

- Sufficient workspace for the proposed activities and uninterrupted access to the work area during operations
- A minimum of 500,000 gallons of wastewater sludge per event, accessed by a 4-inch camlock fitting outlet within 50 feet of our equipment
- Fresh water source (2" connection, 140 gpm at 60 psi) within 50 feet of our equipment
- Access to manway or lift station to be used for centrate return within 50 feet

Pricing:

Dewatering of wastewater sludge based on the % solids of the in-feed sludge and volume of sludge to dewater:

- **Dewatering** of Sewage Cake Sludge = **4.5 cents per gallon** (100k to 120k gallons/day)
- **Mobilization Fee** for Equipment, Operator = **$2,000 / service**
- **Generator** mobilization and rental = **$1,500/day**, if needed
- **Hauling** end dump trailers to Cedar Trail landfill = **$430/load**
- **Disposal** of dewatered cake at Cedar Trail = **$66.80/ton**

This proposal is delivered in good faith and we are prepared to enter into a mutually acceptable contract. Please note that this proposal is based on Synagro's standard terms and conditions and shall be strictly non-binding upon Synagro until all parties negotiate and execute a binding contract. This proposal shall not obligate Synagro to negotiate an agreement and any of the terms of the contract shall be subject to Synagro's approval, at its discretion.

If you have any questions or comments regarding this proposal or we can be of further assistance, please contact me at 813-495-1060. Thanks again for an opportunity to offer our services and value to the City of Winter Haven. We look forward to working together.

Sincerely,

Curt DeBrunner

Curt DeBrunner
Area Sales Manager

DATE: June 18, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Gary M. Hubbard, Water Department Director

SUBJECT: Purchase of Pipe Fittings and Materials for Lead and Copper Rule Revisions (LCRR) Compliance

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BACKGROUND

The U.S. Environmental Protection Agency (EPA) Lead and Copper Rule Revisions (LCRR) require public water systems to develop and maintain a service line inventory and identify service lines that may contain lead or galvanized materials requiring replacement. Compliance with these regulatory requirements necessitates field investigations, meter box inspections, service line verification, and replacement activities within the City of Winter Haven water distribution system.

To support these efforts, the Water Department requires the purchase of fittings, valves, couplings, pipe materials, and related components necessary to complete service line investigations, repairs, and replacements associated with the LCRR program. The materials will be procured from Ferguson Waterworks, utilizing an existing piggyback contract in accordance with the City's procurement policies.

The purchase of these materials, totaling $206,845.55, will ensure the City remains in compliance with federal and state drinking water regulations while supporting continued protection of public health and the integrity of the water distribution system.

FINANCIAL IMPACT

Sufficient funds are budgeted in FY25-26 under 402-08-322-4605. The purchase will be made utilizing the Ferguson Waterworks piggyback contract.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Infrastructure
- **Goal:** 3.3 – Ensure an actionable strategy is in place for the future of water resources.

- **Strategy:** 3.3.3 – Establish and annually fund a utility infrastructure repair and replacement program prioritizing the replacement of vulnerable and obsolete infrastructure.

RECOMMENDATION

Staff recommends the City Commission approve the purchase of required materials for the Lead and Copper Rule Revisions (LCRR) program from Ferguson Waterworks at a total cost of $206,845.55, utilizing the existing piggyback contract, and authorize the City Manager, or their designee, to take any and all actions necessary thereto.

ATTACHMENT

- Ferguson Waterworks, Bid No B602793

FERGUSON WATERWORKS

FEI_WINTER HAVEN,FL WATERWORKS
#1588
2439 7TH ST SW
WINTER HAVEN, FL 33880-1948
Phone: 863-401-2764
Fax: 863-291-4240

Deliver To:
From: Craig Pearce
craig.pearce@ferguson.com
Comments:

22:55:03 JUN 09 2026

FEL-WINTER HAVEN, FL WW
Price Quotation
Phone: 863-401-2764
Fax: 863-291-4240

Bid No: B602793
Bid Date: 06/03/26
Quoted By: BKR

Cust Phone: 863-291-5853
Terms: NET 10TH PROX

Customer: CITY OF WINTER HAVEN
PO BOX 2277
WINTER HAVEN, FL 33883

Ship To: CITY OF WINTER HAVEN
PO BOX 2277
WINTER HAVEN, FL 33883

Cust PO#: RFQ 6/2

Job Name: SARASOTA COUNTY

Item	Description	Quantity	Net Price	UM	Total	Cust-Cd
	LCR MATERIALS					
FC1444NL	LF 1 FIP X CTS COMP COUP	60	31.060	EA	1863.60	
FC1434NL	LF 3/4 FIP X 1 CTS COMP COUP	40	26.970	EA	1078.80	
FC4733NL	LF 3/4 CTS X PVC COMP COUP	30	35.840	EA	1075.20	
FC4734NL	LF 3/4X1 CTS X PVC COMP COUP	30	50.140	EA	1504.20	
FC4743NL	LF 1X3/4 C47-43-NL COUP	40	37.830	EA	1513.20	
FC4744NL	LF 1 CTS X PVC COMP COMP	30	51.780	EA	1553.40	
FC0144NL	LF 1 TUBE NUT FEM FLR X FIP	75	30.050	EA	2253.75	
FC0134NL	LF 3/4X1 TUBE NUT FEM FLR X FIP	50	26.470	EA	1323.50	
FY44274NL	LF 2X1 CTS COMP Y BRCH	50	153.360	EA	7668.00	
FC7734NL	LF 3/4X1 C77-34-NL COUP	100	52.810	EA	5281.00	
FT441774NL	LF 2 CTS X 1 FIP SERV TEE	50	171.830	EA	8591.50	
FY11474NL	LF 2X1 FIP MULTI SERV Y	30	106.980	EA	3209.40	
SP-FLFSC444AWTNL	LF 1XS LFSC4-44-NL FLGD	120	91.540	EA	10984.80	
FGT158	1 IN. LEAD CORP.SWIVEL GSKT	120	4.750	EA	570.00	
FC1834NL	LF 3/4 FIP X 1 MIP BRS BUSH	100	6.750	EA	675.00	
FC1847NL	LF 1 FIP X 2 MIP BRS BUSH	100	26.370	EA	2637.00	
IBRLFCPLUGG	LF 1 BRS SQ HD CORED PLUG	25	13.440	EA	336.00	
IBRLFCPLUGF	LF 3/4 BRS SQ HD CORED PLUG	25	10.200	EA	255.00	
GBRNFU	LF 3/4X6 BRS NIP GBL	200	12.850	EA	2570.00	
GBRNGU	LF 1X6 BRS NIP GBL	100	19.850	EA	1985.00	
IBRLFS4G	LF 1 BRS ST 45 ELL	150	39.820	EA	5973.00	
IBRLFS9G	LF 1 BRS ST 90 ELL	100	37.570	EA	3757.00	
FB84444WNL	LF B84-444W VLV **WITH LOCKING WING**	100	138.280	EA	13828.00	
FB84777WNL	LF 2 B84-777W-NL BV **WITH LOCKING WING**	50	426.330	EA	21316.50	
FB94324WNL	LF 1 CTS COMP X 3/4 STRT YK VLV	200	107.190	EA	21438.00	
FB94344WNL	LF 1 CTS COMP X MTR YOKE STRT BALL	50	113.100	EA	5655.00	
SP-FFC202540IP7	4X2 IP SDL SS EPOX 4.50-5.40	30	139.400	EA	4182.00	
FFC202480IP7I	4X2 IP DBL STRP SS EPOXY SDL	20	136.500	EA	2730.00	
SP-FFC2021213IP7	10X2 IP SDL SS EPOX 10.64-12.13	20	239.590	EA	4791.80	
FFC2021110IP7I	10X2 IP DBL STRP SS EPOXY SDL	20	241.830	EA	4836.60	
FFC202905IP7I	8X2 IP DBL STRP SS EPOXY SDL	10	169.720	EA	1697.20	12027
FFC202760IP7I	6X2 IP DBL STRP SS EPOXY SDL	10	142.660	EA	1426.60	
FFC202979IP7I	8X2 IP DBL STRP SS EPOXY SDL	10	170.000	EA	1700.00	

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to
complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=44&on=96

FERGUSON WATERWORKS

FEL-WINTER HAVEN, FL WW
Price Quotation

Fax: 863-291-4240

22:55:03 JUN 09 2026
Reference No: B602793

Item	Description	Quantity	Net Price	UM	Total
FY202	5/8X3/4 YOKE BAR - WINTERGREEN SPEC	200	27.000	EA	5400.00
FY504	1 MTR YOKE BAR	50	37.030	EA	1851.50
FC9144NL	LF 1 MTR YOKE X FIP STRT OUT COUP	50	19.900	EA	995.00
PEC9BLK300	2X300 CTS DR9 HDPE BLUE PIPE	6000	242.000	C	14520.00
PEC9BLG300	1X300 CTS DR9 HDPE BLUE PIPE	4500	72.000	C	3240.00
PSISCG	1 SS INS STIFFENER CTS PE	400	2.850	EA	1140.00
PSISCK	2 CTS OR 1-1/2 IPS SS INS STFNR PE	200	4.100	EA	820.00
C1045BEHS500	10GA 45MM 500FT EHS COP WIRE BLUE	5000	750.000	M	3750.00
M450L04LF	LF 3/4X5 BRS COMP COUP	150	34.150	EA	5122.50
M450L05LF	LF 1X5 BRS COMP COUP	75	35.150	EA	2636.25
M450L08LF	LF 2X5 BRS COMP COUP	75	65.150	EA	4886.25
M450L06LF	*NAS LF 1-1/4X5 BRS COMP COUP	30	50.900	EA	1527.00
M450L07LF	LF 1-1/2X5 BRS COMP COUP	30	51.500	EA	1545.00
M450T04LF	*NAS LF 3/4X3 BRS COMP COUP	80	23.000	EA	1840.00
M450T05LF	*NAS LF 1X3 BRS COMP COUP	50	24.800	EA	1240.00
M450T08LF	*NAS LF 2 BRS COMP COUP	40	49.300	EA	1972.00
SDR41PBEPU	6 SDR41 100 PSI PIP PVC BE PIPE	400	10.250	FT	4100.00

Net Total:	$206845.55
Tax:	$0.00
Freight:	$0.00
Total:	$206845.55

Quoted prices are based upon receipt of the total quantity for immediate shipment (48 hours). SHIPMENTS BEYOND 48 HOURS SHALL BE AT THE PRICE IN EFFECT AT TIME OF SHIPMENT UNLESS NOTED OTHERWISE. QUOTES FOR PRODUCTS SHIPPED FOR RESALE ARE NOT FIRM UNLESS NOTED OTHERWISE.

Due to the uncertain impact of potential tariffs, Ferguson's quotation/proposal has not included any provision or contingency for future tariffs or increase of existing tariffs. Ferguson reserves the right to adjust prices to reflect the impact of any new or increased tariffs that affect our costs at the time of shipment. Ferguson will provide notice of any such adjustments along with documentation supporting the changes.

CONTRACTOR CUSTOMERS: IF YOU HAVE DBE/MBE/WBE//VBE/SDVBE/SBE GOOD FAITH EFFORTS DIVERSITY GOALS/ REQUIREMENTS ON A FEDERAL, STATE, LOCAL GOVERNMENT, PRIVATE SECTOR PROJECT, PLEASE CONTACT YOUR BRANCH SALES REPRESENATIVE IMMEDIATELY PRIOR TO RECEIVING A QUOTE/ORDER.

Seller not responsible for delays, lack of product or increase of pricing due to causes beyond our control, and/or based upon Local, State and Federal laws governing type of products that can be sold or put into commerce. This Quote is offered contingent upon the Buyer's acceptance of Seller's terms and conditions, which are incorporated by reference and found either following this document, or on the web at https://www.ferguson.com/content/website-info/terms-of-sale
Govt Buyers: All items are open market unless noted otherwise.

LEAD LAW WARNING: It is illegal to install products that are not "lead free" in accordance with US Federal or other applicable law in potable water systems anticipated for human consumption. Products with *NP in the description are NOT lead free and can only be installed in non-potable applications. Buyer is solely responsible for product selection.

HOW ARE WE DOING? WE WANT YOUR FEEDBACK!
Scan the QR code or use the link below to complete a survey about your bids:
https://survey.medallia.com/?bidsorder&fc=44&on=96

DATE: July 1, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Scott Eilers, Parks, Recreation, and Culture Interim Director

SUBJECT: Cooperative Facilities Use Agreement Between the City of Winter Haven and the School Board of Polk County

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BACKGROUND:

The City of Winter Haven and the School Board of Polk County have maintained a long-standing cooperative relationship since 1990**,** working collaboratively to maximize public resources and expand recreational opportunities for residents and students. For more than three decades, this relationship has allowed both agencies to effectively share facilities, coordinate programming, and provide enhanced recreational amenities that benefit the broader Winter Haven community. The continued partnership reflects a shared commitment to youth development, healthy lifestyles, and responsible stewardship of public assets.

Under the updated and restated 10 year agreement, renewable annually thereafter (i.e. after April 21, 2036 via mutual consent), the City and the School Board will each have priority use of its own facilities and will mutually coordinate use by the other during available times. The updated and restated agreement also provides provisions for expendable materials, supervision, special preparation, maintenance, and any necessary repairs. The updated and restated agreement is intended to maximize the use of existing public infrastructure while minimizing duplication of facilities and services. Exhibits A and B of the agreement outline the facilities of each organization subject to the agreement as well as relevant additional fee structures. Through this relationship, both organizations can provide expanded recreational programming, athletic opportunities, and community access to facilities in a cost-effective and efficient manner.

The renewal and continuation of this Updated and Restated Cooperative Use Agreement reinforces a successful relationship that has served the Winter Haven community for years. By continuing to work together, the City of Winter Haven and the School Board of Polk County remain committed to providing

safe, accessible, and high-quality recreational, athletic, and community opportunities while maintaining fiscal responsibility and maximizing public resources.

FINANCIAL IMPACT:

Under the proposed updated and restated agreement, which will run from 2026 through 2036, the School Board's $100,000 contribution (consistent with previous 10-year agreement) will be applied toward the $350,000 commitment made by the City Commission in 2022 for renovations to Denison Stadium. This adjustment recognizes the School Board's financial contribution and results in a remaining balance of $250,000 owed by the City of Winter Haven to the Polk County School Board for the stadium renovation commitment. FY26 cash carryfoward is available to support the contribution.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Quality of Life
- **Goal:** 2.4– Ensure that as the City grows, opportunities for access to recreation grow along with the population, especially geographically.

RECOMENDATION:

Staff recommends the City Commission approve the Updated and Restated Cooperative Facilities Use Agreement and authorize the City Manager or his designee and other City Officials to execute the Updated and Restated Facilities Use Agreement with the School Board of Polk County, Florida and to take all other actions necessary and incidental thereto.

ATTACHMENT

- Updated and Restated Cooperative Facilities Use Agreement Between the City of Winter Haven and the School Board of Polk County, Florida

UPDATED AND RESTATED COOPERATIVE FACILITIES USE AGREEMENT BETWEEN THE CITY OF WINTER HAVEN AND THE SCHOOL BOARD OF POLK COUNTY, FLORIDA

THIS UPDATED AND RESTATED COOPERATIVE FACILITIES USE AGREEMENT ("Agreement"), is made by and between the School Board of Polk County, Florida, a Florida statutory corporation, ("School Board"), whose address is P.O. Box 391, Bartow, FL 33831, and the City of Winter Haven, Florida, a Florida municipal corporation, ("City"), whose address is 451 3rd St NW, Winter Haven, FL 33881. The SCHOOL BOARD and the CITY shall collectively be referred to herein as the "Parties" or individually as the "Party".

WHEREAS, the Parties entered into a Cooperative Facilities Use Agreement on April 22, 2014; and

WHEREAS, the Parties now desire to update and restate the Agreement as outlined in this Agreement; and

WHEREAS, the City and the School Board desire to formally continue a working relationship for the joint use of certain recreation, athletic, and public facilities located in and around the greater Winter Haven area; and

WHEREAS, substantial savings to the public will result from the joint use of properties for recreation, athletic, and other proper public purposes; and

WHEREAS, both the City and the School Board own properties and facilities that are useful to each other in their respective programs and have previously entered into similar "Cooperative Facility Use Agreements" involving specific sites; and

WHEREAS, the continued use by each Party of properties and facilities of the other is lawful and in the public interest;

NOW THEREFORE, in consideration of the mutual promises contained herein and other good and

valuable consideration, the City and the School Board agree to continue to cooperate with each other in carrying out the above purposes as follows;

1. **Term**: The term of this Agreement shall be for Ten years commencing April 22, 2026, and terminating April 21, 2036If the Agreement has not otherwise been terminated, the Parties agree that sixty (60) days prior to April 21, 2036, they may enter into negotiations for a new Cooperative Facilities Use Agreement. Provided further if either of the Party does not desire to enter into negotiations for a new Cooperative Facilities Use Agreement it shall so notify the other Party within sixty (60) days prior to April 21, 2036.

2. **Use of School Board Facilities**: The School Board shall have priority of use of its own recreation, athletic, and public facilities located within the greater Winter Haven area and as more specifically listed on Exhibit A attached hereto and incorporated herein by reference. When such facilities are not being used for a school activity, then the City and/or entities under sponsorship of the City shall be allowed to use such facilities after school hours provided the scheduling of activities is mutually coordinated by the City's Director of Parks, Recreation, and Culture or their designee and appropriate School Board Employees.

3. **Use of City Facilities**: The City shall have priority of use of its own recreation, athletic, and public facilities as more specifically listed on Exhibit B attached hereto and incorporated herein by reference. When the City is not using its facilities, the School Board and/or entities under sponsorship of the School Board may do so provided the scheduling of activities is mutually coordinated by the City's Director of Parks, Recreation, and Culture or their designee and appropriate School Board Employees.

4. **Normal Operating Schedules**: Both the City and the School Board shall provide a schedule of its normal operating hours for the facilities listed in Exhibits A and B attached hereto.

Each Party shall provide the other Party with notice in writing of any changes to normal operating hours. To the extent that the scheduling and holding of activities requires the owner of the facility wherein the activity or event is conducted to pay any additional staffing fees and/or any other expenses beyond those normally budgeted then the Party who has scheduled the activity and/or event shall upon the rendering of a written statement by the owner of the facility be responsible for the payment of such expenses and charges.

5. Additional Consideration: The School Board has agreed to contribute the amount of $100,000 to the City as additional consideration for the use of City Facilities under this Agreement. The City has also agreed to contribute the amount of $350,000 to the School Board as additional consideration under this Agreement to be utilized by the School Board for the Denison Field renovations. Accordingly, the City will remit the amount of $250,000 to the School Board within thirty (30) days of the Effective Date of this Agreement and retain $100,000 representing the School Board's contribution to the City as additional consideration for the use of the City Facilities under this Agreement.

6. **Maintenance:** The responsibility for maintaining the various facilities shall be as follows:

1. The School Board's recreation, athletic, and public facilities shall be maintained by the School Board and the City's recreation, athletic, and public facilities shall be maintained by the City.

2. The cost of any damage to either Party's property or facility or to adjacent property resulting from the other Party's use of the property or facility, other than normal wear and tear, shall be borne by the Party using the property or facility.

7. **Materials and Supplies**: The Parties hereto will furnish and supply all expendable supplies and materials necessary to support their respective activities.

8. **Supervision**: When utilizing a facility for a scheduled activity, the Party using the facility will provide competent supervision and bear the cost of that supervision.

9. **Coordination of Special Preparation Maintenance and Repairs**: In the event that either Party needs to make special preparations, maintenance, or repairs on the other's property in connection with its use of the other Party's property, the Party which owns the property shall make necessary arrangements to provide the Party which will be using the property or its employees with access to the facilities upon which the work is to be performed and to ensure that safe conditions exist for accomplishment of the work. The Party requiring the special preparations, maintenance, or repairs shall be responsible for all costs and expenses associated therewith. A contact person designated by the owner of the facility where such work is being performed will have the responsibility to make the above-described arrangements to facilitate and coordinate work performed by the City's work crews with that performed by the School Board work crews.

10. **Indemnification**: Subject to the doctrine of sovereign immunity and Section 768.28, Florida Statutes, the Party that is making use of or sponsoring an event or activity at the other Party's recreation or athletic facility shall indemnify and hold the other Party harmless from and against any liability, actions, claims, causes of action, losses or responsibilities arising from any personal injury, death, or property damage occurring while the indemnifying Party is using the recreation or athletic facility unless the personal injury, death, or damages were caused by the act or omission of the other Party or the other Party's agents or employees. Notwithstanding the indemnity and hold harmless provision contained herein, neither Party waives sovereign immunity under Florida law by virtue of this Agreement and all sovereign immunity is claimed by the parties hereto to the fullest extent allowed under Florida law. Further neither Party waives the limits of liability under Section 768.28, Florida Statutes, as it may be amended from time to time, and any other applicable provision of law. Specifically, the limits of

liability expressed in Section 768.28, Florida Statutes, shall be applicable and shall remain in effect, and are not waived hereby regardless of whether such obligations are based in tort, contract, statute, strict liability, indemnification, negligence, product liability or otherwise.

11. **Notice**: Notices and demands pursuant to the provisions of this Agreement shall be sent in writing and shall be either delivered in person, or mailed by United States Mail, certified with return receipt requested and all postage charges prepaid. Except where receipt is specifically required in this Agreement, any notice mailed in accordance with these standards to the proper address as set forth below shall be deemed to be effective three (3) calendar days after the date of postmark whether or not actually received; notices delivered in person shall be effective upon delivery; and notices sent by overnight courier shall be effective as of the next business day after being placed into the hands of the courier service, properly addressed; and any time period shall begin running as of that date, whether or not the notice is actually received. Notices shall be given in the above manner to the following persons and addresses:

As to School Board:
Jennifer Rouse, Deputy Superintendent, Chief of Staff
The School Board of Polk County, Florida
1915 South Floral Avenue
Post Office Box 391
Bartow, Florida 33831-0391
Telephone (863) 534-0521

With copy to General Counsel (*which shall not constitute notice*):
James Greene, Esquire
The School Board of Polk County, Florida
1915 South Floral Avenue
Post Office Box 391
Bartow, Florida 33831-0391
Telephone (863) 534-0773

As to City:
Scott Eilers

Parks, Recreation, and Culture Interim Director
City of Winter Haven
451 Third Street, N.W.
Post Office Box 2277
Winter Haven, Florida 33883-2277
Telephone (863) 291-5656

With a copy to City Attorney (*which shall not constitute notice*):
Frederick J. Murphy, Jr., Esquire
Boswell & Dunlap ILP
245 South Central Avenue
Post Office Drawer 30
Bartow, Florida 33831-0030
Telephone (863) 533-7117

12. **Termination**: Either party may terminate this Agreement upon giving written notice of such termination to the other party at least thirty (30) days in advance.

13. **Governing Law and Venue**: This Agreement is to be construed in accordance with the laws of the State of Florida without regard to any conflicts of laws provisions. Venue for any actions arising under this Agreement shall be exclusively in the State Courts of competent jurisdiction located in Polk County, Florida.

14. **Effective Date**: The Effective Date of this Agreement shall be the last date on which this Agreement was approved by both the governing body of the City and the governing body of the School Board and executed by both Parties' duly authorized representatives.

IN WITNESS WHEREOF the Parties hereto have caused this Agreement to be executed by their respective authorized officers or representatives as of the last date set forth above.

The City of Winter Haven, Florida	The School Board of Polk County, Florida
By: _____	By: _____
T. Micheal Stavres	Justin Sharpless
City Manager	Board Chair
Date: _____	Date: _____
Attest:	Attest:
By: _____	By: _____
Vanessa Castillo, MMC	Frederick Heid
City Clerk	Superintendent of Schools
Approved as to Form and Legality:	Approved as to Form and Legality:
_____	_____
Frederick J. Murphy, Jr.	James Greene
City Attorney	School Board General Counsel

AMENDED

EXHIBIT A
Polk County School Board Facilities

The City of Winter Haven Parks Recreation and Culture Director or his/her designee and the Polk County Schools Athletic Director will coordinate and determine the use, scheduling, and rental fees for the use of the following facilities, including the use of any meeting of field space:

- Brigham Academy
- Chain of Lakes Elementary
- Denison Middle School
- Elbert Elementary
- Garden Grove Elementary
- Garner Elementary
- Inwood Elementary
- Jewett Middle School
- Jewett School of the Arts
- Lake Region High School
- Lake Shipp Elementary
- Ridge Technical
- Snively Elementary School
- Westwood Middle School
- Winter Haven High School

As part of this Agreement, the City of Winter Haven will have access to certain school facilities for the City's Summer School Camp Program. Camps will be scheduled for dates and times when school is not in session.

The following schools may be utilized as potential sites for the City of Winter Haven Parks, Recreation and Culture Summer Camp Program.

- Denison Middle School
- Jewett Middle Academy
- Winter Haven High School

Amended
Exhibit B
City of Winter Haven Facilities

The City of Winter Haven Parks Recreation and Culture Director or their designee and the Polk County Schools Athletic Director will coordinate and determine the use, scheduling, and rental fees for the use of the following facilities, including the use of any meeting of field space:

- AdventHealth Fieldhouse (Meeting Rooms / Gymnasium)
- "Rowdy" Gaines Olympic Pool
- Bradley T. Dantzler Tennis Center
- Chain of Lakes Park
- Sertoma Park Baseball
- Sertoma Park Football
- DiamondPlex Softball Complex
- Winter Haven Recreation and Cultural Center
- Willowbrook Golf Course
- PSC Soccer Complex
- Rueben Williams Sports Complex

Usage for the City facilities described below will have a flat fee per High School and per team.

"Rowdy" Gaines Olympic Pool

- HS Teams using 3 lanes or less $500 per season
- HS Teams using 4 lanes or more $1,000 per season
- HS Swim meet host team $75 per meet

The above fees include practice and meets for their season.

Willowbrook Golf Course

- HS Driving Range $10 per team per use
- MS Driving Range $10 per team per use

All other locations/sports are subject to the City of Winter Haven hourly fee available on the City Commission-approved fee chart.

DATE: July 2, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Scott Eilers, Interim Parks, Recreation & Culture Department Director
Richard "Tank" Artz, Facilities Division Superintendent
Ashley Hamilton, Facilities Division Fiscal Specialist

SUBJECT: Library HVAC unit 4 Emergency Replacement & HVAC unit 3 Emergency Repair

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BACKGROUND

The library opened in 2004 and is served by an HVAC system that includes four units for the entire facility (Unit #'s 1,2,3,&,4). As part of the library's long term capital replacement strategy, funding was programmed to support spreading replacement costs over multiple fiscal years. Two of the original HVAC units (Unit 2&4) were scheduled for replacement equipment to be purchased in in FY26, with the proposed FY27 budget providing funding for the installation and replacement of a system controller.

On June 16, HVAC unit 4 went into failure. Given the age and condition of the equipment, staff determined that full replacement of the unit was appropriate. To maintain library operations while a replacement is procured and installed, staff authorized a temporary repair intended to extend the unit's life, though additional failures remain possible until the unit is permanently replaced. Current lead times for the replacement unit are estimated at six to eight weeks from the date of order through installation.

At the same time, HVAC unit 3, which operates in tandem with HVAC unit 4, began experiencing significant mechanical issues, and was operating at 50 percent capacity. With both units impacted, the library's cooling capacity was significantly reduced, leaving the facility, collection, staff, and visitors at risk during peak summer conditions. As a result, staff authorized immediate repair and replacement through three Emergency Justifications.

FINANCIAL IMPACT

Emergency replacement and repair costs have exceeded the $150,000 budgeted for the library's multiyear HVAC replacement program in FY26. As a result of the unexpected failure of HVAC Unit 4 and

the emergency repair needs of HVAC Unit 3, total FY26 project costs are now estimated at $198,836.80. Costs contributing to this include:

- Emergency diagnostic and temporary repair services for HVAC unit 4.
  - Temporary repair cost: $11,014.00
    - Rental of temporary HVAC equipment may still be required if the temporary repair fails.
- Purchase and installation of a replacement HVAC unit 4.
  - Replacement cost: $169,180.80
- Emergency repair of HVAC unit 3's failed two-compressor system.
  - Repair cost: $18,642.00.
- Increased replacement costs compared to original budget estimates.
  - Original FY26 budget: $150,000.00 for the replacement of two HVAC units.
  - Revised FY26 budget: $198,836.80 for one replacement unit and one emergency repair.

Staff identified available cost savings resulting from the successful completion of two FY26 budgeted facility HVAC replacement projects at Rotary Park and the PEP Building. Staff recommend reallocating these funds to address the library's emergency HVAC needs (any temporary HVAC rental equipment that may be required to maintain facility operations during the replacement process could be draw from other savings as well). Reallocating these available funds will allow the City to address critical HVAC system failures at the library without requiring additional appropriations.

Project	Funding Source	GL account	FY26 Budget Amount	FY26 Cost Savings	FY26 Project Total
Library HVAC unit 4 replacement	FY26 Budget - Library	101-07-728-6301	$ 150,000.00	$ -	$ 169,180.80
	FY26 Budget - Rotary Park	001-07-710-6301-710	$ -	$ 19,180.80	
Library HVAC unit 4 repairs	FY26 Budget - Rotary Park	001-07-710-6301-710	$ -	$ 11,014.00	$ 11,014.00
Library HVAC unit 3 repairs	FY26 Budget - PEP Building	501-03-906-4605	$ -	$ 18,642.00	$ 18,642.00
		Total:	$ 150,000.00	$ 48,836.80	$ 198,836.80

With these changes, the overall multi-year replacement strategy shifts to a full replacement of Unit 4 in FY26, a full replacement of Unit 2 in FY 27, and the potential need to push the system controller replacement out to a future fiscal year depending on the final cost of Unit 2.

STRATEGIC PLAN ALIGNMENT

The emergency purchases of the HVAC repairs and replacements at the Winter Haven Public Library are not specifically defined as a goal or strategy within the strategic plan. However, they are aligned with the Responsible Government and Quality of Life Pillars.

RECOMMENDATION

Staff recommends the City Commission ratify the emergency purchases for HVAC repairs and replacements at the Winter Haven Public Library, approve the funding plan outlined within this fact sheet and authorize the City Manager or his designee to take any and all necessary actions related to maintaining cooling at the library, bringing the system back to full operating capacity, or other items necessary thereto.

ATTACHMENTS

- Emergency Justification - Library HVAC unit 4 – temporary repairs
- Emergency Justification - Library HVAC unit 4 – replacement
- Emergency Justification - Library HVAC unit 3 – repairs

EMERGENCY PURCHASE JUSTIFICATION

If the emergency requires **immediate** action the user Department/Division is authorized to proceed and advise Procurement of action taken. This form must be submitted with the related paperwork (sales ticket, bill, delivery slip receipts, etc.) by the close of business of the next business day following the emergency. The emergency purchase of goods and/or services is defined as **any purchase made in response to a requirement for goods and/or services in which a delay would adversely affect the public health or safety of the citizens of the City as well as any immediate repairs that are needed to prevent further damage to public property, machinery, or equipment.**

Department/Division: Parks Recreation & Culture - Facility Maintenance

Date and Location of **Emergency**: 6/18/2026 - Library

Emergency Purchase vendor: Refrigeration & Electric Service, Inc.

Describe **Emergency** and action taken: The 30-ton HVAC unit #4 at the Library has failed and requires immediate replacement. Due to equipment lead times, the new unit may take 6-8 weeks to be delivered and installed. R&E performed a temporary coil patch repair to address the condensing unit refrigerant leak and replaced the condensing fan motor in an effort to extend the system's life until the replacement arrives. This main unit is critical for the health and safety of everyone using the building, as well as protecting books, technology and equipment from humidity related damages. Due to the risk of a complete system failure, a temporary HVAC rental unit may still be needed if the temporary fix fails, due to the unit's deterioration.

Subsequent repairs needed: A full unit replacement is pending delivery and installation.

Total cost or estimated cost of **Emergency Purchase** $ 11,014.00

Charge to ACCOUNT CODE: 101-07-728-6301

Additional Quotes (if any):

Ashley Hamilton 6/22/26
Requestor Name - printed Date

6/24/26
Division/Department Director Approval Date

6/24/2026
Procurement Approval Date

6/24/2026
Finance/Budget Approval Date

City Manager Approval Date

Refrigeration & Electric Service, Inc.

Invoice

435 6th Street SW
Winter Haven, FL 33880-3316

Date	Invoice #
6/19/2026	36809

vendor #1014

Bill To	Ship To
City of Winter Haven 451 3rd Street Nw Winter Haven, Fl 33881	325 Ave A Nw Library GL # 101-07-728-6301

Work Oder	P.O. No.	Terms	Rep	Ship Date
2-18173		Net 15	AR	6/18/2026

Item	Description	Qty
R22		100
Condenser motor	MOT 11207	1
LABOR - Service		7.5
	Repaired leak in condensing unit.#4. Replaced 1HP Condensing fan motor. Recharged unit with 100# R22 refrigerant	

Subtotal	$11,014.00
Total	$11,014.00
Payments/Credits	$0.00
Balance Due	$11,014.00

EMERGENCY PURCHASE JUSTIFICATION

If the emergency requires **immediate** action the user Department/Division is authorized to proceed and advise Procurement of action taken. This form must be submitted with the related paperwork (sales ticket, bill, delivery slip receipts, etc.) by the close of business of the next business day following the emergency. The emergency purchase of goods and/or services is defined as **any purchase made in response to a requirement for goods and/or services in which a delay would adversely affect the public health or safety of the citizens of the City as well as any immediate repairs that are needed to prevent further damage to public property, machinery, or equipment.**

Department/Division: Parks Recreation & Culture - Facility Maintenance

Date and Location of **Emergency**: 6/18/2026 - Library

Emergency Purchase vendor: Refrigeration & Electric Service, Inc.

Describe **Emergency** and action taken: FY26 funds were budgeted to purchase equipment for the FY27 replacement of two 30-ton HVAC units at the Library. However, one of the units has completely failed, creating immediate health and safety concerns for everyone who uses and works in the building, along with potential risk of damages to books, equipment, etc. There's approx. $42,000.00 remaining in FY26 from a completed under budget HVAC replacement project at Rotary Park. FY26 funding will cover the purchase of one unit. Funding for the second unit will need to be included in the FY27 budget. Additionally, the controls will require replacement in FY28, resulting in an additional cost due to this replacement timeline shift.

Subsequent repairs needed: Replacement of the unit is estimated to take approximately 6–8 weeks. R&E is attempting coil patch as a temporay fix for now, but due to the deterioration, it might not last long.

Total cost or estimated cost of **Emergency Purchase** $ 175,865.00

Charge to ACCOUNT CODE: 101-07-728-6301 / 101-07-728-6402

Additional Quotes (if any): Temporary rental HVAC unit may be required to maintain operations, quote pending.

Ashley Hamilton	6/18/26		
Requestor Name - printed	Date		
		Division/Department Director Approval	6/18/26 Date
		Procurement Approval	Bethany Owen 6/18/2026 Date
		Finance/Budget Approval	6/22/2026 Date
		City Manager Approval	Date

City of Winter Haven
Purchase Order Request Form

Winter Haven Public Library Address:	Winter Haven Public Library 325 Avenue A NW, Winter Haven, FL 33881 ,

Subcontractor:	Submit Sub's detailed request for materials

Name:	Refrigeration & Electric Service, Inc.
Address:	435 6th St. SW, Winter Haven, FL 33880
Phone:	863-293-2145
Fax:	863-299-1018
E-Mail:	Office@rescowh.com

Suppliers Information	Submit Suppliers detailed quote for materials

Name:	Trane U.S. Inc.
Address:	902 N. Himes Avenue, Tampa, FL 33609
Phone:	813-877-8251
Fax:	
E-Mail:	josh.wand@trane.com

Description of Items:

AHU-4,, 1, Performance Climate Changer (CSAA)
CU-4,, 1, IntelliCore 30T Air-Cooled Cond

DPO Amount (no tax included): $ 110,570.00

DPO tax savings $ 6,684.20

Original proposal $175,865.00

Purchase Order amount to Refrigeration & Electric Service, Inc. $58,610.80

200

Carrier
Turn to the Experts.

Proposal

26 - JD - 103



Refrigeration & Electric Service, Inc.
435 Sixth Street SW
Winter Haven, FL 33880
Phone: (863) 293-2145 Fax: (863) 299-1018
www.rescowh.com

Attention:

State License #: CAC023496

SUBMITTED TO City Of Winter Haven	**PHONE:**	**DATE:** June 18, 2026
STREET	**JOB NAME:** Library Unit # 4	
CITY, STATE & ZIP CODE	**JOB LOCATION:**	

We are pleased to provide this quote to
Provide and install 30 ton Trane split system

Scope of Work:
- ***o Remove the existing equipment***
- ***o Install new air handler sections***
- ***o Connect unit to existing ductwork (make any transitions needed)***
- ***o Connect unit to existing electrical***
- ***o Remove the Condenser***
- ***o Install new 30 ton condenser***
- ***o Connect to existing refrigerant lines and electrical***
- ***o Pressure check refrigerant lines***
- ***o Supply air VAV control***
- ***o Low ambient damper control to 0°F***
- ***o Non-fused disconnect switch (5,000A SCCR)***
- ***o Hot-gas bypass to the evaporator inlet***
- ***o Corrosion protected condenser coil***
- ***o 7–inch user interface touch display***
- ***o BACnet communication protocol***

*** *Start-up by a factory authorized technician*
*** *1st Year parts warranty*
*** *2nd – 5th Year Compressor Parts Warranty*
*** *DOES NOT INCLUDE NEW CONTROLS*

We Propose to furnish material and labor - complete in accordance with the above specifications, for the sum of: Dollars ($175,865).

All material is guaranteed to be as specified. All work to be preformed in workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra cost will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. All our workers are fully covered by Workers Compensation Insurance.

Authorized signature JAY DIXON

Note: This proposal may be withdrawn by us if not accepted within 30 days.

Acceptance of Proposal–
The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature _____

Print _____

Date of Acceptance: _____ Purchase Order # _____

Payment to be made as follows: Due within 30 days of completion. or in accordance with above proposal details
All materials provided by Refrigeration & Electric remain the property of Refrigeration & Electric until Paid in Full.

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Sales Tax Savings

Form

Project: Emergency HVAC unit #4 replacement - Library

Dept: PR&C - Library

Vendor: TRANE U.S. Inc. (vendor #11813)

Description: 30 ton TRANE split system

per ODP #1 dated 6/18/26, a copy of which is attached and Sales Tax Savings Procedure - for Emergency HVAC unit #4 replacement - Library - approved by City Commission on _____.

Owner Direct Purchase per ITB-_____

Account #: 101-07-728-6402

Delivery/Completion Time: 9/30/26

Next level approval: Scott Eilers

PO Expiration Date: 9/30/26

This P.O. Amount:	$	110,570
Tax Savings Amount:	+ $	6,684
Deduct Amount:	= $	117,254

Proposal

Proposal is valid for 15 days.
Customer must obtain credit approval and release order to production within 60 days of proposal date.

PROPRIETARY AND CONFIDENTIAL PROPERTY OF Trane U.S. Inc.
DISTRIBUTION TO OTHER THAN THE NAMED RECIPIENT IS PROHIBITED

Prepared For: City of Winter Haven

Date: June 18, 2026

Job Name:
Winter Haven Library AHU-3

Proposal Number: H5-268368-43128-1
Opportunity ID: 8754013

Delivery Terms:
Freight Allowed and Prepaid - F.O.B. Factory

Payment Terms: Net 30 Days

Trane U.S. Inc. is pleased to provide the following proposal for your review and approval.

Tag Data - Performance Climate Changer (CSAA) (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	AHU-4	1	Performance Climate Changer (CSAA)	CSAA025UA

Product Data - Performance Climate Changer (CSAA)
Item: A1 Qty: 1 Tag(s): AHU-4

Unit level options
- Unit size 25
- 6in. integral base frame
- UL listed unit
- 2" Double wall foam injected casing for R-13 thermal resistance

VFD/starter
- Supply fan VFD w/bypass
- Left side drive
- **VFD start-up by a factory authorized technician**

Warranty
- 1 year parts warranty

Air mixing section (Pos #1)
- Mixing box w/o filter
- Door- left side
- Back damper - parallel blade
- Top damper - parallel blade

Filter section (Pos #2)
- Cartridge filter
- Door- left side
- Bag/cartridge filter frame
- 12in. cartridge - 65% eff – one (1) set (Field Installed)
- 2" Pleated media – one (1) set (Field Installed)

DX Coil section (Pos #3)
- Refrigerant – R-454B
- 8 rows
- Stainless steel drain pan, coil casing, and coil supports

Direct Drive Plenum Fan section (Pos #4)
- Door- left side

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Confidential and Proprietary Information of Trane U.S. Inc.
Sensitivity: Highly Confidential

Door guard
24.5in. dd plenum, full width, H press
1 Fan quantity
Voltage 460/3
15 hp
Inverter balance with shaft grounding

Electric Heating Coil section (Pos #5)

Electric heat
Mounted on unit discharge
SSR Staging
67 kW
460V/3PH

Not Included: Controls, Tie-In or Interface to BAS, Refrigerant Specialties, External Vibration Isolators, Hanger Rods, Auxiliary Drain Pans, Float Switches, Extra Filters, or Labor Warranty.

Tag Data - IntelliCore 20-120T Air-Cooled Cond (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
B1	CU-4	1	IntelliCore 30T Air-Cooled Cond	RAUKC304B*13ABDF0002021000B

Product Data - IntelliCore 20-120T Air-Cooled Cond
Item: B1 Qty: 1 Tag(s): CU-4

Air Cooled Condensing Unit
R-454B
30 Tons
460/60/3
Low ambient damper control to 0°F
cULus approval
Non-fused disconnect switch (5,000A SCCR)
Hot-gas bypass to the evaporator inlet
Suction service valve
Pressure Gauges and Piping
Corrosion protected condenser coil
Neoprene-in-shear vibration isolators
7–inch user interface touch display
BACnet communication protocol
Start-up by a factory authorized technician
1st Year Parts & Refrigerant Warranty Whole Unit
2nd-5th Year Compressor Warranty

Not Included: Thermostats, Refrigerant Line Sets, Refrigerant Specialties, Controls, Vibration Isolators, Equipment Stands, Hurricane Tie-Downs, or Labor Warranty.

Total Net Price *(excluding sales tax)* ..... $ 110,570.00

Trane shall have the right, at its discretion, to pass along any related increases should (1) its costs related to the manufacture, supply, and shipping for any product or service materially increase. This includes, but is not limited to, cost increases in raw materials, supplier components, labor, utilities, freight, logistics, wages and benefits, regulatory compliance, or any other event beyond Company's control and/or (2) any tariffs, taxes, levies or fees affecting, placed on or related to any product or service materially increases.

Tax Status: Taxable ☐ Exempt ☑	If you are claiming an exemption from sales tax on this project, please submit a completed exemption certificate for both the jobsite location state and the state where the equipment will be delivered (if different from the jobsite). You can submit the relevant state exemption certificate at the following link: https://trane.certifytax.com/custportalas.aspx . You will receive an email indicating approval or rejection within 1-2 business days. If your exemption claim is rejected, sales tax will be billed based on the state where the equipment was delivered. For any questions, please email: financial_services-tax_department@tranetechnologies.com.

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Confidential and Proprietary Information of Trane U.S. Inc.

Sincerely,

Josh Wand, Account Manager
Trane U.S. Inc.
902 N. Himes Avenue
Tampa, FL 33609
E-mail: josh.wand@trane.com
Office Phone: (813) 877-8251
Cell: (813) 610-1206
Fax: (813) 877-8257

This proposal is subject to your acceptance of the attached Trane terms and conditions.

CUSTOMER ACCEPTANCE	TRANE ACCEPTANCE
~~Refrigeration & Electric Service~~ City of Winter Haven	Trane U.S. Inc.
Company Name	
Authorized Representative	Authorized Representative
Scott Eilers	Josh Wand
Printed Name	Printed Name
Public Works Director	Account Manager
Title	Title
Purchase Order _____	
Acceptance Date _____	Signature Date _____

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Account	Account Description	2026 Final Budget
Fund	**101 - Library Fund**	
EXPENSE		
Department	**07 - Parks and Recreation**	
Cost Center	**728 - Library**	
Operating Services		
5102	Tools,Equip under $1,000	1,000.00

Budget Transactions

Level	Transaction	Number of Units	Cost Per Unit	Total Amount
Final Budget	Paper towel dispenser / soap dispenser	1.0000	850.00	850.00
Final Budget	United States Flags	2.0000	75.00	150.00
			Final Budget Totals	$1,000.00

5204	Copier Use & Supplies	11,450.00
5208	Uniform, Protect Clothing	800.00
5209	Housekeeping Supplies	8,400.00
5210	Program Related Expense	9,000.00

Budget Transactions

Level	Transaction	Number of Units	Cost Per Unit	Total Amount
Final Budget	Adult Programming	1.0000	1,500.00	1,500.00
Final Budget	STEM Programs	1.0000	3,000.00	3,000.00
Final Budget	Summer programs	1.0000	4,500.00	4,500.00
			Final Budget Totals	$9,000.00

5220	Materials-Visual/Photo/Signage	35,900.00
5404	Employee Dev-Material & Training	100.00
5407	Employee Dev-Recog & Apprec	100.00
	Operating Services Totals	$355,136.00
Capital		
6301	Other Capital Improvements	150,000.00

Budget Transactions

Level	Transaction	Number of Units	Cost Per Unit	Total Amount
Final Budget	HVAC Equipment Replacement	1.0000	150,000.00	150,000.00
			Final Budget Totals	$150,000.00

6601	Library Materials	128,000.00
	Capital Totals	$278,000.00
Cost Center	**728 - Library** Totals	$2,143,489.00
Department	**07 - Parks and Recreation** Totals	$2,143,489.00
	EXPENSE TOTALS	$2,143,489.00
Fund	**101 - Library Fund** Totals	
	EXPENSE TOTALS	$2,143,489.00

Account	Account Description	2026 Final Budget
Fund	**001 - General Fund**	
EXPENSE		
Department	**07 - Parks and Recreation**	
Cost Center	**710 - Leisure Park Rentals**	
Operating Services		
4620-735	R/M Contracts-Garden Center	1,929.00
4702	Printing & Binding	100.00
5102-710	Tools,Equip < $1,000-Rotary Prk	100.00
5102-720	Tools,Equip < $1,000-Womans Club	500.00
5102-723	Tools,Equip < $1,000-Lions Park	500.00
5102-735	Tools, Equip under $1,000-Garden Center	200.00
5200-735	Non-Cap Equip $1000-$4999-Garden Center	10,000.00

Budget Transactions

Level	*Transaction*	*Number of Units*	*Cost Per Unit*	*Total Amount*
Final Budget	Garden Center Tables	1.0000	10,000.00	10,000.00
			Final Budget Totals	$10,000.00

5208	Uniform, Protect Clothing	33.00
5209-710	Housekeeping Supplies-Rotary Prk	2,000.00
5209-720	Housekeeping Supplies-Womans Clu	220.00
5209-735	Housekeeping Supplies - Garden Center	1,000.00
	Operating Services Totals	$146,674.00
Capital		
6301-710	Other Capital Improvements - Rotary Park	50,000.00

Budget Transactions

Level	*Transaction*	*Number of Units*	*Cost Per Unit*	*Total Amount*
Final Budget	Building HVAC Complete System	1.0000	50,000.00	50,000.00
			Final Budget Totals	$50,000.00

Capital Totals	$50,000.00
Cost Center **710 - Leisure Park Rentals** Totals	$196,674.00

EMERGENCY PURCHASE JUSTIFICATION

If the emergency requires **immediate** action the user Department/Division is authorized to proceed and advise Procurement of action taken. This form must be submitted with the related paperwork (sales ticket, bill, delivery slip receipts, etc.) by the close of business of the next business day following the emergency. The emergency purchase of goods and/or services is defined as **any purchase made in response to a requirement for goods and/or services in which a delay would adversely affect the public health or safety of the citizens of the City as well as any immediate repairs that are needed to prevent further damage to public property, machinery, or equipment.**

Department/Division: Parks Recreation & Culture - Facility Maintenance

Date and Location of **Emergency**: 6/23/26 - Library

Emergency Purchase vendor: Refrigeration & Electric Service, Inc.

Describe **Emergency** and action taken: HVAC Unit #3 at the library has experienced a failure of its two-compressor system and requires immediate repair. This is a critical issue, as the unit is currently operating at only 50% of its cooling capacity. Additionally, partnering HVAC unit #4 is operating under a temporary repair until the emergency replacement unit arrives and remains unreliable. If Unit #3 is not repaired immediately, the library faces a significant risk of health and safety for everyone in the building,along with potential damages to books, equipment, etc. Given the current condition of both units, prompt repairs of Unit #3 is necessary to prevent a potential HVAC crisis and ensure continued operation.

Subsequent repairs needed: N/A

Total cost or estimated cost of **Emergency Purchase** $ 18,642.00

Charge to ACCOUNT CODE: 501-03-906-4605

Additional Quotes (if any): There's approximately $59,000.00 remaining in FY26 from a completed HVAC replacement project at the PEP building that may be used to cover this project.

Ashley Hamilton 6/23/26
Requestor Name - printed Date

6/23/26
Division/Department Director Approval Date

Procurement Approval 6/23/2026
Date

6-22-2026
Finance/Budget Approval Date

City Manager Approval Date

Proposal

26 - JD - 107



Carrier
Turn to the Experts

Refrigeration & Electric Service, Inc.
435 Sixth Street SW
Winter Haven, FL 33880
Phone: (863) 293-2145 Fax: (863) 299-1018
www.rescowh.com

State License #: CAC023496

Attention:

SUBMITTED TO	City Of Winter Haven	**PHONE:** 863-289-3379	**DATE:** June 22, 2026
STREET		**JOB NAME:**	
CITY, STATE & ZIP CODE	Winter Haven, FL	**JOB LOCATION:** Library Unit # 3	

We are pleased to provide this quote to
Provide and install compressors

Scope of work:
o Remove all the refrigerant
o Remove the 2 compressors
o Remove the filter drier cartridge
o Install new compressor
o Install new filter drier
o Pressure check unit
o Evacuate the refrigerant circuit
o Install new refrigerant (approximately 80lbs)
o Run unit in cooling to check TD
o Remove all trash and clean work area

Price = $18,642.00

***** Recommend both compressors since they are tied together and work as 1***

We Propose to furnish material and labor - complete in accordance with the above specifications, for the sum of: Dollars (_____).

All material is guaranteed to be as specified. All work to be preformed in workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra cost will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements contingent upon strikes, accidents or delays beyond our control. Owner to carry fire, tornado and other necessary insurance. All our workers are fully covered by Workers Compensation Insurance.

Authorized signature JAY DIXON

Note: This proposal may be withdrawn by us if not accepted within 30 days.

Acceptance of Proposal–
The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Signature _____

Print Scott Eilers

Date of Acceptance: 6/23/26

Purchase Order # _____

Payment to be made as follows: Due within 30 days of completion. or in accordance with above proposal details
All materials provided by Refrigeration & Electric remain the property of Refrigeration & Electric until Paid in Full.

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DATE: June 30, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Brittany Hart, Public Works Director
Tyler Williams, Capital Projects & Special Initiatives Manager

SUBJECT: Kimley-Horn Design Services for Old Helena Road Complete Street Project

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BACKGROUND

On January 23, 2023, The City Commission adopted Resolution R-23-07 supporting the submission of a Transportation Alternative Project Grant application to the Polk Transportation Planning Organization (TPO) and to the Florida Department of Transportation (FDOT) for funding to reconstruct and complete a 3,800-foot segment of Old Helena Road from Legoland Way to Cypress Gardens Road. The project will include the construction of a path that will tie into the existing sidewalk infrastructure on Cypress Gardens Road, exemplifying efforts to identify and fill sidewalk gaps within City limits. Additional improvements include new roadway realignment and pedestrian crossings, drainage improvements, and enhancements to bus stops and shelters within the project limits.

FDOT awarded a $883,140 grant to the City for the purpose of funding a portion of these improvements and construction is anticipated in Fiscal Year 2028. The City is required to fund the project's design and any construction costs exceeding $883,140. The preliminary estimated project cost is $1,500,000.

Kimley Horn and Associates, Inc. a firm under the City's continuing professional services contract (RFQ-20-01) has prepared a scope for the design of this project. A construction cost estimate will be prepared by Kimley Horn during the design phase of the project, and construction is not anticipated to exceed the $7,500,000 CCNA threshold. Staff has worked with Kimley Horn to produce a consulting engineering agreement proposal that includes the following general services:

- Survey work
- Geotechnical work
- Attendance at Monthly Progress Meetings
- Permitting Assistance
- Preparation of 30%, 60%, 90%, and 100% design plans for submittal to FDOT
- Preparation of construction bidding documents

The design timeline aligns with the agreement with FDOT, with final approved plans anticipated by summer 2027.

FINANCIAL IMPACT

Kimley-Horn's lump-sum fee for the design services is $311,865. A total of $285,000 has been budgeted in the Transportation Fund for this effort in FY 2025/2026. The remaining $26,865 will be funded through available cost savings within the Transportation Fund.

STRATEGIC PLAN ALIGNMENT

- Pillar: Infastructure
- Goal: 3.2 - Take a comprehensive approach to transportation planning and maintenance of transportation assets.
- Strategy 3.2.5 - Improve pedestrian network with a multi-year plan for expansion, filling of gaps, and maintenance.

RECOMMENDATION

Staff recommends the City Commission approve the Task Order with Kimley Horn and Associates and authorize the City Manager or his designee to execute the Task Order, issue a purchase order, and take all other actions necessary and incidental thereto, to complete the design phase of Old Helena Road Complete Street Project.

ATTACHMENT

- Kimley Horn – Task Order for design work for Old Helena Road Complete Street Project

TASK ORDER FOR:
Old Helena Road

PURPOSE

Kimley-Horn and Associates, Inc. ("Kimley-Horn" or "the Consultant") is pleased to submit this scope of services to the City of Winter Haven ("the Client" or "the City") in accordance with the terms and conditions of RFQ #20-01 pursuant to Master Continuing Professional Services Agreement dated March 20, 2020 as set forth herein for engineering services for roadway improvements along Old Helena Road. Our project understanding, scope of services, and fees are described below.

The purpose of this document is to describe the scope of work and the responsibilities of Kimley-Horn and the City, for the preparation of construction documents associated with the roadway improvements along Old Helena Road for the City of Winter Haven. Improvements will focus on enhancing pedestrian facilities, providing safer crossings, and optimizing roadway operations to support multimodal mobility along the corridor.

The limits of the improvements are identified below:

- Old Helena Road from Legoland Way to Cypress Gardens Road.
- Cypress Gardens Road from Old Helena Road to SR 540 (Cypress Gardens Boulevard).
- The total distance of improvements is approximately 3,200 ft (0.6 mi).



SCOPE OF SERVICES

Task 1 – Design Improvements

Kimley-Horn will prepare a set of construction documents as described below. This scope of work consists of roadway, drainage, sidewalk, utility coordination, transit coordination, and signing and pavement marking design necessary to prepare a complete set of construction documents for the proposed improvements along the project corridor.

The existing typical section consists of two 11-ft travel lanes, curb and gutter along the east side, and flush shoulder along the west side of the corridor. The proposed improvements will consist of an 8-ft to 10-ft asphalt sidewalk along the east side to accommodate pedestrians. The plans will also include pavement marking modifications associated with the new roadway realignment and pedestrian crossings, drainage improvements required to accommodate the curb and gutter system and the additional impervious area, and enhancements to the bus stops and shelters.

Kimley-Horn will coordinate with the local transit provider regarding existing bus stop locations within the project limits. Construction plans will depict bus stop improvements at existing bus stop locations, as appropriate, consisting of concrete boarding and alighting pads and sidewalk connections to provide ADA-compliant access to transit facilities within the corridor. Improvements will be applied based on site conditions and coordination with the transit provider.

A. General/Project Administration

Project administration activities will be undertaken throughout the project duration and will consist of the following:

1. Project Setup: Kimley-Horn will establish project files, prepare a project work plan, develop the project schedule, and initiate the project within Kimley-Horn's accounting system.

2. Kick-off Meeting: Kimley-Horn will participate in a kick-off meeting with the City and the project team to review the project scope, schedule, and coordination requirements.

3. Progress Meetings: Kimley-Horn will participate in monthly coordination calls with the City to review project progress, discuss design development, and coordinate with utility companies as needed. Kimley-Horn will maintain the project schedule and review or update the schedule during each progress meeting. Five (5) monthly meetings are budgeted for this project.

4. Progress Reports and Invoices: Kimley-Horn will prepare a brief monthly progress report summarizing work completed during the billing period to be submitted with the monthly invoice.

5. Public Meeting: Kimley-Horn will prepare for and attend one (1) public meeting with the City following the 60% submittal to present the proposed improvements. Supporting materials, consisting of design renderings, will be developed in advance of the meeting.

6. Coordination with adjacent businesses and residences.

B. Construction Documents

Kimley-Horn will prepare construction documents on 11”x17” sheets depicting the needed improvements.

The improvement design plans will consist of the following sheets:

1. **Key Sheet** – Depicting the project limits, location map, and sheet index.

2. **Typical Sections** – Typical sections will be developed for critical areas, as necessary. Two (2) typical sections are anticipated, one for Old Helena Road and another for Cypress Gardens Road. The proposed pavement design will be identified on the roadway typical sections.

3. **General Notes** – General project notes and applicable design criteria for construction of the proposed improvements.

4. **Roadway Plan Sheets** – The plan sheets will illustrate the horizontal layout of the roadway improvements consisting of milling and resurfacing limits, curb and gutter installation, asphalt sidewalk, driveway connections, drainage structures, pavement markings, and other roadway features necessary for construction.

5. **Driveway Details** – Where necessary, driveway detail sheets will include information depicting the limits of driveway reconstruction and grading information for accommodation of existing commercial driveway connections.

6. **Roadway Cross Sections** – Where necessary, cross sections will include information depicting the limits of reconstruction and other information. It is anticipated that 35 sections will be provided, one every 100 ft.

7. **Traffic Control Plan** – Kimley-Horn will design a safe and effective (Level I) Traffic Control Plan, consisting of notes and details, to move vehicular and pedestrian traffic during construction.

   Maintenance of Traffic requirements for the construction of this project will be provided through the use of typical sections, plans, general notes and reference to the appropriate FDOT Design Standards (600 Series). In addition, a conceptual MOT phasing plan depicting detour routes and phase segments of pavement lane closures and traffic shifts will be prepared.

8. **Erosion Control Plans** – Erosion control plans will be prepared depicting site specific erosion control measures, as well as general notes, details, and quantities for additional erosion control measures that may be needed depending on site conditions. It is anticipated that the preparation of a Stormwater Pollution Prevention Plan (SWPPP) may be required.

9. **Utility Adjustment Plans** – Based on information provided by the various utility providers in the corridor, proposed utility adjustments will be detailed in plan view on these sheets, as necessary.

10. **Submittals –** Kimley-Horn will submit the construction documents in electronic format at 60%, 90%, and 100% completion stages to the City for review and comment. In addition, Kimley-Horn will submit electronic copies of the roadway plans at 60%, and 90% stages to affected utility companies, as necessary. An Opinion of Probable Construction Cost (OPC) will be submitted with the 60%, 90%, and 100% submittal for the City’s review and comment.

C. Utility Coordination

Kimley-Horn will coordinate the proposed design with the affected utility companies within the project limits in order to minimize utility conflicts. The individual utility owners will locate/designate their existing utilities within the project limits.

Each utility provider will be responsible for the design of their respective utilities for this project. These designs will be provided to Kimley-Horn by the utility provider in CADD format for inclusion into the Improvement Plans for this project. Kimley-Horn will be responsible for coordinating with the utility providers for the proposed construction elements such that utility conflicts are minimized or avoided.

Kimley-Horn will provide electronic PDF files of plans to the utility owners at the 60%, 90% and 100% submittals. Kimley-Horn cannot be responsible for the accuracy of the CADD files after they are provided to the Utility owners, if requested. Kimley-Horn will, prior to and during design, obtain available data from the Utility Owners that may be needed to determine the actual location and depth of the underground utilities. Kimley-Horn will prepare for and attend one (1) utility coordination meeting.

D. Signing and Marking Plans

Signing and pavement marking plan sheets, details, and general notes sheet will be provided in accordance with City and MUTCD standards. This scope will also consist of analyzing the pedestrian crossing locations and considering the addition of Rectangular Rapid Flashing Beacon (RRFB) where necessary.

The plan set will consist of the following sheets, but will not be prepared as a component set of plans:

1. Notes and tabulation of quantities,
2. Signing and Pavement Marking plans,
3. RRFB Details Sheet.

E. Lighting Plans

Kimley-Horn will prepare the design and specifications of pedestrian-level photometrics associated with the pedestrian crossing movements along the corridor.

The plan set will consist of the following sheets, but will not be prepared as a component set of plans:

4. Notes and tabulation of quantities,
5. Lighting plans.

F. Surveying and Subsurface Utility Exploration

The ENGINEER will subcontract with a registered professional land surveyor (“LAND SURVEYOR”) to provide surveying services as described below:

1. *Survey Control Horizontal/Vertical:* The LAND SURVEYOR will establish horizontal and vertical control on the proposed corridor and set 2 benchmarks and control points along said route using the datum as specified by the design.
2. *Records Research:* The LAND SURVEYOR will obtain information from the Polk County Property

Appraiser's Office, Polk County Clerk of Courts, FDOT, and Bureau of Land Management to acquire record evidence of parcel ownership, existing right-of-way limits for Old Helena Road and intersecting roadways, certified corner records and horizontal and vertical control and shown on a plan sheet file and in CADD.

3. *Base Map Digital Control File:* The LAND SURVEYOR will create a master horizontal control file to be utilized throughout the planning and design of the roadway alignment. This map will include the location of the existing right-of-way lines for those portions of intersecting roadways that fall within the project limits. These right-of-way lines together with the boundary lines and controlling monuments for the ownership entities will serve as the base geometry for the project.

4. *Route Survey and Topography:* The LAND SURVEYOR will obtain cross-section elevations at 100-foot intervals along the route and extend a distance of 10 feet right and 10 feet left of the right of way line. Above ground improvements, including trees lying within 10 feet either side of the proposed right of way line will be located. Surface evidence of underground utilities, including valves and manholes, will be located. Invert elevations and pipe sizes will be obtained on all structures along the proposed route.

5. *Subsurface Utility Exploration (SUE):* The LAND SURVEYOR will complete up to ten (10) Subsurface Utility Explorations (SUE) Level A test holes at identified locations within the topographic survey limits to identify underground utilities such as gas, electric, fiber optic cable, sewer, septic tank connection, and water lines. The LAND SURVEYOR will perform the investigation utilizing vacuum excavation and/or other appropriate methods to expose and document the horizontal and vertical location of the utilities. Kimley-Horn will provide the specific test hole locations if potential conflicts with existing utilities are identified or suspected during the design process. This work shall be performed on a cost-plus maximum basis. Final deliverable will be a CADD file identifying the existing utilities along with a "pot hole" report identifying the measure down information for each location.

G. Geotechnical Explorations

Kimley-Horn will subcontract with a geotechnical subconsultant ("Geo-Tech") to provide geotechnical investigations for the project.

Geo-Tech's scope of services for this project will consist of the following:

1. Four (4) Pavement cores spaced every 1000 ft. along corridor.

2. Ten (10) soil borings to depths of six (6) feet below existing grade in the existing roadway right-of-way. Soil borings will be performed on three-hundred (300) foot centers in alternating sides of the roadway to classify existing road base and ground water elevation.

Samples will be recovered from the roadway soil borings per ASTM standards and returned to the laboratory for visual classification per the AASHTO Classification Group System. A report will be issued, to the City and EOR, presenting the findings, evaluations and recommendations to aid in the design of the proposed roadway improvements.

Task 2 – Permitting and Bid Assistance

A. SWFWMD Permitting Assistance

Kimley-Horn will prepare and submit the following permit applications:

1. Southwest Florida Water Management District Environmental Resource Permit (Exemption) – One (1) exemption letter request will be prepared accounting for the revised conditions proposed by the corridor improvements. A letter of exemption is anticipated for the project given the overall proposed safety improvement for the project and the fact that additional roadway capacity is not being added to the facility. Permitting services beyond the requirements for an exemption letter, as required by the SWFWMD, will be compensated as additional services.

2. Meetings and Coordination – Kimley-Horn will attend one (1) pre-application meeting with SWFWMD to verify permitting requirements and procedures.

B. FDOT Permitting/LAP Coordination

1. FDOT permitting/LAP Coordination – Kimley-Horn will prepare construction plans in accordance with the applicable requirements set forth in the FDOT Design Manual, Standard Plans, and other applicable FDOT criteria. Kimley-Horn will coordinate with FDOT through the Local Agency Program (LAP) review process, consisting of preparation of required documentation, responses to FDOT comments, and plan revisions to obtain approval.

Kimley-Horn will submit the required number of plans and supporting documentation to provide a complete permit application. Kimley-Horn will respond to Requests for Additional Information (RAI) and address permitting agency review comments associated with this scope of services as appropriate.

C. Bid Documents and Assistance

This AGREEMENT consists of the scope of services necessary to prepare the Project for competitive bidding by construction contractors. It specifically does not include Construction Engineering Inspection (CEI) services or geotechnical materials testing during construction of the project. It is anticipated that a separate AGREEMENT for those services will be prepared at a future date.

Bidding Assistance

1. *Bid Document Preparation and Contractor Notification*. The ENGINEER will prepare and assemble construction bidding documents, including specifications for the subject Work and the construction contract, based on “Standard General Conditions of the Construction Contract” (EJCDC No. C-700, 2002 edition) prepared by the Joint Contract Documents Committee. The ENGINEER will coordinate with City of Winter Haven Purchasing staff to support the issuance of bid packages for the submittal of quotations to perform the work and conduct one (1) pre-bid meeting with potential bidders.

PROVISIONS FOR WORK

A. Governing Regulations

The services performed by Kimley-Horn will be in compliance with all applicable City and FDOT Standards Guidelines. The current edition, including updates, of the following References and Guidelines will be used in the performance of this work.

1. FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, Green Book.
2. AASHTO's "A Policy on Geometric Design of Highways and Streets".
3. FDOT Design Standards.
4. FDOT Standard Specifications for Road and Bridge Construction.
5. Florida Manual on Uniform Traffic Studies (MUTS).
6. Manual on Uniform Traffic Control Devices (MUTCD).
7. AASHTO Guide for Bicycle Facilities Design.
8. SWFWMD ERP guidelines.

ADDITIONAL SERVICES

A. Payment for Additional Services

Any professional services not specifically listed in the above Scope of Services are not included in the contracted fees. Should the City desire any services beyond those specified, Kimley-Horn will prepare a fee, scope and schedule for the work at the time the services are requested.

SCHEDULE

Kimley-Horn will provide the above Scope of Services as expeditiously as possible to meet a mutually agreed upon schedule. A project schedule will be developed and discussed at the first progress meeting. The project schedule will be maintained throughout the performance of the scope of services.

FEE

Kimley-Horn will perform the services described in Tasks 1 through 2 of the Scope of Services for the fees listed below. Tasks 1A through 1G and Tasks 2A and 2C will be completed on a lump sum basis for a total lump sum fee of $275,925. In addition, SUE services under Task 1F, FDOT Permitting/LAP Coordination under Task 2B, and the Design Allowance will be performed on a cost plus max basis due to the unknown level of effort and potential additional coordination, permitting, and design services that may become necessary as the project advances and assumptions made during the project scoping process are refined. The combined not-to-exceed fee for these cost plus max tasks is $35,940. A breakdown by task is provided below.

Task	Description	Fee	
1	Design Improvements		
1.A	General / Project Administration	Lump Sum:	$37,850.00
1.B	Construction Documents	Lump Sum:	$135,500.00
1.C	Utility Coordination	Lump Sum:	$13,430.00
1.D	Signing and Marking Plans	Lump Sum:	$17,400.00
1.E	Lighting Plans	Lump Sum:	$13,430.00
1.F	Survey	Lump Sum:	$39,725.00
1.G	Geotechnical	Lump Sum:	$7,400.00
2	Permitting and Bid Assistance		
2A	SWFWMD Permitting Assistance	Lump Sum:	$6,190.00
2C	Bidding Assistance	Lump Sum:	$5,000.00
	Lump Sum Subtotal		**$275,925.00**
1F	SUE	Cost Plus Max:	$9,580.00
2B	FDOT Permitting/LAP Coordination	Cost Plus Max:	$16,360.00
T&M	Design Allowance	Cost Plus Max:	$10,000.00
	Cost Plus Max Subtotal		**$35,940.00**
	Total		**$311,865.00**

All permitting, application, and similar project fees will be paid directly by the City. Fees and expenses will be invoiced monthly based, as applicable, upon the percentage of services performed or actual services performed and expenses incurred as of the invoice date. Payment will be due within 30 days of your receipt of the invoice. If additional efforts become necessary during the performance of the assignment, the ENGINEER will immediately advise the City of any budget revisions.

ACCEPTED

CITY OF WINTER HAVEN
POLK COUNTY, FLORIDA

BY:_____

TITLE:_____

DATE:_____

KIMLEY-HORN AND ASSOCIATES, INC.

BY:_____
Gary J. Nadeau, PE

TITLE: Principal

DATE: July 01, 2026

G:\Marketing\Propose\City of Winter Haven\2026_Old Helena Road\Scope of Work-Old Helena Road_07_01_26.docx

DATE: June 30, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Brittany Hart, Public Works Director
Todd Gooding, Assistant Public Works Director
Dustin Everitt, Natural Resources Manager
Devon Moore, Senior Environmental Scientist

SUBJECT: R-26-19 – Adopting the 2025 Annual Lakes Report

BACKGROUND

Established in 1986, the Lakes Advisory Committee (LAC) serves in an advisory role to the City Commission and the City's Natural Resources Division. This citizen-led committee provides guidance and recommendations for managing Winter Haven's lakes, with the shared goal of protecting and enhancing the health of local waterbodies.

Each year, the LAC presents the Annual Lakes Report, summarizing lake conditions and documenting the City's management efforts. The 2025 report includes assessments for 37 lakes in the greater Winter Haven area, selected based on public accessibility, data availability, and connectivity to the Winter Haven Chain of Lakes and the Peace Creek Basin.

Lake health is evaluated using water quality, hydrologic, and biological data. In 2025, 51% (19 of 37) of monitored lakes met the State of Florida's regulatory thresholds for chlorophyll-a, total nitrogen, and total phosphorus, representing a substantial improvement from 2018, when only 37% of monitored lakes met these standards. Many of the remaining impaired lakes continue to show improving water quality trends, demonstrating the long-term benefits of sustained, science-based management.

Since active lake monitoring began in 2016, several previously impaired lakes have improved enough to meet regulatory thresholds for at least one pollutant. Even lakes that have not yet met all State standards continue to trend in a positive direction and are expected to improve with continued management.

The Annual Lakes Report serves two primary purposes: to provide a scientifically rigorous, data-driven assessment of local lake conditions and to document the City's lake management efforts in support of the mission, vision, and goals of the Natural Resources Division and the Lakes Advisory Committee.

Each lake includes a Water Quality Management Plan identifying site-specific challenges, documenting current management activities, and outlining future priorities. These plans serve as living documents, allowing the City to track progress, adapt to changing conditions, and refine its management approach over time.

Since 2020, the report has included an interactive online version, giving residents, researchers, and the public a visual, user-friendly way to explore lake information. Complementing that effort, the Natural Resources Division continues to publish the Lakes Report in Brief, a concise 12-page companion highlighting major findings, lake health trends, and management initiatives through photographs, maps, charts, and other visual summaries.

Together, these resources make lake management information more accessible. QR codes throughout the publications provide direct access to the full report, an interactive online version, and additional City resources, while staff contact information encourages residents to ask questions and learn more about Winter Haven's lakes.

FINANCIAL IMPACT

There is no financial impact associated with this item.

STRATEGIC PLAN ALIGNMENT

- **Pillar**: Environmental Stewardship
- **Goal**: 4.3 – Continue to monitor lakes and implement proactive strategies for lake management.
- **Strategy**: 4.3.1 – Publish and implement strategies within the Annual Lakes Report and develop community education campaigns based on the information within the report.

RECOMMENDATION

Staff recommends the City Commission approve Resolution R-26-19, adopting the City of Winter Haven 2025 Annual Lakes Report.

ATTACHMENTS

- Resolution R-26-19
- Exhibit 'A' - 2025 Annual Lakes Report
- Exhibit 'B' – 2025 Lakes Report in Brief

RESOLUTION NO. R-26-19

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF WINTER HAVEN, FLORIDA, MAKING FINDINGS; APPROVING AND ADOPTING THE 2025 ANNUAL LAKES REPORT; PROVIDING FOR SEVERABILITY; THE ADMINISTRATIVE CORRECTION OF SCRIVENER'S ERRORS; AND PROVIDING FOR AN EFFECTIVE DATE.

WHEREAS, lakes are a unique and integral part of Winter Haven's character contributing to its economic future and its resident's quality of life; and

WHEREAS, the City's Lakes Advisory Committee's Mission for the Natural Resources Division of the City's Public Works Department is "[t]o maintain and improve natural resources through management based on a sound understanding of social, economic, and ecological systems"; and,

WHEREAS, achieving that mission begins with a thorough understanding of the conditions as they exist, is progressed towards by identifying management strategies, and is ultimately achieved by implementation of those management strategies; and

WHEREAS, successful implementation of those strategies hinges on community support of the initiatives, good government transparency, and tracking of changes in the local natural systems; and

WHEREAS, the City's Lakes Advisory Committee's Vision for the Natural Resources Division of the City's Public Works Department is "[t]o be the premier knowledge base for local natural resources, with an engaged public, supporting natural systems through a community ethic"; and,

WHEREAS, the nature of water resource management is dependent on cooperation with other agencies; and

WHEREAS, the City endeavors to be a leader in cooperative relationships related to managing local water resources; and

WHEREAS, the City's 2025 Annual Lakes Report, prepared by City staff with input from the Lakes Advisory Committee and which is attached hereto as Exhibit "A" and incorporated herein by reference, exemplifies this effort by providing technically sound information that can be utilized by other agencies, while remaining approachable and accessible by the general public; and

WHEREAS, the City's 2025 Annual Lakes Report attached hereto as Exhibit "A" serves to memorialize the conditions and efforts of the previous year for posterity; and

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF WINTER HAVEN, FLORIDA AS FOLLOWS:

1. The 2025 Annual Lakes Report a copy of which is attached hereto as Exhibit "A" and incorporated herein by reference is hereby adopted and may serve as a local resource for the following:
    a. A data-driven understanding of the current state of local lakes;
    b. Management strategies identified to improve the state of local water quality; and
    c. Water Quality Management Plans for individual local lakes.

2. The said 2025 Annual Lakes Report approved herein and attached hereto as Exhibit "A" may be used as a reference guide to provide direction for the City, the community, and cooperative efforts with other agencies where appropriate relating to lakes and related natural resources.

3. The administrative correction of typographical and/or scrivener's errors in this Resolution which do not affect the intent may be authorized by the City Manager

or designee, without need of public hearing, by filing a corrected or recodified copy of same with the City Clerk.

4. If any section, subsection, sentence, clause, phrase of this Resolution, or the application thereof shall be held invalid by any court, administrative agency, or other body with appropriate jurisdiction, the remaining section, subsection, sentences, clauses, or phrases under application shall not be affected thereby. The City of Winter Haven hereby declares that it would have passed this Resolution, and each section, subsection, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses, and phrases be declared unconstitutional.

5. This Resolution shall take effect immediately upon passage.

INTRODUCED AND PASSED by the City Commission of the City of Winter Haven, Florida, in Regular Session, on this 13th day of July, 2026.

CITY OF WINTER HAVEN, FLORIDA

BY: _____
Mayor–Commissioner

ATTEST:

_____
CITY CLERK

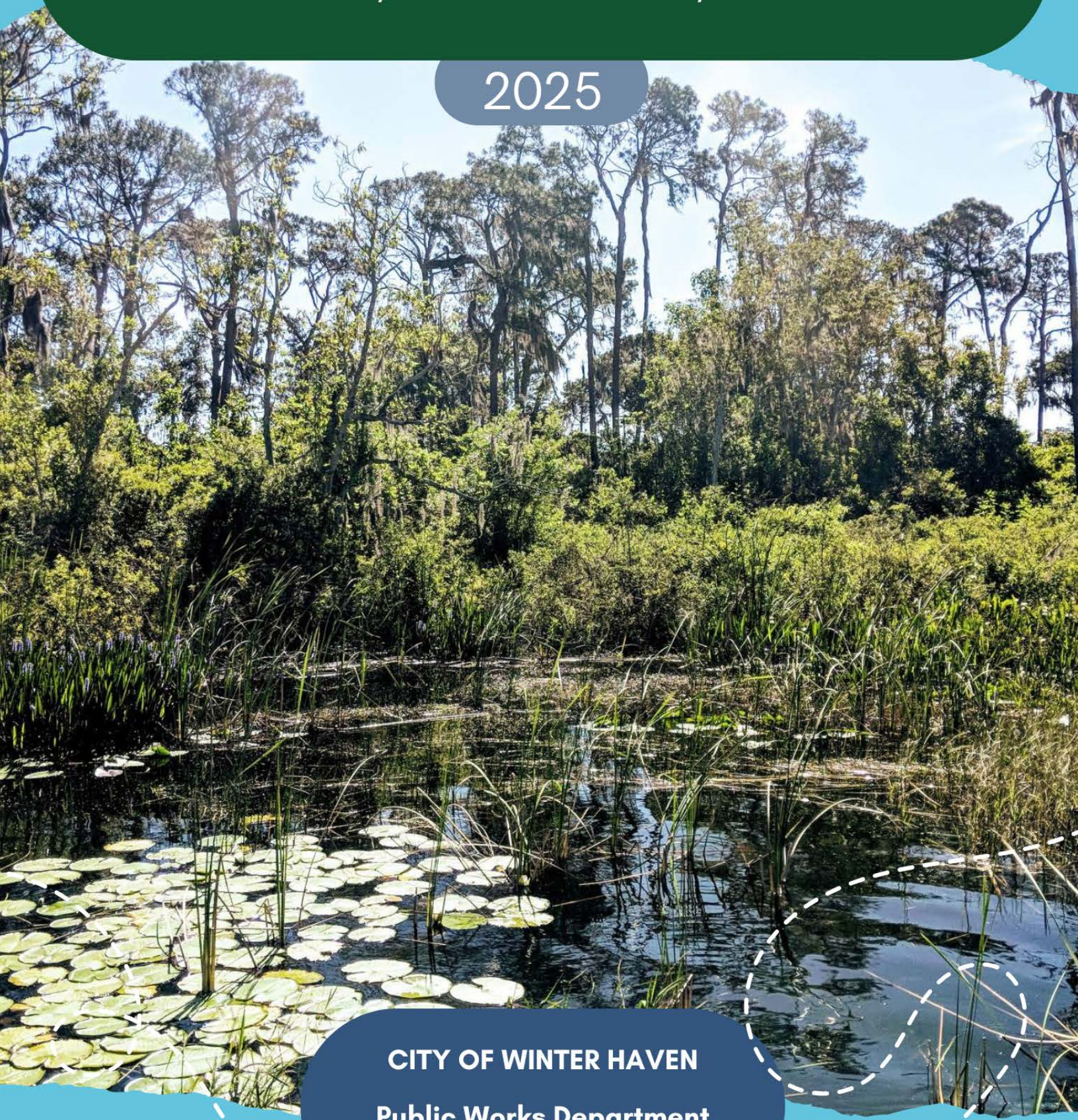
Approved as to form:

_____
CITY ATTORNEY

Winter Haven Lakes Report

Presented by the Lakes Advisory Committee

2025



CITY OF WINTER HAVEN

Public Works Department
Natural Resources Division

City of Winter Haven Natural Resources

Mission:

Maintain and improve local natural resources through management based on a sound understanding of social, economic, and ecological systems.

Vision:

To be the premier knowledge base for local natural resources, with an engaged public, supporting natural systems through a community ethic.

Purpose:

Balance the needs of diverse user groups to sustain natural resources the community can be proud of.

Values:

Courteous, Cognizant, Cooperative, Resourceful, Responsive, Accurate, Adaptive

Executive Summary

The City of Winter Haven possesses one of the highest densities of natural lakes in the state of Florida. Thirty-seven of these lakes have been identified as providing cultural, ecologic, and economic benefits for the Chain of Lakes City. Proper management of these resources is absolutely necessary to ensure that Winter Haven remains a place of enriched lifestyle for residents and visitors alike.

Effective lake management requires an understanding of the factors that impact lake health. The Winter Haven Natural Resources Division (NRD) regularly evaluates the water quality, hydrologic, and biological factors for all 37 lakes in our jurisdiction—presented via a publicly accessible document. The purpose of this report is to educate the public about the factors that affect lake health, present the most recent data and analysis, and highlight the management strategies employed by the City to maintain and improve lake health. This report and the information contained within is shared not only with our residents, but with federal, state, and local agencies with whom the City partners. It is our hope that this document helps to increase community understanding and support to protect these valuable natural resources. In addition to this version, the annual lakes report is presented in an interactive online format that can be accessed using the following link: www.tinyurl.com/wh-fl-lakesreport-app.

2025 State of the Lakes

The following information presents a brief summary of lake health statistics for Winter Haven area lakes as of 2025:

Water Quality:

- 51% of lakes met State regulatory water quality standards—up from 37% in 2018.
- 55% of impaired lakes exhibited improving trends in one or more water quality metrics—indicating general improvement.
- 2 impaired lakes exhibited deteriorating water quality trends—Lakes Hamilton & Idyl remain the top management priority

Hydrology:

- 45 inches annual rainfall total—slightly below the average of 52 inches.
- Low rainfall led to lake level declines, but most lakes remained above-average.
- 60% of area lakes experience better water quality with higher lake levels.

Aquatic Biology:

- 84% of lakes exhibited maintenance or increases in aquatic plant abundance—good for water quality and ecological health.

- 27% of lakes exhibited significant increases in invasive species presence—indicating need for increased vegetation management.
- 81% of lakes exhibited maintenance or increases in species diversity—good for ecological health.

Management Highlights

The City employs various management practices aimed at improving lake health. The important milestones for these activities are detailed extensively in the Management Strategies section of the report. There are some notable projects and initiatives to highlight:

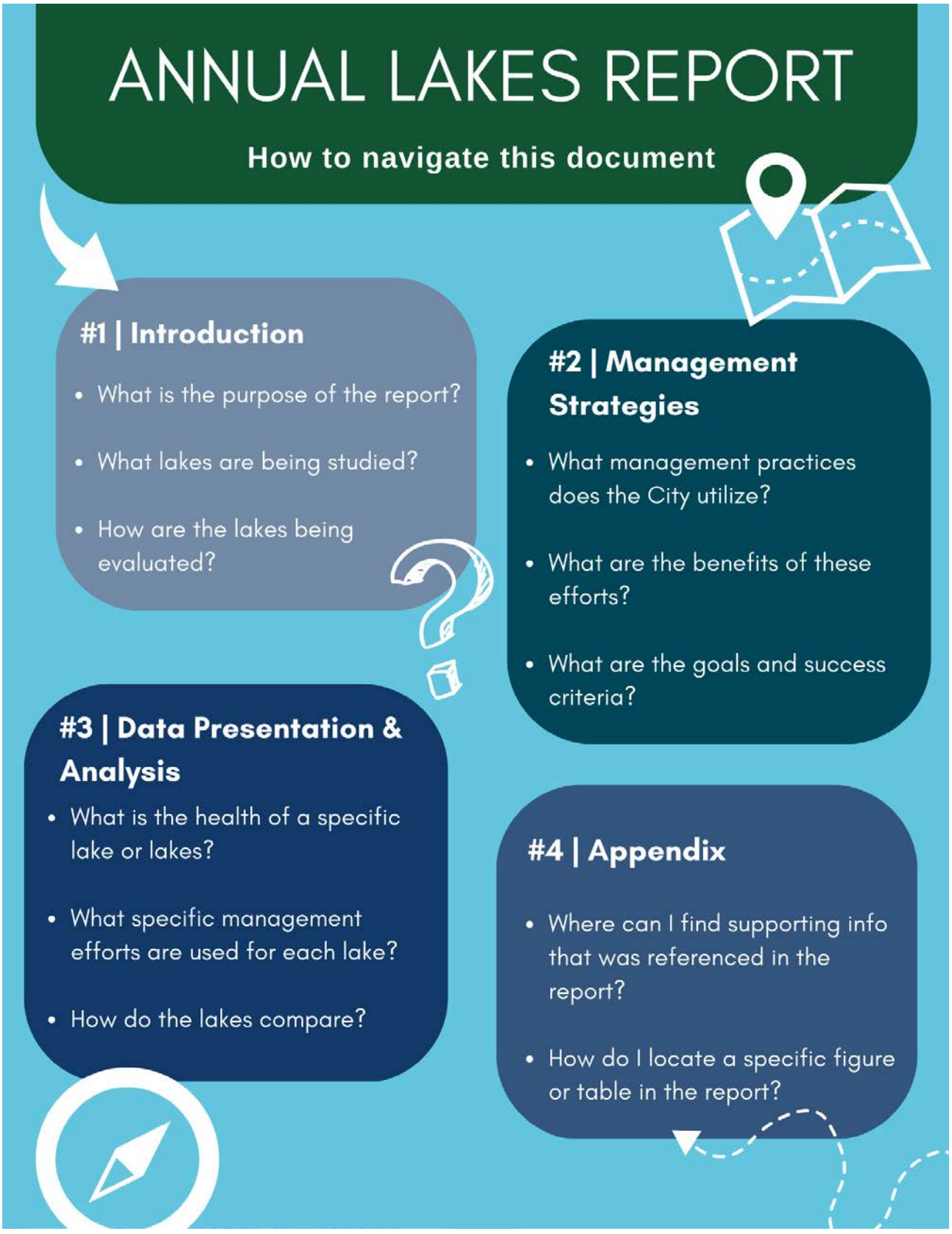
- Monitoring network expansion and exploration of innovative technologies to better track rainfall, lake levels, and water quality (page 38).
- Lake Elbert Trail and South Lake Howard Nature Park expansion projects implemented—green stormwater infrastructure designed to capture and treat urban runoff and increase groundwater recharge (page 40).
- Public outreach and educational programming expanded to increase community engagement and stewardship of our lakes—reaching 3,600 individuals (page 50).
- Vulnerability Assessment and Resiliency Plan initiated to better understand risks of flooding an infrastructure improvement needs (page 56).

This report represents a significant undertaking of the NRD—one that would not be possible without the guidance, advice, and support of local citizens with the passion to protect our natural resources. The City recognizes the efforts of the Lakes Advisory Committee whose leadership resulted in the initial directive to create this report and whose time spent reviewing the document is greatly appreciated. Additionally, we'd like to thank you, the reader, for engaging with this scientific document. We hope the information contained herein allows for a deeper, more meaningful connection to our lakes and drives you to seek opportunities for environmental stewardship. Please don't hesitate to contact the City Natural Resources Division if you have questions, suggestions, or wish to support lake management efforts in the Winter Haven area.

Sincerely,

City of Winter Haven
Natural Resources Division

863-291-5881 | naturalresources@mywinterhaven.com


ANNUAL LAKES REPORT
How to navigate this document
#1 | Introduction
• What is the purpose of the report?
• What lakes are being studied?
• How are the lakes being evaluated?
#2 | Management Strategies
• What management practices does the City utilize?
• What are the benefits of these efforts?
• What are the goals and success criteria?
#3 | Data Presentation & Analysis
• What is the health of a specific lake or lakes?
• What specific management efforts are used for each lake?
• How do the lakes compare?
#4 | Appendix
• Where can I find supporting info that was referenced in the report?
• How do I locate a specific figure or table in the report?

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#1 | Introduction



1.1 Purpose

The lakes of the greater Winter Haven area are considered some of its most important natural assets. The use of these waterbodies by visitors and residents alike has cemented their role as economic and cultural resources. Our lakes also impart environmental benefits such as fish and wildlife habitat, water storage, aquifer recharge, and flood protection. By virtue of this, one of the primary objectives of the City's Natural Resources Division is to monitor their overall wellness and to implement best management practices that will ensure the continued enjoyment of their benefits by our diverse user groups.

Much of the information in this report has been gathered by the Natural Resources Division's ongoing monitoring efforts. It presents a comprehensive outlook on the characteristics that comprise lake health and provides a detailed list of management strategies aimed at improving water quality. In using this holistic assessment approach, the City can prioritize waterbodies based on measurable conditions and implement specific management practices geared toward each lake's characteristics and issues. Using methods and techniques that are technically sound but presented in a manner that is accessible ensures that the information contained within this report can be understood and applied by the scientific community as well as the general public.

The work the City does to monitor and maintain the health of its lakes is also incredibly beneficial outside City limits. Winter Haven's lakes form part of the headwaters for the Peace River. The Peace River flows toward the Gulf of Mexico, eventually emptying into Charlotte Harbor—an economically and ecologically vital estuary along Florida's southwest coast. Since our lakes flow into such a major waterway, the health of both are intrinsically tied with far-reaching consequences for many people, businesses, and ecosystems.

Lastly, this annual report serves to document the City's evolving approach to environmental stewardship. As we continue to gain a better understanding of our natural systems, we hope to use that knowledge to refine our analytical methods and management practices. The principles we learn today will certainly drive how we preserve our lakes for the future.

1.2 Background on the Waterbodies

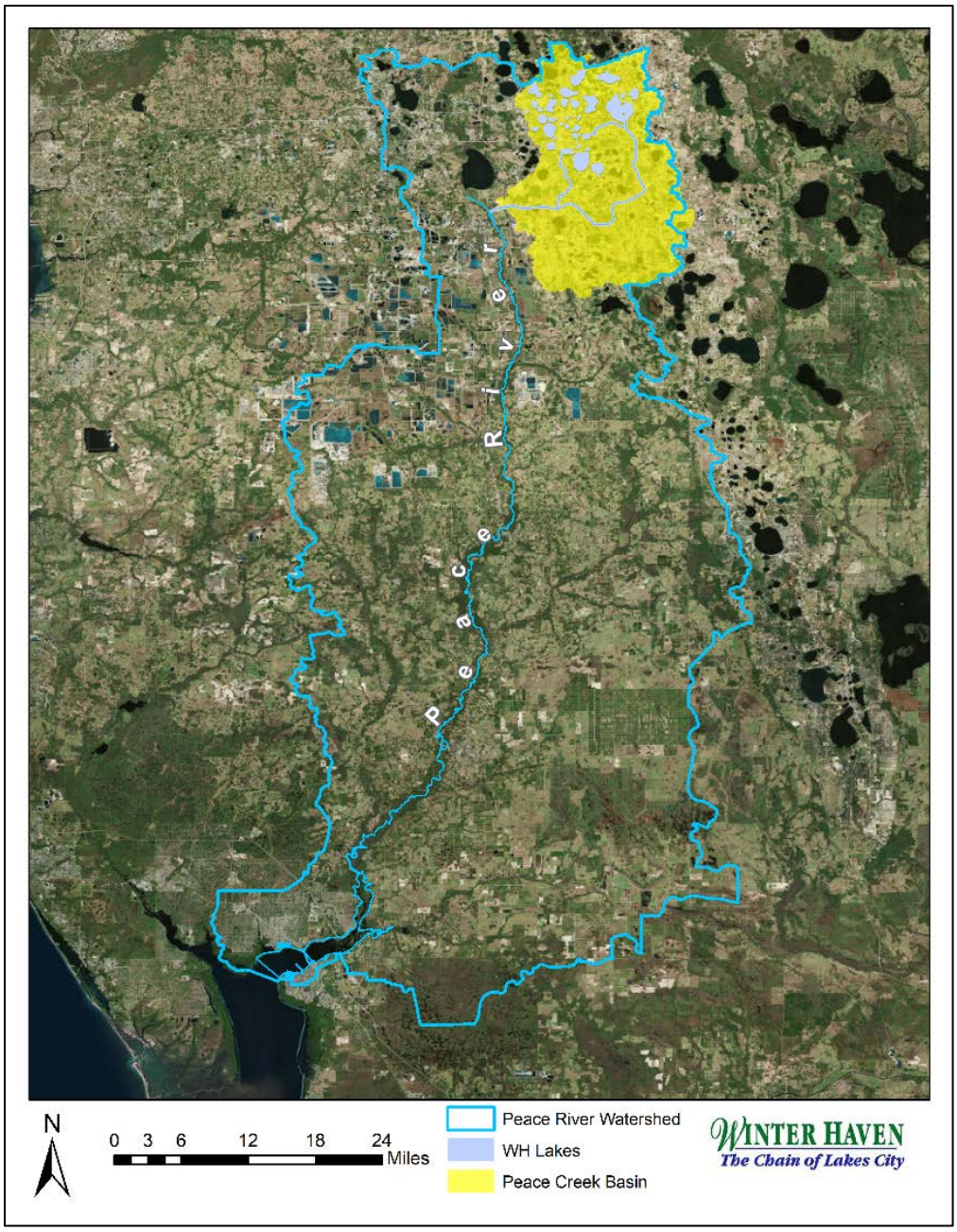


Figure 1-1. Map of Peace River & Peace Creek Watersheds

The lakes of the Winter Haven area are located at the top of the Peace River watershed, in what is known as the Peace Creek sub-basin. As excess water discharges to the Peace Creek, the lakes become a major contributor of surface and groundwater flow to the Peace River which flows to the Gulf of Mexico at Charlotte Harbor (Figure 1-1). The lakes chosen for this evaluation discharge directly or indirectly to the Peace Creek Canal—a major tributary that flows south of the Winter Haven area from Lake Hamilton and then west to join with Saddle Creek to become the Peace River (Figure 1-2).

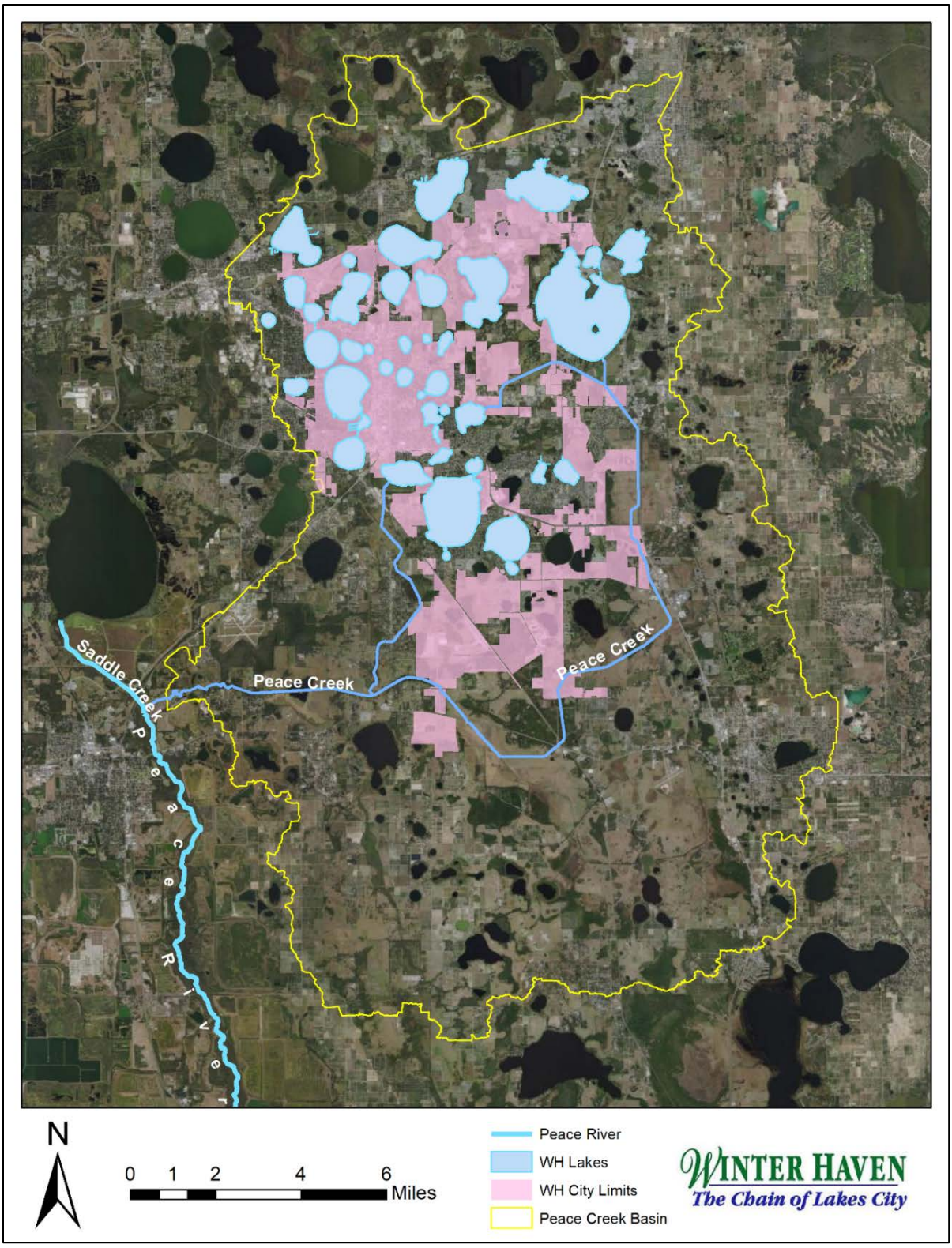


Figure 1-2. Map of the Peace Creek sub-basin, City of Winter Haven limits, contributing lakes and flow-ways.

Winter Haven Lakes

This report focuses on the 37 primary lakes that the Winter Haven Natural Resources Division monitors for lake health. These lakes were selected for monitoring based on several criteria:

- The lake must have some form of public access (e.g. public park, boat ramp, or navigable canal from another publicly accessible lake).
- The lake must be located within or adjacent to Winter Haven municipal limits, or it must discharge directly to a public lake within municipal limits.
- The lake must discharge, either directly or indirectly, to the Peace Creek.
- The lake must have a sufficient water quality and hydrologic period of record data set (approximately 20 years) in order to be evaluated.

The lakes included in this report were previously categorized into five groups: *North Chain of Lakes, North Central Lakes, South Chain of Lakes, South Central Lakes, and Outlying Lakes*, based on their geographic location and where they discharge water to. This was done in order to summarize the water quality, hydrologic, and ecological data by group. Recent iterations of this report evaluate each lake individually, meaning the lake groupings are no longer necessary. The following are the 37 lakes listed in alphabetical order:

1. Blue
2. Buckeye
3. **Cannon**
4. **Conine**
5. Daisy
6. Deer
7. Elbert
8. **Eloise**
9. Fannie
10. **Haines**
11. Hamilton
12. **Hartridge**
13. **Howard**
14. Idyl
15. **Idylwild**
16. **Jessie**
17. Link
18. **Lulu**
19. Mariam
20. Mariana
21. Martha
22. Maude
23. **May**
24. **Mirror**
25. Ned
26. Otis
27. Pansy
28. **Rochelle**
29. **Roy**
30. **Shipp**
31. Silver
32. **Smart**
33. **Spring**
34. **Summit**
35. **Winterset**
36. Little Hamilton
37. Middle Hamilton

The series of waterways connected by navigable canals is colloquially referred to as the Winter Haven Chain of Lakes (highlighted in **bold** in the list above). Many of these canals were constructed in the early 1900's, in part as a means to transport citrus through the region [Cavitt, 2015; Gernert, 2016]. With the advent of the automobile, the canals never got to serve this purpose—instead their primary role became recreational transportation. Winter Haven's Chain of Lakes are a paramount component of the City's culture and economy. The lakes are used year-round for recreation and lake-centric tourism benefits many local businesses. Similarly, residents and visitors enjoy the lakes for everything from water skiing to seaplane training. Whether it's fishing, boating, water skiing, kayaking, or flying a seaplane, Winter Haven has built its day-to-day life around our lakes, which means caring for them is a critical responsibility.

The Winter Haven Chain of Lakes can be differentiated into a 'North Chain' and 'South Chain'; managed at different levels and separated by a lock system between lakes Conine and Hartridge. The lock system is controlled by the Lakes Region Lakes Management District (LRLMD), a special taxing district originally established to maintain the canals and local boat ramps. The LRLMD also controls surface levels for the 14 Southern Chain of Lakes via a passive control structure at Lake Lulu. The Southwest Florida Water Management District (SWFWMD) manages the surface level of the 9 Northern Chain of Lakes via a series of active water control structures. For the purposes of water conservation and flood control, the SWFWMD sets the maximum desired levels at each of these structures—discharging water to the Peace Creek Canal when surface levels exceed the upper limits [SWFWMD, 2019]. In this system, water flows from west to east toward the terminal discharge point at Lake Hamilton.

The remaining (Interior) lakes have non-navigable flow ways (i.e. pipes and ditches) that allow them to flow either directly to the Peace Creek or indirectly via one of the lake chains. The movement of water through many of these connections is determined by water control structures put in place primarily to maintain the lakes at desirable levels. The control structures can be grouped into active or passive categories. Active structures rely on the deliberate opening/closing of a gating mechanism to allow water to pass through the flow-way at an adjustable level. Whereas passive structures include weirs or pipes set at the lake's maximum desired water level. Passive structures only allow for the overflow of water above that set level. The SWFWMD and LRLMD maintain the majority of structures in the Winter Haven area, however, a couple of passive structures are managed by Polk County (Table 1-1). The canals and connections for these lakes are shown in Figure 1-3.

Control Structure ID	Contributing Waterbodies	Managing Organization	Control Type	Maximum Desired Elevation (NGVD29)
P-5	Lake Henry	SWFWMD	Active	126.0
P-6	Lakes Conine, Haines, Rochelle, Smart	SWFWMD	Active	128.5
P-7	Lake Fannie	SWFWMD	Active	125.5
P-8	Lake Hamilton	SWFWMD	Active	121.25
Lulu-CS	Southern Chain of Lakes	LRLMD	Passive	132.0
Silver-CS	Lake Silver	LRLMD	Passive	146.5
Martha-CS	Lake Martha	LRLMD	Passive	142.0
Maude-CS	Lake Maude	LRLMD	Passive	140.5
Idyl-CS	Lake Idyl	LRLMD	Passive	132.0
Link-CS	Lakes Link, Otis	LRLMD	Passive	128.0
Mariam-CS	Lake Mariam	LRLMD	Passive	124.75
Mariana-CS	Lake Mariana	LRLMD	Passive	137.5
Blue-CS	Lake Blue	Polk County	Passive	148.86
Deer-CS	Lake Deer	Polk County	Passive	138.61

Table 1-1. Control structure elevations, contributing waterbodies, and managing agencies of study area lakes.

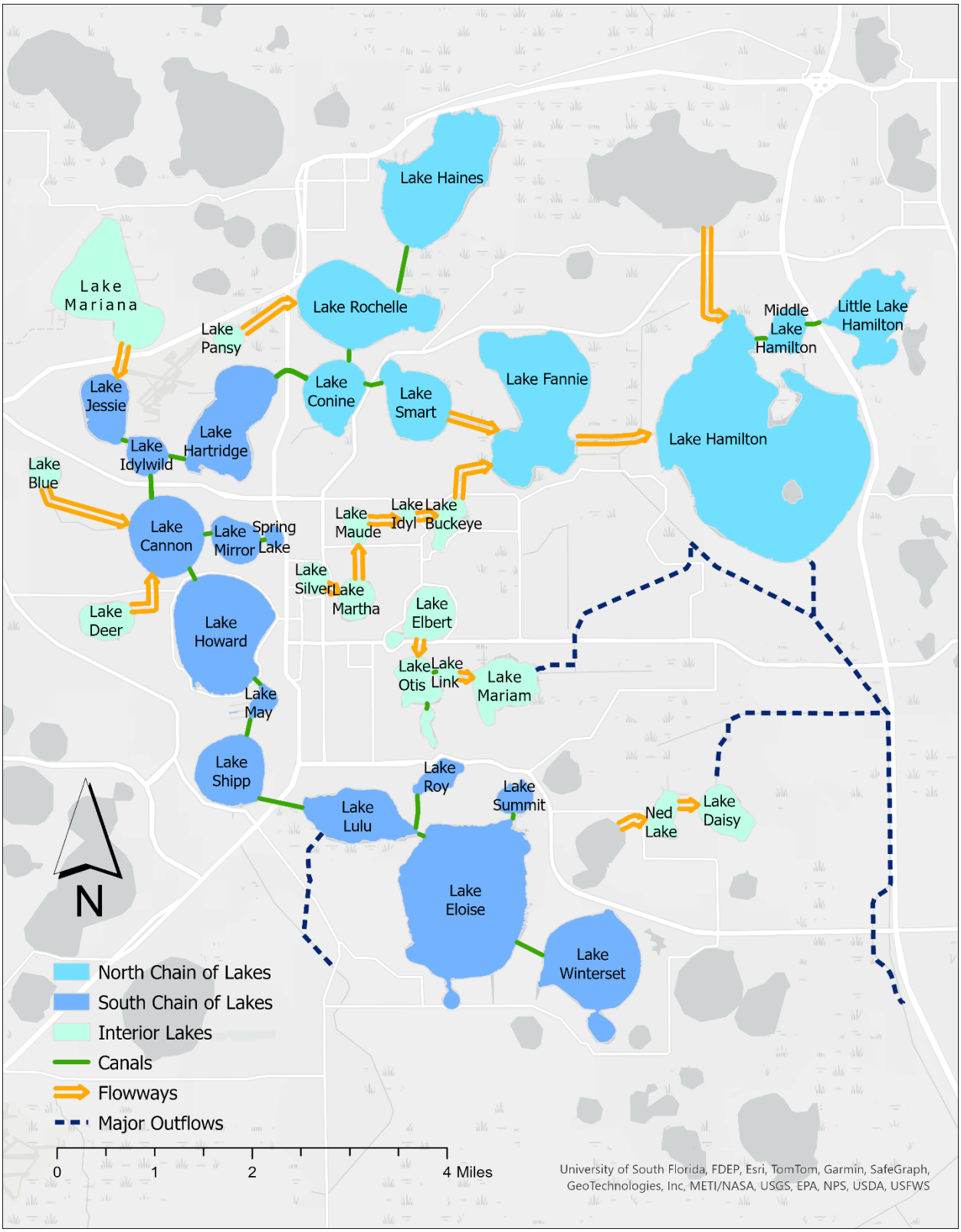


Figure 1-3. Map of Winter Haven Lakes, navigable canals, non-navigable flow-ways, and major outflows.

1.3 Background on the Metrics

Just as a person's physical health relies on multiple factors, so are the facets of lake health built upon complex interactions amongst various components. The focus of this report will be placed on understanding the interactions between and among water quality, hydrology, and ecology.

Water Quality

The term "water quality" refers to a selection of physical and chemical characteristics, parameters, or attributes pertaining to water. Some parameters more obvious to the casual observer include water clarity or color. However, there are myriad less-obvious parameters with examples ranging from the amount of dissolved oxygen to the concentration of metals or other elements in the water column.

An extensive synopsis of every water quality metric studied would be extraneous. For the sake of simplicity, this report focuses on the water quality metrics that are most relevant from a regulatory standpoint—or parameters that are indicative of a lake's ability to meet environmental, human health, or water supply standards. Throughout the remainder of this report, the following core water quality metrics will be used in the City's analysis in the context of overall lake health.

Primary Water Quality Metrics

Chlorophyll-a (Chl-a): *Measured as the concentration of the photosynthetic pigment found in plant and algal cells, Chl-a is used to estimate algal abundance in the water column. While algae is important ecologically, it can become problematic at higher concentrations. Therefore, the goal is to maintain Chl-a concentrations at or below a target threshold and/or lower them over time.*

Nutrients: *Measured as the concentration of total nitrogen (TN) and total phosphorus (TP) in the water column, TN and TP are the primary nutrients that contribute to plant and algal growth. Therefore, a higher concentration of nutrients leads to higher Chl-a levels As a result, the goal is to maintain TN and TP concentrations at or below specified target thresholds and/or lower them over time.*

Water Clarity: *Measured as Secchi depth, or the maximum depth in the water column that light can penetrate. Clarity can be used to represent the amount of both suspended and dissolved matter in the water column. Clarity is often inversely proportional to Chl-a concentrations. Therefore, the goal is to maintain clarity at or above levels consistent with natural lakes in Florida and/or increase clarity levels over time.*

Trophic State & Water Quality

Mentioned above, trophic state is a concept describing a waterbody's level of primary productivity; a term that relates to the amount of plants, algae, and wildlife a waterbody can support. Trophic status is broken down into several classes (Figure 1-4) [USGS, 1998]:

Trophic States

- **Oligotrophic:** *Low productivity*
- **Mesotrophic:** *Moderate productivity*
- **Eutrophic:** *High productivity*
- **Hypereutrophic:** *Very high productivity*

Generally, oligotrophic lakes are clearer, less build-up of organic sediments, and possess less abundance of plants and fish. These types of lakes are rare in Florida, but ubiquitous in the northern US. Eutrophic lakes, on the other hand, are less clear due to increased amounts of organic matter and sediments. These lakes are typically shallower and have higher natural nutrient concentrations—as such they can support more plants, algae, and wildlife. Mesotrophic waterbodies fit the middle ground between these two while hypereutrophic waterbodies are on the extreme high end—often associated with toxic algal blooms, fish kills, and overabundance of nuisance plants.

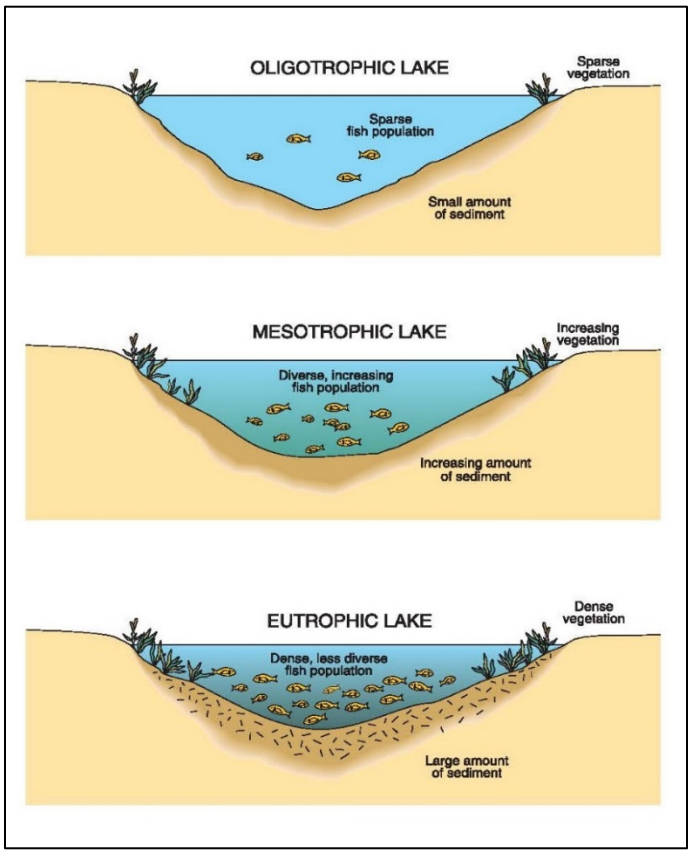


Figure 1-4. Diagram of Lake Trophic States [USGS, 1998].

Eutrophication is the process by which waterbodies increase in trophic state, usually due to human-originated (anthropogenic) factors, like pollution from runoff; although trophic state increases naturally over the geologic timescale. Chlorophyll-a (Chl-a), a measure of algal abundance, is generally used as an indicator for a waterbody's trophic state. Nitrogen and phosphorus, two of the main elements required for plant growth, are the primary drivers of Chl-a increases in the water. Figure 1-5 shows that an increase in total nitrogen (TN) and/or total phosphorus (TP) will generally lead to an increase in Chl-a. Trophic state index (TSI) is a standard metric incorporating chlorophyll and nutrient values into one measure. While it was used as a regulatory water quality metric for a time, TSI was determined to be too simplistic and didn't capture the complex interactions between nutrients and algal concentrations [FDEP, 2013]. For example, due to Florida's naturally high-phosphorus soils, meeting a standard TSI threshold was impossible for many Florida lakes. Instead, Chl-a, TN, and TP are evaluated separately as regulatory water quality metrics. This way localized differences in the lakes can be better accounted for.

Nutrient Cycles

Nitrogen (N) and Phosphorus (P) have been established as the primary drivers of eutrophication, but each is involved in a complex natural cycle within lake ecosystems. Both nitrogen and phosphorus enter aquatic systems through similar external pathways: surface runoff, groundwater infiltration, and atmospheric deposition. Nitrogen is typically present in three forms: organic N, inorganic N, and atmospheric N. Typically, only the inorganic, mineral form of N is biologically available for plants and algae to uptake. Most inorganic N is derived from a microbial process called mineralization that converts it from organic forms. Inorganic N can also be introduced via anthropogenic sources such as fertilizers and wastewater. One of the more important aspects of the nitrogen cycle is denitrification—a process by which soil bacteria in anoxic conditions can convert inorganic N to atmospheric N; effectively removing it from the aquatic environment.

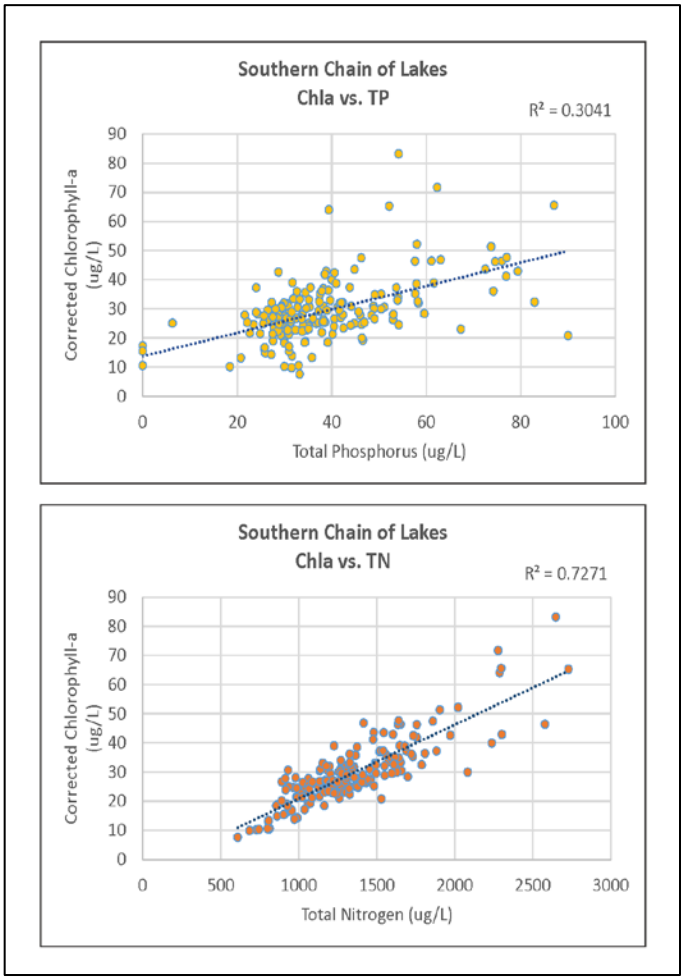


Figure 1-5. Linear Regression of Chlorophyll-a vs. Total Phosphorus & Total Nitrogen

Similar to nitrogen, phosphorus also cycles in and out of inorganic (mineral) and organic forms. Plants and algae uptake mineral P from the water column and sediments and convert it into organic P as it's incorporated into their cellular structure. When plant and algal cells die or are eaten, the remains are left to decompose on lake beds. Bacteria in the sediments convert the organic P to inorganic P which can return to the water column depending on the current phosphorus gradient in the water. This process, called phosphorus flux, can allow large amounts of P to be stored and released over long periods of time—facilitating a continual source of P. Unlike the nitrogen cycle, phosphorus does not undergo a transformation to an atmospheric form; meaning the only effective means to reduce P in aquatic environments is through the physical removal of plants, animals, or sediments (muck removal). Due to the large costs associated with removal, it's often more economically feasible to develop methods to lock phosphorus in an unavailable form or prevent it from entering aquatic environments altogether.

Underscoring the concepts of phosphorus flux and nitrogen mineralization is the concern regarding internal nutrient loading. The presence of legacy nutrients originating from historic wastewater, industrial discharges, or the presence of naturally phosphate-rich sediments can exacerbate eutrophication. These legacy nutrients require special consideration as even a significant reduction of stormwater input may not have much effect on water quality if the majority of nutrient loading originates from the underlying sediments.

Paleolimnology, or the study of historic lake conditions, can provide insights into the trophic state of lakes before human activity. By testing the layers of sediment that have accumulated on the lake floor, inferences regarding historic nutrient and chlorophyll concentrations can be made. Several studies performed on Winter Haven area lakes have shown that several of these waterbodies were naturally eutrophic before human development in the region [Whitmore et al., 1996; Whitmore & Brenner, 2002]. That said, anthropogenic pollution has led to an increase in trophic status and poorer water quality over time.

Regulatory Impairment Evaluation

A major effort by State and Federal environmental agencies in recent decades was the development of an objective set of standards to measure anthropogenic impacts to waterbodies. In 2011, under section 303(d) of the Clean Water Act, the US Environmental Protection Agency (EPA) and the Florida Department of Environmental Protection (FDEP) established sets of Numeric Nutrient Criteria (NNC) for all of Florida's surface waters. These criteria are based on a waterbody's intended use classification and historical water chemistry characteristics. All of the Winter Haven lakes fall under Class III and are therefore subject to NNC impairment thresholds that support recreation and healthy ecosystems. As a result, whether or not a lake is impaired is one of the primary metrics that we use to evaluate lake health.

FDEP Intended Use Classifications

- **Class I**: *Potable Water Supply*
- **Class II**: *Shellfish Propagation & Harvesting*
- **Class III**: *Recreation; Propagation, & Maintenance of a Healthy, Well-Balanced Population of Fish & Wildlife*
- **Class IV**: *Agricultural Water Supply*
- **Class V**: *Navigation, Utility, & Industrial Use*

Impairment: *Threshold concentrations of Chl-a, TN, and TP, set forth by the Numeric Nutrient Criteria, used to determine whether a lake is meeting its intended use classification. Figure 1-6 is a flow chart that explains the impairment determination process.*

As stated, impairment determination also looks at historic water chemistry values. Lakes are initially categorized based on the long-term geometric mean (average) true color and total alkalinity. Color, or the measure of dissolved organic material in the water column, is measured in platinum cobalt units (PCU). High color concentrations can block sunlight, limiting Chl-a concentrations. The presence or absence of wetland vegetation can alter a

lake's natural color concentration. Alkalinity, measured as the amount of calcium carbonate (mg/L $CaCO_3$) in the water, buffers against changes in pH and can affect flux of nutrients in the water column. Generally, lakes with more alkalinity can support more productivity which is why this metric is used to classify lakes. Due to the increased presence of underlying carbonate rock (limestone) in this region of Florida, the majority of Winter Haven's lakes possess relatively high natural alkalinity.

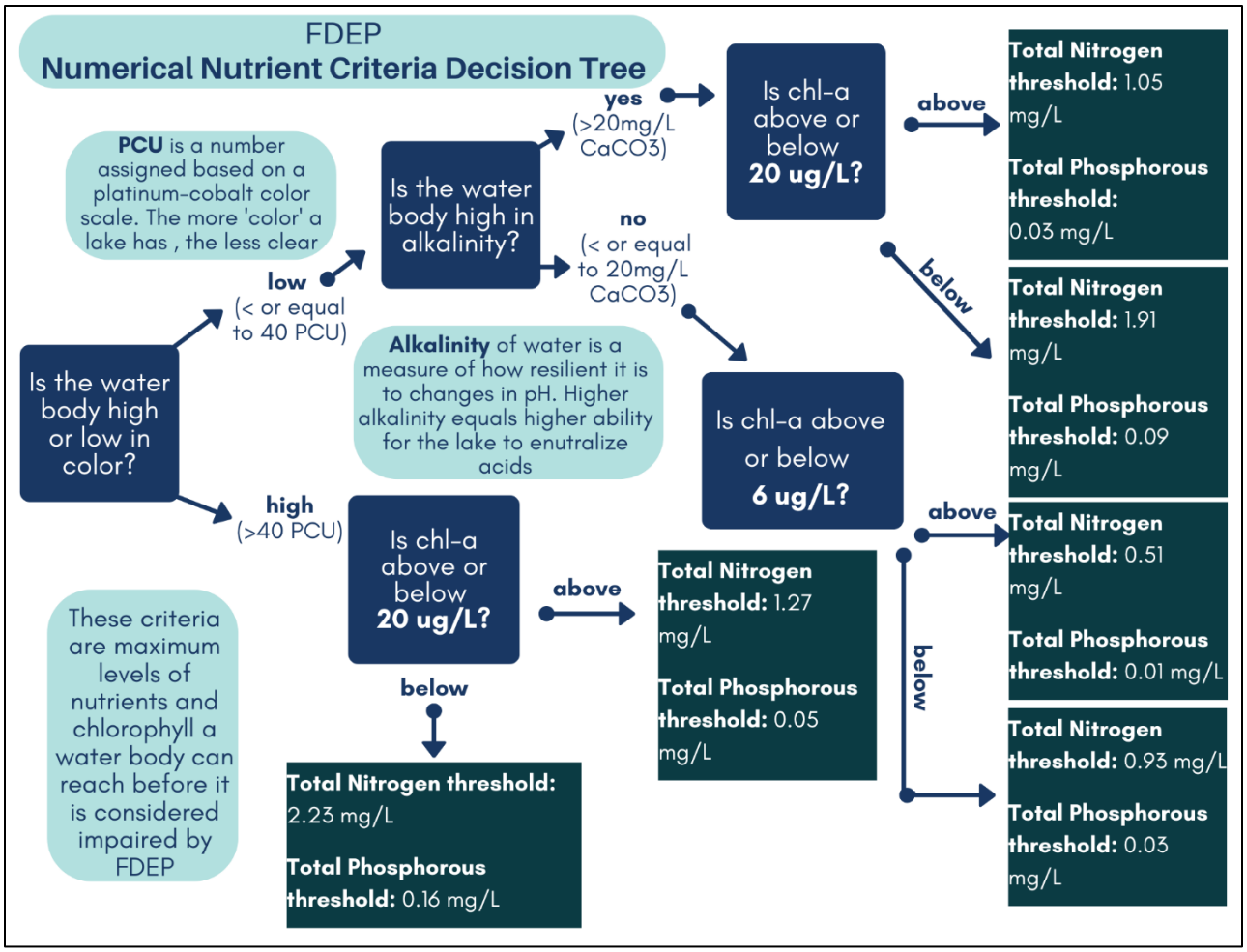


Figure 1-6. NNC Impairment Determination Flowchart

Impairment Response

After a waterbody is determined to have a nutrient impairment, the FDEP develops pollutant reduction goals for government entities that contribute surface water or groundwater to that waterbody. Referred to as a Total Maximum Daily Load (TMDL), the reduction goals represent the total allowable amount of pollutants that can be discharged to a waterbody per day and still meet the intended use. TMDLs are established for the pollutant of concern which is typically the nutrient of impairment, but can also be the limiting nutrient(s). A nutrient is considered limiting if present in lower relative concentrations than other nutrients or if it would be the first to be used up through natural processes. When a limiting nutrient is depleted, plant and algal growth cannot continue

regardless of the presence of other nutrients. Depending on the ratio of nitrogen to phosphorus, a lake may be considered phosphorus-limited, nitrogen-limited, or co-limited. Research shows that the majority of Florida lakes are phosphorus limited or co-limited (by both nitrogen and phosphorus) [Lakewatch 102, 2000]. Knowledge of the limiting nutrient can assist lake managers in determining which management practices to focus on to improve water quality.

In order to establish appropriate nutrient reduction goals that will lead to water quality improvement, the FDEP must estimate the current pollutant loading rate from potential sources (e.g. lbs/year of TP). Point sources refer to discharge from wastewater treatment plants and **M**unicipal **S**eparate **S**torm **S**ewer **S**ystems (MS4s). Nonpoint sources refer to the introduction of pollutants through surface runoff, atmospheric deposition, groundwater, sediments, and any other sources that don't possess a discrete entry point. Modeling pollutant loading rates is explained more in the next section.

Once a waterbody has a TMDL established, the FDEP works with local stakeholders to develop a management plan. Plans include the targeted water quality goals, a timeline for achievement, and a confirmation process for best management practices. This ensures that the managing entities (like the City) are able to meet the intended goals using methods that are scientifically sound, technically and financially feasible, and in a timely manner.

Tracking water quality trends is critical to lake management. For impaired waterbodies, it helps lake managers know whether their strategies are being effective. Whereas, for waterbodies that are meeting the water quality targets, it can warn of potential future issues that managers can work proactively to correct. It is for these reasons that the City considers water quality trends a critical lake health metric.

Water Quality Trends: *The long-term changes in Chl-a, TN, TP, and Clarity. Trend analysis uses statistical analysis to determine direction (up or down), magnitude (how much are levels changing), and significance (validity of the trend).*

Hydrology

Hydrology is the study of the pathways that water takes through our environment. Water's journey is long as it travels the Earth through different pathways. The way water enters, leaves, and interacts with our lakes plays a large part in their overall health. The following metrics are the primary hydrologic response variables and characteristics that are assessed by the City and other environmental agencies. While the metrics listed below are not direct indicators of lake health, they are useful for determining underlying causes of poor water quality and/or biological health. In addition, management practices can be tailored to specific waterbodies based on their unique hydrologic characteristics. In the health and wellness analogy, hydrology is akin to a patient's medical history and genealogy—things that cannot be changed, but can point to underlying issues that can be managed.

Primary Hydrologic Metrics

Surface Level: *The elevation of a waterbody's surface measured in feet above sea level. Also known as lake stage, surface level changes over time in response to environmental stimuli such as precipitation (rainfall) and groundwater flows.*

Groundwater Level: *The elevation of groundwater surface measured in feet above sea level. There are two major types of groundwater in peninsular Florida. The surficial aquifer or water table and the confined aquifer.*

Drainage Characteristics: *How water enters and leaves a given waterbody from its surrounding drainage basin. This includes precipitation, land use, soil types and surface runoff potential (imperviousness), this information can even be used to model the rate of pollutant loading.*

Precipitation

It is important to start off with the primary driver of Winter Haven's hydrology—precipitation (i.e. rainfall). Due to Winter Haven's elevation on Florida's central ridge system, its lakes sit at the top of a watershed. This means that all water naturally flows downstream away from the lakes. With no rivers imparting flow to the area, rainfall remains the only water input for the region. As a result, the amount of rainfall received is responsible for fluctuations in lake levels and for maintaining the capacity of groundwater reservoirs.

Precipitation enters lakes either directly or via surface runoff from the surrounding land (i.e. stormwater). The total area that contributes stormwater runoff to a waterbody is referred to as its drainage basin. In a natural system the effective drainage basin of a lake is relatively small. The lack of impervious surfaces (e.g. roads and buildings) and stormwater infrastructure (i.e. pipes and ditches) cause much of that surface flow to seep into the ground before it reaches the lake. Land development increases both impervious surface area and the drainage basin size, causing issues such as more extreme surface level fluctuations as well as increased pollutant loading in lakes. However, these impacts can be mitigated by creating open spaces for water seep into the ground. Stormwater that infiltrates into the ground is then referred to as groundwater.

Groundwater

There are two primary tiers of groundwater in Florida: the upper layer known as the surficial aquifer, and the deeper Floridan aquifer that is confined under a layer of impermeable clay. Measurement of the elevation above sea level of the upper surface of each aquifer is the accepted method for determining their current water quantity. The surficial aquifer level, referred to as the water table, generally fluctuates readily based on rainfall, soil saturation, temperature, and humidity. The Upper Floridan Aquifer is confined under pressure. As a result, its level is measured as the potentiometric surface, or the level at which water will rise in a well pipe due to the pressure exerted on it. Where there are breaks or perforations in this confining layer, water can be exchanged with the surface. Fluctuations of both the surficial and Upper Floridan levels can significantly impact lake surface levels (Figure 1-4). In locations or during periods of time where the aquifer levels are high, water may flow to the surface via the bottom of lakes. Naturally, the opposite occurs when the water table and potentiometric surface are low.

One less frequently discussed component of hydrology is lake morphology or the size and shape of a waterbody. The depth and slope of a lake bed can provide insights into how it reacts to changes in groundwater. For example, a deeper lake may have a more direct connection with the aquifer and would more quickly gain or lose water due to potentiometric changes.

The Upper Floridan Aquifer is the sole municipal water source for the City of Winter Haven. As one of the fastest growing metropolitan regions in the Country [US Census Bureau, 2018], the potential hydrologic impacts of water use must be considered for both the ecological outlook of our lakes and the future of our drinking water supply. The primary hydrologic strategies for this area include promoting rapid recharge of the Floridan aquifer and the long-term storage, treatment, and slow infiltration of stormwater in areas where fast recharge isn't feasible.

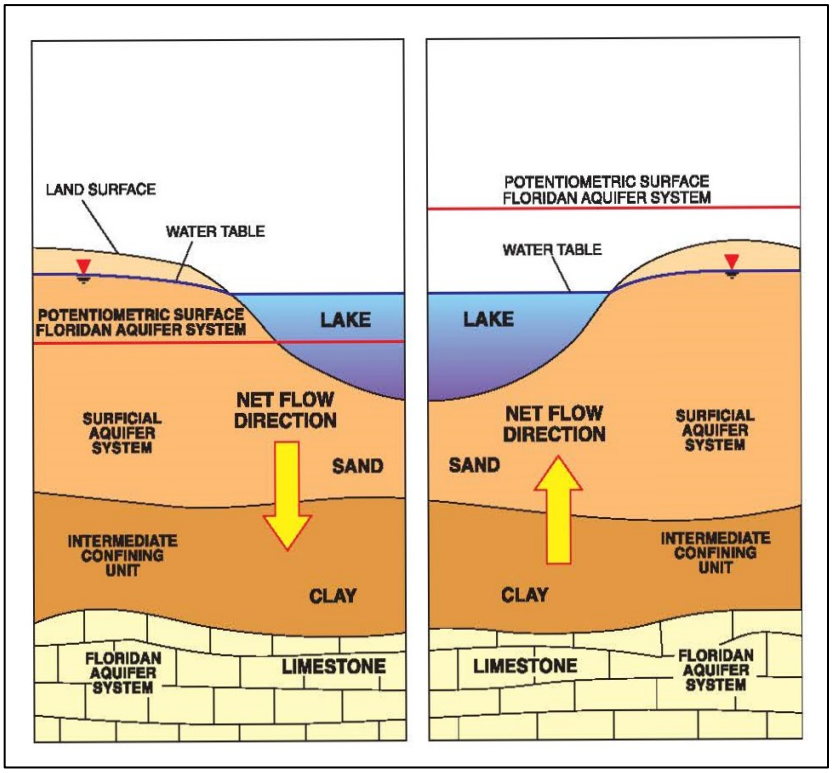


Figure 1-4. Diagram of Groundwater Interactions.

Soil Characteristics

The types of soils found in lake drainage basins can significantly impact the infiltration rate of stormwater. The United States Department of Agriculture (USDA) has classified soils into several hydrologic groups based on sediment types (e.g. sand, clay, loam) and their respective water infiltration rates. This information has been used in site development planning and engineering across the country since the early 1900s. Environmental scientists can also utilize soil data to determine how quickly water can percolate into the groundwater system.

USDA Hydrologic Soil Groups

Group A: *Soils consisting mostly of excessively drained sands or gravel with a high infiltration rate when thoroughly wet.*

Group B: *Soils consisting of moderately well-drained course or fine texture sediments with a moderate infiltration rate when thoroughly wet.*

Group C: *Soils consisting of fine textures having a layer that impedes the downward movement of water with a slow infiltration rate when thoroughly wet.*

Group D: *Soils consisting chiefly of clays or clay layers near the surface or over nearly impervious material with a very slow infiltration rate.*

Dual Groups: *(A/D, B/D, C/D) Mixed soils with no dominant type where the designation applies to their status when 'drained'/'saturated'.*

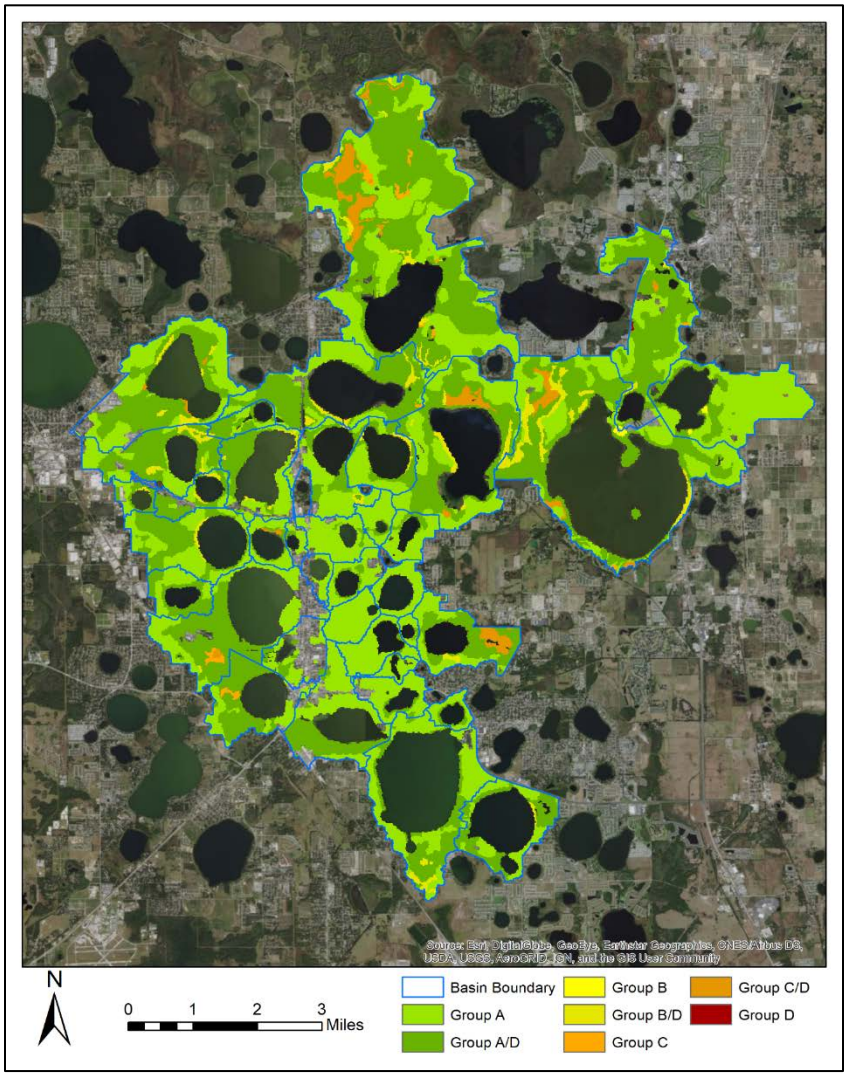


Figure 1-5. Hydrologic Soil Groups of the Winter Haven Lakes.

The proportion of each soil group making up a given lake drainage basin can indicate the infiltration potential within that basin. This information can also be used to determine adequate locations for management practices that promote groundwater recharge or treatment of stormwater. The majority of the Winter Haven area consists of Class A or A/D soils. However, notice that the proportion of poorly-drained soil types increases

further from the downtown area (Figure 1-5). It can be inferred that stormwater infiltration BMPs will be more effective in the City center with surface water storage/treatment practices being relegated to the less well-drained lower elevations at the periphery of the downtown area.

Drainage/Pollutant Modeling

Pulling together the previously mentioned drainage characteristics can yield insights into the amount of stormwater and pollutants entering a lake. This process is referred to as stormwater modeling. Modeling stormwater flows is the basis for the TMDL targets mentioned in the water quality section, but the process can also be useful in pinpointing pollution sources in a drainage basin and helping lake managers prioritize drainage projects.

There are various methods and tools that lake managers use to model stormwater and pollutant loads. The 'Simple Method', developed by Thomas Schueler in 1987, is an EPA approved model that utilizes rainfall volume, soil type, impervious area, and land use to estimate the annual load of various pollutants such as TN, TP, suspended solids, and heavy metals [Schueler, 1987]. Tied to each land use are average impervious percentages to determine runoff rates as well as event mean concentrations (EMCs) which denote average loading rates for each pollutant for a given storm event size. The result of this modeling work is the ability to estimate annual pollutant loads from a delineated drainage basin. In Figure 1-6, differences in land use types and impervious percentages result in drastically different TP loading rates.

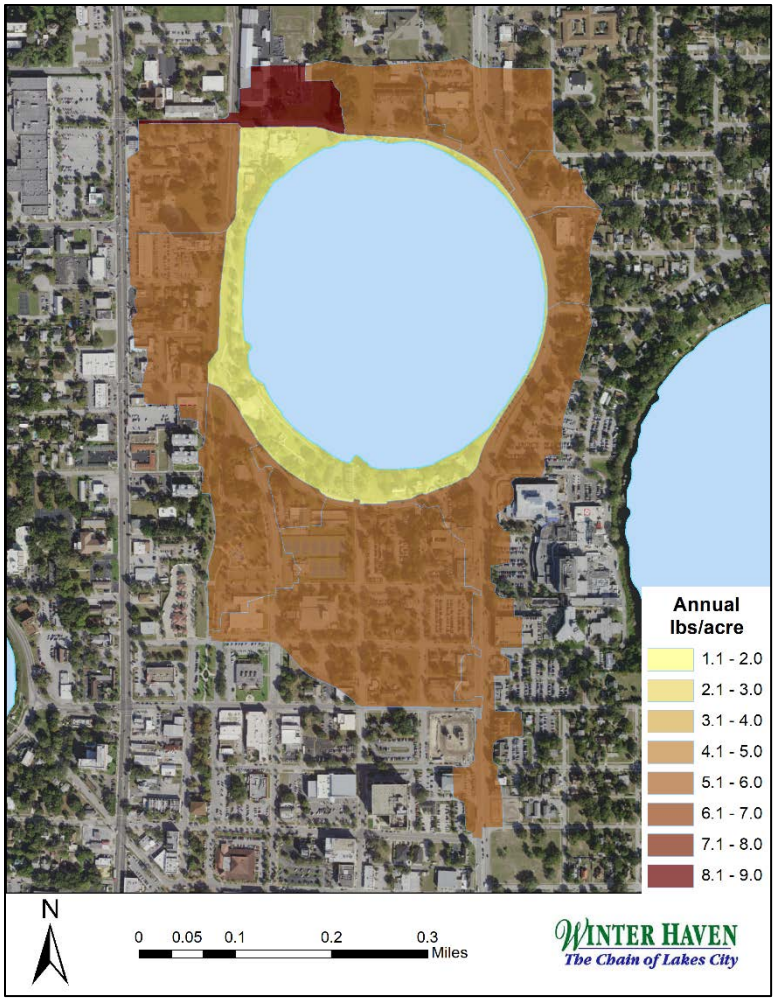


Figure 1-6. Annual Total Nitrogen Loads to Lake Silver in lbs/acre.

The calculated loading rates displayed here are raw values that exclude nutrient load reductions from stormwater best management practices (BMPs). There are numerous privately owned BMPs within each drainage basin, however the estimated load reduction they confer is not always documented. The City's Unified Land Development Code

requires a match of pre and post-development runoff rates and volumes [City Code § 21-161]. By design, these BMPs capture the majority of runoff. However, many parcels that were developed before the initiation of these ordinances have no stormwater management BMPs implemented. By identifying where raw pollutant loads are highest and where there are no documented BMPs, staff can pinpoint specific areas where new stormwater practices will have the greatest effect. This strategy is most effective in Winter Haven's urban center where aging stormwater infrastructure and high density of impervious surfaces funnel untreated stormwater directly to lakes. The City actively installs stormwater management practices that capture, filter, or infiltrate runoff in downtown areas lacking existing infrastructure. Additionally, City officials review development projects and recommend these types of practices on private properties.

As previously mentioned, groundwater can also be a contributor of pollutants if there are potential sources within a lake's drainage basin. Leaky Onsite Sewage Treatment & Disposal (OSTD), aka septic systems, near a lake could be contributing to water quality issues. While the density of OSTDs within a basin doesn't provide concrete evidence of this, considering septic as a potential nutrient source can lead to exploratory studies as confirmation. This is just one component to consider when developing a water quality improvement plan.

Ecology

Ecology is a subsection of biology that focuses on the study of living organisms and their interactions with one another and their environment. An understanding of these biological communities is necessary to meet the intended use requirements for Class III waterbodies; that is, maintenance of a healthy, well-balanced population of fish and wildlife.

One of the main components of any ecosystem is the presence of primary producers (i.e. plants and algae). These photosynthetic organisms provide multiple benefits for the aquatic environment. Management of non-algal plants, or macrophytes, ensures that their populations remain healthy and well-balanced. The quantity and quality of vegetation in a waterbody can respond to and impact the response of both hydrologic and water quality metrics. In addition, a healthy plant community will also provide habitat and food sources for fish and wildlife. It is for this reason that the City decided to focus on aquatic vegetation as a vital component of lake health.

Primary Ecological Metrics

Biological Abundance: *The quantity of vegetation growing in a waterbody can be estimated through the use of remote monitoring methods. Percent area coverage (PAC) and biological volume (BV) represent the respective 2-dimensional and 3-dimensional quantification of plant matter relative to a waterbody's size.*

Species Composition: *Ecological surveys are performed to estimate the overall population of aquatic plants in each lake. A count of each species present during a survey allows for the evaluation of diversity, dominant taxa, and the presence of harmful invasive species.*

Species Diversity: *Species diversity is a measure of the overall richness (number of unique species) and evenness (relative species proportion) of a lake's biological community. Multiple indices are used to evaluate overall diversity.*

Aquatic Plant Types

Of the different types of primary producers in aquatic environments, both microscopic algae and macrophytes (large aquatic plants) fill a similar ecological role as producers of oxygen and a food source for organisms higher on the food chain. A healthy balance of each is necessary for a functioning, diverse aquatic community. However, macrophytes provide additional ecological benefits such as their role as habitat for aquatic fauna. Based on their various fundamental growth strategies, aquatic macrophytes are separated into several categories: submerged aquatic vegetation (SAV), emergent aquatic vegetation (EAV), floating leaf vegetation (FLV), and free-floating vegetation (FV) (Figure 1-7). A full list of commonly occurring plant species in the area, with links to images, is provided in Table 4-9 (in the appendix).

Submerged plants grow completely under the water's surface and are usually rooted in the benthic sediments. Since the main body of the plant is supported by water, SAV isn't hampered by the energy requirements needed to develop rigid support structures to keep them upright. Due to this, SAV species typically grow relatively quickly. However, this

evolutionary strategy ties the growth of submerged plants to the availability of sunlight—meaning that water clarity, lake morphology, and surface level can significantly impact available real estate where SAV can grow. Common examples of SAV in our lakes include eelgrass (*Vallisneria americana*) and the invasive species hydrilla (*Hydrilla verticillata*).

Emergent plants are similar to SAV in that they are rooted in the benthic substrate, however, the main photosynthetic body of the plant grows above the water's surface. This adaptation negates some of the issues associated with light availability, but these plants must put more energy into structural components that allow them to rise above the surface. In addition, the growing depth of EAV is limited by the capacity to transport oxygen and nutrients to their root systems—meaning that most species are relegated to the shallow margins of lakes. Duck potato (*Sagittaria lancifolia*) and cattail (*Typhus spp.*) are a couple examples.

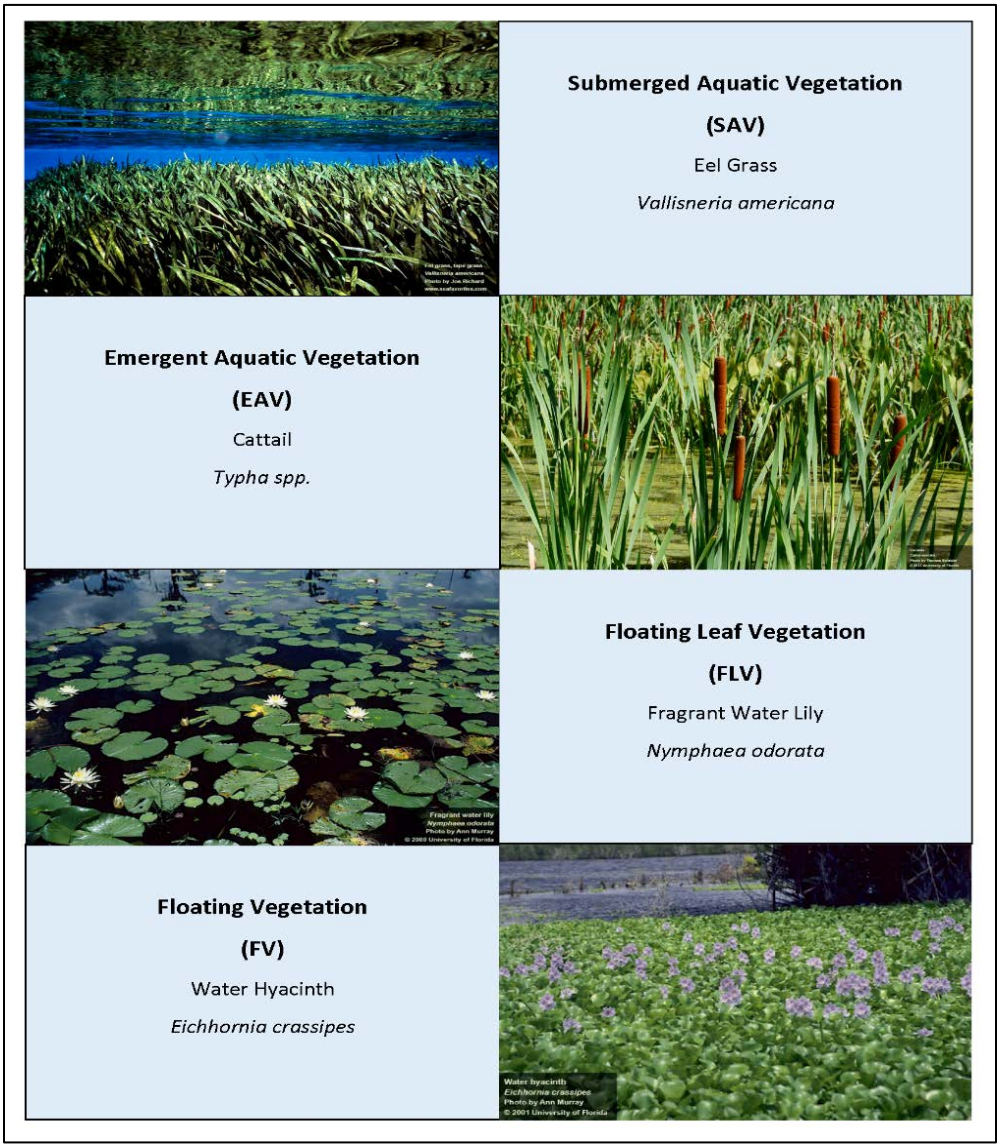


Figure 1-7. Examples of Aquatic Vegetation Categories.

Floating leaf plants (FLV) are a subcategory of emergent vegetation that behave very similarly to EAV, but present a unique habitat type for fish and wildlife. Like other rooted plants, they are restricted to the shallower margins of lakes. However, their floating leaves provide cover from sunlight which restricts the growth of SAV below them. Often, floating leaf plants will form dense stands that can be an impediment to navigation in shallow waterbodies. Common species of FLV include fragrant water lily (*Nymphaea odorata*) and Spatterdock (*Nuphar advena*).

Floating plants are unique in that they have evolved beyond the need to root into the underlying substrate. To prevent them from sinking, most are small in size while some species possess adaptations that create buoyancy. The ability to float negates many of the challenges that SAV and EAV must contend with. Because of this, some of the most prolific invasive or nuisance plant species in Florida are floating plants. Examples of FV species are water hyacinths (*Eichhornia crassipes*) and duckweeds (*Lemnoideae spp*.).

Vegetation Abundance

The areas of saturated or inundated ground along the peripheries of some lakes can support emergent vegetation. These areas, known as wetlands, are a unique habitat area that many species of wildlife rely on. Wetlands can act as a pollutant sink and a source of beneficial chemical components [USEPA, 2015]. Surface water that comes into contact with wetland areas deposits sediments, nutrients, and other contaminants. Also, most forested wetlands provide a source of dissolved organic compounds that impart color to the water column. Figure 1-8 illustrates the correlation between surface level and true color in a system with a surrounding wooded wetland area and one without significant wetlands. Lake Haines, with its dense surrounding wetlands, elicits a much stronger relationship between surface

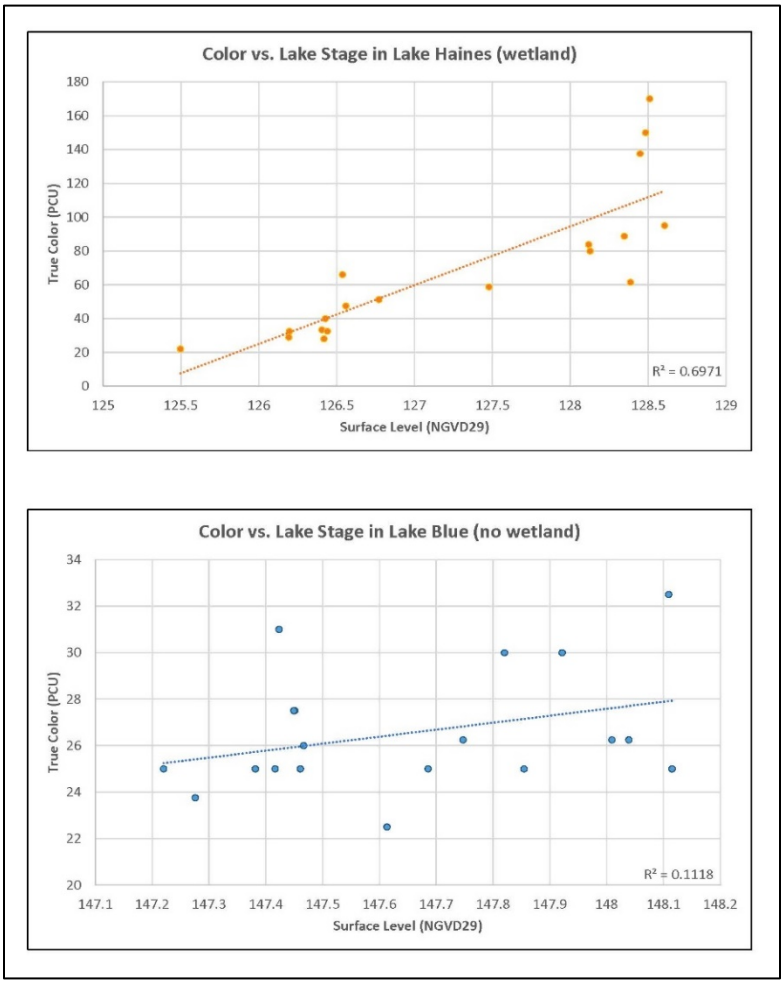


Figure 1-8. Correlation between Wetlands and True Color in Lake Haines & Lake Blue.

level and color than Lake Blue which lacks any substantial forested wetland area. Reductions in wetland connectivity through land development or surface level alteration can diminish these benefits. Identification and restoration of historic wetland connections is one management strategy that can be employed to improve water quality.

The area within a lake that can support the growth of rooted aquatic vegetation is referred to as the littoral zone. Taking into consideration the growth habits of SAV, EAV, and FLV, the size of the littoral zone is determined by lake morphology, water clarity, and the unique requirements of the species of plants that inhabit it. A strong network of rooted plants contribute to the stabilization of the benthic sediments in lakes [Barko & James, 1998]. Therefore, it can be inferred that greater area of rooted vegetation generally equates to lower potential suspended sediment concentrations.

One additional benefit of SAV in lakes is their increased capacity to uptake nutrients directly from the water column compared to other growth patterns [Denny, 1980]. Monitoring the total quantity of SAV can help determine a lake's ability to buffer against changes in nutrient concentrations. The use of SONAR mapping technology allows for the 3-dimensional quantification of SAV. In addition to measuring the areal coverage of aquatic plants, SONAR mapping can determine the volume of the water column taken up by plant matter. Both measures are used to evaluate the vegetation abundance in Winter Haven's lakes.

Percent Area Coverage (PAC): The percentage of a lake area taken up by rooted aquatic vegetation. Lake managers suggest maintaining PAC of at least 15% for most Florida lakes.

Biological Volume (BV): The volume of aquatic plant mass measured as a percentage of the total lake volume. Generally, a higher BV equates to better water quality.

Vegetation Diversity

Species diversity is a complex metric that takes into account the number of species present (richness) as well as the relative proportion of each species (evenness). Since each individual plant can't feasibly be counted, scientists can use a variety of survey methods to identify what a representative sample of the overall population looks like. Using a point-intercept method to sample regularly spaced points across a lake's area, the City can record not only the estimated number (frequency) of each species but also their relative spatial distribution.

Using frequency data, we can identify a waterbody's dominant species, proportion of each plant category, and gauge the relative distribution or evenness of the species present (Figure 1-9). The resulting scores, referred to as diversity index values can be used to evaluate the health of vegetation communities. Ecologically, a diverse and evenly distributed population is a healthy one. As an example, a lake that is dominated by one or two species is at a substantially greater risk of collapse than one with numerous, equally abundant species. Common sources of collapse include climatic changes, pests, diseases, as well as competition from invasive species. Since species diversity is such a complex metric, no single index can adequately represent diversity in all cases. Moreover,

some indices make assumptions regarding the population being studied and are applicable only in specific scenarios. For the intents and purposes of this study, the following indices were chosen to compare the changes in vegetation communities over time and not for comparing the diversity of one lake to another: **[Ludwig & Reynolds, 1988]**

Richness: known as *Menhinick's richness index, represents the number of unique species sampled in a given site or area. This index is reliant upon sampling effort, therefore it is useful only for comparing richness of the same site over time (assuming sample size remains constant).*

Evenness: *One of many popular indices that represent how evenly the species in a population are distributed. This index ranks a sample from 0 – 1 where the index value approaches 1 when all species are present in equal proportions.*

Diversity: *Referred to as Shannon's Diversity Index, this metric incorporates concepts of richness and evenness. This index represents the level of uncertainty of sampling the same species multiple times in a row; as such, this value increases as a population becomes more diverse.*

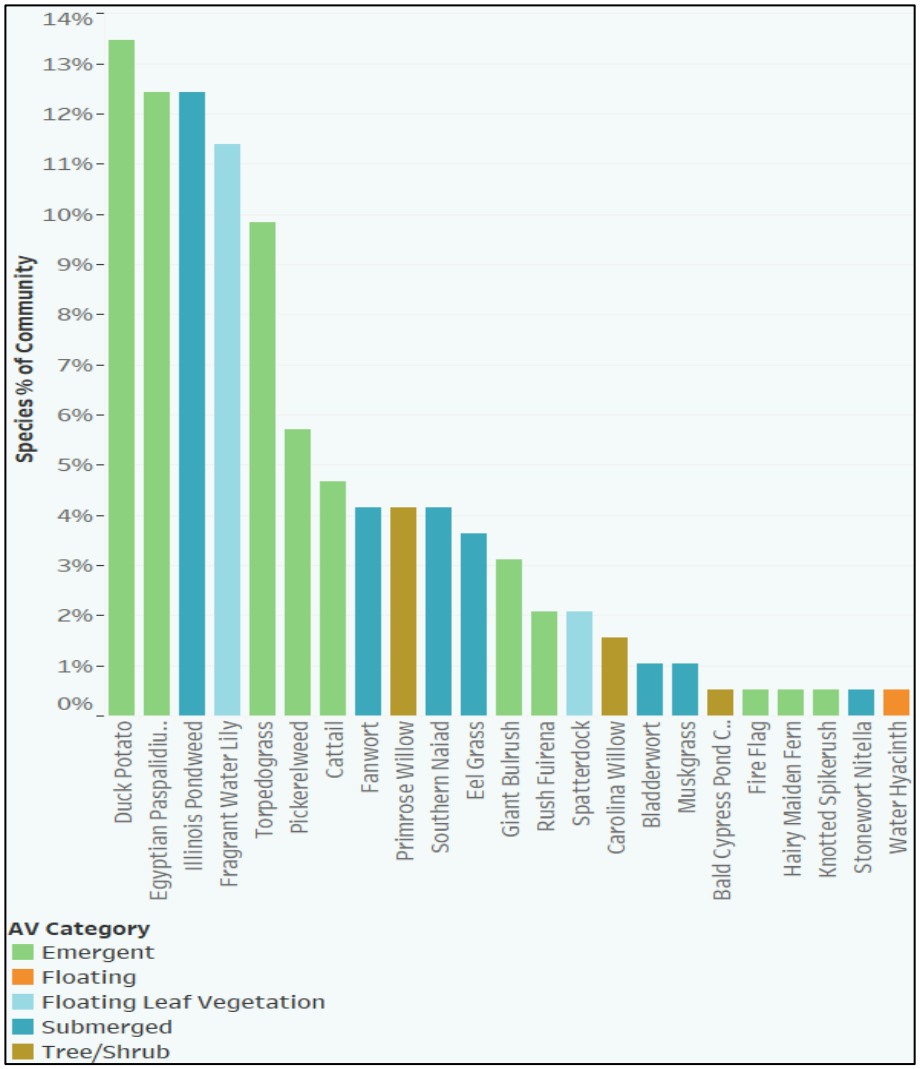


Figure 1-9. Species Frequency Chart of Aquatic Vegetation in Lake Howard (2023).

In the realm of vegetation management, knowing where a given species is located is equally as important as understanding the community dynamics of the local population. Where a particular plant species is commonly found can provide information about its optimal growing conditions (e.g. light, depth, or substrate). It can also be used as a handy method for tracking invasive species such as hydrilla and water hyacinth. These plants have few natural checks that would limit their growth in this region and can outcompete most natives; often to the detriment of navigation and ecological diversity.

Invasive Species Presence: Measured as the percentage of the total aquatic vegetation community comprised by ecologically or economically significant invasive species. Ideally, invasive presence is maintained at or as close to zero as possible.

The City of Winter Haven manages invasive aquatic plants along City-owned shorelines and provides support to the organizations that manage aquatic plants in the lakes proper. The Florida Fish and Wildlife Commission (FWC) is the jurisdictional governing body overseeing aquatic plant management in state waterbodies. Through funding and guidance from FWC, Polk County assists in the treatment of invasive plants in this area using various methods including herbicide, mechanical removal, and biological controls. Each of these management methods carries benefits and detriments.

By far, the most common strategy is herbicide due to its cost effectiveness and ability to target specific types of plants. However, the death and subsequent decomposition of plant matter left in a waterbody releases excess nutrients in the water column—leading to water quality declines. Mechanical removal strategies help to limit this nutrient release, but methods are slow, more costly, and difficult to target individual species or plants when intermixed. Last, biological controls, like grass carp, can be useful strategies. That said, results are mixed as the animals lack species-specific targeting and cannot be controlled. Moreover, overstocking can have disastrous effects on native plant communities. As a result, these strategies are typically used to supplement more controllable practices, like herbicides.

Regular vegetation monitoring allows staff to track invasive plant populations so that treatment efforts can be prescribed. Specific percentage thresholds have been established to describe the level of invasive species infestation in a lake. A complete lack of invasives is the obvious target. However, since it is functionally impossible to completely and permanently eradicate most invasive species, a maintenance state (invasives making up less than 2.5% of the total vegetation community) is preferred. Large-scale infestations (over 10% of the total community) is considered failing according to this metric. Ultimately, the best strategy to counter many of these negative outcomes from management is minimizing treatment efforts as much as possible. This is accomplished through early detection and rapid treatment response.


#2 | Management Strategies

Summary

One of the primary challenges of managing dozens of lakes spanning both urban and rural areas involves balancing the diverse needs of the various lake user groups while addressing the unique challenges associated with each lake or watershed. A single management practice or approach will not be effective in all scenarios. One of the first steps in developing a management strategy is to gain an understanding of which practices are available and applicable in addressing a given issue.

To that end, management practices are often categorized based on what aspects of lake health they seek to maintain or improve. Practices that improve water quality should seek to reduce algae or pollutant concentrations. Hydrologic strategies should incorporate groundwater recharge or surface water storage components to maintain or restore natural hydrologic processes. Strategies aimed at ecological improvement should help to improve fish and wildlife habitat either through the creation of new habitat or by the restoration of disturbed areas. Further, the primary purpose of some practices is to increase awareness of environmental issues and to promote public engagement and stewardship of our natural resources. This last category is important since widespread adoption of pro-environment practices by citizens can be more effective than individual projects implemented by a government agency. In many cases, a single practice is able to address multiple lake health aspects.



The City's Natural Resources team is constantly reviewing the effectiveness of practices the organization currently utilizes while also researching new and innovative solutions applicable to our lakes. The following section details many of the City's management strategies with a brief description of the practice itself and explanation for which aspect(s) of lake health it addresses. Furthermore, this section of the report details strategic goals for each management strategy that helps demonstrate how staff plan to implement these practices in the future.

Additionally, it is critical for the management strategies to be consistent with the mission, goals, and values of the organization implementing them. In 2024, the City of Winter Haven adopted its Strategic Plan which established a comprehensive framework to guide all City policies, operations, and decision-making over the next five years (Figure 2-1). The plan describes six pillars that comprise the City's vision for a sustainable, vibrant, and inclusive future: economic sustainability, quality of life, infrastructure, environmental

stewardship, community safety, and responsible government. Each of the management strategies detailed in this section should align with one or more of these pillars. This ensures that all of Winter Haven's lake management actions work within the framework approved by the government and its citizens.

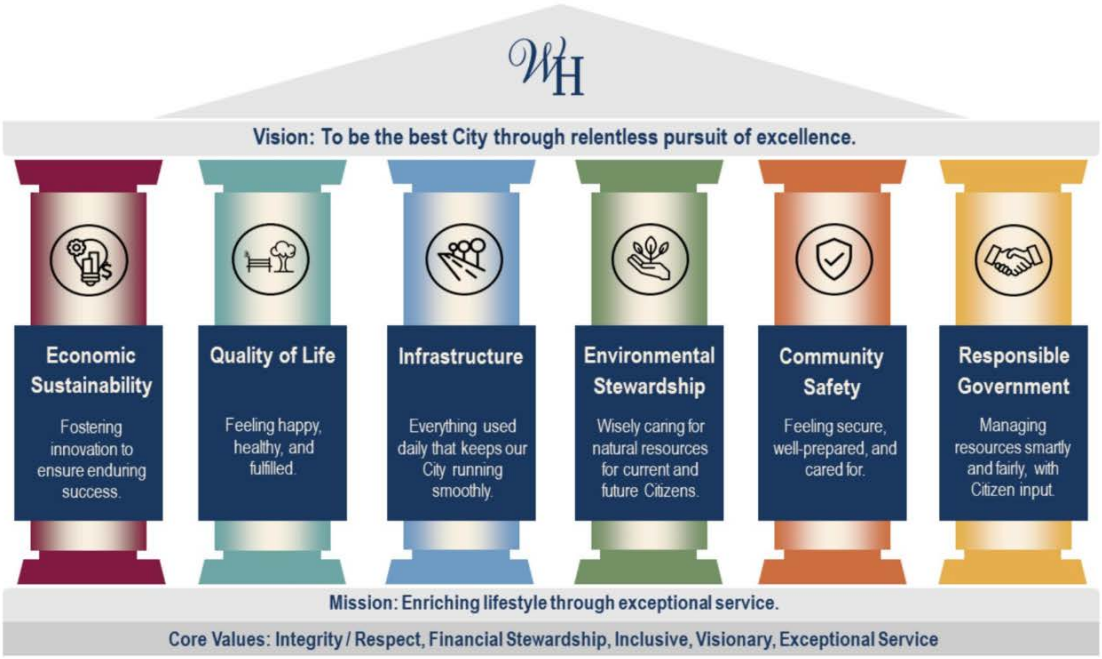


Figure 2-1. Diagram of the Winter Haven Strategic Pillars

Environmental Monitoring

Summary:

Environmental monitoring encompasses the Natural Resources Division's data collection programs as they relate to the lakes and their health. These include water quality sampling, surface level and groundwater level tracking, and aquatic vegetation surveying. The information gathered through these monitoring efforts helps guide the City's management decisions. Since so much of this data appears in the annual Lakes Report, these monitoring efforts not only address the water quality, hydrology, and ecology aspects of lake health, but public engagement as well. Therefore, this particular management strategy lies at the heart of the Division's purpose, mission, and vision. The individual monitoring efforts are described more below:

Aquatic Vegetation Monitoring

Aquatic vegetation monitoring (AVM) is a methodology employed by the Winter Haven Natural Resources Division to regularly assess plant abundance and diversity in City lakes. This protocol is based on a survey process developed by the Florida Fish and Wildlife Commission (FWC). Utilizing sound navigation and ranging (SONAR) technology, the Division is capable of measuring the amount of vegetation in the water column. Percent area cover and biological volume make up the vegetation abundance metrics obtained through SONAR mapping (Figure 2-2). In addition, the Division performs point-intercept sampling; identifying the species present at regularly spaced points across a lake to provide a representative sample of plant diversity. This

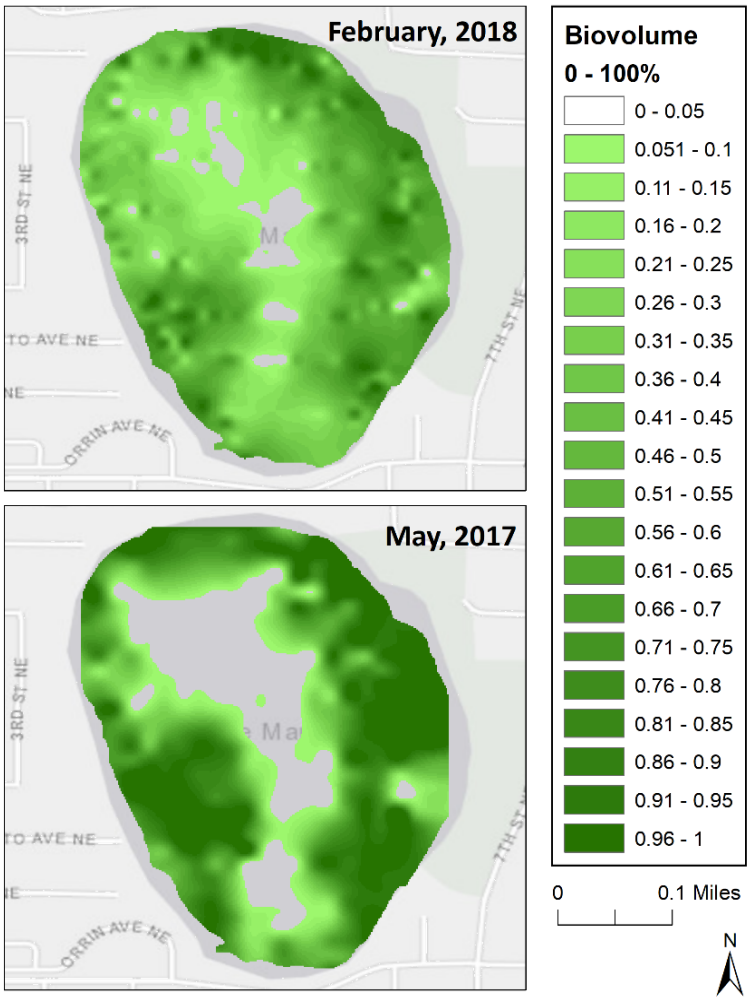


Figure 2-2. Biovolume heat map of Lake Maude. Color scale represents percent of water column occupied by plants.

information is also shared with partner agencies, such as Polk County and the Florida Fish and Wildlife Commission (FWC) to assist with invasive plant management efforts.

Hydrologic Monitoring

Hydrologic monitoring is a practice that provides information on the quantity and movement of water in an area. Collection and analysis of rainfall, surface water, and groundwater data allows the City to build a better understanding of the relationships amongst these parameters as well as their impacts on lake health and municipal water supply. The Natural Resources Division and Utilities Department work together to obtain this data through a network of weather stations, monitoring wells, and surface level gauges located throughout the City. Surface level, rainfall, groundwater, and streamflow data collected by Polk County, the Southwest Florida Water Management District (SWFWMD) and the Lake Region Lakes Management District (LRLMD), is also incorporated into the City's analysis. This data is also used in hydrologic models that can help identify areas of potential flooding and/or higher pollutant loading due to differences in soils and land use.

Water Quality Monitoring

Water quality monitoring involves collecting and analyzing the chemical properties of surface and groundwater. This includes physical properties like dissolved oxygen, pH, and temperature; as well as concentrations of pollutants of concern like chlorophyll-a, nutrients, and other heavy metals. The City relies heavily on outside parties like the Florida Department of Environmental Protection, Polk County, and the volunteer-based Lakewatch program to gather water quality samples—mostly due to funding and staffing constraints. Utilizing these publicly-available data, the City is able to devote more time and effort to statistical analysis; allowing for impairment determination and water quality trend tracking. That said, the City does conduct some water quality sampling such as when evaluating the effectiveness of municipal stormwater or water quality projects or tracking the presence of forever chemicals (e.g. PFAS) in our lakes.

Support of City Pillars:

Environmental Stewardship

Goal 4.3: Continue to monitor lakes and implement proactive strategies for lake management. *Data collected through monitoring efforts drive management strategies to improve lake health. Both the data and these strategies are published in the annual Lakes Report.*

Strategic Goals:

- Continue aquatic vegetation, hydrologic, and water quality monitoring efforts for analysis in the annual lakes report and to guide management efforts.
- Stay up to date on new and innovative research, methods, and technologies; such as aerial and satellite imaging, AI-based analysis tools, plant tissue nutrient content analysis, and automated hydrologic monitoring equipment.
- Maintain close working partnerships with state and local environmental agencies.

Green Stormwater Infrastructure



Summary:

Green stormwater infrastructure (GSI) is a term referring to stormwater management practices that incorporate natural processes to capture and filter runoff. Traditional, or "gray", stormwater infrastructure relies on impervious materials, gutters, and pipes to transfer runoff from one area to another. The primary purpose of gray infrastructure is to prevent flooding by diverting runoff, as well as any pollutants, directly to lakes or stormwater ponds. In contrast, green infrastructure works to slow runoff rates, promote natural hydrologic processes like evaporation and groundwater infiltration, and filter pollutants using the nutrient sequestration capacity of plants.



Figure 2-3. Photo of a raingarden capturing runoff and road debris in downtown Winter Haven.

Infiltration GSI

The purpose of these types of GSI practices is to capture sediments, heavy metals, and other solid debris during the first flush of a rainfall event, preventing it from entering waterbodies at the "end of the pipe". Taking advantage of well-drained soils to promote infiltration, flooding along roadways can be reduced during 1-year to 10-year storm events. Planting of appropriate vegetation can also allow for nutrient uptake while also beautifying the urban landscape. Under the right soil conditions, these types of GSI can be utilized in lieu of conventional stormwater practices; often occupying smaller footprints than traditional stormwater ponds while providing improved pollutant capture. The common types of infiltration GSI practices include raingardens (Figure 2-3), vegetated swales, and exfiltration pipes (i.e. French drains). Practices such as raingardens can also be a relatively low-cost option for residents to reduce minor flooding and improve aesthetics on private property as well. Currently, the City has constructed over 60 raingardens, bioswales, and exfiltration systems in and around Winter Haven's urban center. Waterbodies receiving stormwater benefits from these systems include: Lakes Elbert, Howard, Martha, Maude, May, Otis, Roy, and Silver.

Storage GSI

In areas lacking highly porous soils, infiltration GSI practices become much less effective. Instead there are types of GSI practices that are designed to store stormwater and slow down runoff rates. One type of storage practice includes constructed wetlands which function similarly to traditional stormwater retention ponds. However, these practices have added benefits such as increased evaporation and plant water uptake (transpiration), nutrient sequestration by the wetland plants, and habitat for fish and wildlife. Additionally, these areas can be used as recreational green spaces by the public. These constructed wetlands, ranging from the 6 acre Lake Maude Nature Park to the 40 acre Lake Conine Nature Park, capture and filter runoff from drainage basins totaling over 760 acres, restore historic wetland habitat, and provide enhanced recreational features like walking trails, picnic pavilions, and playgrounds (Figure 2-4). The natural resources division maintains these parks through regular invasive plant management efforts and occasional sediment removal. Other forms of storage GSI practices include rainwater catchment systems and green roofs. Rain barrels are an excellent example of a storage practice that is low cost and easily implemented by residents and homeowners.



Figure 2-4. Map depicting the Winter Haven nature parks and their drainage basins.

Support of City Pillars:

Quality of Life

Goal 2.3: Champion arts, beautification, and address blight to be an attractive and enriching community. *Many of the green infrastructure practices implemented on public properties and rights-of-way include landscaping design choices that enhance the aesthetics of the City's green spaces.*

Goal 2.4: Ensure that as the City grows, opportunities for access to recreation grow along with the population, especially geographically. *Constructed wetland parks include passive recreational amenities such as walking trails, exercise equipment, picnic areas, and playgrounds that further the recreational opportunities available in various locations throughout Winter Haven.*

Infrastructure

Goal 3.4: Pursue emerging opportunities to embrace new technology, infrastructure, and enterprise opportunities. *Green stormwater infrastructure is considered an innovative stormwater design strategy for managing urban runoff. City staff are consistently identifying areas where GSI can be implemented to address nonexistent or underperforming gray infrastructure.*

Environmental Stewardship

Goal 4.3: Continue to monitor lakes and implement proactive strategies for lake management. *One of the primary benefits of GSI is the reduction in stormwater runoff and pollutant loading to the lakes.*

Goal 4.4 Integrate the elements of the One Water philosophy to ensure a balance between water supply and nature. *Many GSI practices promote groundwater infiltration where applicable; leading to an increase in aquifer recharge and more sustainability of the City's water supply.*

Strategic Goals:

- Continue to maintain the functionality of the more than 75 green stormwater best management practices; including regular sediment removal and landscape maintenance of raingardens & exfiltration systems, sediment removal and vegetation management of the nature park ponds.
- Complete expansion of South Lake Howard Nature Park, to include additional stormwater treatment and recreational amenities (by FY2027)
- Complete Lake Elbert trail project, to include vegetated swales and raingardens to capture runoff from a previously untreated drainage basin (by FY2026)
- Explore opportunities to implement additional GSI practices where needed; specifically in areas lacking existing infrastructure and those experiencing roadway flooding and relatively high pollutant loading rates.

Litter Control



Summary:

In addition to the microscopic pollutants, like nitrogen and phosphorus, litter and other solid debris present a very visible form of pollution that can enter the lakes via stormwater infrastructure. Litter is defined as any type of discarded refuse, ranging from household solid waste, to old fishing line, and even yard or landscaping debris—like grass clippings and leaf rakings. The breakdown of waste like plastics and other chemical products can introduce toxic constituents to the lakes, harming the plants and wildlife that reside there. Moreover, an abundance of solid waste severely diminishes the aesthetic benefits of our natural environment. As a result, the City makes a deliberate effort to reduce the impacts of litter on the lakes.

Like with nutrient pollution, prevention is the best method to control or minimize these negative impacts. The City has implemented specific structural features, known as debris catchers or trash collectors, at some of the more heavily impacted stormwater outfalls (Figure 2-5). These features essentially function as large filters, capturing solid waste before it can enter the lakes. Additionally, many of the existing green infrastructure features around town (e.g. nature parks, raingardens, etc.) doubly function to collect litter and other solid waste before it can enter the lakes. That said, the cost to construct and operate these systems limits their use to specific high-priority areas. As a result, the vast majority of stormwater networks in the City do not have debris catchers present.

The other form of litter control is to remove it once it has entered the environment. This strategy obviously requires greater investment in manual labor to make a difference. Volunteerism presents a means to not only solve the labor challenge, but also to educate the public about the impacts of litter and promote environmental stewardship behaviors. The City has partnered with the Keep Winter Haven Clean and Beautiful and Keep Polk Clean and Beautiful organizations to coordinate several litter cleanup events each year. In 2025, these events helped to remove a collective 11 tons of solid waste from local lakes. Together, proactive prevention and reactive removal measures help to limit the negative impacts of litter on our lakes.

Support of City Pillars:

Quality of Life

Goal 2.3: Champion arts, beautification, and address blight to be an attractive and enriching community. *Litter control measures help to address blight and beautify natural areas for the enjoyment of residents and visitors.*

Infrastructure

Goal 3.4: Pursue emerging opportunities to embrace new technology, infrastructure, and enterprise opportunities. *While primitive, the City's use of debris catchers represents a culture that embraces new infrastructure to solve complex and challenging issues.*

Environmental Stewardship

Goal 4.2: Leverage partnerships and implement best practices to ensure a clean environment for all citizens. *The City has leveraged partnerships with local non-governmental organizations to clean the environment through resident volunteerism and stewardship.*

Goal 4.3 Continue to monitor lakes and implement proactive strategies for lake management. *The removal of litter represents a proactive strategy to improve water quality and reduce environmental impacts from refuse.*

Strategic Goals:

- Continue to maintain the existing debris catcher infrastructure locations at the strategic outfalls on Lakes Conine, Hartridge, Howard, Maude, and May.
- Explore alternative sites that litter catchers can be deployed.
- Continue to maintain partnerships with local non-governmental organizations and organize public litter cleanup events.



Figure 2-5. Photo of debris catcher signage and access hatches located at Heritage Park on Lake Howard.

Low-Impact Development & Gray to Green



Summary:

Conventional development philosophy has been to move stormwater runoff from roads and properties as quickly as possible; sending pollutants downstream to the lakes with little to no treatment. This type of stormwater management is often referred to as gray infrastructure in reference to the use of pipes, drains, and concrete flumes. In recent decades, there has been an increase in awareness and adoption of low-impact development (LID); stormwater practices that seek to slow, spread, and soak runoff into the landscape close to where it originates. These features functionally mimic natural hydrologic processes groundwater infiltration and evapotranspiration, often incorporating vegetation into their designs (e.g. raingardens, grassed swales, etc.). This led to these best management practices being defined as green stormwater infrastructure (GSI). Taken together, LID+GSI provides water quality and hydrologic benefits for local lakes.

Since the 1990s, Winter Haven has become a forerunner in the implementation of GSI in the state of Florida by implementing numerous raingardens and infiltration basins throughout the City. However, to be effective, it was determined that the adoption of GSI practices on City properties and rights of way alone would not be sufficient. Therefore, in 2016, the City initiated a public education program targeting local engineers and developers, providing tools and incentives to shift mindsets away from gray infrastructure and toward GSI. This program was referred to as Gray to Green.

The Gray to Green initiative began by exploring the perceived benefits and barriers to widespread LID+GSI adoption within the development community. Based on feedback from roundtable discussions with local development professionals, the City worked with subject matter experts to produce a Gray to Green Development Guide. This document was designed to be an educational introduction to the philosophy of LID+GSI; illustrating the benefits and demonstrating which practices would be effective in the Winter Haven area. Expanding on the development guide, the City followed up with the creation of the Gray to Green Permit Design Methodology—a step-by-step guide for engineers on how to properly design GSI practices and how to get infiltration credit through the permitting process. Both phases of the Gray to Green program were made possible through 319 Stormwater Education grants via the Florida Department of Environmental Protection.

City staff continue to prioritize developer adoption of LID+GSI through the development review process. Natural Resources staff not only promote the Gray to Green philosophy to developers, but we actively review and recommend specific practices based on individual site conditions. Advocating for these GSI practices early in the development review process is critical in order to reduce redesign costs by developers. At its heart, the Gray to Green program is an education strategy designed to increase engagement with practices and technologies that benefit the environment.

Support of City Pillars:

Economic Sustainability

Goal 1.4: Ensure the strategic approach to growth management that includes robust public engagement. *The Gray to Green program seeks to engage the development community in sustainable development practices that are considered a smart form of growth.*

Quality of Life

Goal 2.3: Champion arts, beautification, and address blight to be an attractive and enriching community. *The principles of low-impact development include preserving open space and utilizing green infrastructure to capture and store stormwater runoff on site. These concepts implemented in new development promote aesthetic benefits and beautification over traditional pipe and pond systems.*

Infrastructure

Goal 3.4: Pursue emerging opportunities to embrace new technology, infrastructure, and enterprise opportunities. *The Gray to Green program champions the innovative principles of low-impact development and promotes LID+GSI practices on private properties through new and redevelopment.*

Environmental Stewardship

Goal 4.2: Leverage partnerships and implement best practices to ensure a clean environment for all citizens. *The Gray to Green Development Guide and Permit Design Manual are tools to assist in collaborations with private developers to implement innovative best management practices.*

Goal 4.3 Continue to monitor lakes and implement proactive strategies for lake management. *One of the primary benefits of GSI is the reduction in stormwater runoff and pollutant loading to the lakes.*

Goal 4.4 Integrate the elements of the One Water philosophy to ensure a balance between water supply and nature. *Many GSI practices promote groundwater infiltration where applicable; leading to an increase in aquifer recharge and more sustainability of the City's water supply.*

Strategic Goals:

- Continue promotion of the Gray to Green Development Guide and Permit Design Manual to construction, engineering, and landscape architecture firms seeking to engage in commercial and residential development within the City of Winter Haven.
- Conduct and support research into developer perceptions on municipal stormwater policies that can promote LID+GSI practices by private commercial and residential developers (by FY2027).
- Pursuant to Strategic Plan goals 4.3.5 and 4.4.1: work with the Winter Haven Planning Department to update the City's land development code and comprehensive plan such that LID+GSI is promoted and incentivized.

National Pollutant Discharge Elimination System Reporting



Summary:

As a directive of the United States Environmental Protection Agency (EPA), the National Pollutant Discharge Elimination System (NPDES) was created in 1972 under the Federal Clean Water Act. The NPDES is a permit system designed to regulate point source discharge into U.S. waters in an effort to improve water quality. The EPA works closely with the Florida Department of Environmental Protection (FDEP) to administer this program within the State of Florida.

Polk County is a primary permit holder in the region with the City of Winter Haven as a co-permittee under it. The permit requires each co-permittee to list all Municipal Separate Storm Sewer Systems (MS4s) maintained in their jurisdiction, document the functional maintenance of all infrastructure, track any public education initiatives that support pollutant load reduction, and monitor lake health to determine any measurable impacts. Natural Resources staff compile relevant information from each City department and submit an annual NPDES report to the FDEP each spring. The benefit of this program to the City is the quantifiable standard it provides for actions like stormwater infrastructure inspections and repairs, best management practices implemented, and outreach programs conducted that can be referenced to track annual performance.

Support of City Pillars:

Infrastructure

Sub-goal 3.3.4: Maintain relationships with local, regional, state, and federal regulatory agencies directly related to integrated water resource management. *The NPDES reporting process requires that the City report its stormwater management efforts to the Federal, State, and County agencies. This enhances accountability by ensuring that Winter Haven maintains the strict standards outlined in the NPDES reporting guidelines. It also provides an opportunity to coordinate with other co-permittees under the Polk County permit.*

Environmental Stewardship

Goal 4.3: Continue to monitor lakes and implement proactive strategies for lake management. *The NPDES report requires annual evaluation of lake water quality and other factors important to lake health; ensuring that the City is cognizant of potential infrastructure and management needs.*

Strategic Goals:

- Submit report for Cycle 4 Year 9 report by March 2026.
- Begin compiling data for Cycle 4 Year 10 report due in 2027.
- Attend coordination meetings with NPDES report co-permittees and FDEP/EPA agency officials.

Nutrient Pollutant Inactivation/Treatment

Summary:

Nutrient inactivation is an umbrella term for a suite of non-structural best management practices that utilize chemical compounds that limit the bioavailability of pollutants like nitrogen and phosphorus. There are numerous products available that differ in their active ingredients, modes of action, and methods of application. Understanding how these function allows lake managers to select the best tool for different situations.

Aluminum sulfate (Al_2SO_4), also known as alum, has been a popular treatment option to reduce phosphorus and total suspended solids concentrations in surface waters for several decades. Alum works as a coagulant, causing nutrients and sediments to adsorb to the product's particles and binding together into a gelatinous flocculent (Figure 2-6). This alum floc is stable in a pH range of 5.5 – 7.5 [Harper, 2007] making it effective in Winter Haven's lakes which are typically a neutral pH of 7. Alum can be broadcast over the entirety of a lake's surface to strip phosphorus from the water column, or injected at stormwater outfalls to treat pollutants from a discrete entry point. The City currently maintains three alum injection sites at points on Lakes Howard, Lulu, and May. Additionally, a broadcast alum treatment was conducted by Polk County in the mid-1990's to cap internal phosphorus loading from historic point-source discharges in Lake Conine [ERD, 2018].

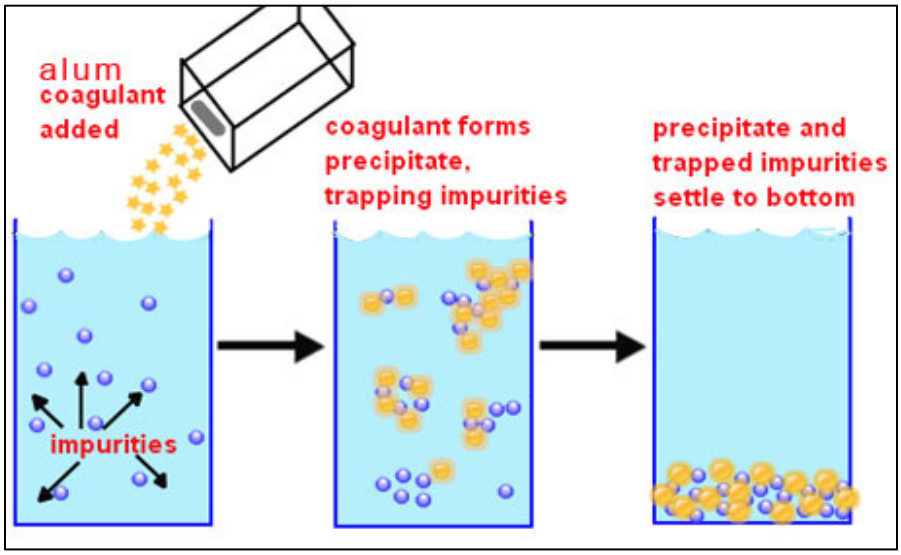


Figure 2-6 Diagram of alum floc adsorption properties. [Bionics, 2013]

Other phosphorus-binding materials include lanthanum-based products like Phoslock® and EutroSORB®. These function very similarly to alum, but instead of using aluminum sulfate, bioavailable phosphorous in sediment binds to a lanthanum-embedded bentonite clay material. These have shown relatively high capacity to reduce total phosphorus concentrations in lakes and reduce phosphorus flux from lake bed sediments [Copetti et al., 2016]. These products are relatively new, so lake managers are exploring different applications such as stormwater effluent filtration or broadcast applications over large areas. The City of Winter Haven has conducted a pilot study using EutroSORB® on a small private lake, with great success. This has resulted in plans to employ this product to reduce phosphorus levels in Lake Idyl

as well. While these products have been shown to be effective in different applications, they are relatively expensive compared to alum or other options.

An even more recent product that aims to inactivate phosphate from the water column is made from silica (i.e. sand particles). Products like Algae Armor are demonstrated to remove up to 80% of the phosphate dissolved in the water column [Xanthopoulou et al., 2021]. Despite being the least expensive category of phosphorus-reducing product on the market, it only targets dissolved phosphate in the water column, with minimal application to deactivate sediment-bound phosphorus. The City is currently exploring a pilot study to examine the effectiveness of this product and where it can most feasibly be utilized.

Support of City Pillars:

Environmental Stewardship

Goal 4.3: Continue to monitor lakes and implement proactive strategies for lake management. *Phosphorus is considered a pollutant of concerns for the majority of lakes in the Winter Haven area. Addressing phosphorus loading from stormwater runoff and flux from lake sediments helps to curtail eutrophication, thereby reducing the presence of harmful algal blooms and growth of nuisance vegetation in the lakes.*

Sub-goal 4.4.3: Explore and implement best management practices and innovative approaches to water resource infrastructure that further protect the natural environment. *Identifying and testing innovative products and approaches to phosphorus inactivation keeps staff knowledgeable about the latest scientific advancements and provides opportunities for the City to be a leader in lake management research application.*

Strategic Goals:

- Continue to maintain the City's 3 alum injection systems at Lakes Howard, Lulu, and May.
- Acquire grant funding to implement a EutroSORB® treatment for Lake Idyl.
    - Identified potential funding source in early 2026.

One Water

Summary:

One Water is an organizational planning effort which was borne out of the 2010 Sustainable Water Resource Plan and seeks to preserve the quality of life afforded by Winter Haven's water resources. The impetus for this effort is the identified threat of hydrologic decline that is driven by several factors: population growth, limited fresh water supply, climate change, aging infrastructure, funding needs, and increased regulatory pressure [Black & Veatch, 2021]. The goals of the plan are to ensure the future of the region's potable water supply and natural water resources. This is accomplished by improving utility planning, water conservation, wastewater treatment processes, reuse water infrastructure, watershed optimization, land use planning, and many other practices.

One of the signature recommendations evaluated and accepted as part of the One Water Master Plan is the Sapphire Necklace—a conceptual design of Winter Haven ringed by approximately 5000 acres of restored wetlands and nature parks (Figure 2-7). These sites would provide water storage, groundwater infiltration, wildlife habitat, and the backdrop for recreational amenities such as an expanded trail network—all of which benefit Winter Haven's lakes and the residents that utilize them while addressing water quality, hydrologic, ecologic, and public engagement needs of the community.

For more information visit:

www.OneWaterWH.com

Support of City Pillars:

Infrastructure

Sub-goal 3.3.1: Adopt, implement, and maintain the One Water Master Plan to ensure sufficient capacity for potable, reuse, and wastewater needs. *Completing and implementing the One Water Master Plan is, in itself, one of the City's primary strategic goals. Natural Resources' role in this effort is to provide technical guidance on hydrologic analysis and monitoring.*

Environmental Stewardship

Sub-goal 4.4.2: Continue to explore acquisition and/or activation opportunities of priority parcels that significantly benefit sustainable water resource initiatives. *The Natural Resources Division has assisted with identifying and acquiring potential wetland restoration sites that further the water storage and treatment capacity of the Winter Haven area.*

Strategic Goals:

- Winter Haven Water Department acquired parcel on Dundee Rd and plans to construct wetland storage areas on the site.
- Purchased 150+ acre wetland parcel on US17 with funding assistance from Polk County. Plans to utilize FDEP grant funding to restore habitat on site.

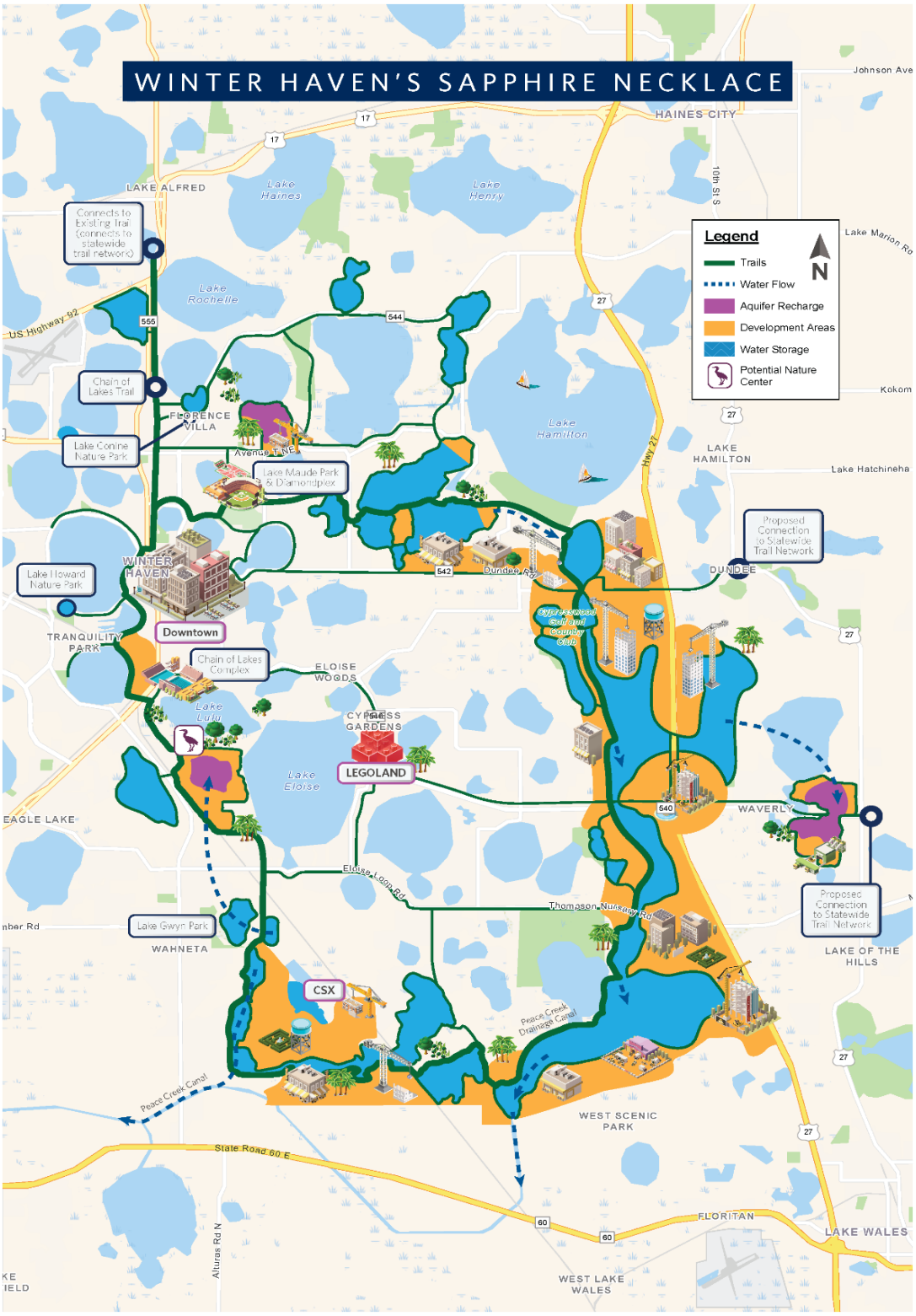


Figure 2-7. Rendering of the Sapphire Necklace concept that includes water storage, aquifer recharge, and nature park areas.

Public Outreach & Education

Summary:

Outreach encompasses most of the Division's efforts that spread information to the public, with the aim of increasing knowledge and engagement to solve common issues like litter, residential runoff, and overuse of potable water. Some believe that the role of government agencies is to solve issues through command and control policies like regulations. However, studies have shown that many environmental issues cannot be solved through regulatory compliance alone—mostly due to limits on staff and funding to implement, oversee, and enforce these regulations [Paddock, 2004]. Instead, increasing residents' understanding of local environmental issues is shown to result in voluntary public participation and stewardship actions. Therefore, informal education efforts are a vital public service that help to protect natural resources by motivating community participation. The Natural Resources Division has implemented numerous outreach programs that fall into distinct categories:

Public Events

Staff participation in public events like the 7 Rivers Water Festival, Arbor Day, and Community Fest are opportunities to hear from individual residents and respond with personalized information and guidance in a relaxed setting (Figure 2-8). The events often provide the widest reach, allowing for interactions with several dozen to several hundred participants per event. Whether the events are sponsored by the City or another agency (e.g. Water Wings & Wild Things at Circle B Bar Reserve), the Natural Resources team is excited to participate and interact with attendees.



Figure 2-8. Photo of Arbor Day Tree Giveaway booth during the 2023 Community Fest event.

Recreation

Residents who can physically interact with natural resources may be more likely to take action to protect them. Considering that about one third of residents have never recreated on a Winter Haven lake, kayaking is an excellent outreach opportunity to introduce the

public to some of our prominent water resources and the plants and animals that reside in them (Figure 2-9). Time spent on the water also provides an excellent setting to discuss concepts like water quality, hydrology, ecology, and what actions residents can take to improve them. These tours are typically hosted on local lakes monthly and attendees are provided with a pre and post tour survey to gauge knowledge retention and satisfaction.



Figure 2-9. Photo of 2022 guided kayak tour on Lakes Conine and Hartridge.

Workshops/Seminars

These include adult educational programs that target neighborhood, community groups and homeowner's associations (HOAs). The goal is to provide knowledge so that these groups can solve issues specific to their area. Workshop topics include sustainable landscaping, residential stormwater management, and living with wildlife. While the total number of participants is smaller than the public events, these seminars provide a unique forum for community members to share their specific issues and gain insights into how they can be solved through cooperation. The City has conducted in-person lake watershed seminars, virtual raingarden workshops, and community tree planting discussions, with plans to expand the capacity to implement more each year.

Volunteer Missions

Volunteer events provide unique opportunities for especially dedicated residents to make a difference in their community. The City has traditionally partnered with other organizations, like Keep Winter Haven Clean and Beautiful to host litter pick-up events such as Project Eagle. Additionally, the Natural Resources Division has begun sponsoring other types of activities like lakeshore clean-ups and adopt-a-raingarden programs. These forms of outreach are still relatively new, but the City's strategic plan includes goals associated with developing and expanding a City-wide volunteer network.

Youth Education

The primary objective of youth outreach is the creation of positive experiences that instill an appreciation for water, wildlife, and outdoor recreational activities. Children that are able to build stronger connections with nature are increasingly likely to engage in stewardship or other activities that protect natural resources later in life [Andrejewski, 2011]. Outreach also supports STEM education by reinforcing concepts learned in school while providing guidance to students interested in pursuing careers in environmental sciences. Natural Resources staff have worked with numerous local schools and youth

organizations, developing and teaching lesson plans both in the classroom and on field trips. Additionally, the City hosts a youth summer camp annually where attendees get to learn about nature, the water cycle, and wildlife in our local parks.

Support of City Pillars:

Quality of Life

Sub-goal 2.3.2: Establish a community adoption program for rights of way, parks, and public spaces. *While the volunteer missions so far have only included individual events, there are plans to incorporate public lakeshores, raingardens, and parks into the planned public space adoption program.*

Sub-goal 2.4.5: Provide creative opportunities for adult sports and recreation. *The City's kayaking tours on public lakes constitute a unique recreational opportunity in addition to the educational benefits they provide.*

Environmental Stewardship

Sub-goal 4.3.2: Develop and facilitate and education/outreach program tied to awareness and protection of local lakes. *The majority of the outreach programs mentioned in this section aim to improve lake health by developing public stewardship of these resources.*

Strategic Goals:

- The City conducted 30 outreach events in 2025 with a total of almost 3,600 individual participants or engagements. This was double the nearly 1,800 engagements achieved during the previous report year.
- Continue to participate in public outreach events and develop new and unique offerings and educational opportunities at Natural Resources' exhibitions.
- Conduct at least 9 guided kayak tours on local lakes in 2025.
- Coordinated with UF/IFAS to enhance the educational lesson plans incorporated during kayak tours.
- Budget for kayak, trailer, and equipment upkeep and replacement at regular intervals to ensure quality experiences for participants.
- Continue to develop relationships with local schools and youth organizations to expand youth education opportunities.
- Organize and conduct at least two litter clean-up events in 2026.

Sediment Management

Summary:

As a result of natural deposition, biological cycles, and pollution, sediment (aka muck) accumulates in Florida's waterbodies over time. Sediment deposited from historic point-sources, often referred to as legacy sediments, can be a significant contributor of nitrogen and phosphorus. Internal pollutant loading, also known as nutrient flux, can be exacerbated by low lake surface levels as well as wind and wave action. This internal loading can even exceed pollutant reductions from external sources such as stormwater—leading to declines in water quality despite the implementation of numerous best management practices [PBS&J, 2010]. As a result, the City of Winter Haven conducted sediment analysis in several muck-heavy waterbodies. Sediment cores were collected from Lakes Lulu, May, and Shipp from 2005 to 2009, coupled with bathymetric evaluation to determine water and muck volumes as well as seepage monitoring and chemical analysis of surface water and sediments to estimate internal nutrient loading.

The volume of muck in Lakes Lulu, May, and Shipp was estimated to be 1.3M yd^3, 1.0M yd^3, and 487K yd^3, respectively. To put these volumes in perspective, if equally distributed over the lake's surface area, the depth of muck in Lakes Lulu, May, and Shipp would be 2.25 ft, 2.75 ft, and 6 ft, respectively. The estimated annual nitrogen and phosphorus loading from these sediments is provided in Table 2-1 [PBS&J, 2010]. Based on these estimates, internal influx accounts for between 27%-44% of total nitrogen loading and between 5%-14% of total phosphorus loading in these lakes.

While nutrient inactivation treatments can help to reduce internal loads of phosphorus, nitrogen flux and sediment suspension through wind and wave action limit their effectiveness. Therefore, sediment removal via dredging remains one of the most effective means of mitigating legacy nutrient loading. However, this practice is often prohibitively expensive—exceeding multi-million dollar figures for even small areas of muck removal. Nonetheless, the City has explored outside funding opportunities and other means to reduce these costs. Recently, staff are seeking legislative funding to develop a pilot project that would remove a considerable volume of sediment from Lake May. A significant cost-cutting aspect of this project is the utilization of a City-owned parcel on the southwest shore of Lake May to temporarily store and dewater the removed muck. The expected outcome includes improvements to water quality, navigability, and fish habitat in the lake.

Support of Mission, Vision, and Purpose:

Environmental Stewardship

Sub-goal 4.3.4: Inventory and develop strategies to address legacy stormwater systems and discharges that negatively impact local waterbodies. *Much of the sedimentation that occurs in local lakes is considered to be comprised of legacy pollutants from historic point-source discharges (i.e. wastewater, stormwater, etc.). Sediment removal is a viable strategy that has*

been identified and efforts are underway to acquire funding to implement it as a management practice.

Strategic Goals:

- Continue to seek grant and/or legislative funding for sediment removal projects in Winter Haven lakes.
- Staff exploring potential Lake Idyl water level drawdown project which would promote sediment oxidation and removal at a lower cost than dredging.

Lake	TN Influx (kg)	TP Influx (kg)	TN Areal Loading (kg/ac)	TP Areal Loading (kg/ac)
May	641	14.3	12.7	0.28
Shipp	2814	80.5	10.2	0.29
Lulu	1668	91.7	5.43	0.3

Table 2-1. Annual TN & TP mass loading & areal loading values for Lakes May, Shipp, and Lulu determined through the sediment analysis performed by ERD.

Stormwater Assessment and Improvement Program



Summary:

Winter Haven's stormwater system is a network of drainage pipes, ditches, and other conveyances that capture surface water runoff and move it to storage ponds or, more often, directly into lakes. The Stormwater Assessment and Improvement Project (SAIP) was drafted by the City, in conjunction with various agencies and organizations, employing a holistic approach to planning maintenance and improvements to the stormwater infrastructure. This project was 100% funded by a legislative appropriation administered by the Florida Department of Environmental Protection (FDEP) and involved contracted work through the consulting firm Chastain-Skillman. The SAIP is a four-pronged approach that includes:

1. Cataloging and refining a database of stormwater infrastructure using geographic information systems (GIS).
2. Ground-truthing existing and previously unidentified stormwater infrastructure with information such as pipe and drain size, material type (e.g. concrete, steel, etc.), and flow capacity.
3. Hydrologic modeling, which incorporates accurate topographic, surface water, and groundwater information as well as land use and impervious surface data to identify areas where storm flooding and pollutant loading are highest.
4. Identification and prioritization of targets for improvement by incorporating all of the previously mentioned methods. This suite of information allows the Public Works Department to make objective, data-driven decisions about where to address stormwater issues.

The City has incorporated asset management software into this plan, which has greatly enhanced the speed and efficiency of repairs, maintenance, and improvements to Winter Haven's stormwater systems. Figure 2-10 displays the locations of high-priority target areas within the City as identified by initial evaluation by the SAIP. Once improvements are implemented in the top priority areas, future analysis of this stormwater model will allow the City to explore additional areas in need of stormwater infrastructure practices.

Traditionally, stormwater improvement needs are identified by City staff that observe conditions directly in the field or when residents submit complaints. As a result, this process has been reactive. The primary benefit of utilizing up-to-date data and modelling, is that the City can now take a more proactive approach to addressing drainage issues. However, this effort requires consistent inspections and cataloging of information to function properly—underscoring the need for proper data management.

Support of City Pillars:

Infrastructure

Sub-goal 3.4.1: Incorporate advanced transportation and infrastructure systems that leverage technology for enhanced effectiveness and efficiency in the delivery of municipal services. *The SAIP utilizes innovative technologies, like ArcGIS and Cartegraph asset management software to increase the efficiency and effectiveness of stormwater infrastructure improvement.*

Environmental Stewardship

Sub-goal 4.3.4: Inventory and develop strategies to address legacy stormwater systems and discharges that negatively impact local waterbodies. *One of the most critical components of the SAIP is the inventorying of existing stormwater infrastructure to determine where repairs and improvements are needed. Implementing these improvements often comes with significant water quality and hydrologic improvements for lakes and their drainage basins.*

Strategic Goals:

- Utilize concept plans for Priority Area 1 from SAIP to implement stormwater improvements for Lake Idyl. These improvements were incorporated into a Pollutant Reduction Plan approved by FDEP in 2025.
- Acquired FDEP grant funding to implement a portion of the Priority Area 1 stormwater improvements identified in the SAIP.
- Explore implementation of stormwater improvements in the other priority areas identified in the SAIP.
- Utilize information from the SAIP as a baseline for the development of the Winter Haven Vulnerability Assessment and Resiliency Plan.

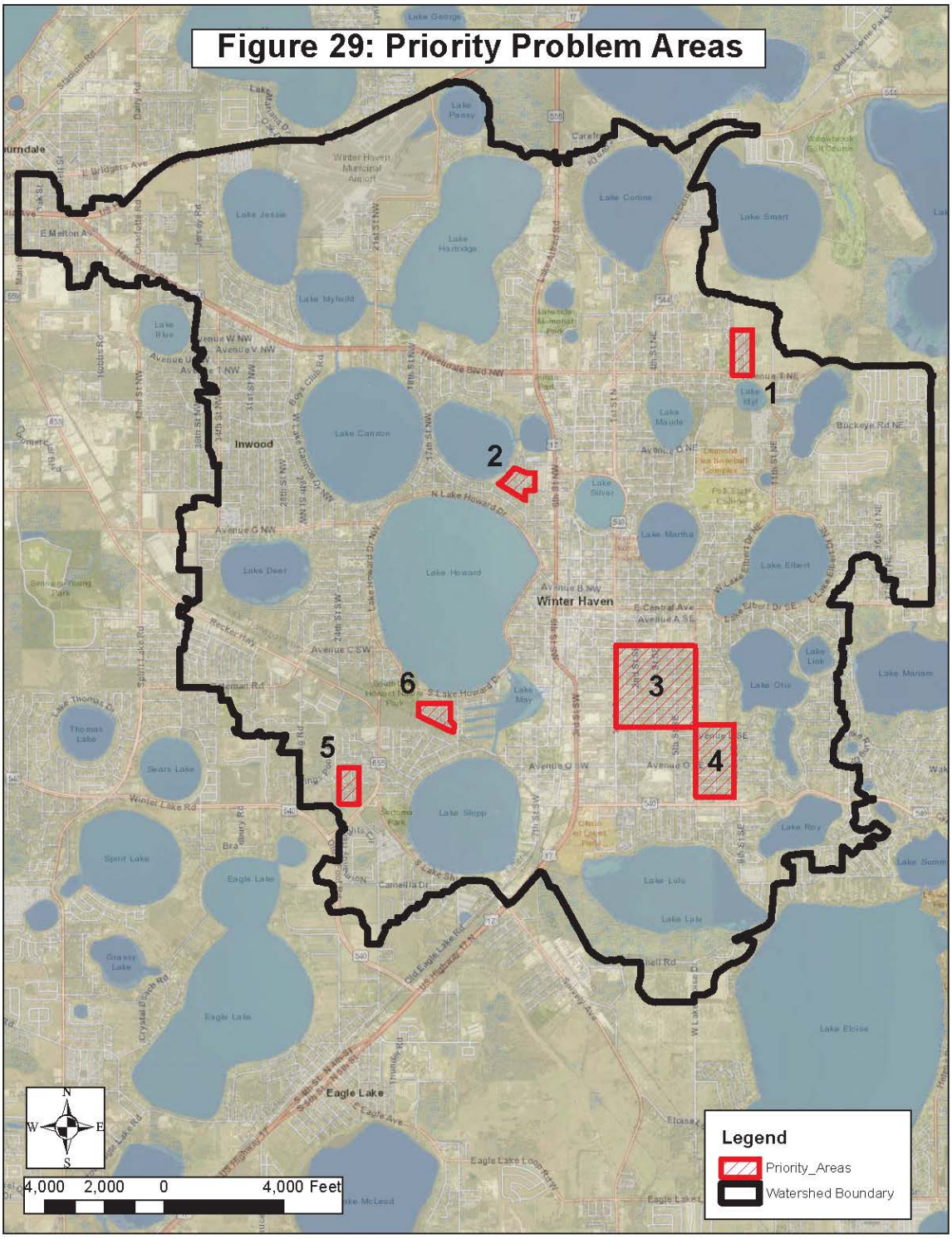


Figure 2-10. Priority sites indicated by increased flooding and pollutant load potential as determined by the Winter Haven SAIP.

Street Sweeping

Summary:

One significant source of pollutant loading comes from sediment and debris accumulation in streets which drain to waterbodies via stormwater. Street sweeping is what is referred to as a non-structural best management practice (BMP) that helps to reduce pollutant loading by removing debris before it can enter the stormwater infrastructure and the lakes. In 2013, the City contracted third-party support to sweep curbed streets in specified areas to mitigate this pollutant loading source. However, in 2016, the City began exploring a transition to in-house sweeping services in order to improve the quality and efficiency of road debris removal. In 2020, a new position was created within the Drainage division and a street sweeper was purchased; leading to an increase in sweeping quality, efficiency, route control, and total area swept.

The areas where sweeping is conducted include commercial and residential roadways in the core downtown corridor. Department of Transportation (DOT) roads have also been prioritized for regular sweeping. The sweeper routes and frequency are presented in Figure 2-11.

Support of City Pillars:

Environmental Stewardship

Sub-goal 4.2.2: Develop and implement a litter and dumping mitigation plan. *Street sweeping efforts help to remove a considerable amount of litter from entering the City's stormwater system.*

Sub-goal 4.4.3: Explore and implement best management practices and innovative approaches to water resource infrastructure that further protect the natural environment. *The debris and sediment captured through street sweeping is a preventative measure that helps to improve lake water quality.*

Strategic Goals:

- Continue to conduct in-house sweeping services as a best management practice to reduce pollutant loading to the lakes. A total of almost 3,500 centerline miles of City roadways were swept in 2025—resulting in over 3,500 pounds of material removed. This removal accounts for over 2,100 pounds of TN and over 1,100 pounds of TP prevented from entering area lakes in 2025.
- The street sweeper position was vacant for much of 2024. Fortunately, this position was filled near the end of the previous year, allowing for the restoration of sweeper services.
- Explore the addition of new sweeper routes and/or increasing the frequency of sweeping in high-volume areas.

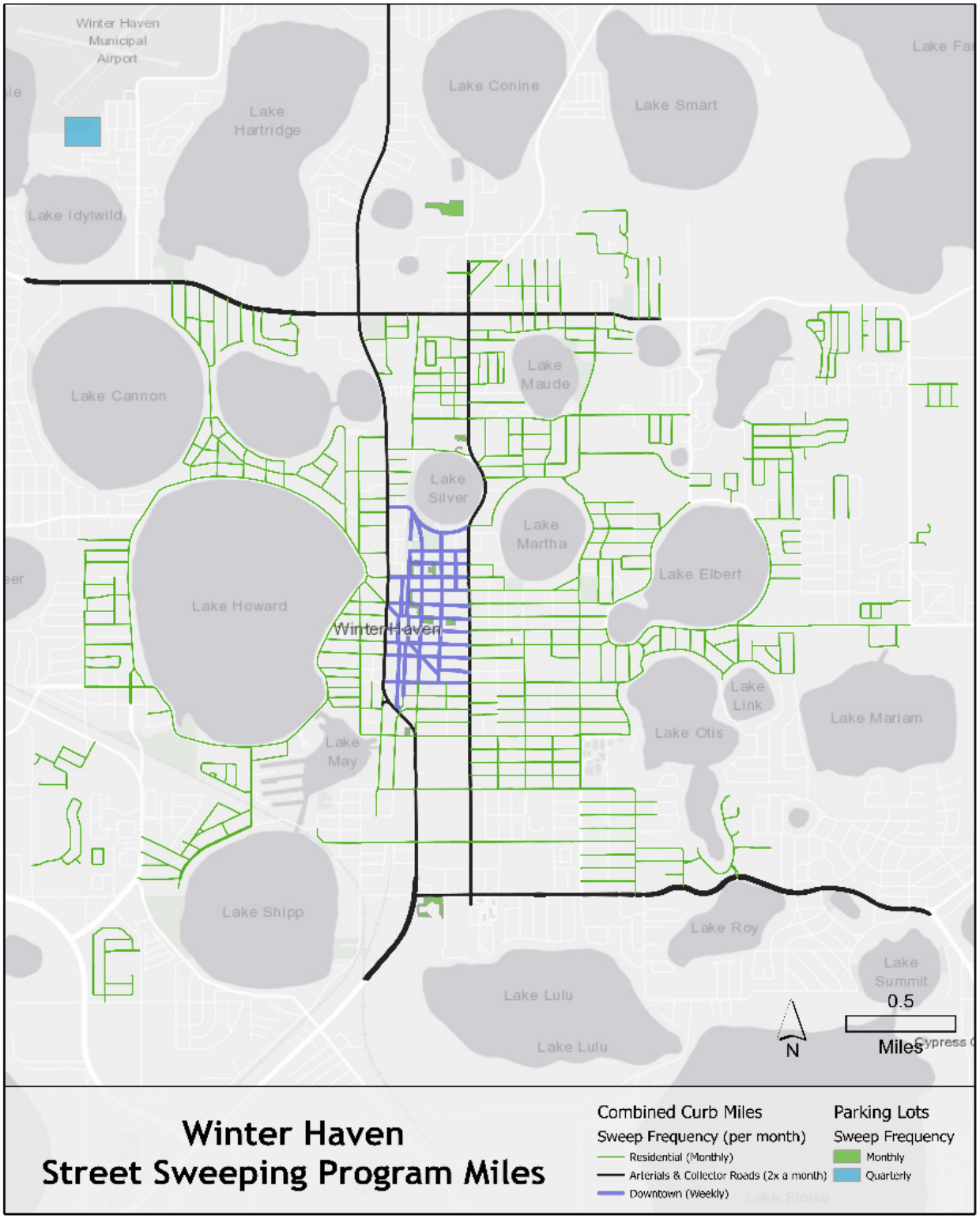


Figure 2-11. Map depicting roadways undergoing street sweeping. Legend indicates sweeping frequency of each street category.

Vegetation & Habitat Management

Summary:

Fostering adequate fish and wildlife habitat is one of the core objectives for managing healthy lakes. In the absence of more structural features like coral and rock outcroppings not typically found in Florida's fresh waterbodies, the majority of habitat is comprised of aquatic vegetation. Proper management of this habitat involves actions that promote the proper abundance and diversity of plants. Some circumstances may require removal of nuisance plants and floating mats of vegetation (i.e. tussocks), which can cause both ecological and economic issues (Figure 2-12). Areas underneath tussocks are deprived of oxygen creating dead zones. Also, as tussocks drift around lakes, they can become navigational hazards by blocking canals and stormwater outflows.



Figure 2-12. Photos of Lake Martha diesel spill remediation planting (top) and Lake Idyl tussock removal (bottom).

Another practice involves the reduction and removal of invasive plant species. Native plants have trouble competing with the extraordinary growth rates and lack of natural predators of exotic species, thus reducing diversity and wildlife habitat. Many invasive plants, like hydrilla and water hyacinth can clog up waterways, making navigation and recreational activities more difficult. Controlling terrestrial invasives, like Brazilian Peppertree, is also important for maintaining healthy ecosystems on City-owned properties. Controlling the introduction and spread of invasive plants is critical to preserving the health of our lakes and other natural resources. That said, early detection and rapid response planning is especially important to minimize the negative impacts of invasive removal efforts and herbicides.

Some circumstances require the re-introduction of native plants in areas that have become denuded (Figure 2-10). Planting efforts can help to

restore fish and wildlife habitat in areas that have been heavily impacted by invasive species or other environmental factors. Finally, the City also looks for opportunities to expand critically important fish and wildlife habitat through the purchase and management of public properties. Many of the City's nature parks were purchased wetland parcels that have been improved to provide multiple recreational amenities and ecosystem services.

Support of City Pillars:

Environmental Stewardship

Sub-goal 4.4.2: Continue to explore acquisition and/or activation opportunities of priority parcels that significantly benefit sustainable water resource initiatives. *The City has acquired several parcels in the last few decades that have been designated for use as recreational and wildlife habitat areas—including each of the 4 nature parks and sites identified as part of the One Water 'Sapphire Necklace' concept. These properties serve multiple purposes, one of which involves protection of critical fish and wildlife habitat.*

Sub-goal 4.4.3: Explore and implement best management practices and innovative approaches to water resource infrastructure and further protect the natural environment. *Invasive and nuisance plant removal, if conducted properly and under the right conditions, constitute best management practices that help to maintain the ecological integrity of the lakes and terrestrial ecosystems. Planting of native vegetation is another form of ecological best management practice.*

Sub-goal 4.5.1: Develop and maintain a complete inventory of all City-owned parcels and assess opportunities for enhanced access to lakes and natural upland areas. *The City has inventoried and conducts regular inspections and improvements to its multiple nature parks and natural parcels. Vegetation management is a large component of maintaining this collection of natural public properties.*

Strategic Goals:

- Continue to explore opportunities to introduce native vegetation in local lakes that may be in need.
- Continue to monitor lakes for drainage, navigation, and habitat issues; coordinate with the Lakes Region Lakes Management District to remove tussocks from lakes that pose a critical navigational and or flooding risk to local residents.
- Acquired funding to restore habitat and/or improve the US17 wetland parcel with passive recreational amenities. Develop restoration plan (by FY 2026).
- Continue to budget for internal aquatic plant management efforts (i.e. equipment, herbicides, licensing); ensure City staff maintain applicator licenses and permits.


#3 | Data Presentation & Analysis

Overview

The purpose of this section is the compilation of lake data and the assessment of lake health with a focus on the metrics and criteria described in the introduction. The objective nature of this evaluation methodology allows for the identification of issues affecting each lake individually as well as the comparison of lakes with each other. This prescriptive approach allows staff to not only recommend management actions to correct lake-specific issues, but also prioritize these actions so that funding and effort go to the lakes with the greatest need.

This section has been organized so that hydrologic information common to all study area lakes (i.e. rainfall, aquifer level, etc.) is presented at the beginning in order to reduce redundancy. Next, lake-specific information is presented separately for each waterbody. The lakes are ordered alphabetically by name to make locating them easier. Finally, this section concludes with a comparison of all lakes in the study area where prioritization rankings and management considerations for the Winter Haven area as a whole are presented.

Lake Health Evaluation Methodology

The primary feature in this section is the Lake Health Index (LHI). This evaluation methodology was developed by Winter Haven staff to provide an objective score for each lake to assist with prioritizing management efforts. By focusing on multiple measures, the LHI presents a more comprehensive outlook on lake health. However, this methodology is not absolute or exhaustive and is designed primarily to track the health of individual lakes over time rather than as a means to rank or compare lakes to each other.

Each lake's annual LHI score is based on an average of five water quality and three biological criteria. ***The eight individual criteria are scored based on a scale of 0 to 3. The higher the score, the better the lake is doing in that particular criterion.***

Lake Health Index								
Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
0	3	2	3	2	2	0	1	**1.6**

The mean (average) of individual criterion values is calculated to derive the LHI value for each lake during the current report year. **This overall Lake Health Index value also ranges from 0 to 3** and can be used to track changes in lake health over time as well as rank the area lakes to prioritize management action. The following are descriptions of the individual lake health criteria.



Water Quality Criteria

- *Water Quality Impairments*
- *Chlorophyll-a Trends*
- *Total Nitrogen Trends*
- *Total Phosphorus Trends*
- *Clarity Trends*

Biological Criteria

- *Vegetation Abundance*
- *Invasive Species Percentage*
- *Species Diversity*

Water Quality Impairments: This criterion indicates a lake's level of impairment in the three primary water quality parameters—chlorophyll-a (Chl-a), total nitrogen (TN), and total phosphorus (TP)—based on exceedance of the Numeric Nutrient Criteria thresholds. A point is awarded for each parameter not exhibiting impairment. For example, a lake with no impairments receives a score of **3**, but a lake impaired for Chl-a and TN would receive a score of **1**.

Water Quality Trends: The water quality trend criteria explores long-term changes in the four primary water quality parameters (i.e. Chl-a, TN, TP, and Clarity) which is critical for identifying potential water quality issues before impairment sets in while also highlighting successes in the management of currently impaired lakes. Improving trends for Chl-a, TN, and TP correspond with decreasing concentrations, whereas an improving water clarity trend would correspond with an overall increase in Secchi depths; and vice versa for deteriorating trends.

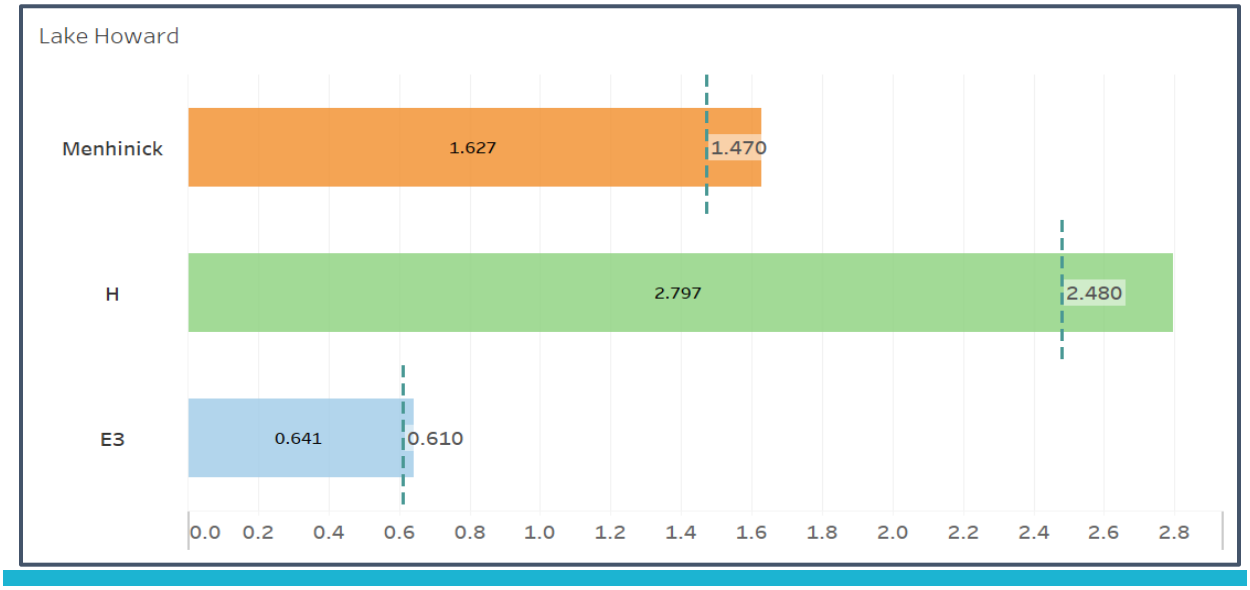
A linear regression statistical analysis is used to evaluate 20-year trend direction and significance for each parameter. The Pearson Correlation Coefficient (R Coefficient) ranges from negative 1 to positive 1, indicating whether the trend is decreasing (negative) or increasing (positive). The closer this coefficient is to either -1 or +1, the stronger the trend. Subsequently, statistical significance is evaluated to determine if the trend results are valid or due to random chance. Significance is measured using a 95% confidence level, meaning that a trend with a probability value (p-value) of less than 0.05 is considered statistically significant. Significant improving trends are assigned a score of **3**; non-significant improving trends are given a score of **2**; non-significant deteriorating trends are scored as a **1**; and significant deteriorating trends are scored as a **0**. The example below shows Clarity exhibiting a significant deteriorating trend (score = 3); Chl-a and TN exhibiting non-significant deteriorating trends (score = 1); and TP exhibiting a non-significant improving trend (score = 2).

Lake Hartridge 20yr Trend Statistics				
	Chl-a No Trend	**TN** No Trend	**TP** No Trend	**Clarity** Decreasing
R Coeff.	0.411	0.396	-0.389	-0.691
P-Value	0.064	0.075	0.082	0.001

Vegetation Abundance: The abundance of aquatic vegetation is a critical ecological factor that impacts fish and wildlife habitat as well as a lake's ability to buffer against changes in water quality. The evaluation of abundance is based on the percent area coverage (PAC) or the total area of the lake bed occupied by vegetation as determined by SONAR mapping. A score of **3** is given to lakes with PAC exceeding 30%; a score of **2** is given for PAC between 30% and 15%; a score of **1** is assigned to PAC between 15% and 2.5%; and a score of **0** is given to lakes with less than 2.5% PAC.

Invasive Species Percentage: The presence of invasive aquatic plants can have negative impacts on lake ecology and navigation. Evaluation of this criterion is based on the proportion of each lake's managed invasive plant species in relation to all species present during the annual survey. A score of **3** is assigned if a lake has no managed invasive species present; a **2** is given if the invasive percentage is less than 2.5% of the total population; invasive presence between 2.5% and 10% is given a score of **1**; while **0** scores are given if invasive species make up greater than 10% of a lake's total population.

Species Diversity: The diversity of aquatic vegetation often parallels the ecological health of a waterbody. Species diversity is based on the species frequency data for a given report year using three distinct diversity index calculations. These include the Menhinick species richness index which is based on the number of unique species recorded; Hill's evenness index (E3) which measures how evenly species are distributed; and Shannon's overall diversity index (H) which evaluates the probability of sampling the same species multiple times in a row. Using three different indices provides a more robust assessment of diversity that a single index cannot sufficiently approximate. The annual diversity index values are compared to the long-term median values for that lake to determine the lake health score. A point is awarded for each diversity index that meets or exceeds its respective long-term median value; for a total possible score of **3**. In the example below, the diversity criterion score for Lake Howard would be 3 because all of the diversity index values exceeded their long-term medians (shown as dotted vertical lines).



Winter Haven Regional Hydrology

Winter Haven's regional hydrology is completely driven by precipitation. An abundance or lack of rainfall can significantly impact water resources such as lake levels, stream flows to the Peace Creek, and groundwater supply. Changes in lake surface elevation influence not only recreation, such as usability of boat ramps and navigation through canals, but can also have drastic effects on water quality and wetland ecology. Rainfall on the Winter Haven Ridge recharges the Floridan Aquifer—the underground source of the State's drinking water supply. Just as important as rainfall, the amount of water in the Upper Floridan Aquifer (UFA) also affects the levels and overall health of the lakes.

On average, the City of Winter Haven receives 51.62 inches of rainfall annually. This is typically distributed throughout the year in distinct wet and dry seasons. The wet season is concentrated from June through September evidenced by the higher average monthly rainfall around 7-8 inches, shown as the orange dotted lines (Figure 3-1). Whereas the dry season, which ranges from October to May, usually receives much less monthly rainfall—between 2-4 inches. The light blue shaded areas on the graph represent the normal range, or one standard deviation above and below the median rainfall during a given month.

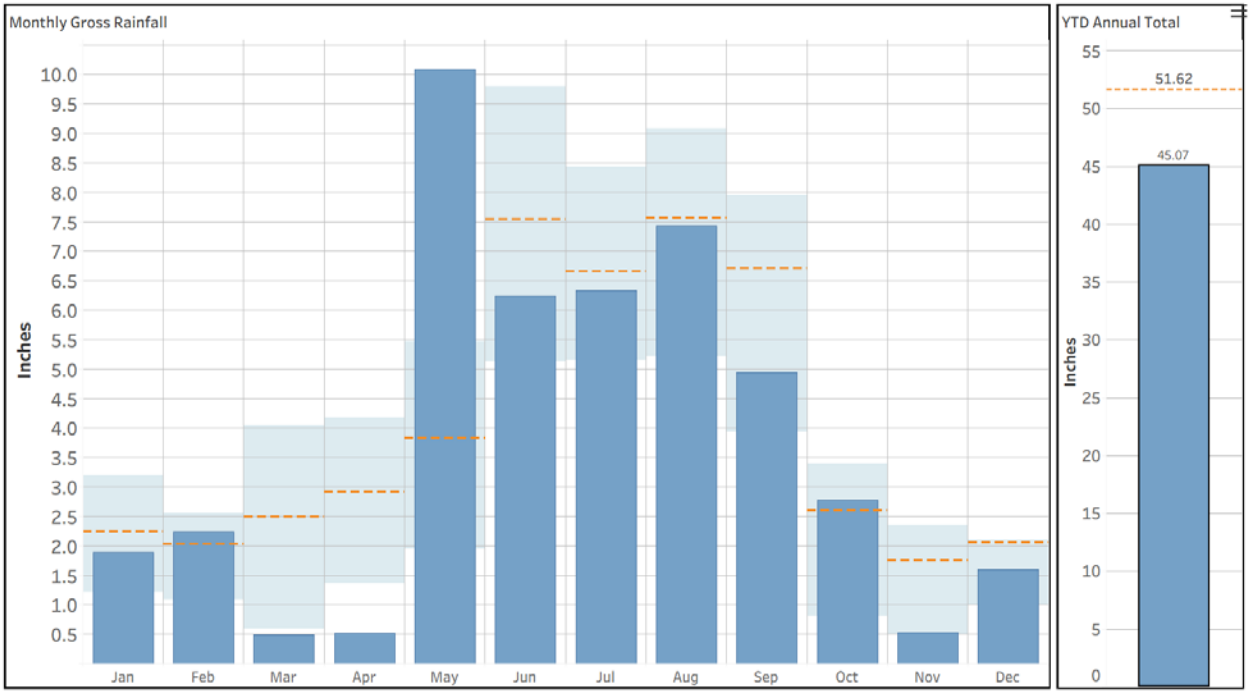


Figure 3-1. 2025 monthly gross rainfall depicting monthly rainfall totals in relation to long-term average and normal ranges; and Year-to-date (YTD) annual total rainfall in relation to the long-term average.

In 2025, the City of Winter Haven received 45.07 inches of rainfall which was more than 5 inches below the annual average. Monthly rainfall totals were only above-average in February, May, and October. The remaining months received below-average rainfall, with monthly totals in March, April, and November at or below the bottom of their normal ranges. The 2025 wet season was proportionally drier than normal. However, May

received near record rainfall, helping to bolster local water supplies for the remainder of the year by providing over 20% of the annual total.

This marks the third consecutive year with below-average rainfall. The last prolonged drought the area experienced occurred between 2006 and 2014 with eight consecutive years of below-average rainfall (Figure 3-2). It is too early to determine if the region is headed toward another extended period of low annual rainfall and subsequent drought. That said, the lower rainfall has pushed most of Florida into drought conditions as of early 2026. This drought has included burn bans and watering restrictions—demonstrating that Florida's boom and bust hydrologic cycle is not only challenging to predict, but impacts everyday citizens.

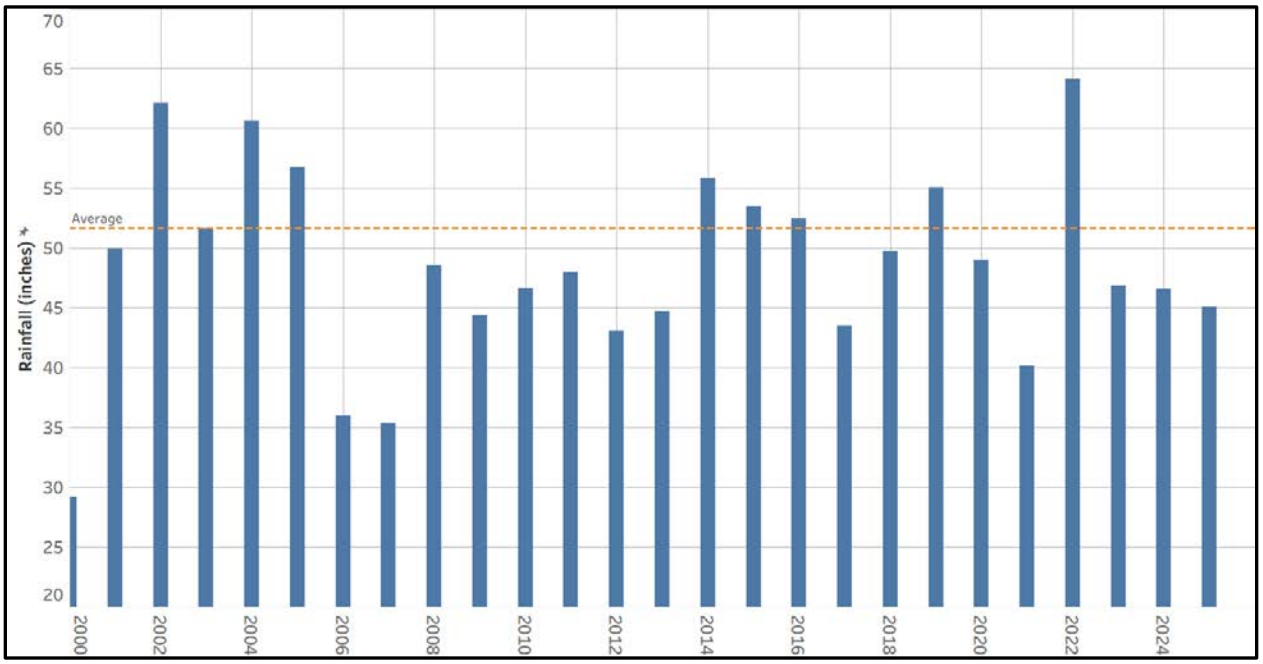


Figure 3-2. Annual rainfall totals for the Winter Haven area from 2000 to 2025.

This lack of rainfall has resulted in hydrologic impacts to local water sources. Individual lake level responses are discussed in greater detail throughout this section of the report, but on the whole, Winter Haven's lakes have remained at above-average levels during 2025. It is understood that the excess rainfall received in May helped to buffer against the below-average rainfall received during the rest of the year. However, the Upper Floridan Aquifer (UFA)—Florida's underground drinking water source—exhibited different results.

Figure 3-3 depicts the upper surface elevation of the UFA and monthly rainfall totals from 2000 until 2025. The dotted line represents the long-term average UFA level, while the shaded area represents the normal range of one standard deviation above and below the median level. For reference, the ground elevation of the monitoring station is approximately 170 feet above sea level; making the long-term average more than 50 feet below the ground surface in downtown Winter Haven.

The UFA undergoes both seasonal and long-term fluctuations corresponding with annual rainfall patterns and climatic cycles. This is evidenced by the drastically lower UFA levels in the early 2000s, followed by a short period of above-average levels from 2003 to 2006. The prolonged drought from 2006 to 2014 resulted in consistently lower UFA levels that barely peaked above the long-term average. The UFA has remained relatively stable since then—consistently exceeding the long-term average and even the upper normal range most years while occasionally dipping below the normal range during the dry season. Over the last 25 years, the UFA has been trending upwards. However, in the last five years, a significant downward trend has emerged—indicating potential impacts to local drinking water supplies.

Like in previous years, the UFA began 2025 at a level above the long-term average (116 ft). The lack of rainfall at the beginning of the year resulted in a sharp decline to 114 feet above sea level by May. With the excessive May precipitation and rainfall received during the 2025 wet season, the UFA had risen back beyond the long-term average to a peak of 117 feet in September. However, the meager rainfall received during the remainder of 2025 caused the UFA to drop below the average level—ending the year at 115.6 feet in December. This marks the first time since 2013 that the UFA has ended the calendar year at below-average levels; potentially forecasting an end to the period of plenty that Winter Haven has experienced since 2014 and underscoring the importance of water conservation efforts.

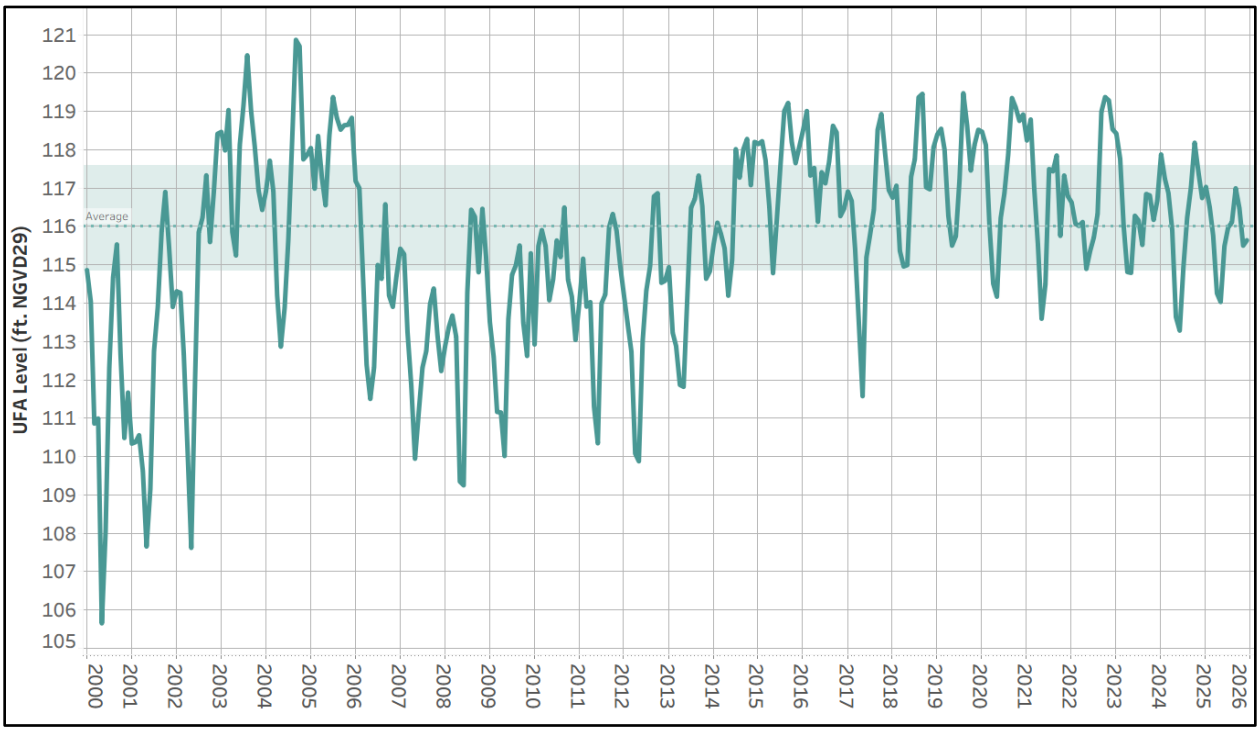


Figure 3-3. Monthly Upper Floridan Aquifer levels from 2000 to 2025. UFA levels graphed in relation to long-term mean and normal range.

Lake-Specific Data Analysis

The following pages comprise water quality, hydrologic, and biological data collected, analyzed, and presented for each individual lake in the study area. The study area lakes are presented in alphabetical order. Additionally, a Lake Management Summary is included at the end of this section that reviews the lake health scores for all area lakes and presents specific management considerations for Winter Haven's lakes as a whole. To quickly access information on specific lakes, please reference the following table which includes page numbers and direct links (in the digital version); click the lake name to go directly to that lake's starting page.

Lake Name	Starting Page #	Lake Name	Starting Page #
Blue	71	Mariana	187
Buckeye	77	Martha	193
Cannon	83	Maude	199
Conine	89	May	205
Daisy	96	Mirror	211
Deer	102	Ned	217
Elbert	108	Otis	223
Eloise	114	Pansy	229
Fannie	120	Rochelle	235
Haines	126	Roy	241
Hamilton	132	Shipp	247
Hartridge	138	Silver	253
Howard	144	Smart	259
Idyl	151	Spring	265
Idylwild	157	Summit	271
Jessie	163	Winterset	277
Link	169	Little Hamilton	283
Lulu	175	Middle Hamilton	289
Mariam	181	Lake Management Summary	295

Lake Blue

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	2	1	2	0	3	3	2	1.6

Features & Statistics:

Surface area	54.3 acres
Mean depth	4.57 feet
Maximum depth	9.8 feet
Volume	268.6 acre-feet
Drainage basin area	128 acres
Annual TN Load	871.5 lbs
Annual TP Load	154.2 lbs
Limiting nutrient	Phosphorus

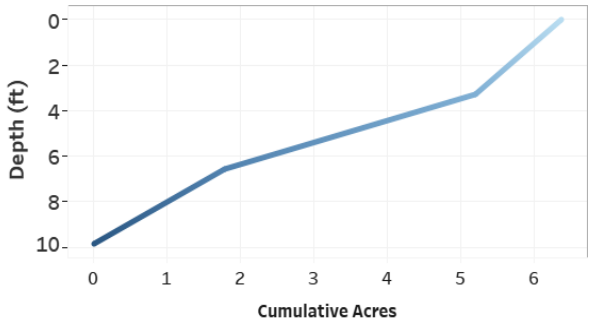


Figure 3-4. Hypsograph of Lake Blue depicting the depth profile and morphology of the lake bed.

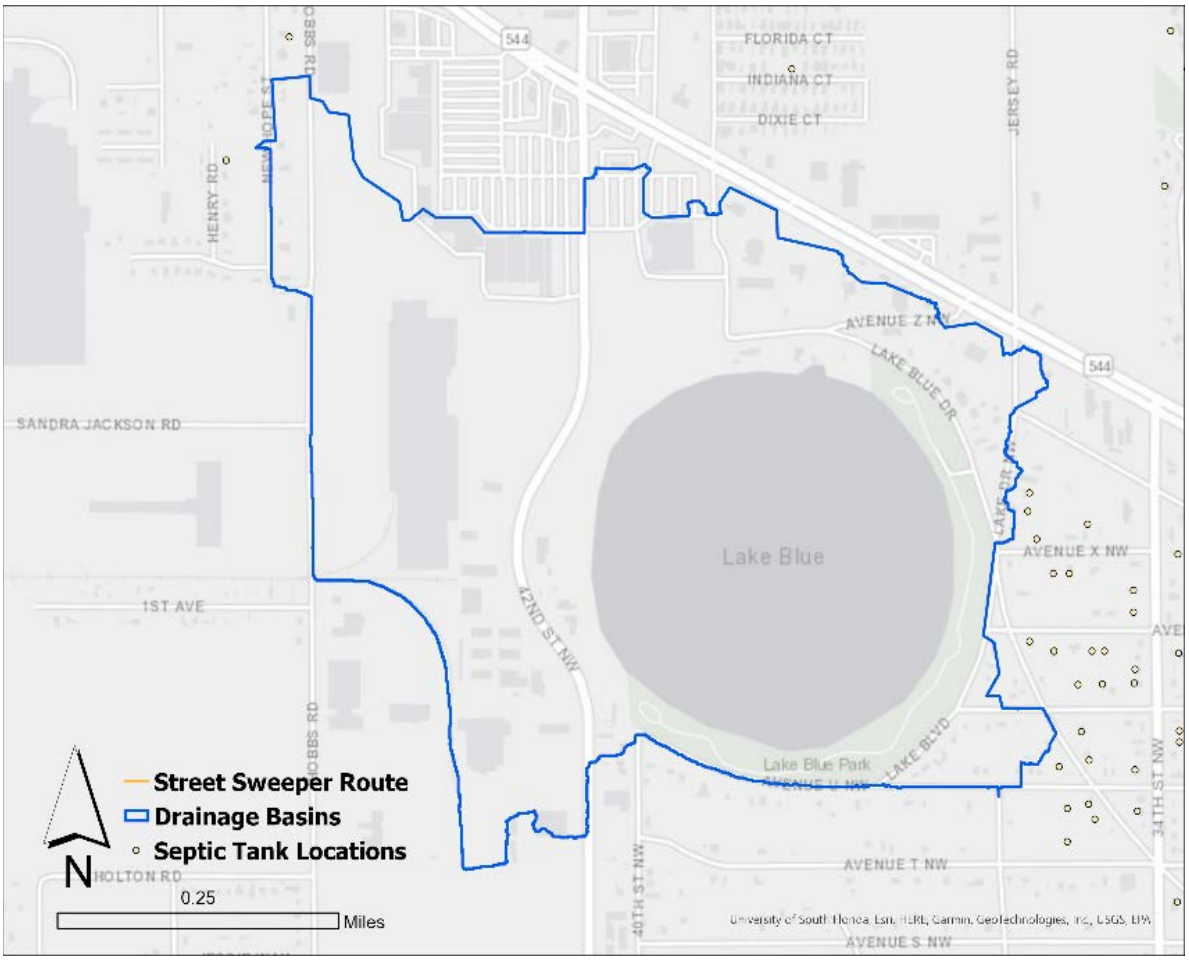


Figure 3-5. Map of Lake Blue's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

The morphology of Lake Blue indicates that it is a relatively small and shallow waterbody (Figure 3-4). Due to its shallowness, Lake Blue may undergo somewhat increased sediment suspension due to wind and recreational boating activities. With little stormwater infrastructure surrounding it, Lake Blue's drainage basin is also relatively small; at just over twice the area of the lake itself (Figure 3-5). Despite the relatively low volume of stormwater entering the lake, a high proportion of industrial land uses in the drainage basin have resulted in some of the highest per-acre rates of nitrogen and phosphorus loading in the area. This has likely contributed to Lake Blue exhibiting some of the poorest water quality in the region. Fortunately, there are few septic systems within close proximity of this waterbody, so surface runoff remains one of the primary pollutant sources to manage. It should be noted that Lake Blue and its drainage basin fall completely outside the municipal limits of Winter Haven.

Lake Blue sits at the very top of the Winter Haven watershed; overflowing via a pipe/ditch system to Lake Cannon only during high-water periods. Throughout the period of record, the surface level of Lake Blue has fluctuated between 146.4 and 149.8 feet above sea level. The normal range of seasonal fluctuations is between 147.3 to 148.1 feet; with more extreme peaks and troughs occurring during particularly wet and dry years, respectively (Figure 3-6). During 2025, Lake Blue reached a wet season peak of 147.7 feet in June—barely exceeding the median surface level. Lake Blue ended the year at its lowest level of 146.8 feet, which is well below the low end of its normal range. In fact, Lake Blue spent the majority of 2025 below its long-term average surface level—indicating significant impacts from lack of rainfall. Changes in Lake Blue's surface level are not correlated with Chl-a, TN, TP, or clarity (see appendix).

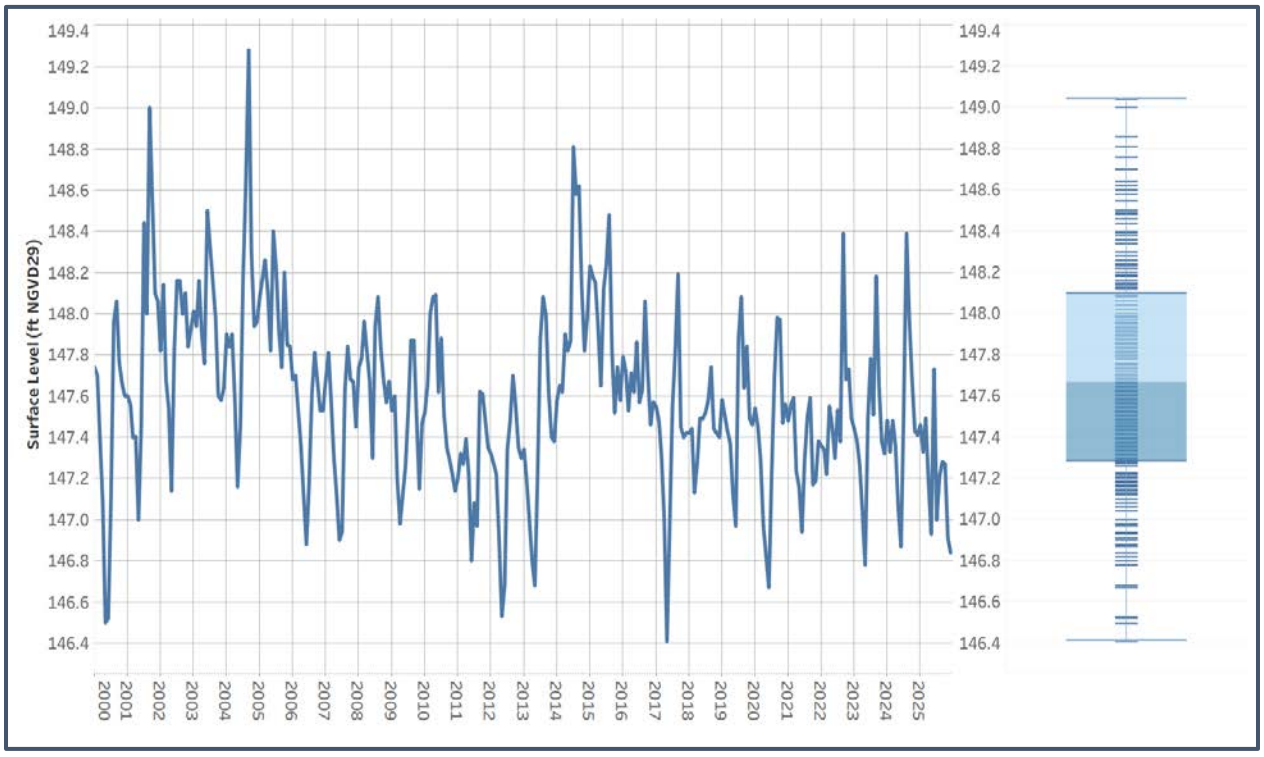


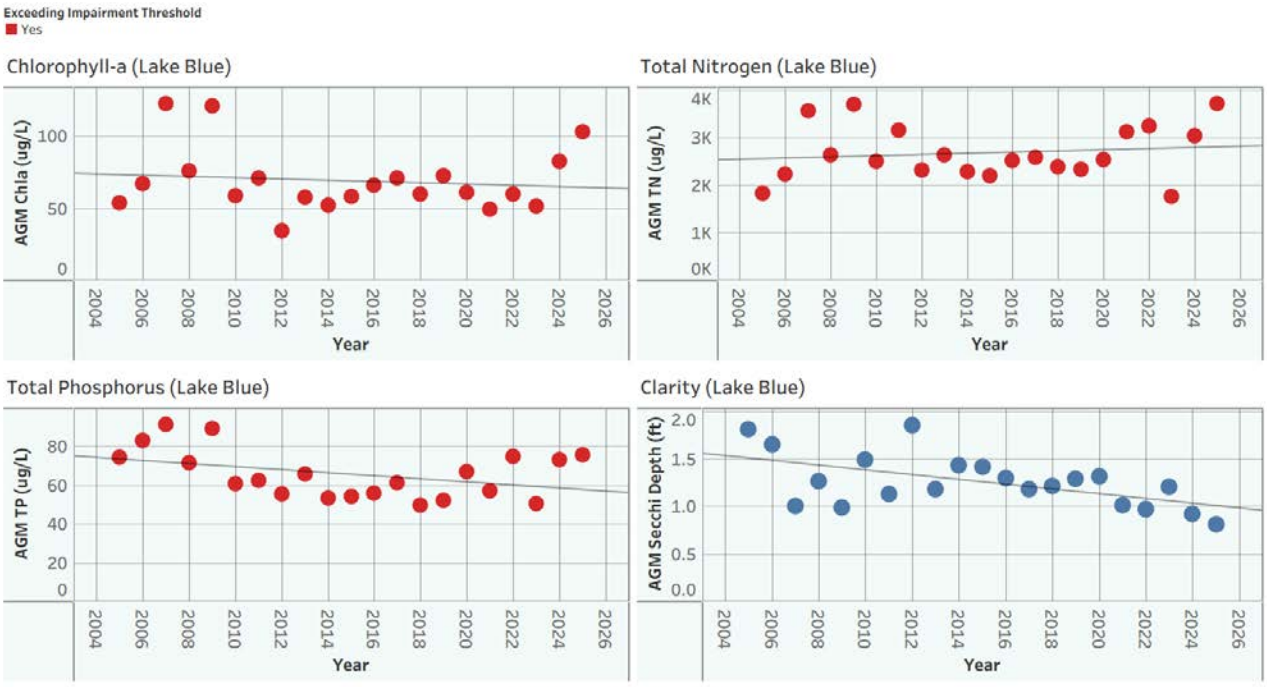
Figure 3-6. Hydrograph of Lake Blue depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details the total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

For purposes of determining water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Blue is categorized as a clear, alkaline waterbody. The lake is considered impaired for Chl-a, TN, and TP due to multiple exceedances of the impairment thresholds over its period of record (Figure 3-7). This equates to an impairment criterion score of 0. In 2018, the FDEP established a total maximum daily load (TMDL) for Lake Blue. The TMDL stipulates a 66% reduction in TN and a 67% reduction in TP to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of annual Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Lake Blue's water clarity metric exhibited a significant declining trend—earning a trend score of 0. The Chl-a and TP metrics exhibited non-significant decreasing trends, resulting in trend scores of 2. Whereas, Lake Blue's TN metric exhibited a non-significant increasing trend, for a trend score of 1. Despite its impairments and high nutrient pollutant loads, Lake Blue has exhibited marginal water quality improvement in the past. That said, it has a long way to go in order to start meeting the impairment thresholds. Polk County is currently implementing algae reduction strategies to help improve Lake Blue's water quality.



Lake Blue 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity Decreasing
R Coeff.	-0.123	0.137	-0.389	-0.554
P-Value	0.597	0.552	0.081	0.009

Figure 3-7. Lake Blue AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Blue on 01/29/2025. The percent coverage during this survey was 75% and the total BV was 11.6% (Figure 3-8). Similar to last year's survey, the high coverage value may have been an error in the SONAR's ability to distinguish between decaying organic matter (i.e. muck) and living vegetation as shown by the light green areas in the center of the lake. That said, there has been a marked increase in vegetation abundance in recent years. The result is the Lake Blue receives a score of 3 for this criterion.

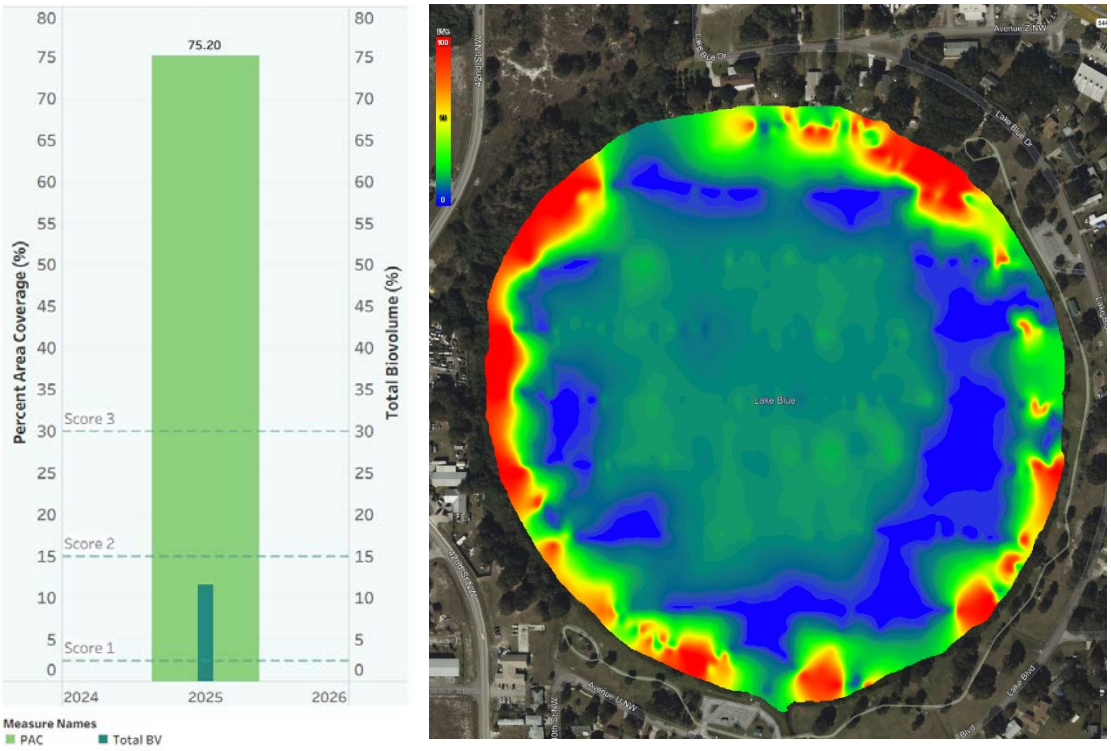


Figure 3-8. Graph depicting 2025 PAC/BV and biovolume heatmap; biovolume values range from green (lowest) to red (highest).

Invasive Species Management:

Based on data from the 2025 vegetation survey, Lake Blue's vegetation community was primarily made up of emergent vegetation (Figure 3-9). The most abundant species was pickerelweed—a native emergent. That said, Lake Blue has experienced a surge in submerged aquatic vegetation abundance in recent years with eelgrass presence along the shallow margins of the lake. In 2025, eelgrass made up over 10% of the population. Normally, the water clarity in this lake is too poor for SAV to grow. Therefore, the increase in eelgrass demonstrates how even gradual water quality improvement can result in biological responses. While exotic plants, like primrose willow, were present these often do not require management action to control. Therefore, Lake Blue possessed no appreciable presence of managed invasive species—earning a score of 3 for this criterion.

Species Diversity:

The species diversity metric is made up of richness, evenness and overall diversity. During 2025, Lake Blue's species evenness and overall diversity indices exceeded their long-term medians. Species richness was slightly below the median resulting in a criterion score of 2 (Figure 3-9). These results are consistent with previous years. The vegetation community in Lake Blue has not

shifted considerably since monitoring began. The lack of invasive species management has not shifted the species dynamics like in other lakes.

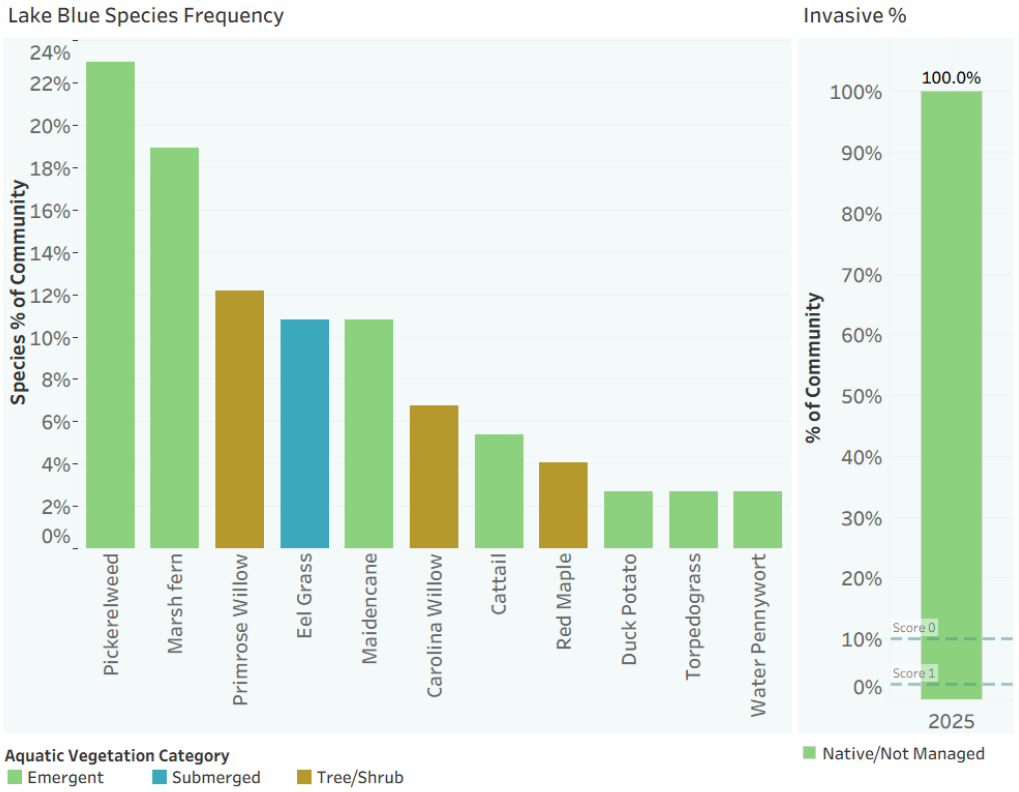


Figure 3-9. Chart depicting species frequency and invasive species percentage of Lake Blue during 2025.

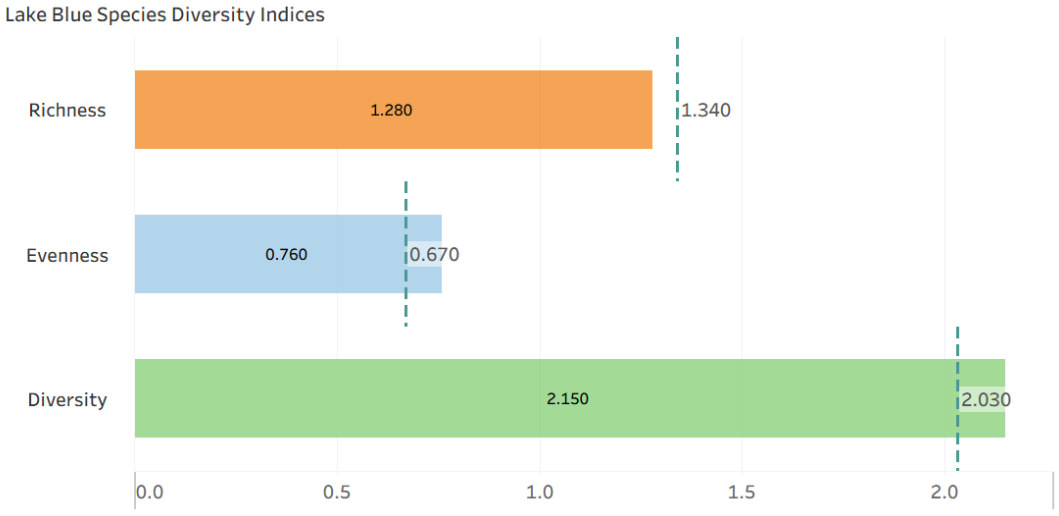


Figure 3-10. Chart depicting 2025 diversity index values for Lake Blue.

Lake Health Tracking:

A comparison of Lake Blue's health index scores from 2018 to 2025 shows relative stability in lake health (Table 3-1). During this period, water clarity has begun to trend downward, but aquatic vegetation abundance and invasive species scores have improved. Though the trends show some general movement toward better water quality, Lake Blue is still far from meeting the impairment thresholds and requires significant management intervention.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	1	2	2	3	1	0	1	**1.6**
2019	3	1	2	2	2	2	0	2	**1.8**
2020	3	1	2	1	2	1	1	1	**1.5**
2021	3	1	2	1	2	3	3	2	**2.1**
2022	3	1	2	1	2	3	2	2	**2.0**
2023	3	0	2	1	2	3	0	3	**1.8**
2024	3	0	2	1	1	3	1	1	**1.5**
2025	0	2	1	2	0	3	3	2	**1.6**

Table 3-1. Lake Health Index scores for Lake Blue from 2018 to 2025.

Lake Health Impacts/Challenges:

- Lake Blue currently exhibits poor water quality with impairments in each of the NNC metrics. With high intensity industrial and commercial land uses dominating the drainage basin, the stormwater pollutant load is likely the primary driver of these water quality issues.
- Despite the high abundance values, Lake Blue distinctly lacks vegetation beyond the shoreline. The low clarity likely prevents the growth of vegetation in water deeper than a few feet, resulting a very narrow littoral zone. Fish and wildlife habitat is limited by the lack of submerged vegetation, but has exhibited improvement in recent years.
- The morphology of Lake Blue likely exacerbates its water quality issues. At an average depth of 4.6 feet, wind and wave action have greater potential to suspend sediments from the lake bed—leading to poorer water clarity.

Lake Management Strategy:

- The City currently conducts annual aquatic vegetation monitoring and shares this information with partnering agencies for use in management efforts. Staff will continue to support Polk County and FWC in these efforts.
- City staff may work with Polk County and other agencies to explore the potential for aquatic vegetation planting. However, the poor water clarity may hinder the planting of submerged vegetation.
- Polk County has implemented an algal neutralization device in the lake to help filter the water column and increase clarity. So far, this has not yielded major changes in chlorophyll-a concentrations or improvements to water clarity. It is likely that any improvements from this effort will observed over a longer time period. Further water quality monitoring may provide additional insights.

Lake Buckeye

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	1	2	1	2	3	2	3	2.1

Features & Statistics:

Surface area	72.4 acres
Mean depth	9 feet
Maximum depth	26.8 feet
Volume	683.2 acre-feet
Drainage basin area	233.6 acres
Annual TN Load	867.1 lbs
Annual TP Load	154.8 lbs
Limiting nutrient	Phosphorus

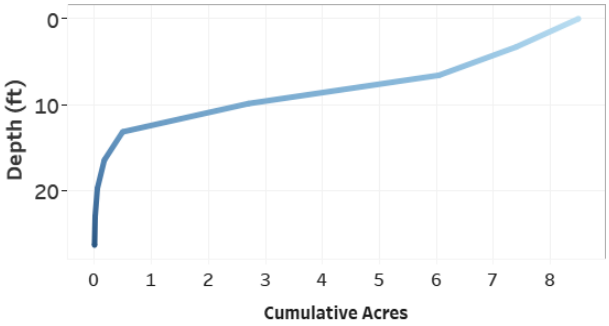


Figure 3-11. Hypsograph of Lake Buckeye depicting the depth profile and morphology of the lake bed.

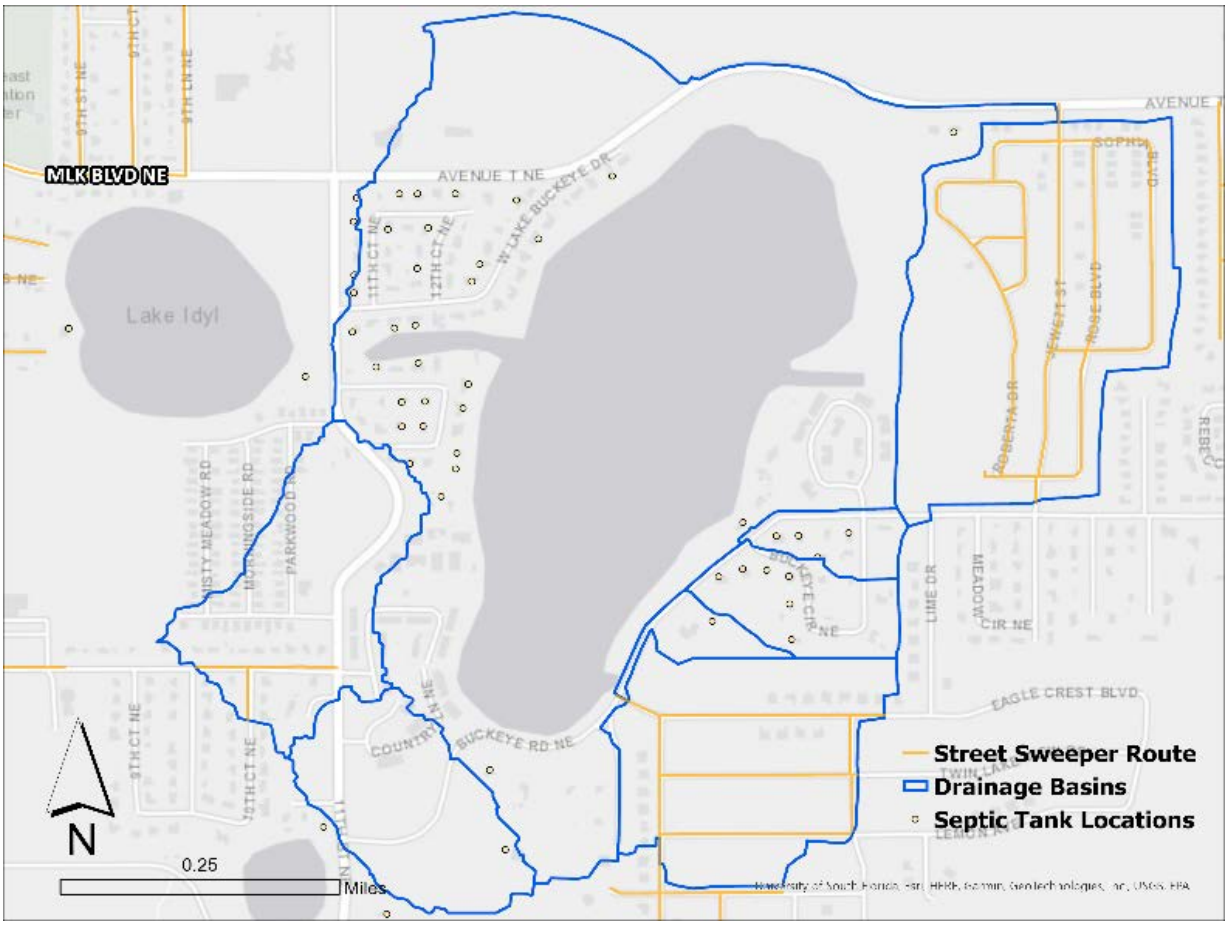


Figure 3-12. Map of Lake Buckeye's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Buckeye is a relatively small waterbody at just over 70 acres. It's mean depth of 9 feet is just slightly more than the overall average for all lakes in the study area, but it has some significantly deeper areas of over 26 feet (Figure 3-11). Compared to the total lake area, Buckeye's drainage basin is over three times as large which is slightly above average (Figure 3-12). Land use within the Buckeye drainage basin is primarily residential, contributing relatively low amounts of nitrogen and phosphorus per acre compared with other lakes in the area. There are approximately 40 septic systems within close proximity of the lake—potentially contributing nitrogen via groundwater seepage. However, as a phosphorus-limited waterbody, this is unlikely to have significant water quality impacts.

Compared with other lakes in the area, Lake Buckeye sits at a lower elevation within the watershed—receiving a constant overflow from Lake Idyl and discharging downstream to Lake Fannie. Over its period of record, Lake Buckeye's surface level has fluctuated between 125 and 129.8 feet above sea level. The normal level range fluctuates less than half a foot, between 127.6 and 128 feet (Figure 3-13). During 2025, Lake Buckeye dropped to a dry season low of 127.15 feet in May and rose to a wet season peak of 128.8 feet in September. The surface level ended the year slightly above average at 128 feet. Despite the below-average rainfall in 2025, Lake Buckeye experienced relatively normal surface level fluctuations. Perhaps this is due to the nearly constant discharge of excess water from Lake Idyl, its upstream neighbor to the west. Changes in Lake Buckeye's surface level are not correlated with Chl-a, TN, TP, or clarity (see appendix).

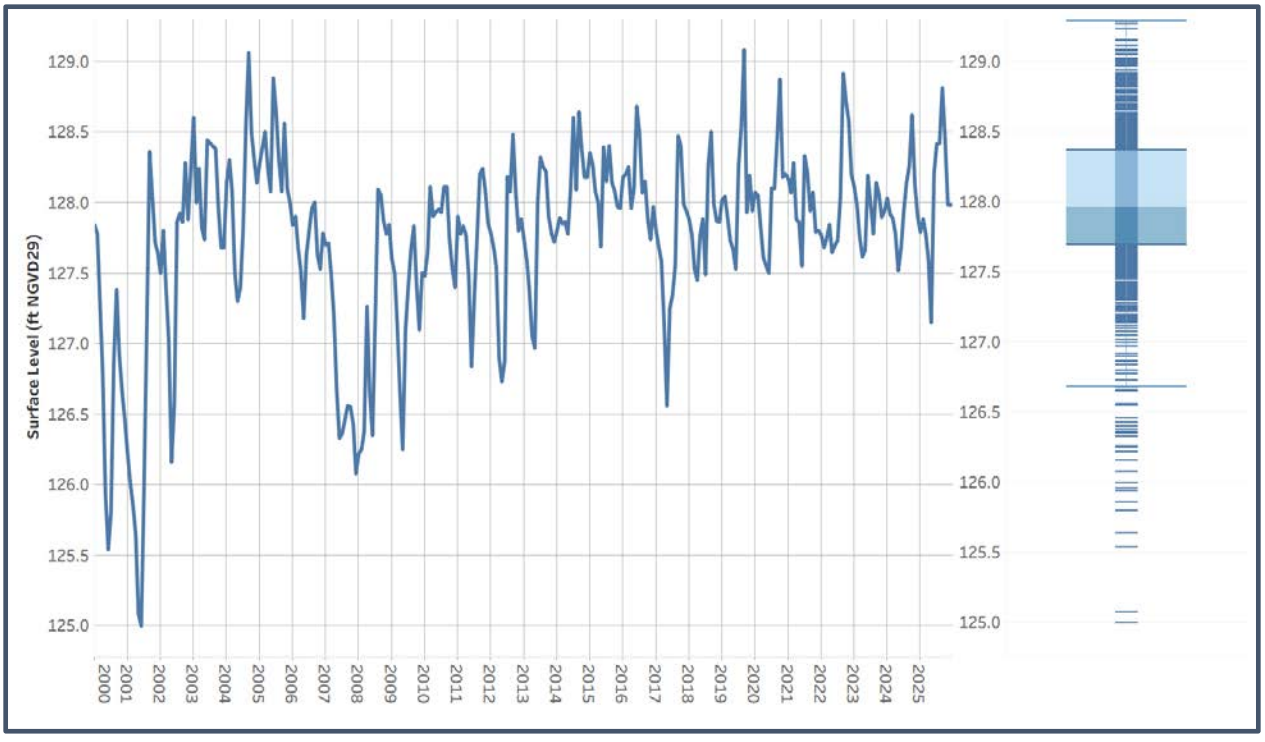


Figure 3-13. Hydrograph of Lake Buckeye depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

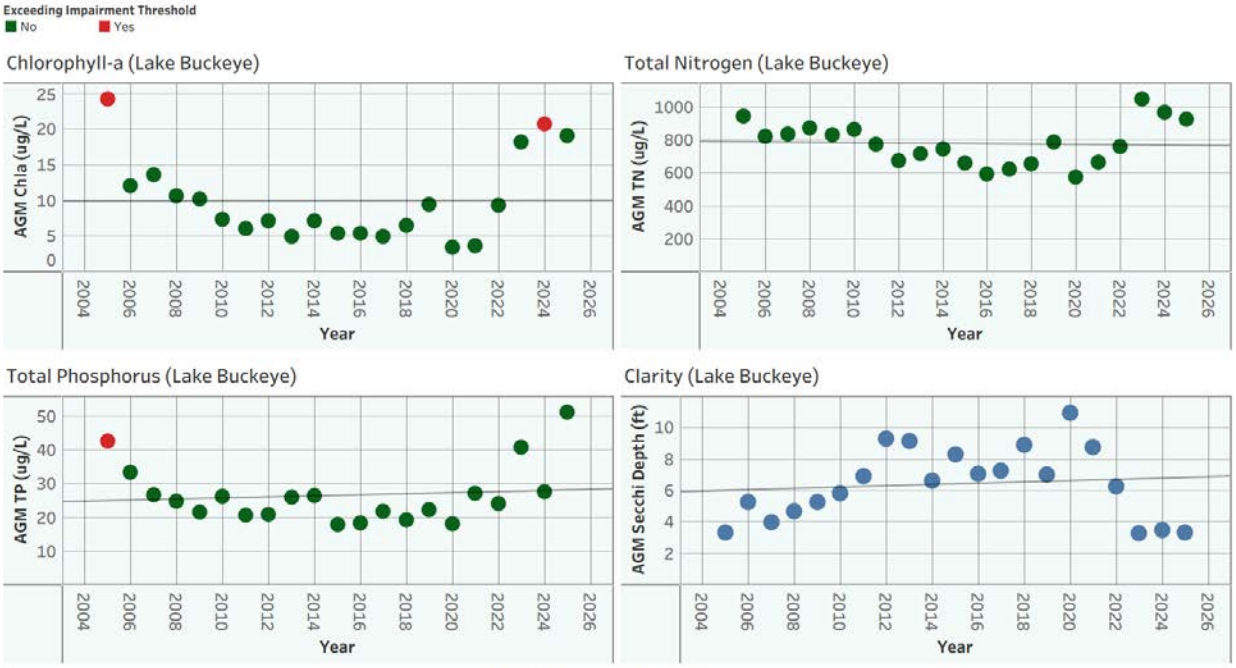
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Buckeye is categorized as a clear, alkaline waterbody. Before 2024, Lake Buckeye exceeded

NNC impairment thresholds in Chl-a and TP in 2005 (Figure 3-14). However, in 2024, Buckeye exceeded the NNC threshold for Chl-a, with elevated Chl-a, TN, and TP concentrations during the last three years. Water quality impairment could be a possibility if Lake Buckeye continues to exhibited these elevated concentrations. The City will be closely monitoring the water quality in this lake moving forward.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. All four water quality parameters exhibited non-significant trends in 2025—earning Chl-a, TN, TP, and Clarity trend scores of 1s and 2s. In recent years, Lake Buckeye has exhibited short term trends in Chl-a, TN, and Clarity that is consistent with water quality decline. Again, this is a lake that will require close monitoring to ensure that water quality does not continue to deteriorate.



Lake Buckeye 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	0.004	-0.048	0.112	0.113
P-Value	0.985	0.837	0.629	0.626

Figure 3-14. Lake Buckeye AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Buckeye on 03/28/2025. The PAC during this survey was 64.2% and the total BV was 6.2%--equating to an abundance criterion score of 3 (Figure 3-15). Compared with the previous year, this constituted a marginal increase in vegetation abundance. Vegetation abundance in 2023 was much lower—likely due to invasive species management efforts. However, this recent resurgence in coverage and abundance indicates consistent recovery and illustrates how invasive management impacts can be short term.

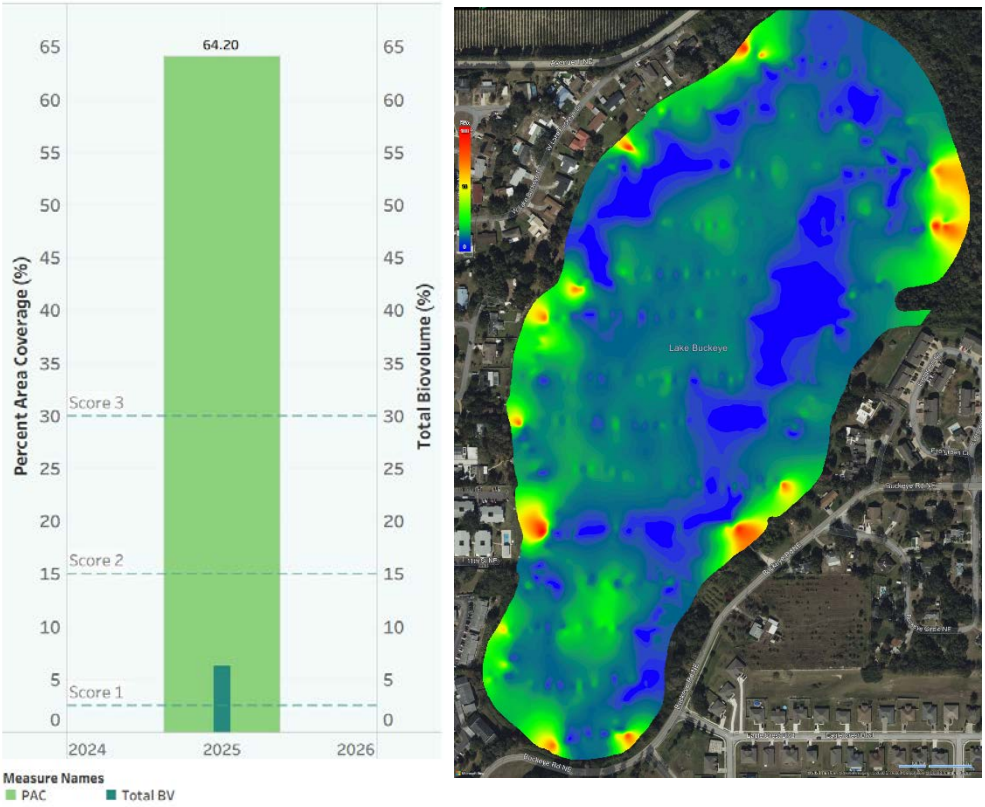


Figure 3-15. Graph depicting 2025 PAC/BV and biovolume heatmap; biovolume values range from green (lowest) to red (highest).

Invasive Species Management:

In 2025, Lake Buckeye appeared to support a wide variety of aquatic plant species. The submerged plant, coontail, was the most dominant species at 17% of the population; followed closely by the floating-leaf plant, spatterdock, at 15.4%. The remaining aquatic plant population was composed of 21 unique species of various plant types. Historically, coontail has been the dominant species. Despite significant declines in coontail populations, this species has recovered as the dominant plant in Lake Buckeye. The invasive plants hydrilla and parrot feather were present in relatively low numbers in 2025, at just 2.5% of the population—resulting in an invasive abundance score of 2 (Figure 3-17). Fortunately, the previously present invasive, burhead sedge, was not detected during the 2025 survey. This indicates the relative success of early detection and rapid response through selective herbicide applications.

Species Diversity:

This evaluation examines species richness, evenness, and overall diversity. During 2025, all three of Lake Buckeye's diversity indices exceeded their long-term medians, resulting in a diversity criterion score of 3 (Figure 3-16). The recovery of several smaller or less common plant species led to a significant increase in the richness index from the previous year. While species evenness decreased slightly from 2024, the overall diversity index surged past where it was during the previous analysis. Again, these results are indicative of general biological improvement in Lake Buckeye.

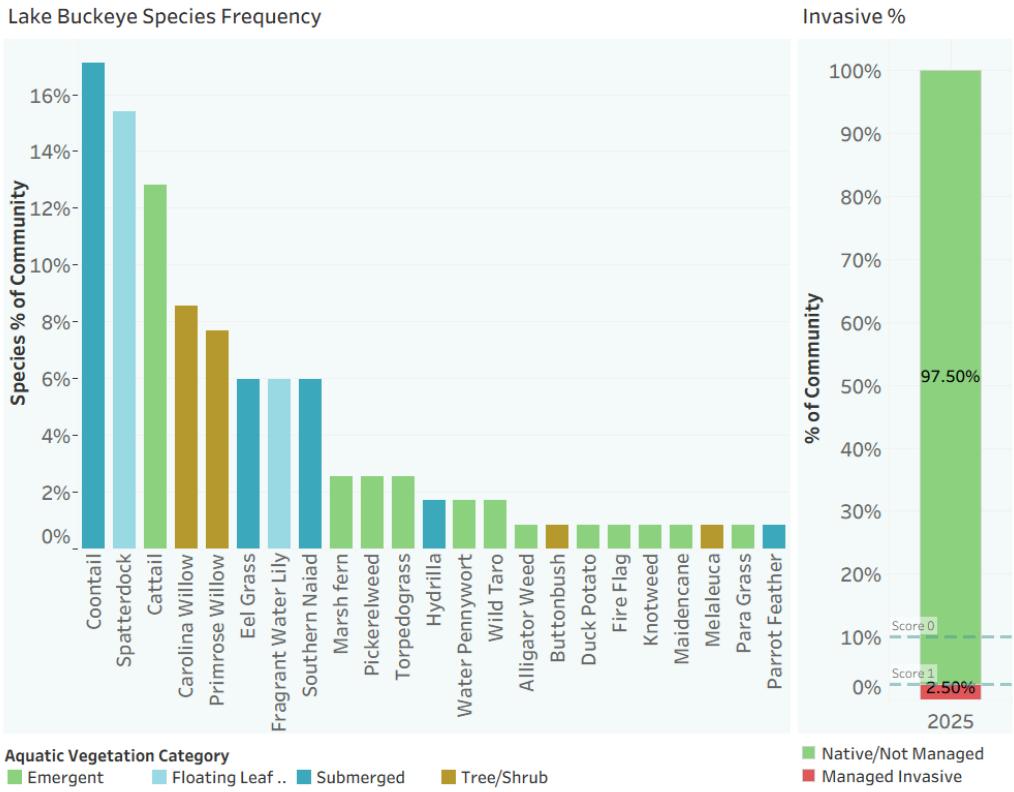


Figure 3-17. Chart depicting species frequency and invasive species percentage of Lake Buckeye during 2025.

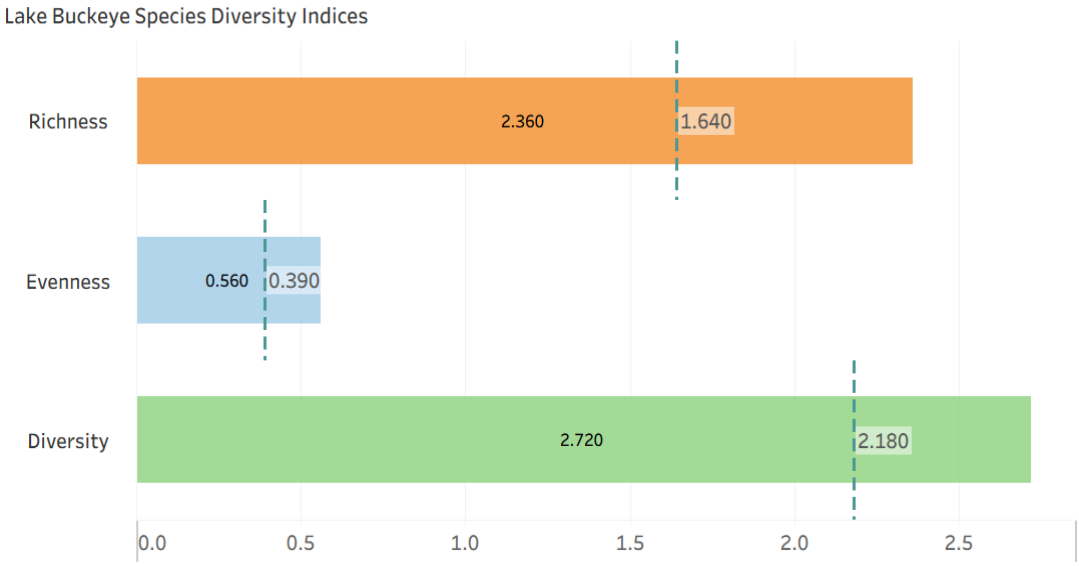


Figure 3-16. Chart depicting 2025 diversity indices for Lake Buckeye. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Buckeye's health index scores from 2018 to 2024 shows relative consistency. However, shifts in the water quality trend scores in 2024 lowered its overall lake health index value to its lowest point since monitoring began (Table 3-2). These shifts in water quality metrics were likely due in part to invasive species treatments and the subsequent impacts from the increase in decaying plant matter in the lake. The restoration of vegetation abundance should help to buffer against future shifts in water quality. However, continual monitoring to facilitate the early detection and rapid response of invasive management efforts should help to prevent impacts on a large scale in the future.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	3	3	3	0	1	**2.4**
2019	3	3	3	3	3	3	0	3	**2.6**
2020	3	3	3	3	3	3	0	2	**2.5**
2021	3	3	3	3	3	3	1	1	**2.5**
2022	3	3	3	3	3	3	1	0	**2.4**
2023	3	3	3	2	3	2	2	3	**2.6**
2024	3	2	2	2	2	3	1	3	**2.3**
2025	3	1	2	1	2	3	2	3	**2.1**

Table 3-2. Lake Health Index scores for Lake Buckeye from 2018 to 2025.

Lake Health Impacts/Challenges:

- Lake Buckeye currently exhibits good water quality. However, stormwater pollutant loading is a potential concern if water quality trends ever change for the worse.
- The presence of OSTDs (septic) systems in the drainage basin may not currently be an issue assuming they are functioning properly. However, as these systems age, they may begin to leach nutrients into the water table—leading to water quality declines.
- The management of invasive species like hydrilla and burhead sedge is a constant concern. It can only take a single season for even a small population to take over large areas of a waterbody. Large-scale invasive treatments can sometimes result in the sharp declines in vegetation abundance as seen in 2023.

Lake Management Strategies:

- Stormwater management within this basin includes street sweeping up to 5.6 miles monthly. Resident education is also important to address non-point pollutants from stormwater runoff such as fertilizer and pesticides.
- City staff may explore source analysis to determine if OSTD leachate is a potential contributor to nutrient pollutant loading. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large scale herbicide treatments and potential water quality issues that follow.

Lake Cannon

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
1	2	2	1	1	3	1	1	1.5

Features & Statistics:

Surface area	338.2 acres
Mean depth	10.9 feet
Maximum depth	20 feet
Volume	3479.2 acre-feet
Drainage basin area	695.4 acres
Annual TN Load	3863.1 lbs
Annual TP Load	637.8 lbs
Limiting nutrient	Co-limited (N & P)

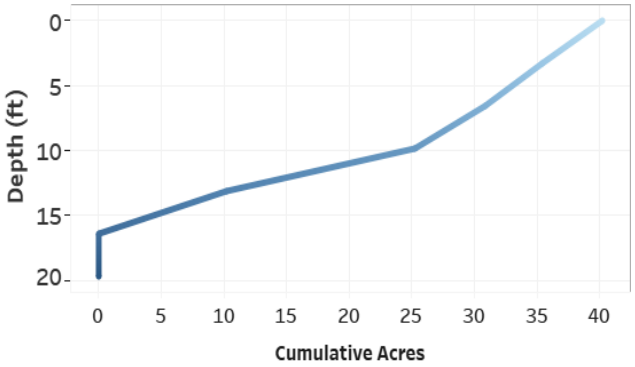


Figure 3-18. Hypsograph of Lake Cannon depicting the depth profile and morphology of the lake bed.

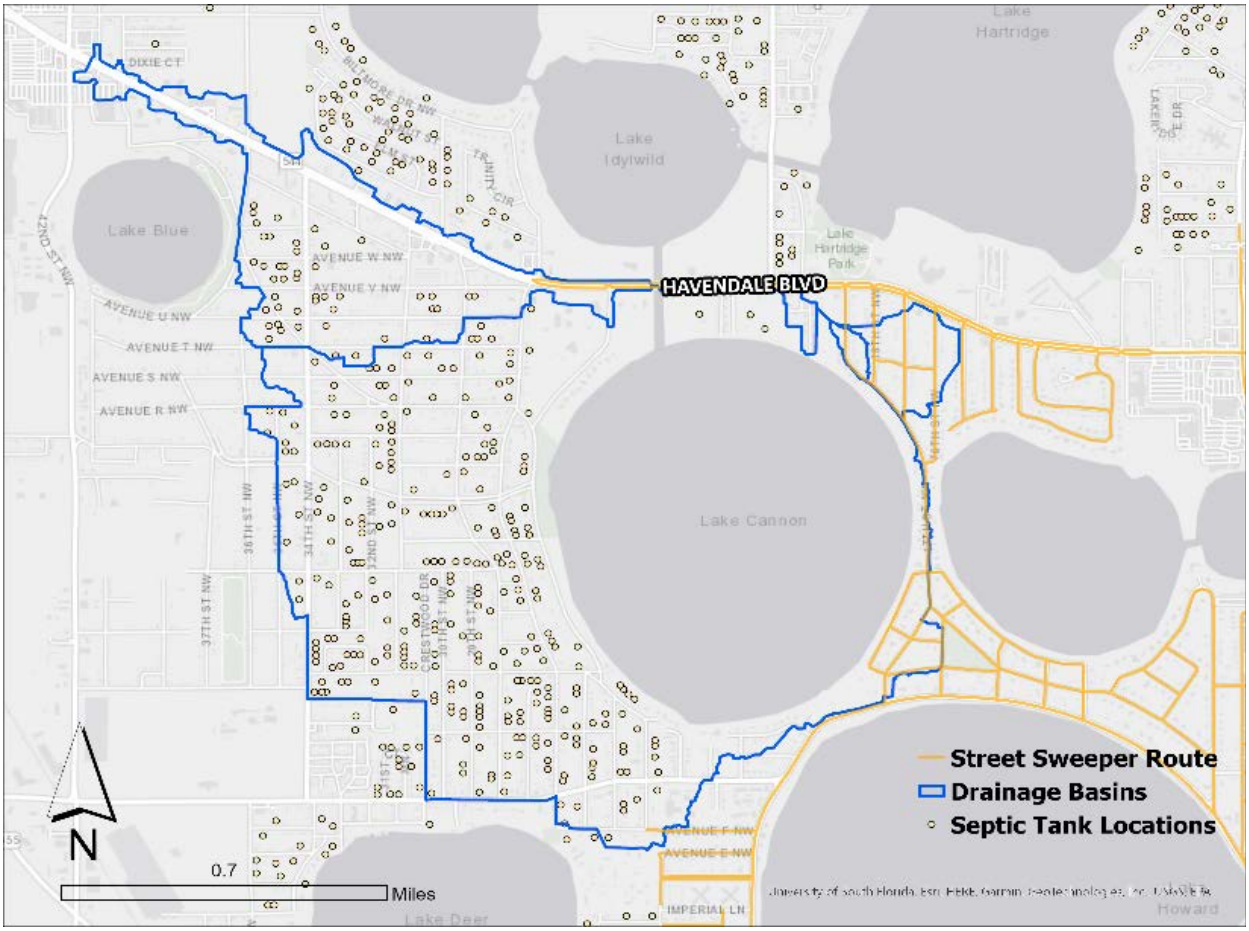


Figure 3-19. Map of Lake Cannon's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Cannon is a moderately sized waterbody at over 300 acres. It exhibits somewhat above average depth compared with other lakes in the area with a mean depth of 11 feet and a maximum depth of 20 feet; a cone-shaped depression typical of most sinkhole lakes on the Central Florida ridge (Figure 3-18). Lake Cannon's drainage basin is roughly twice the size of its lake area and is comprised primarily of medium-density residential land uses (Figure 3-19). The per-acre nitrogen and phosphorus loads contributed by this basin rank 17th compared to the 37 other lakes in the study area. There are 338 known septic systems within the drainage basin on the west side of the lake. These have the potential to contribute elevated nitrogen loads via groundwater seepage.

As part of the South Chain of Lakes, Cannon is connected to Lakes Howard, Idylwild, and Mirror via navigable canals. Excess water from the South Chain of Lakes discharges to the Wahneta Farms drainage canal via a passive overflow structure at the south shore of Lake Lulu; eventually connecting with the Peace Creek near Bartow. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-20). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Cannon's surface level directly correlate with water clarity and indirectly correlate with Chl-a and TN (see appendix). This carries management implications as a higher surface level should result in water quality improvements.

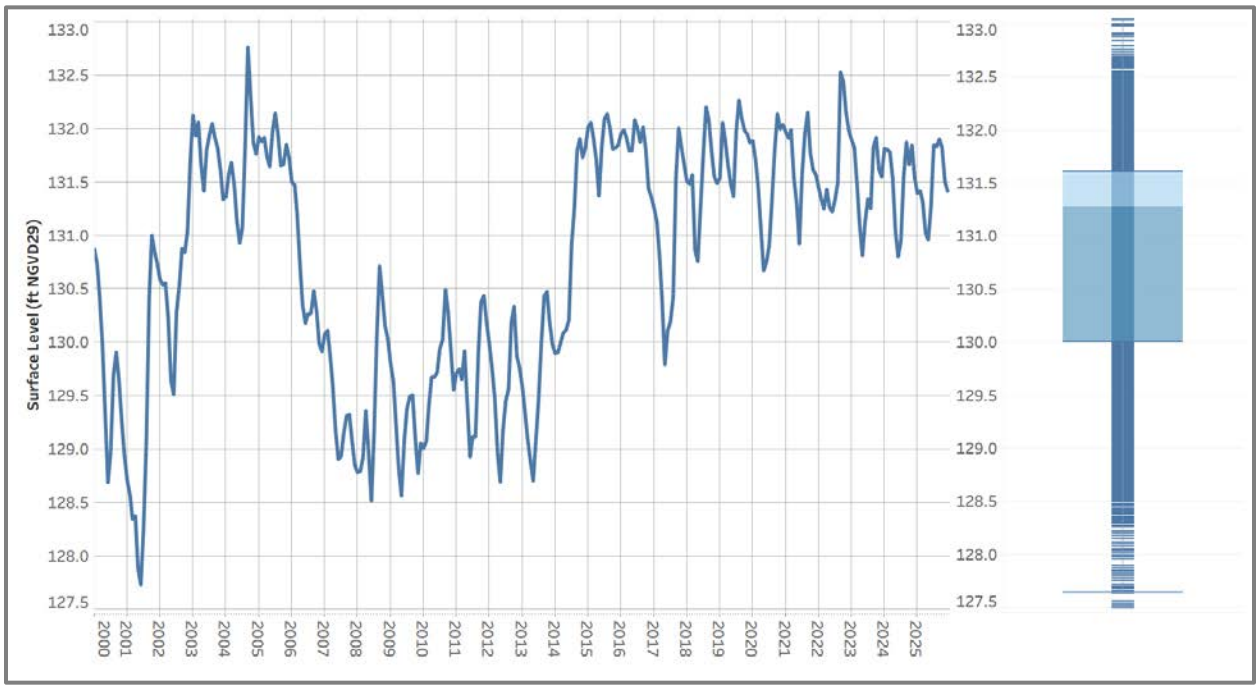


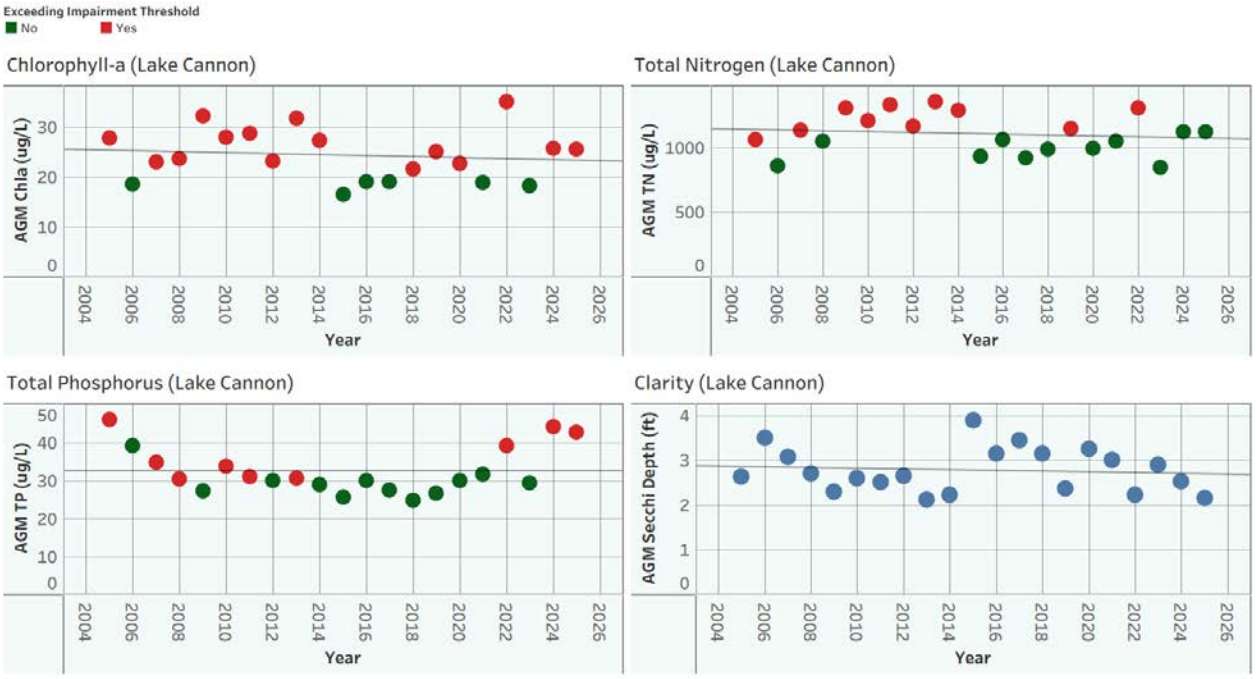
Figure 3-20. Hydrograph of the South Chain of Lakes depicting monthly surface level readings from 2000 to 2025. A box & whisker plot details the total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Cannon is categorized as a clear, alkaline waterbody. Based on exceedances 2024-2025, it is considered impaired for Chl-a and TP (Figure 3-21). In 2019, the FDEP established a total maximum daily load (TMDL) for Lake Cannon which stipulates a 20% reduction in TN concentration to meet the Chl-a guidelines. All three NNC parameters have fluctuated above and below the impairment threshold over the last several years which is relatively common for lakes with pollutant concentrations right at the impairment theshold. Despite the impairments, Lake Cannon's water quality has remained relatively stable.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Each of the four parameters exhibited non-significant trends resulting in Chl-a, TN, TP, and Clarity trends scores of 2,2,1, and 1, respectively. Despite recent impairment exceedances in Chl-a and TP, neither of these parameters exhibited significant short term trends in the last five years that would indicate water quality deterioration.



Lake Cannon 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.119	-0.132	0.000	-0.102
P-Value	0.606	0.569	0.999	0.660

Figure 3-21. Lake Cannon AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are the 20 year trend statistics

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted on Lake Cannon on 04/24/2025. The PAC during this survey was 35% and the total BV was 5.9% (Figure 3-22). Due to the slope of Lake Cannon's bed, the littoral zone is limited to around 10-12 feet in depth. Both the PAC and BV values exhibited a slight increase from the previous two years. Over the years, Lake Cannon has not exhibited much variability in the amount of vegetation—maintaining an abundance score of 3 since monitoring began.

Invasive Species Management:

Based on data from the 2025 survey, Lake Cannon's vegetation community was comprised of a good mix of submerged and emergent species. The most abundant species by far was the submerged native, eel grass at 25.5% of the community (Figure 3-24). Unlike previous years, hydrilla was the only managed invasive species present at just 3.2% of the population. This was a moderate decrease from over 5% in 2024. While Lake Cannon scored a 1 in the invasive species presence criterion, the invasive percentage has been decreasing over the last few years.

Species Diversity:

This evaluation examines species richness, evenness, and overall diversity. In 2025, only species richness exceeded the median value while evenness and diversity fell below-average (Figure 3-23). This equates to a diversity score of 1 and indicates a potential shift in the vegetation community. There is a strong possibility that invasive species management has contributed to the lower evenness and diversity in recent years. Fortunately, these metrics tend to bounce back with time.

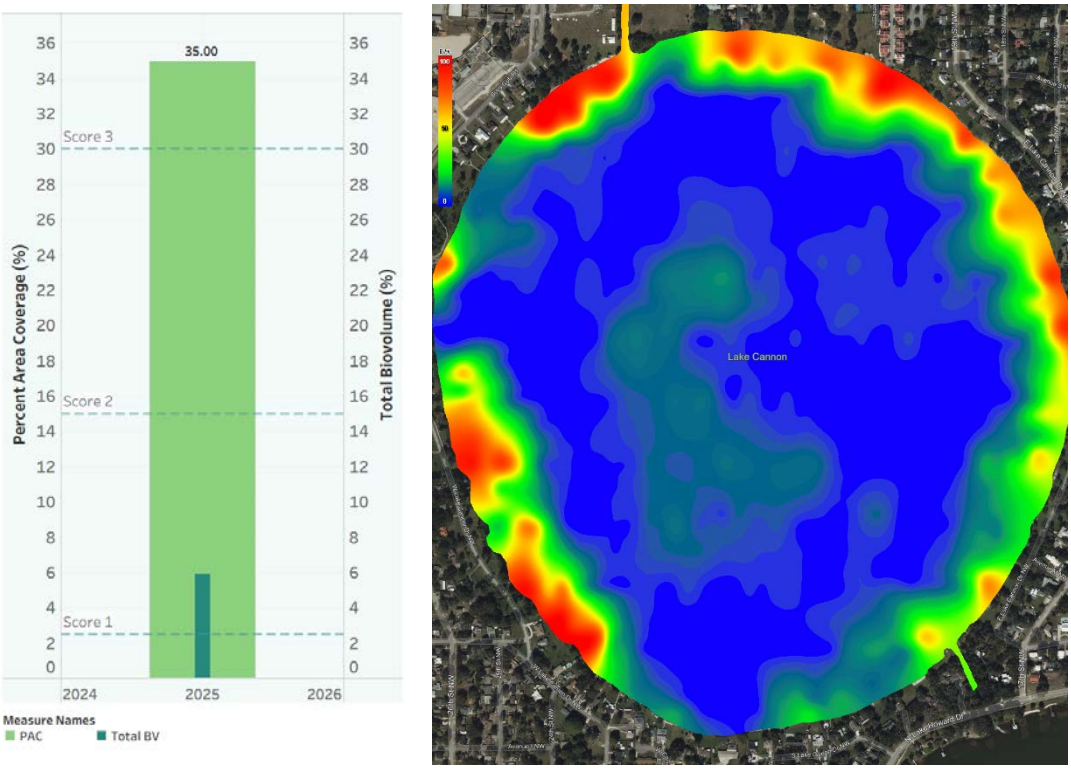


Figure 3-22. Graph depicting 2025 PAC/BV and biovolume heatmap; biovolume values range from green (lowest) to red (highest).

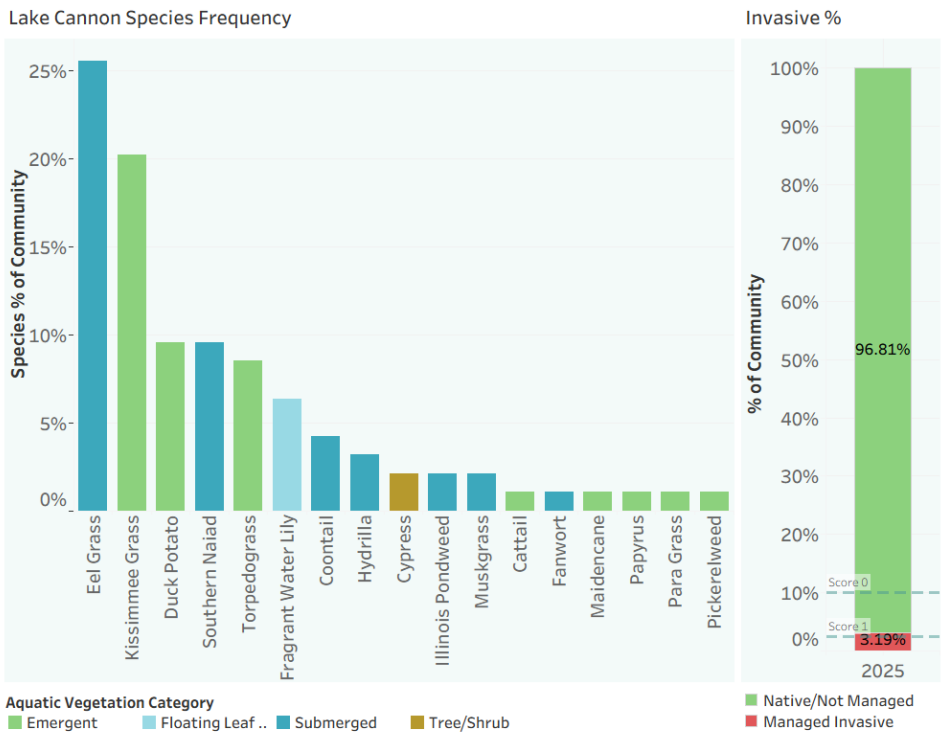


Figure 3-24. Chart depicting species frequency and invasive species percentage of Lake Cannon during 2025.

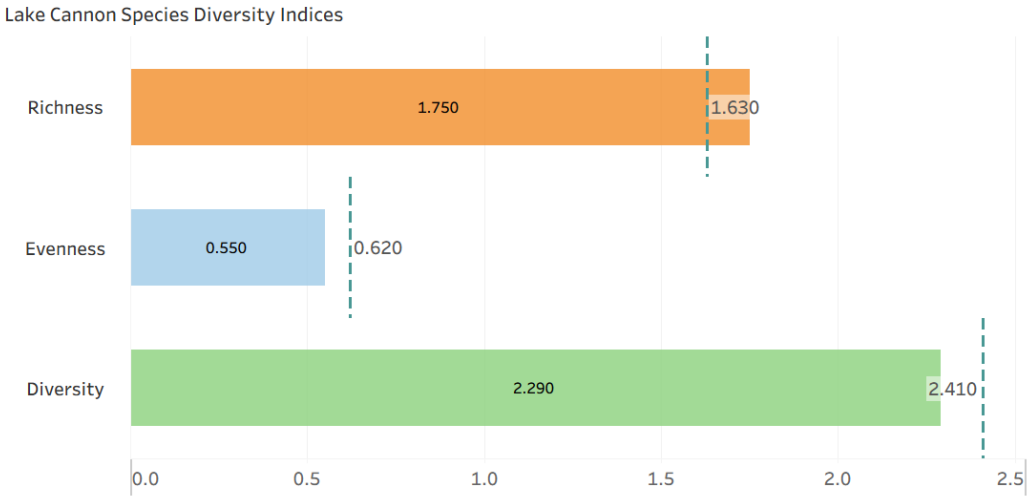


Figure 3-23. Chart depicting 2025 diversity index values for Lake Cannon. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Cannon's health index scores over time shows a gradual increase from 2018 to 2023, then an abupt decrease to its lowest point in 2025 (Table 3-3). In the years since lake health monitoring began, the impairment criterion has shown steady improvement, but recent exceedances have led to a drop in impairment scores. The trend criteria appears to have decreased from significant improving scores to non-significant trends we see in 2024 and 2025.

These shifts in the trends demonstrate how additional management efforts are needed to maintain the water quality back towards improvement. Vegetation abundance has remained high, with some fluctuation in the invasive and diversity criteria.

Lake Health Impacts/Challenges:

- Lake Cannon's chlorophyll-a and TP concentrations exceed the impairment thresholds. Stormwater is a primary concern as a leading contributor of nutrient pollutant loading as is the effluent from Lake Blue.
- The presence of OSTDs (septic) systems in the drainage basin may not currently be an issue assuming they are functioning properly. However, as these systems age, they may begin to leach nutrients into the water table—leading to water quality declines.
- The management of invasive species like hydrilla is a constant concern. It can only take a single season for even a small population to take over large areas of a waterbody. The subsequent treatment can result in impacts to native vegetation and water quality.
- Several water quality metrics are significantly correlated with Lake Cannon's surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- Street sweeping is currently conducted on City roads in the eastern part of the drainage basin (Figure 3-19). In total, nearly 10 miles of roadways are swept monthly.
- City staff may explore source analysis to determine if OSTD leachate is a potential contributor to nutrient pollutant loading. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	3	2	3	3	2	NA	**2.1**
2019	1	2	3	2	3	3	2	1	**2.1**
2020	1	2	3	2	3	3	1	2	**2.1**
2021	2	3	3	2	3	3	1	1	**2.3**
2022	2	2	2	2	3	3	2	3	**2.4**
2023	2	2	2	3	2	3	1	3	**2.3**
2024	2	2	2	2	2	3	1	2	**2.0**
2025	1	2	2	1	1	3	1	1	**1.5**

Table 3-3. Lake Health Index scores for Lake Cannon from 2018 to 2025.

Lake Conine

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	2	3	2	0	3	2.4

Features & Statistics:

Surface area	235.4 acres
Mean depth	9 feet
Maximum depth	18 feet
Volume	2105.1 acre-feet
Drainage basin area	559.1 acres
Annual TN Load	2836.2 lbs
Annual TP Load	474.4 lbs
Limiting nutrient	Co-limited (N & P)

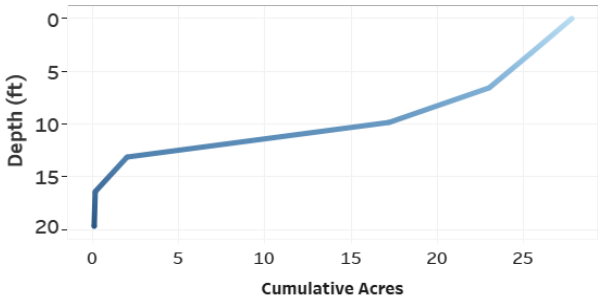


Figure 3-25. Hypsograph of Lake Conine depicting the depth profile and bed morphology.

Hydrology:

With a surface area of 235 acres, Lake Conine ranks 15th of area lakes in size. Its morphology is fairly conical, with an average depth of 9 feet and maximum depth of roughly 18 feet (Figure 3-25). Lake Conine receives surface runoff from an area approximately twice the size of the lake; contributing a moderate amount of nitrogen and phosphorus (Figure 3-26). Based on per-acre loading rates, Lake Conine's pollutant load ranks 19th out of area lakes. There are 39 known septic systems within this basin—potentially contributing a minor amount of nitrogen via groundwater leaching.

As part of the Northern Chain, Lake Conine is connected via navigable canals to Lakes Rochelle and Smart, as well as a lock system to Lake Hartridge, Excess water from the North Chain eventually drains via the SWFWMD-managed P-8 control structure to the south of Lake

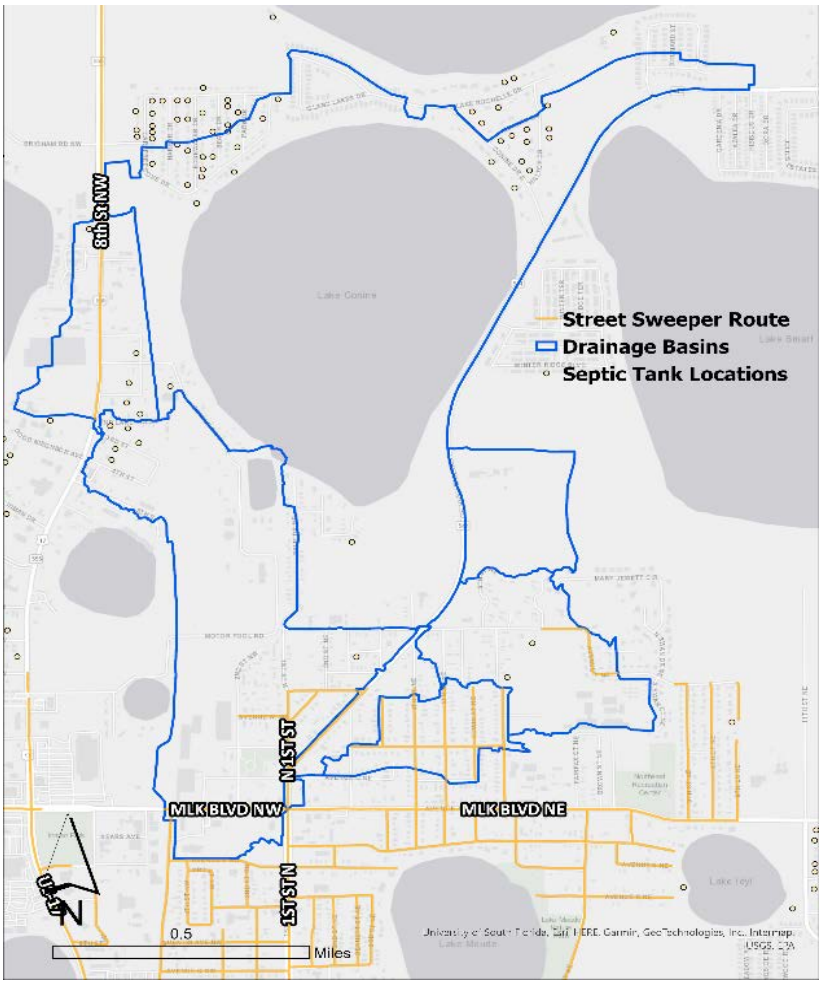


Figure 3-26. Map of Lake Conine's drainage basin, City street sweeper routes, and nearby septic systems.

Hamilton and enters the Peace Creek.

Over the period of record, surface levels in this section of the North Chain (Lakes Conine, Haines, Rochelle, and Smart) have fluctuated between 122 and 129.5 feet above sea level. The normal range fluctuates much less between 126.1 and 128.2 feet (Figure 3-27). During 2025, Lake Conine reached a peak of 128.5 feet in February and a low of 127.6 feet in December. The surface level generally declined throughout the year—likely due to the low annual rainfall as well as hydrologic management by the SWFWMD. While Conine's surface level did not drop below its long-term median, 2025 marks the lowest this chain has reached since the 2017 dry season. Changes in Lake Conine's surface level are directly correlated with water clarity and indirectly correlated with Chla and TN (see appendix). This carries management implications as maintaining a higher surface level should result in improved water quality.

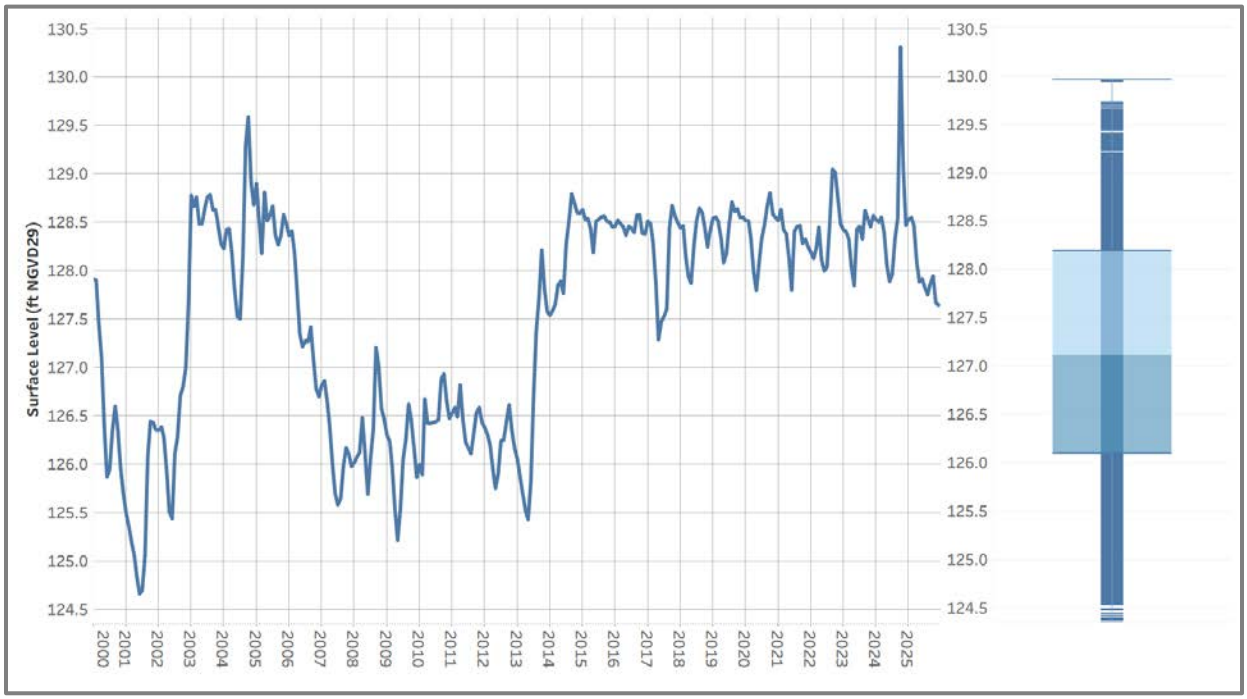


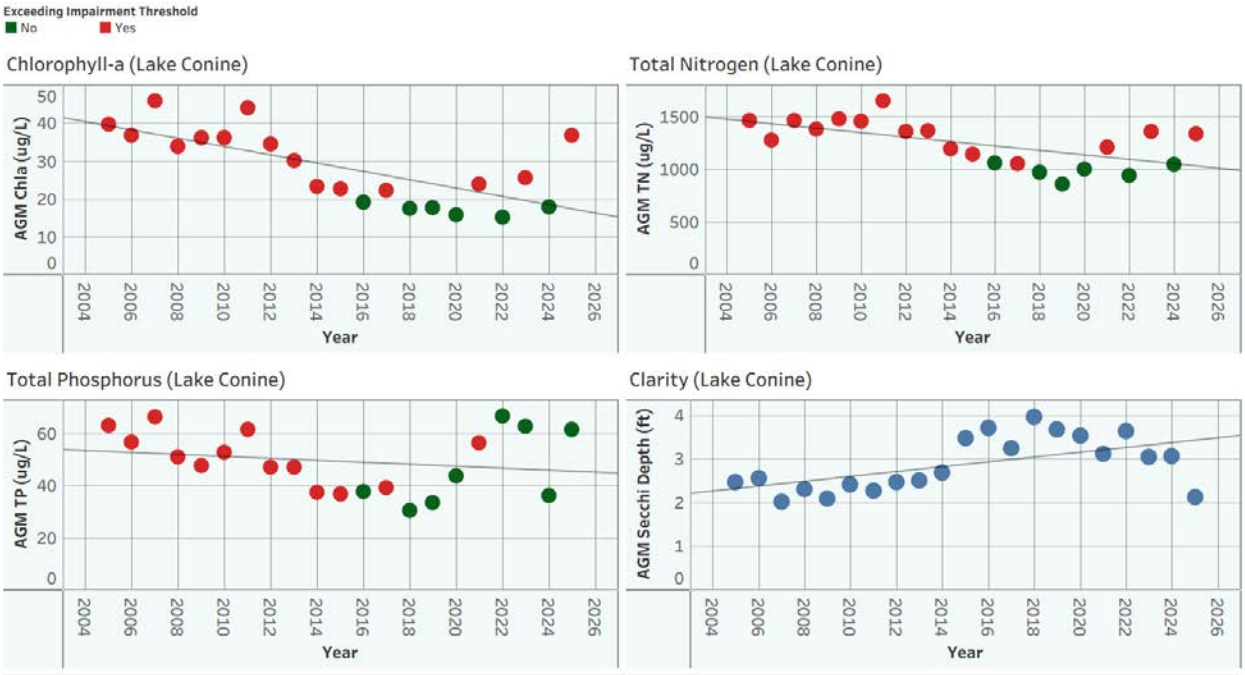
Figure 3-27. Hydrograph of Lake Conine depicting monthly surface level readings from 2000 to 2025. A box & whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Conine is categorized as a clear, alkaline waterbody. Based on a lack of multiple consecutive exceedances in the last 7.5 years, Lake Conine is no longer exhibiting impaired status (Figure 3-28). This marks the second consecutive year that the lake has maintained Chl-a, TN, and TP at levels deemed not-impaired by the NNC. Continued improvement in water quality demonstrates how management actions have helped to restore the lake to previous conditions. Due to its previous impairements, the FDEP established a total maximum daily load for Lake Conine in 2018; stipulating a 36% reduction in TN and a 57% reduction in TP in order to meet NNC guidelines. The City will continue to work towards meeting these guidelines through its management activities.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Lake Conine exhibited significant improving trends in Chl-a, TN, and Secchi depth and a non-significant improving trend in TP. This equates to water quality trend criteria scores of 3 for the improving trends and a 2 for the non-significant trend. Individual AGM values and trend statistics can be found in the appendix.



Lake Conine 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity Increasing
R Coeff.	-0.698	-0.608	-0.199	0.560
P-Value	0.000	0.003	0.386	0.008

Figure 3-28. Lake Conine AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are the 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Conine on 7/11/2025. The PAC during this survey was 28.9% and the total BV was 9.2%--indicating somewhat greater abundance than the previous year (Figure 3-29). Lake Conine saw a dramatic drop in abundance in 2021 and has continued to exhibit similar vegetation abundance since. This was likely due to treatment of invasive species like hydrilla. The percent coverage and biovolume values have gradually increased over the last three years, but the abundance criteria scores have remained below the threshold to receive a score of 3.

Invasive Species Management:

During the 2025 survey, there was a relatively even mix of submerged and emergent plant types present. The most abundant species was the native eelgrass at 17% of the population (Figure 3-31). However, the population percentage for invasive species drastically increased since the previous year. Hydrilla and water hyacinth totaled over 19%, up from 4% in 2024. Unfortunately,

this demonstrates how invasive species can signficantly alter the biological community in a short period.

Species Diversity:

This evaluation examines species richness, evenness, and overall diversity. Based on the 2025 species data, all three of Lake Conine's diversity indices exceeded their long-term median values (Figure 3-30). Conine exhibited increases in each of the diversity indices since the previous years—indicating that the rise in abundance and change in vegetation community had an impact on overall diversity.

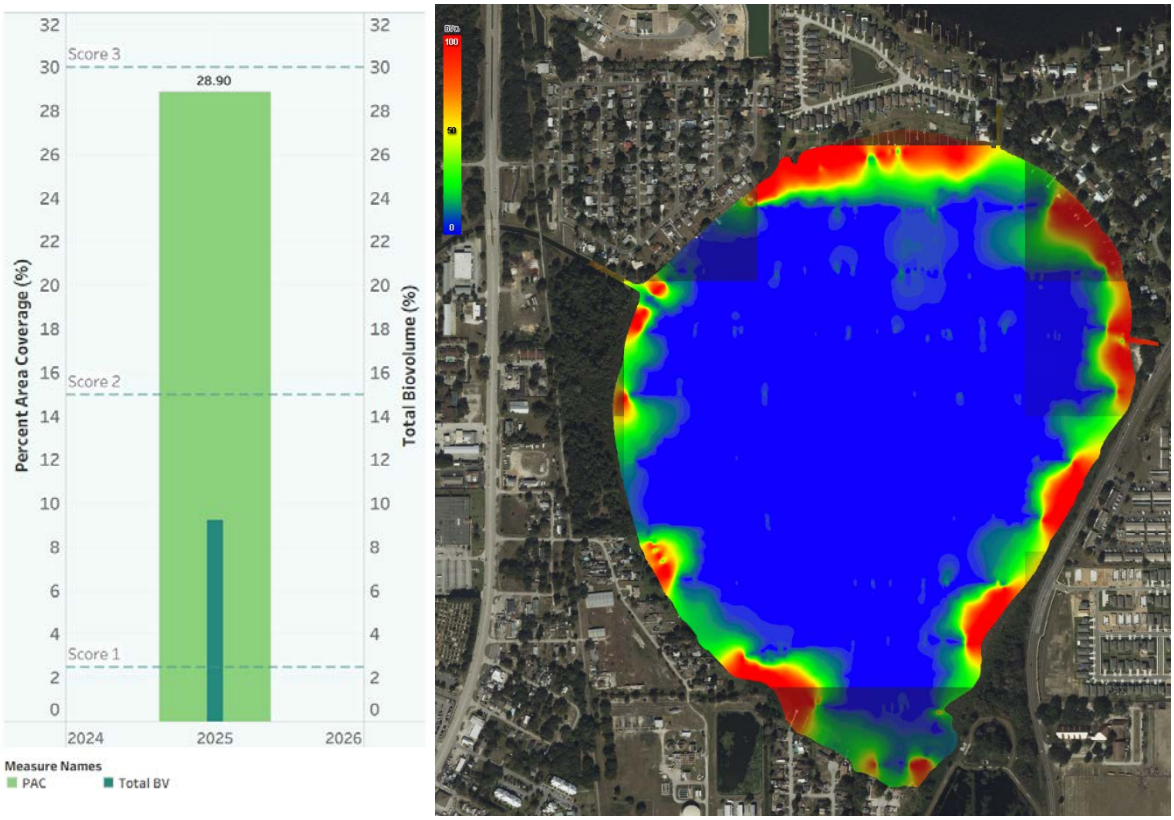


Figure 3-29. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Conine; biovolume values range from green (lowest) to red (highest).

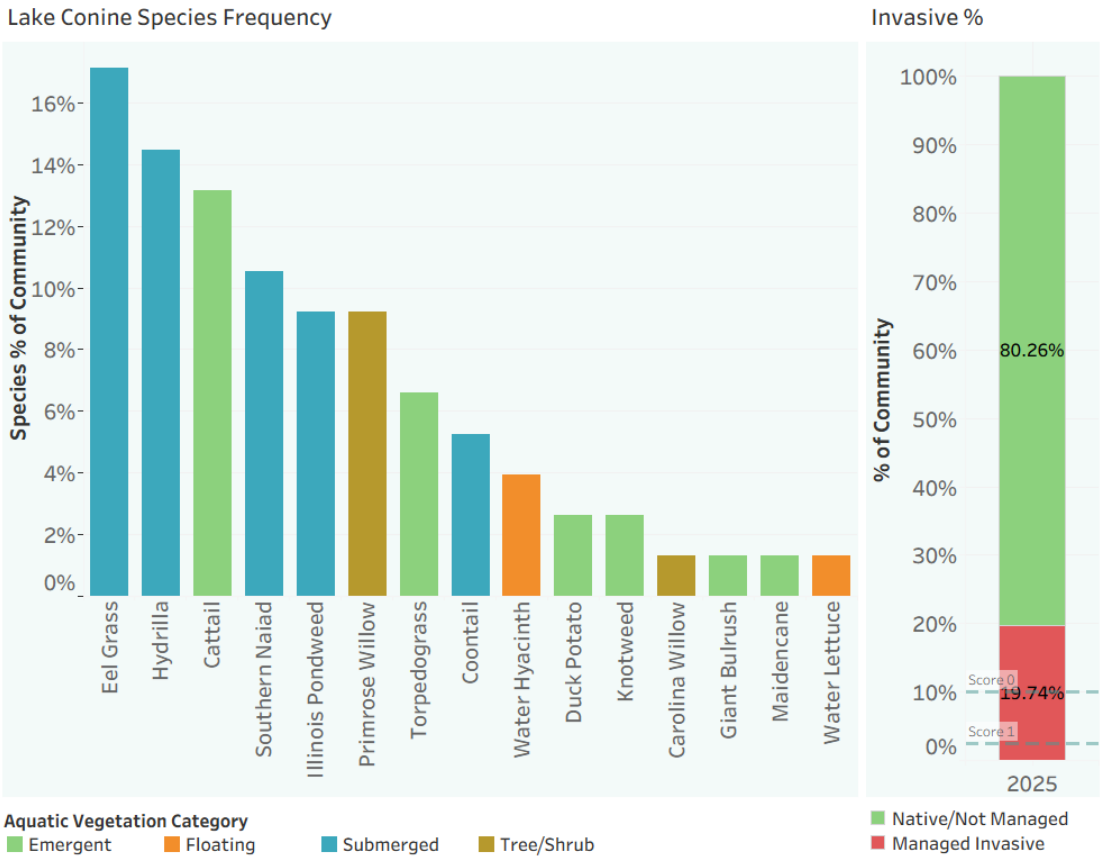


Figure 3-31. Chart depicting species frequency and invasive species percentage of Lake Conine during 2025.

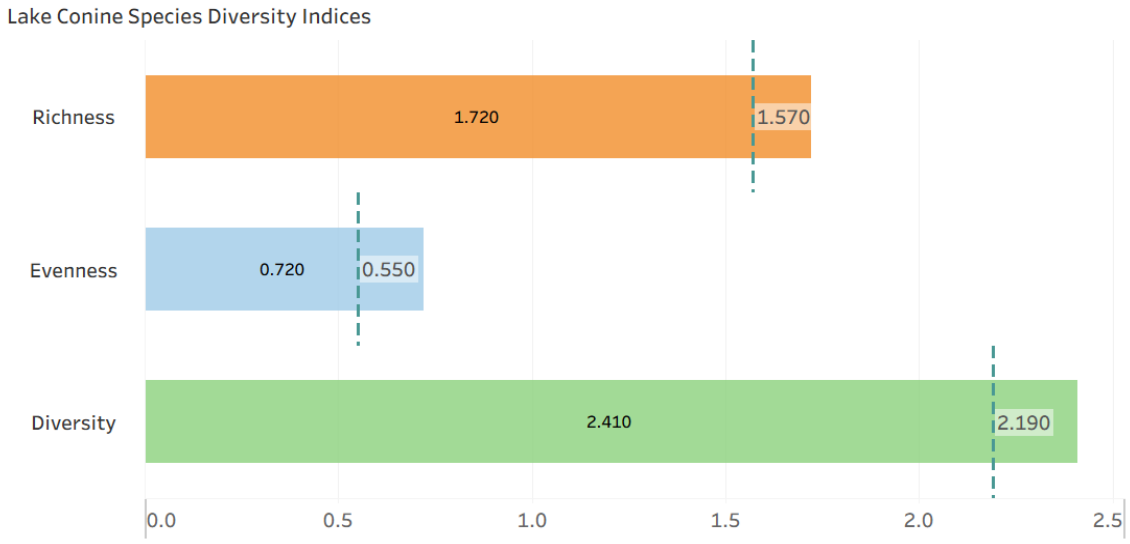


Figure 3-30. Chart depicting 2025 diversity indices for Lake Conine. Dashed line represent median values.

Lake Health Tracking:

A comparison of Lake Conine's health index scores from 2018 to 2025 shows general improvement. The recent shift in the impairment scores since 2022 was the primary driver of these lake health changes (Table 3-4). Additionally, the trend criteria scores have improved somewhat since 2018, indicating that water quality will continue to improve in the future. One of the primary areas for improvement will be addressing invasive species presence which has shown some positive movement since 2022, but exhibited a backslide in 2025. Overall, Lake Conine is doing much better than it was when monitoring began. The stability in lake health scores over the last three years is a good sign that management efforts have made consistent improvements during this time.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	2	2	3	2	0	2	**1.6**
2019	0	3	2	3	3	3	0	2	**2.0**
2020	0	3	2	3	3	3	0	0	**1.8**
2021	0	3	2	2	3	2	0	3	**1.9**
2022	0	3	2	2	3	2	1	1	**1.8**
2023	3	3	3	2	3	2	1	3	**2.5**
2024	3	3	3	2	3	2	1	3	**2.5**
2025	3	3	3	2	3	2	0	3	**2.4**

Table 3-4. Lake Health Index scores for Lake Conine from 2018 to 2025

Lake Health Impacts/Challenges:

- In addition to stormwater influx to Lake Conine, the wastewater treatment plant near this lake was a historic contributor of point-source pollutants. These legacy nutrients in the lake bed are a potential source of nitrogen and phosphorus.
- The management of invasive species like hydrilla and burhead sedge are a constant concern. It can only take a single season for even a small population to take over large areas of a waterbody.
- Several water quality metrics are significantly correlated with Lake Conine's surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- The City is addressing stormwater pollutant loading through the recent construction of the Lake Conine Nature Park—a form of green stormwater infrastructure utilizing constructed wetlands designed to treat runoff from the largest southern sub-basins contributing to Lake Conine.
- Street sweeping is conducted on City roadways in the southern portion of the drainage basin—roughly 0.75 miles monthly.
- City staff continue to monitor aquatic vegetation and share the information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- Previous efforts by Polk County have used alum to “cap” historic legacy sediments in Lake Conine. Future efforts may evaluate the longevity of this project and the potential for future nutrient flux from the lake bed. However, water quality trends indicate that efforts to date have been successful.

Lake Daisy

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	3	3	2	3	3	2.9

Features & Statistics:

Surface area	137.3 acres
Mean depth	8.5 feet
Maximum depth	13 feet
Volume	1179.7 acre-feet
Drainage basin area	356 acres
Annual TN Load	1717.7 lbs
Annual TP Load	382.25 lbs
Limiting nutrient	Co-limited (N & P)

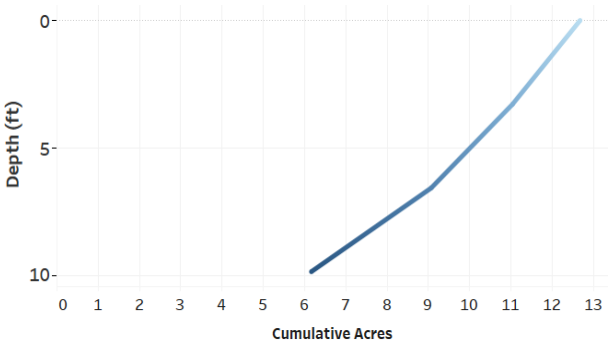


Figure 3-32. Hypsograph of Lake Daisy depicting the depth profile and morphology of the lake bed.

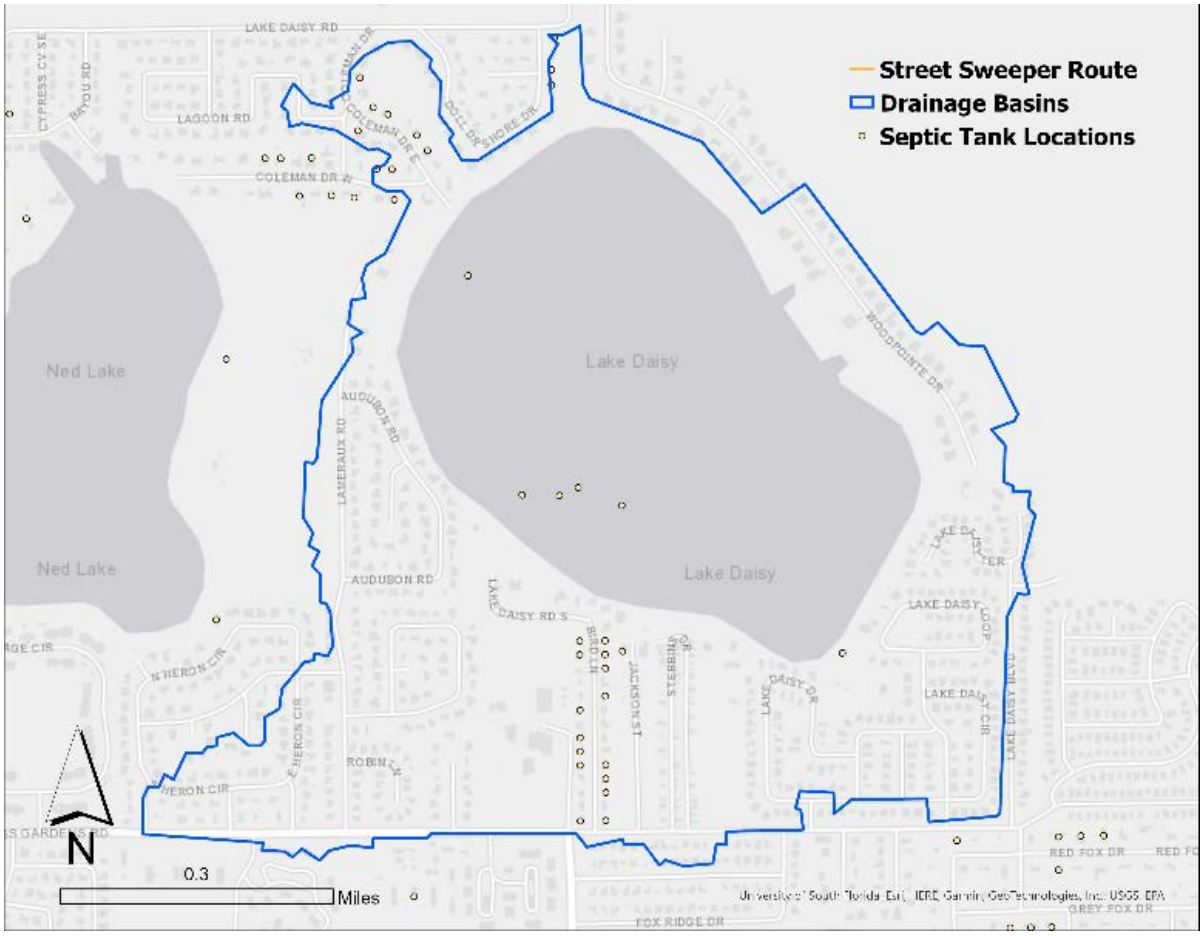


Figure 3-33. Map of Lake Daisy's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Daisy is a small and shallow waterbody at just 137 acres, an average depth of 8.5 feet, and a maximum depth of 13 feet (Figure 3-32). Due to its small size and relative shallowness, it has a higher than normal propensity for sediment suspension due to wind and wave action. Lake Daisy's drainage basin is also relatively small and made up mostly of residential land uses (Figure 3-33). The per-acre nitrogen and phosphorus loads from this drainage basin are some of the highest in the study area—likely due to the residential and agricultural land uses. There are approximately 30 septic systems within the drainage basin, but this density is low and not likely to be a major contributor to pollutant loads.

Over its period of record, Lake Daisy's surface level has fluctuated between 125.75 and 129.9 feet above sea level. The normal range is much narrower; between 127.9 and 128.9 feet (Figure 3-34). During 2025, Lake Daisy reached a dry season low of 128 feet in April and a wet season peak of 128.9 feet in September. The surface level ended the year slightly below the median at 128.4 feet. Changes in Lake Daisy's surface level are not correlated with Chl-a, TN, TP, or clarity (see appendix).

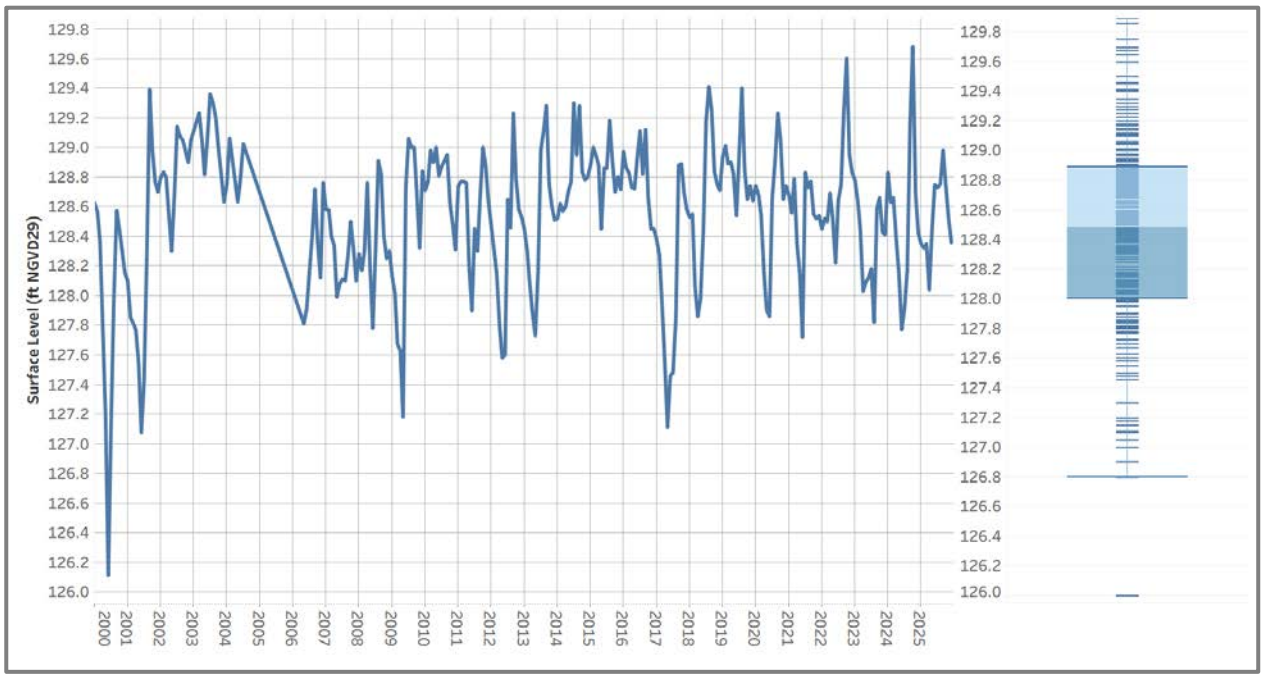


Figure 3-34. Hydrograph of Lake Daisy depicting monthly surface level readings from 2000 to 2025. A box and whisker plot detail total range, median, and normal range of surface level during the period of record.

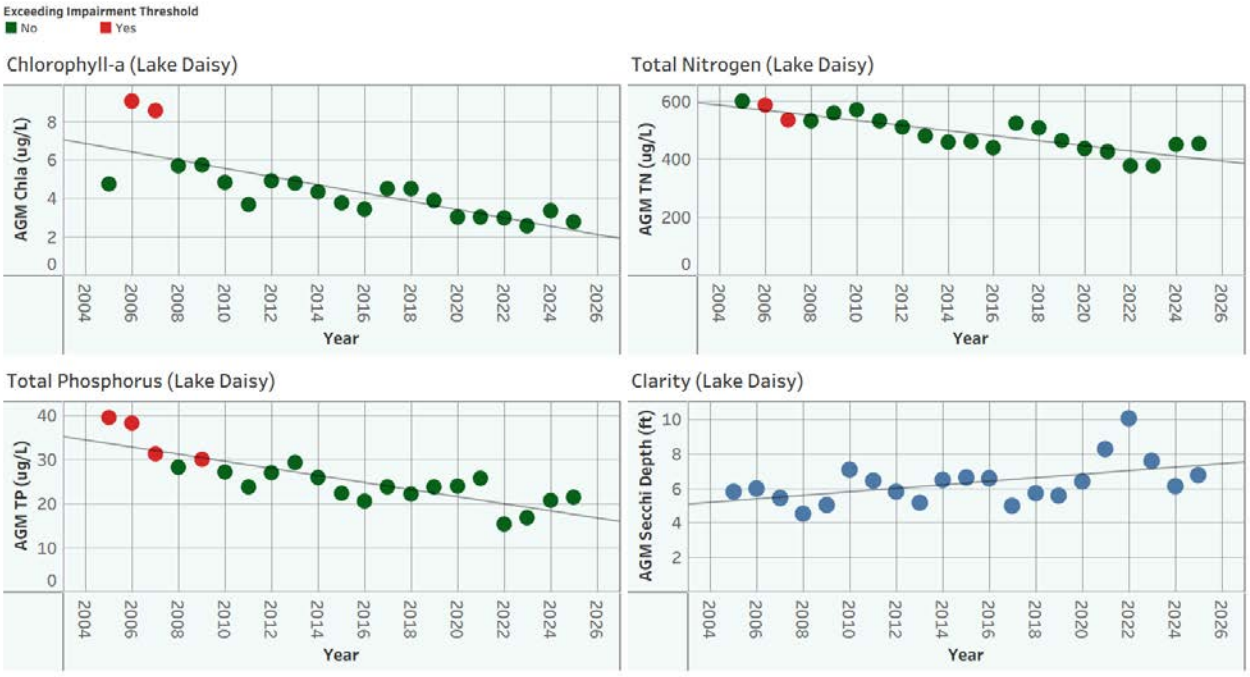
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Daisy is categorized as a clear, softwater waterbody. Lake Daisy has not exhibited exceedances of any of its NNC parameters within the 7.5 year assessment period (Figure 3-35). The most recent exceedance occurred for TP in 2009. The lack of impairments earns Lake Daisy a score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2004 to 2024. Based on the trend analysis, all four of the primary water quality parameters exhibit significant improving trends. This equates to trend criteria

scores of 3 for each of these parameters. Individual AGM values and trend statistics can be found in the appendix.



Lake Daisy 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.782	-0.855	-0.833	0.510
P-Value	0.000	0.000	0.000	0.018

Figure 3-35. Lake Daisy AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Daisy on 9/5/2025. The PAC during this survey was 26.7% and the total BV was 3.4% (Figure 3-37). Lake Daisy has traditionally lacked submerged vegetation. In 2022 there was a significant increase in the presence of native SAV. However, the introduction of hydrilla in late 2022 required immediate treatment which ultimately reduced the overall abundance. Another substantial increase in abundance was observed in 2024, but coverage and biovolume decreased in 2025 again. The result is an abundance criterion score of 2.

Invasive Species Management:

Based on data from the 2025 survey, Lake Daisy exhibited a robust mix of emergent and submerged species (Figure 3-36). Previously wholly dominanted by emergent species, Daisy saw a considerable increase in coontail and eelgrass, which made up nearly a quarter of the community. The previously detected invasive species were absent in 2025—resulting in an invasive score of 3. Despite the slight decrease in biological abundance, the overall vegetation community appears healthy.

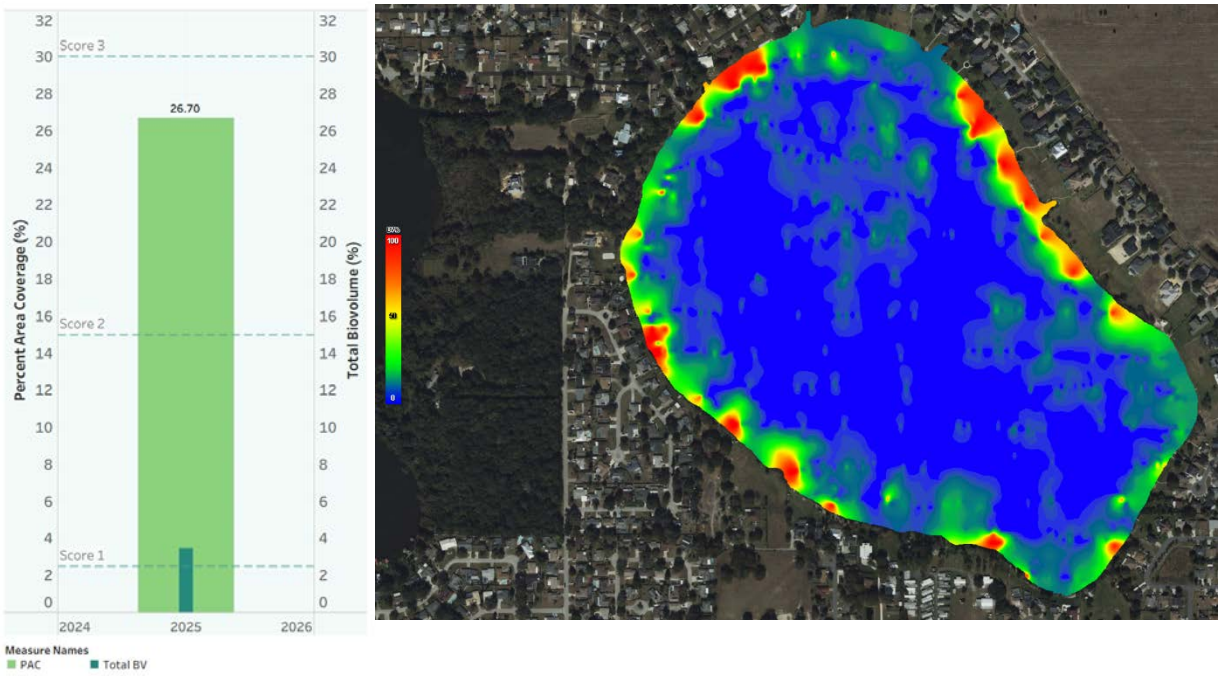


Figure 3-37. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Daisy; biovolume values range from green (lowest) to red (highest).

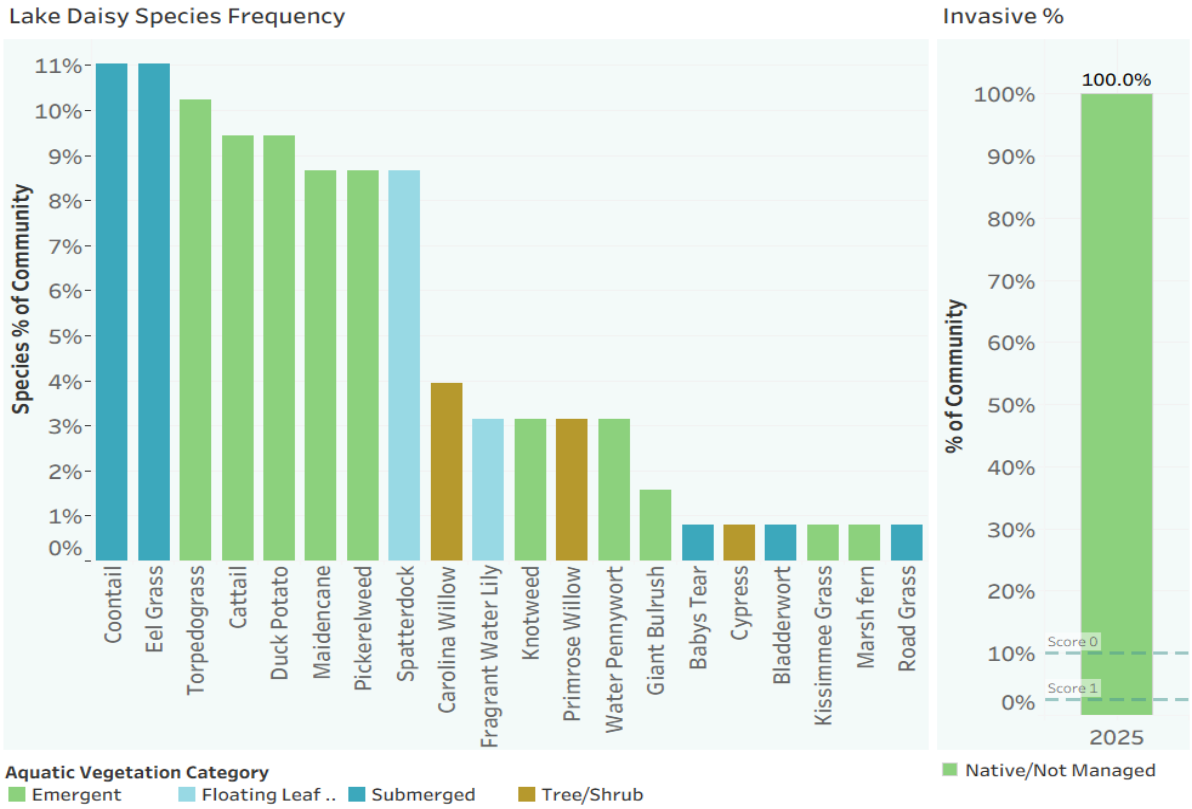


Figure 3-36. Chart depicting species frequency and invasive species percentage of Lake Daisy during 2024.

Species Diversity:

This evaluation examines species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Daisy's diversity indices exceeded their long-term median values (Figure 3-38). Despite the absence of invasive plants, like hydrilla, species richness remained relatively high. The relative distribution of plant species became more even—likely due to the lowered need to compete with invasives. These changes have led to one of the highest overall diversity index scores recorded for Lake Daisy. Overall, Daisy's biological community appears to be improving and is in a much better state than when monitoring began.

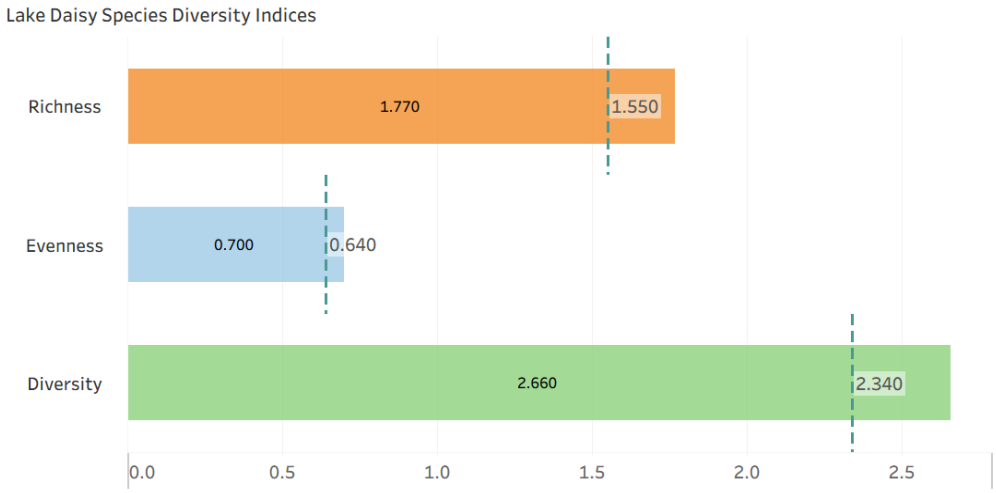


Figure 3-38. Chart depicting 2025 diversity indices for Lake Daisy. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Daisy's health index scores from 2018 to 2025 shows a substantial improvement (Table 3-5). The majority of the LHI score increase has come from statistically significant changes in the biological criteria. Vegetation abundance and species diversity have improved considerably since 2018. That said, the presence of invasive species has fluctuated over this time frame. Ultimately, Lake Daisy exhibited the highest score on record in 2025; not only among its own scores, but out of any lake in the study area.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	2	2	2	1	3	1	**2.1**
2019	3	3	2	2	2	1	3	1	**2.1**
2020	3	3	2	2	2	1	2	2	**2.1**
2021	3	3	2	2	2	2	2	2	**2.3**
2022	3	3	3	3	3	3	2	2	**2.8**
2023	3	3	3	3	3	2	1	3	**2.6**
2024	3	3	3	3	3	3	2	2	**2.8**
2025	3	3	3	3	3	2	3	3	**2.9**

Table 3-5. Lake Health Index scores for Lake Daisy from 2018 to 2025.

Lake Health Impacts/Challenges:

- Lake Daisy currently exhibits acceptable water quality. Lacking stormwater infrastructure, the primary sources of pollutant loading would be from nonpoint sources like direct sheetflow from residential lots.
- While the presence of invasive species is currently low, there is potential for these plants to take over large areas of a waterbody in a single season. This requires regular monitoring to detect new infestations early before they require large-scale management.
- While the OSTD systems within the drainage basin are in low densities, these could be a potential avenue for pollutant loading via groundwater if they begin to fail. Continually monitoring water quality for nitrogen influx is recommended.

Lake Management Strategy:

- With the majority of the drainage basin comprised of residential housing, future management of stormwater will likely consist of public education and outreach. Education aims to increase residents' knowledge of best stormwater practices and ways they can collectively reduce their pollutant load.
- If water quality becomes a future issue, City staff may explore source analysis to determine if OSTD leachate is a potential contributor to nutrient pollutant loading. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species remains the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Lake Deer

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	3	3	3	1	2	2.6

Features & Statistics:

Surface area	119 acres
Mean depth	7.3 feet
Maximum depth	17.5 feet
Volume	877.8 acre-feet
Drainage basin area	377 acres
Annual TN Load	1451.1 lbs
Annual TP Load	261.2 lbs
Limiting nutrient	Co-limited (N & P)

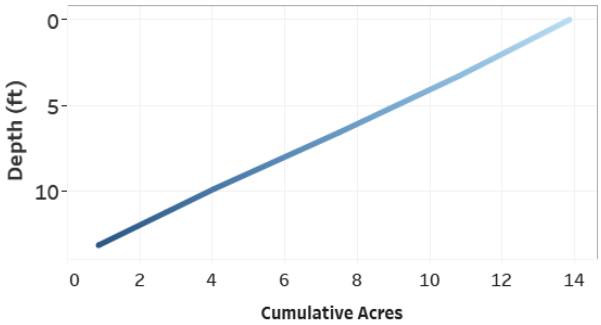


Figure 3-39. Hypsograph of Lake Deer depicting the depth profile and morphology of the lake bed.

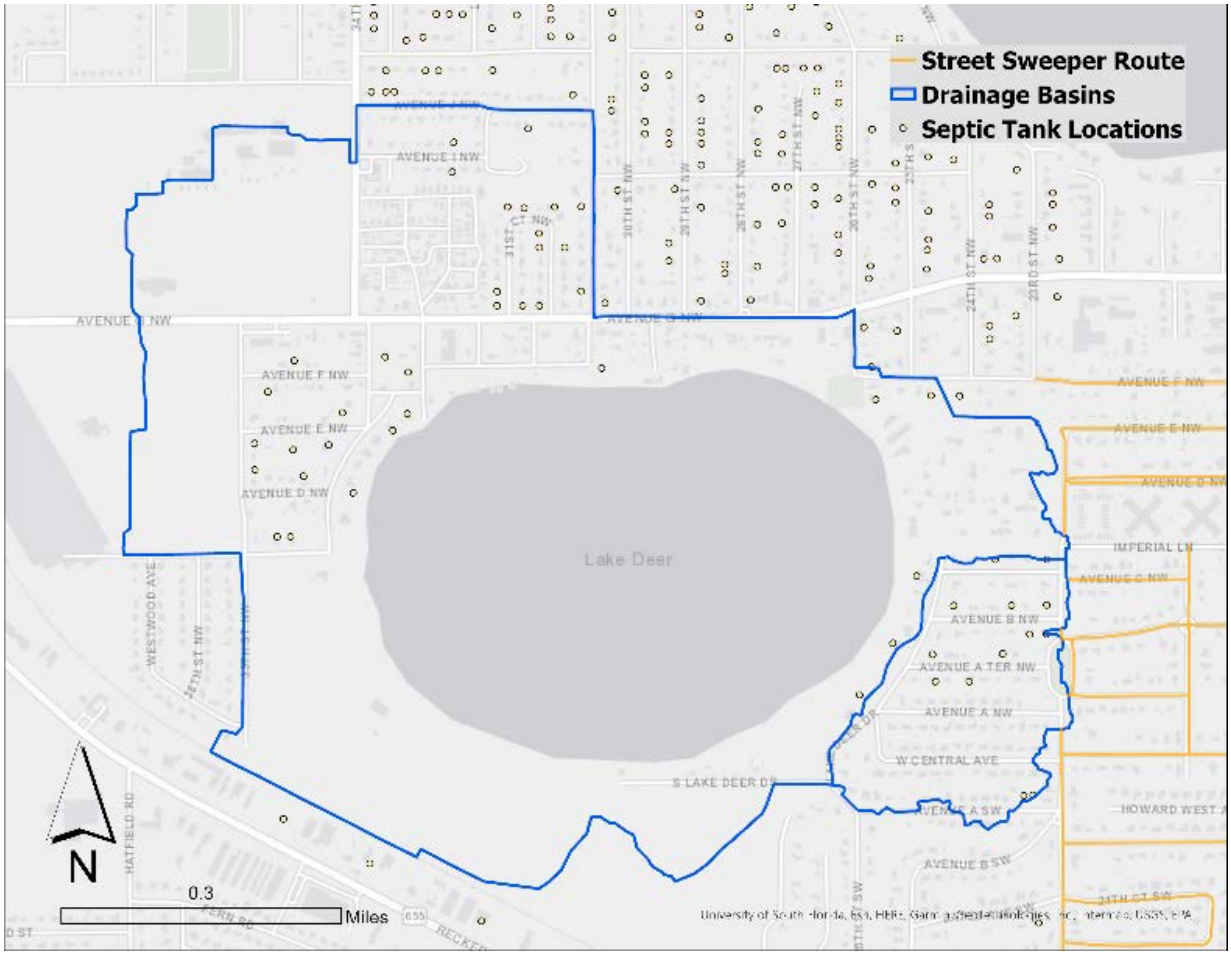


Figure 3-40. Map of Lake Deer's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Deer is a smaller waterbody at 119 acres, with an average depth of 7.3 feet, and a maximum depth of 17.5 feet (Figure 3-39). Despite it having a shallower average depth than the regional mean, Lake Deer possesses some very deep areas. As a result of its morphology, it has a fairly wide littoral zone which supports a very robust area of submerged aquatic vegetation. Lake Deer receives stormwater runoff from a drainage basin nearly three times the size of the waterbody (Figure 3-40). The primary land use within this basin is residential which contributes almost 1,500 lbs of nitrogen and 260 lbs of phosphorus to the lake annually. By area, these pollutant loads rank 9th highest out of the 37 lakes in the study area. There are 41 septic systems located within this basin—a relatively low density. However, factoring in other septic systems in close proximity to the basin reveals a higher density of OSTDs that could impact water quality. The areas of the drainage basin within City limits possess few public roadways. As a result, the City provides no street sweeping services within the basin.

Lake Deer's surface level sits fourth highest within the Winter Haven watershed. Over its period of record, Lake Deer's surface level has fluctuated between 136.9 and 141.9 feet above sea level. That said, Deer's surface level has not exceeded 140.1 feet since before the year 2000 (Figure 3-41). The normal range fluctuates between 136.9 and 139.6 feet. However, since around 2008, Deer's level has remained at the low end of this range. This is likely the result of an alteration to the lake's water control structure driving a shift in the overall hydrological regime. In 2025, Deer dropped to a dry season low of 137.4 feet in May and reached a wet season peak of 138.5 feet in September; ending the year near the low end of the normal range. These fluctuations are consistent with the below-average rainfall received in 2025. Changes in Lake Deer's surface level are not correlated with any of the primary water quality metrics (see appendix).

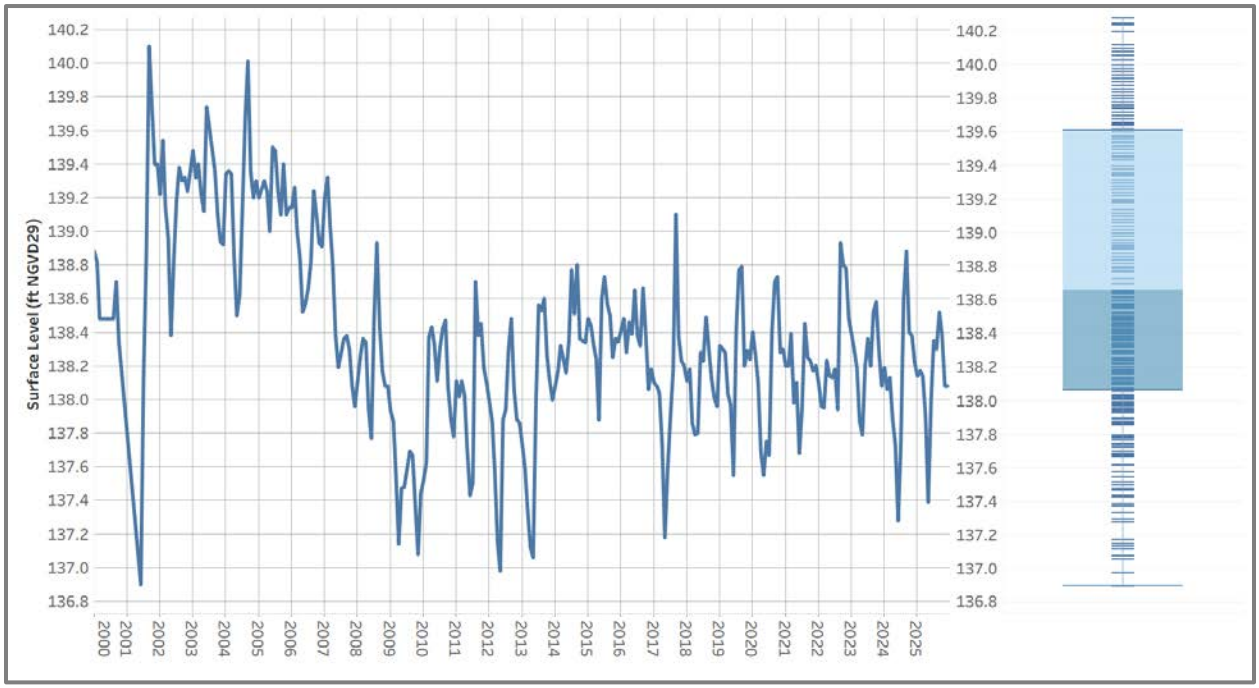


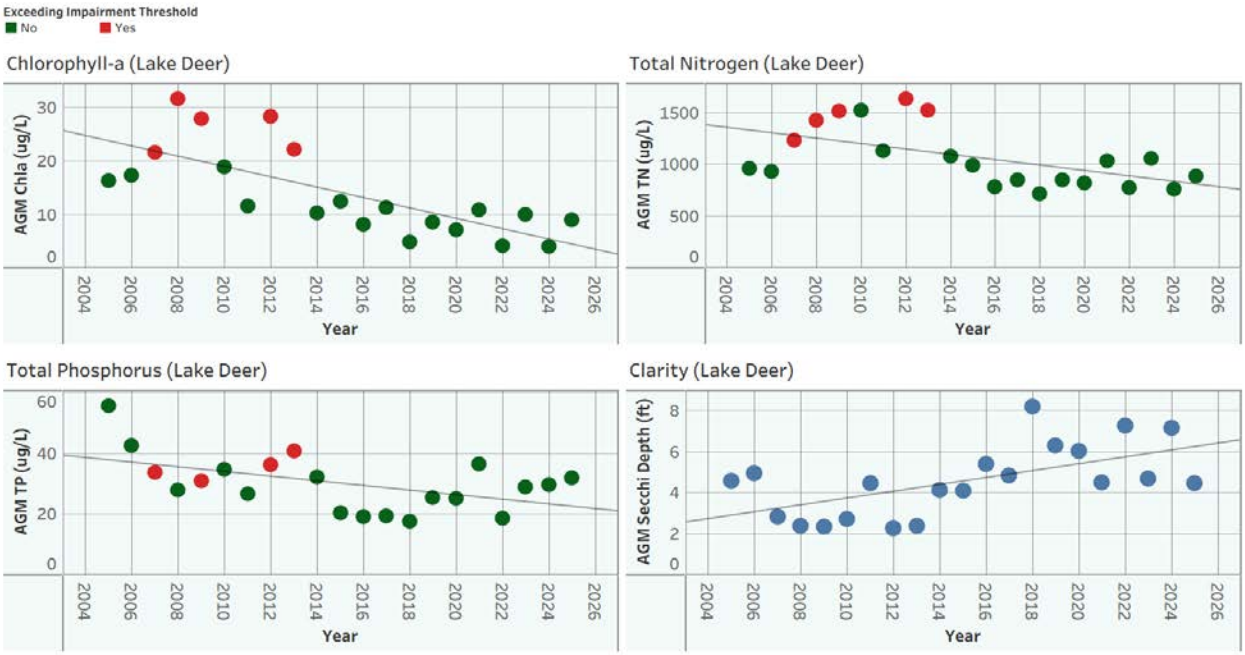
Figure 3-41. Hydrograph of Lake Deer depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface levels during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Deer is categorized as a clear, alkaline waterbody. Lake Deer has not exhibited exceedances of NNC thresholds since 2013 (Figure 3-42). Since there have been no exceedances in the 7.5 year assessment period, Lake Deer is currently considered not impaired—earning an impairment criterion score of 3. Due to its previous impairments, the FDEP established a TMDL for Lake Deer in 2015 stipulating a 12% reduction in TN in order to meet the NNC guidelines. Lake Deer is currently meeting these guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. All four of the primary water quality metrics exhibited significant improving trends during this period. Despite the overall improvement in water quality, Lake Deer is still on FDEP's study list and will be for quite some time to ensure that water quality continues to be maintained below impairment thresholds.



Lake Deer 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.732	-0.556	-0.512	0.599
P-Value	0.000	0.009	0.018	0.004

Figure 3-42. Lake Deer AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Deer on 2/7/2025. The PAC during this survey was 94.3% and the total BV was 28.8% (Figure 3-44). Lake Deer has historically maintained very high abundances of aquatic vegetation due to its shallow morphology and wide littoral zone. The water quality improvements observed are likely due, in part, to the nutrient sequestration capacity of this vegetation. The amount of vegetation coverage observed in 2025 was the highest on record and equates to a vegetation abundance score of 3.

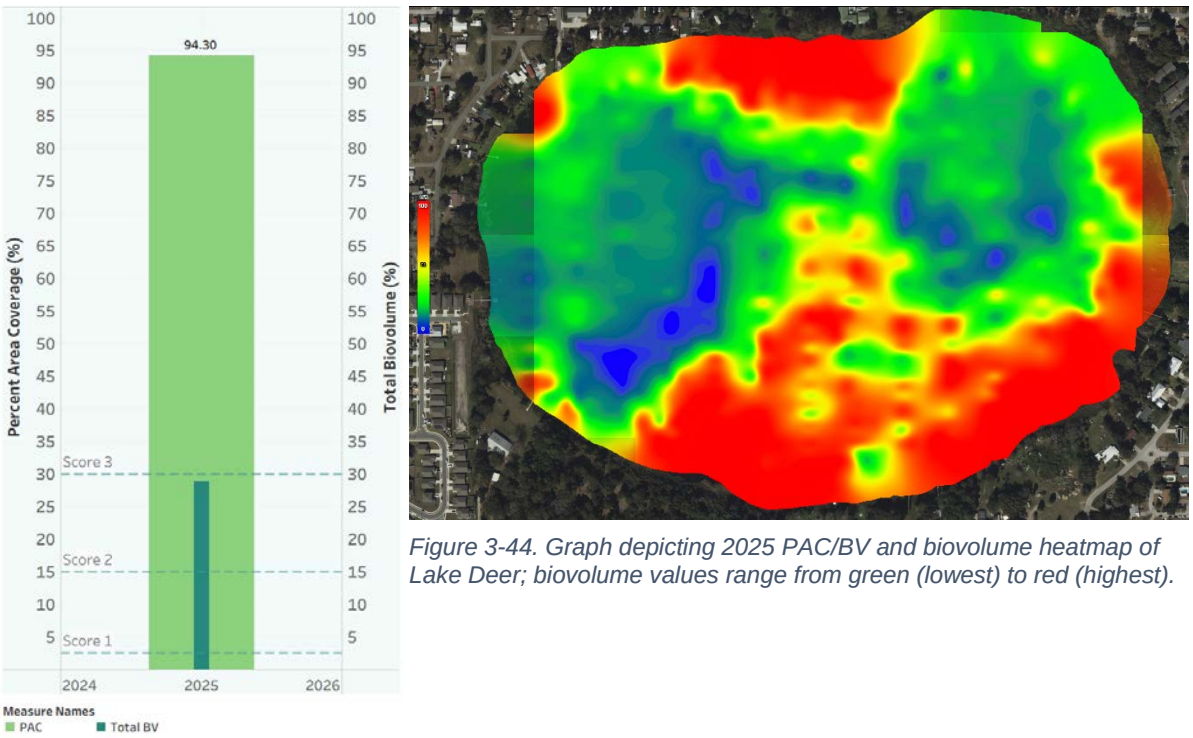


Figure 3-44. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Deer; biovolume values range from green (lowest) to red (highest).

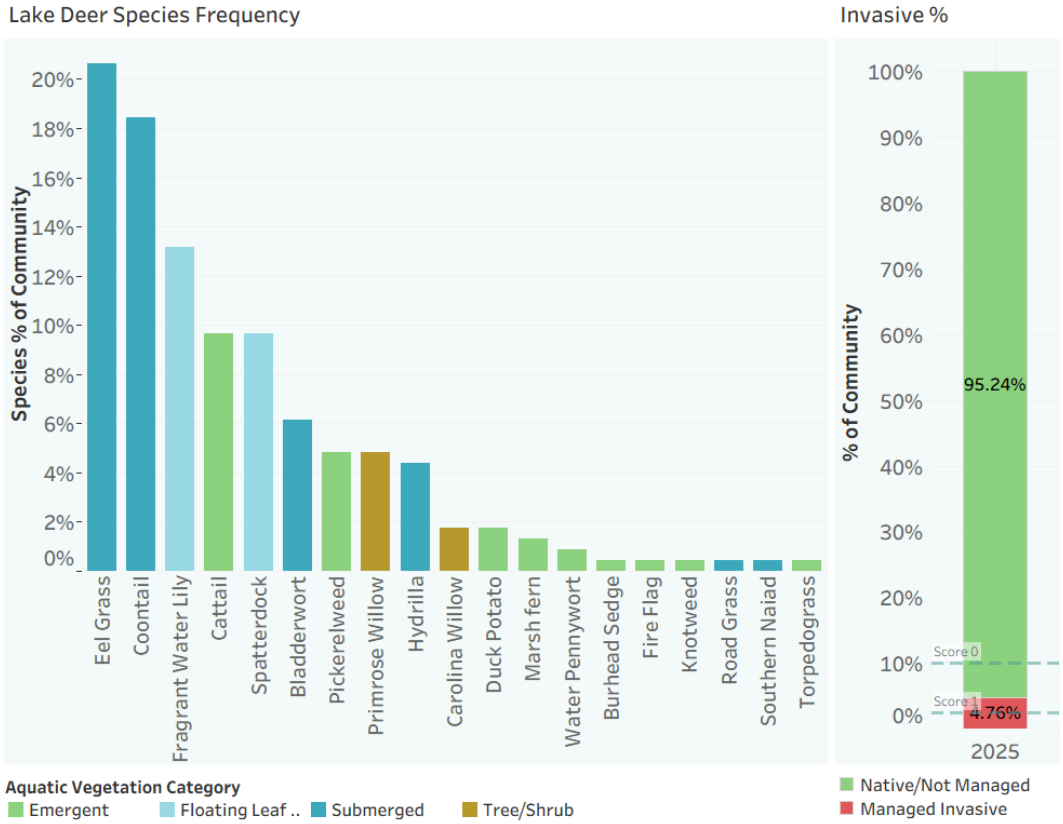


Figure 3-43. Chart depicting species frequency and invasive species percentage of Lake Deer during 2025.

Invasive Species Management:

Based on data from the 2025 survey, submerged plants made up a large percentage of the total vegetation community at around 50% of the population (Figure 3-43). The native eel grass and coontail were the dominant species during this survey—making up almost 40% of the community. Unlike previous years, Lake Deer exhibited a relatively low proportion of invasive species. Hydrilla and burhead sedge made up 4.76% of the population—slightly more than in 2024. This earns Lake Deer an invasive abundance score of 1. Despite the slight increase in invasive population in the last year, proportions are still manageable with small scale herbicide applications.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, the richness and diversity indices exceeded their long-term median values (Figure 3-45). The evenness metric was below-average, earning Lake Deer a score of 2 in the diversity criterion. While the evenness index was below the target threshold, all three index values increased from 2024—indicating some improvement. Continued management employing early detection and rapid treatment should allow natives to fill the niches vacated by the invasive plants.

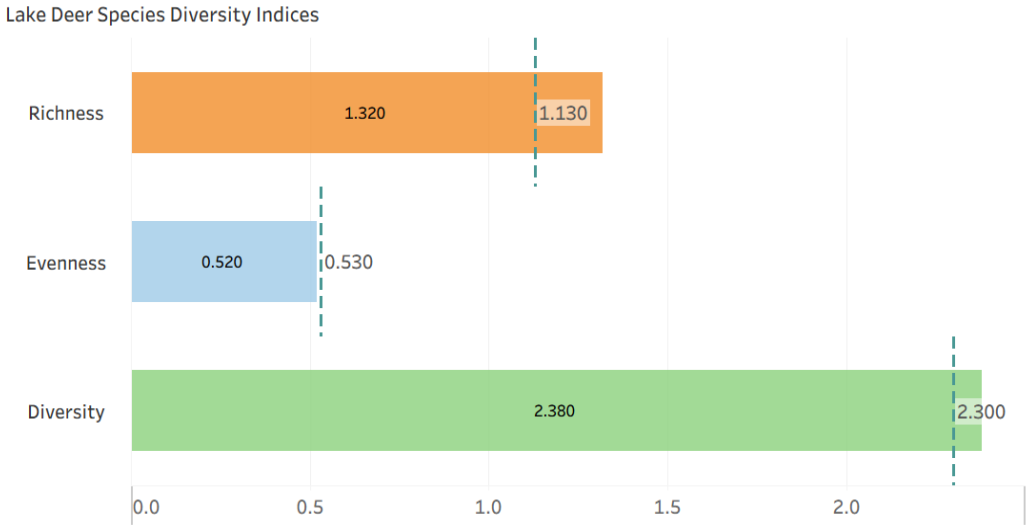


Figure 3-45. Chart depicting 2025 diversity indices for Lake Deer. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Deer's health index scores from 2018 to 2025 shows substantial improvement. Most of this improvement has been due to meeting impairment thresholds along with favorable water quality trends in the last three years (Table 3-6). Vegetation abundance has remained high. Therefore, the main issue plaguing Lake Deer now is management of invasive species.

Lake Health Impacts/Challenges:

- While Lake Deer's water quality is improving, managing the stormwater pollutant loads from its drainage basin is still a priority.

- The presence of OSTDs (septic) systems in the drainage basin may be a potential source of pollutants. As these systems age, they may begin to leach nutrients into the water table—leading to water quality issues.
- The management of invasive species is especially important for Lake Deer. Hydrilla has been a constant issue since monitoring began since it can quickly undo management efforts in a single season.

Lake Management Strategy:

- While the City has little stormwater infrastructure contributing to Lake Deer, efforts can still be made to improve these pollutant loads through implementation of green infrastructure where possible.
- City staff may explore source analysis of septic systems in the vicinity of Lake Deer to determine if they are contributing pollutant loads via groundwater. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	2	2	2	3	1	2	**1.8**
2019	0	2	2	2	2	3	0	2	**1.6**
2020	0	2	2	2	2	3	0	2	**1.6**
2021	0	2	3	2	2	3	0	0	**1.5**
2022	3	2	3	2	3	3	0	1	**2.1**
2023	3	2	2	3	2	3	0	2	**2.1**
2024	3	3	3	3	3	3	1	1	**2.5**
2025	3	3	3	3	3	3	1	2	**2.6**

Table 3-6. Lake Health Index values for Lake Deer from 2018 to 2025.

Lake Elbert

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	0	0	1	0	1	3	3	1.4

Features & Statistics:

Surface area	177 acres
Mean depth	14 feet
Maximum depth	26 feet
Volume	2,325.9 acre-feet
Drainage basin area	605 acres
Annual TN Load	2,365.8 lbs
Annual TP Load	385.1 lbs
Limiting nutrient	Co-limited (N & P)

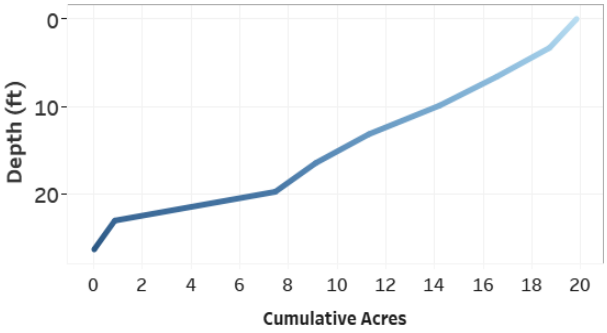


Figure 3-46. Hypsograph of Lake Elbert depicting the depth profile and morphology of the lake bed.

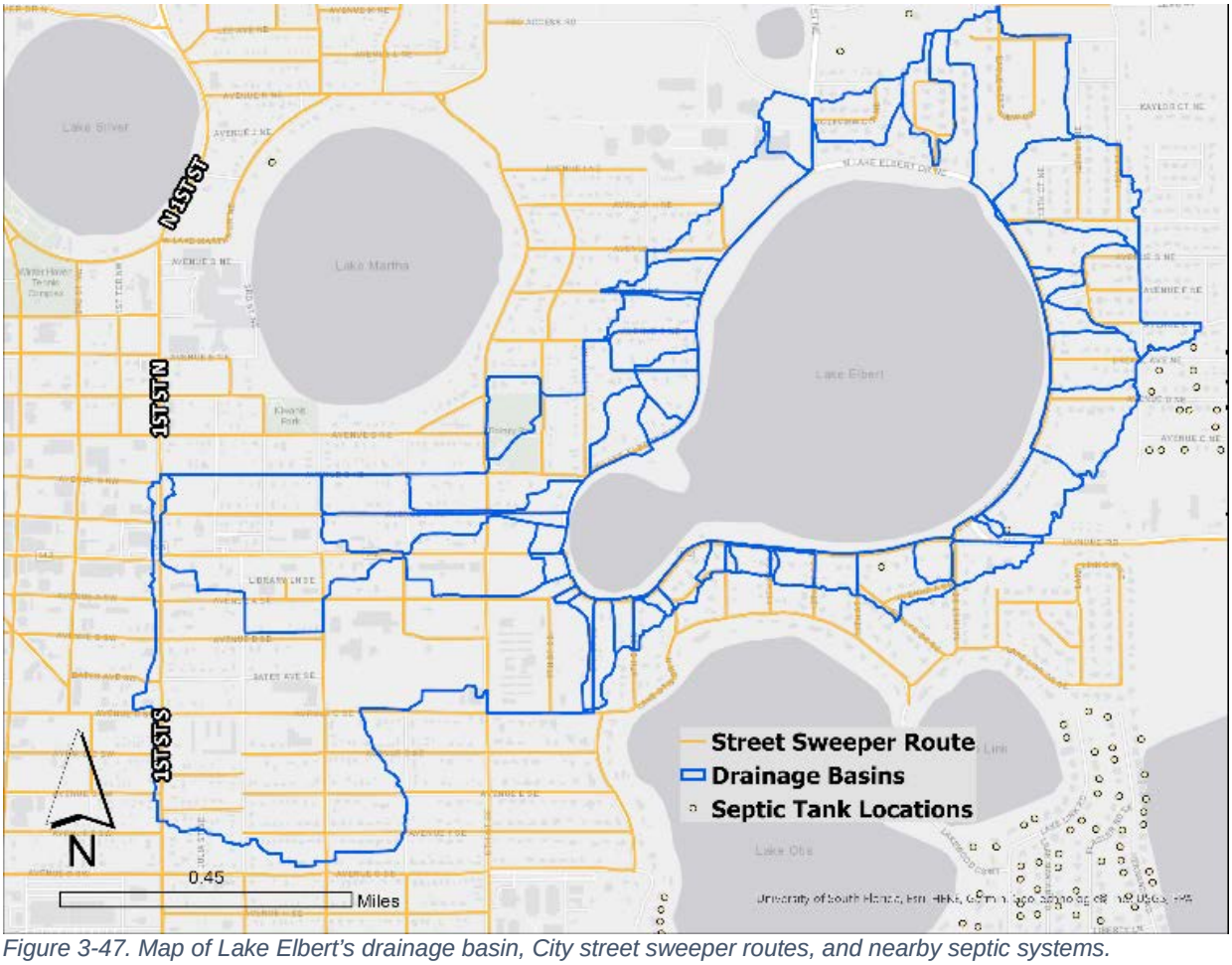


Figure 3-47. Map of Lake Elbert's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Elbert is a moderate-sized waterbody with a surface area of nearly 200 acres. Elbert is deeper than most lakes in the area with an average depth of 14 feet; the regional mean depth is only 8.5 feet (Figure 3-46). Despite its more bowl-shaped morphology, Lake Elbert possesses a wide littoral zone that is capable of supporting a dense submerged aquatic plant community. Stormwater is conveyed to this waterbody from a 439 acre urbanized drainage basin made up of 50 individual sub-basins (Figure 3-47). By far the largest proportion of land use in this basin is comprised of medium-density residential which contributes up to 2,365 lbs of TN and 385 lbs of TP to the lake annually. Compared with the other lakes in the region, the TN and TP loads per acre rank 12th and 15th, respectively. There are very few known Onsite Sewage Treatment and Disposal (OSTD/septic) systems within the vicinity of Lake Elbert. Completely within City limits, Winter Haven conducts monthly street sweeping services of up to 33.5 miles within this basin.

Over its period of record, Lake Elbert's surface level has fluctuated between 128.8 and 137.6 feet above sea level (Figure 3-48). A water level pump station is only activated during extremely high levels—such as after Hurricane Ian in 2022. As a result, Lake Elbert's level is able to fluctuate more or less naturally. The normal level range is much narrower—between 131.9 and 134.7 feet. During 2025, Elbert's level declined to a low of 133.5 feet in May, but reached a wet-season high of 135.5 feet in September—briefly exceeding the lake's normal range for a time. This is surprising considering the relatively low levels exhibited in 2024 and the low annual rainfall in 2025. Based on 2019 regression analyses, changes in Lake Elbert's level are significantly correlated with Chl-a, TN, TP, and clarity such that an increase in surface level should result in water quality improvements.

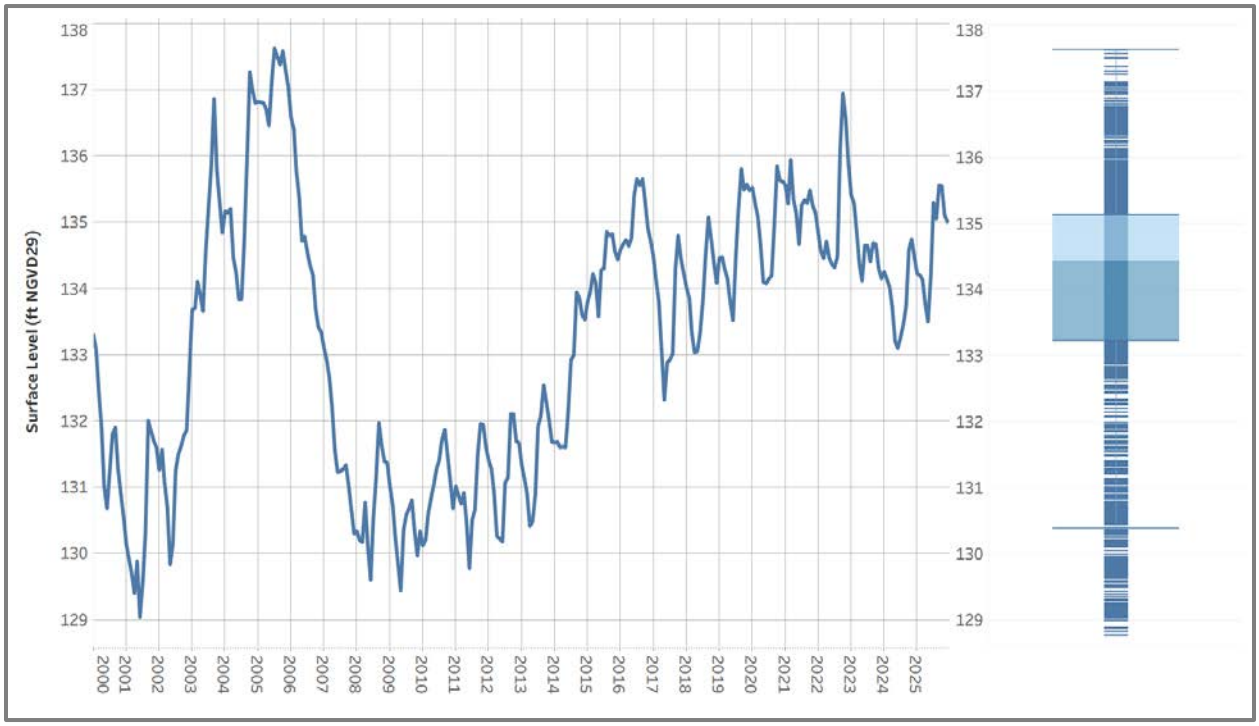


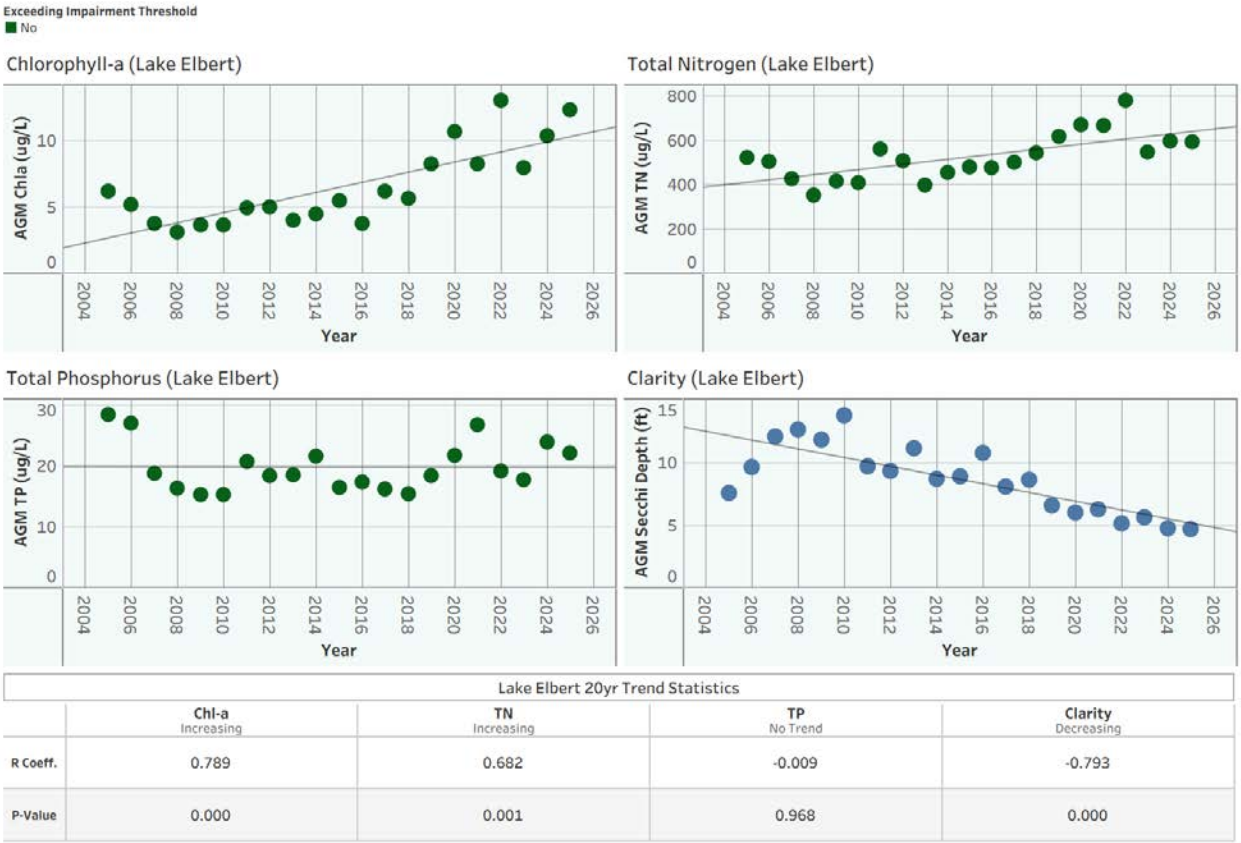
Figure 3-48. Hydrograph of Lake Elbert depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Elbert is categorized as a clear, alkaline waterbody. Since 2000, Lake Elbert has not exhibited any exceedances of NNC thresholds (Figure 3-49). By virtue of this, Lake Elbert is not considered impaired by any of the primary water quality metrics—earning an impairment criterion score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Chl-a, TN, and Secchi depth exhibited significant declining trends—earning scores of 0 for their respective trend criteria. That said, TP exhibited a non-significant increasing trend that has been recently shifting toward a decreasing direction in recent years. These statistics earn TP a trend score of 1.



Lake Elbert 20yr Trend Statistics

	Chl-a Increasing	TN Increasing	TP No Trend	Clarity Decreasing
R Coeff.	0.789	0.682	-0.009	-0.793
P-Value	0.000	0.001	0.968	0.000

Figure 3-49. Lake Elbert AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Elbert on 8/12/2025. The PAC during this survey was 7.1% and the total BV was less than 1% (Figure 3-51). A comparison of abundance from previous years shows a consistent decline in the amount of submerged vegetation present in the lake—resulting in the lowest abundance levels on record. This is likely due to the continued management of hydrilla, but it may also be an indication of the water clarity decline having an impact on the vegetation community. As a result of the below fifteen percent PAC value, Elbert receives an abundance criterion score of 1.

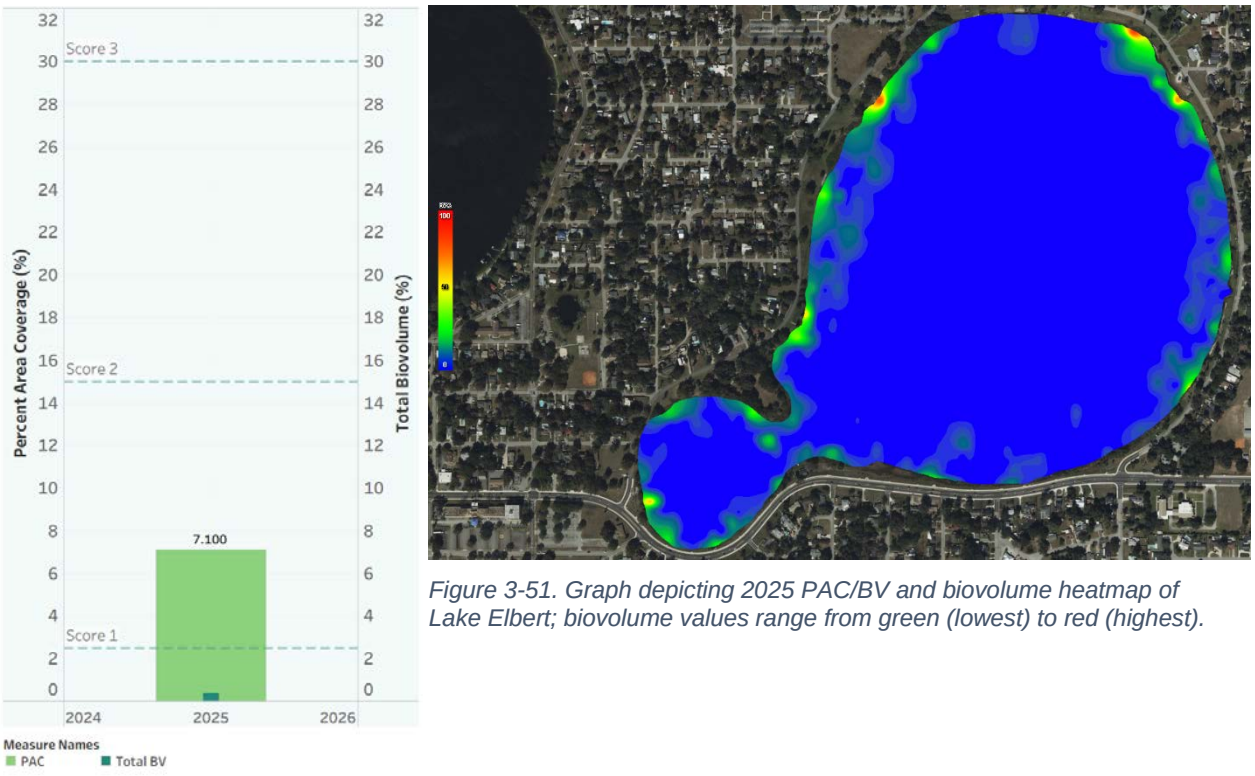


Figure 3-51. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Elbert; biovolume values range from green (lowest) to red (highest).

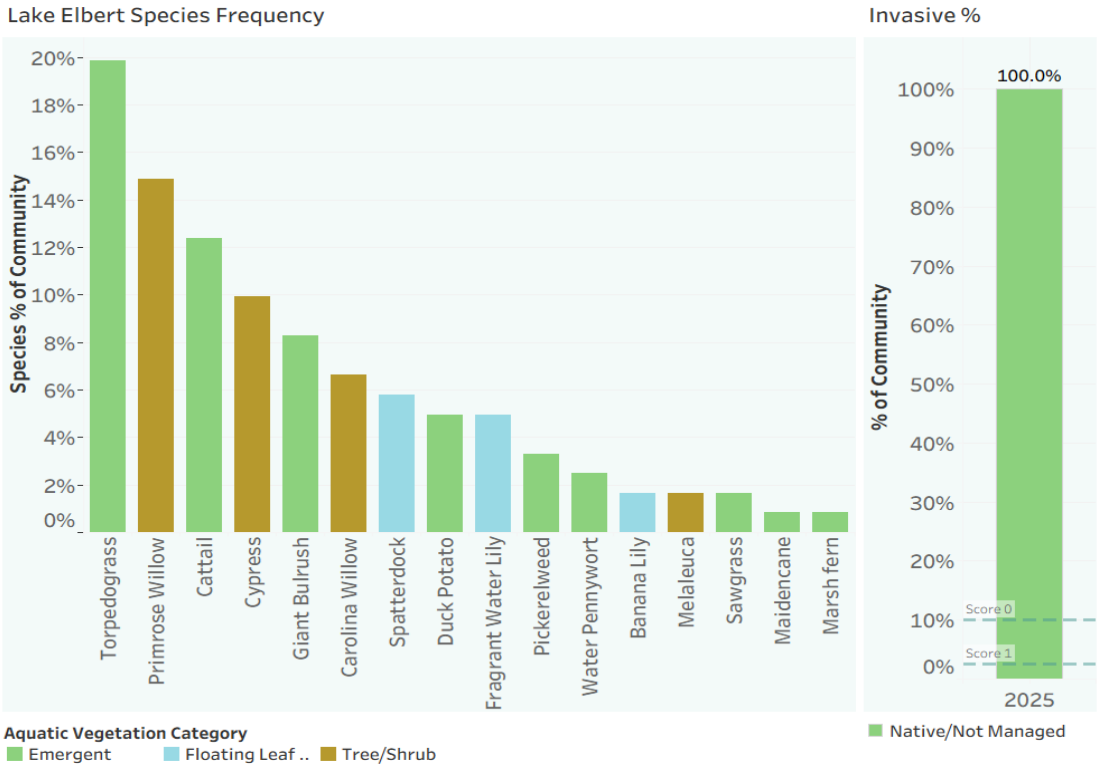


Figure 3-50. Chart depicting species frequency and invasive species percentage of Lake Elbert during 2025.

Invasive Species Management:

Based on 2025 data, emergent species were the only plants present during the survey (Figure 3-50). This marks the second consecutive year that submerged vegetation was not detected. Lake Elbert has historically had significant SAV abundance and the absence likely exacerbates the recent declines in water quality. Despite the lack of SAV, there were no invasive species detected, leading to an invasive presence score of 3. Again, the loss of submerged plants may be the result of continued invasive plant management efforts, but their continued absence presents a positive feedback loop in which water quality will continue to decline.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three diversity indices exceeded their respective median values—resulting in a diversity score of 3 (Figure 3-52). Despite the low vegetation abundance, the number of unique species detected and their relative distribution indicates above-average diversity. Future management efforts should seek to restore native submerged plants in order to better balance the ecological community.

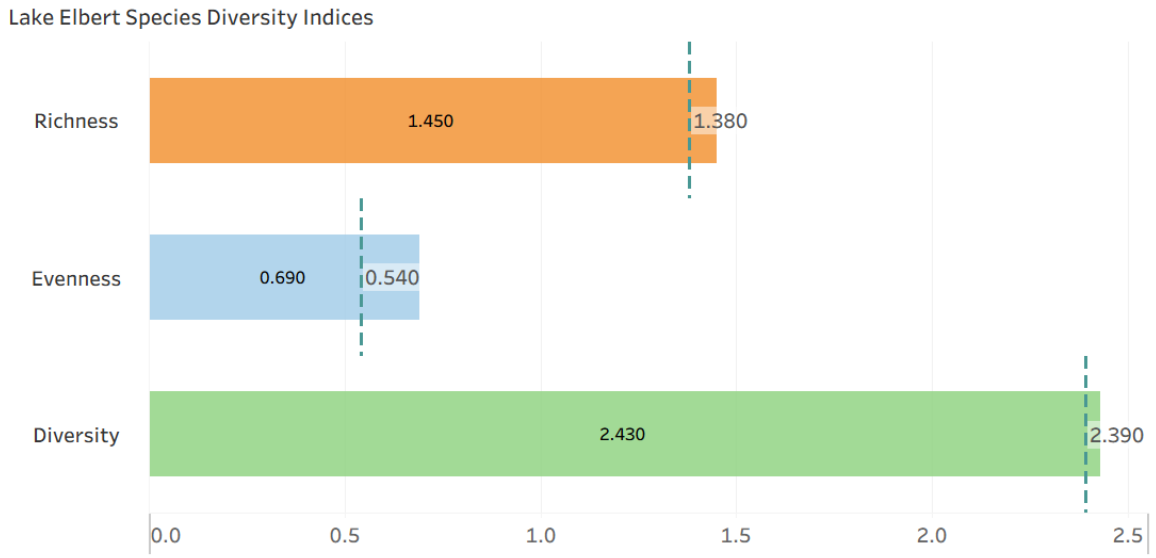


Figure 3-52. Chart depicting 2025 diversity indices for Lake Elbert. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Elbert's health index scores from 2018 to 2025 shows consistently low values, below 1.5 (Table 3-7). The trend scores have been the primary contributor to the low lake health scores. However, the abundance of invasive species has been a consistent issue as well. The lake health score of 2025 ties with 2023 as the best scores on record—mostly due to the improvements in species diversity and invasive species presence.

Lake Health Impacts/Challenges:

- The prevalence of older residential neighborhoods within Lake Elbert's drainage basin means that stormwater pollutant loading goes largely unmitigated. Managing this stormwater is a high priority.

- The management of invasive species like hydrilla is a constant concern. Recent efforts to reduce invasive presence have only been able to slow the spread. Large-scale herbicide applications are not advised due to the fagility of Lake Elbert's water quality.
- Lake Elbert's water quality metrics are significantly correlated with its surface level. This means that drought conditions could result in further declines in water quality.

Lake Management Strategy:

- In addition to conducting street sweeping (annual removal of 378 lbs of TN and 205 lbs of TP), the City has plans to address stormwater pollutant loading through construction of green infrastructure (swales and raingardens) as part of a planned trail improvement project. These structural management practices are estimated to remove an additional 125 lbs of TN and 19 lbs of TP annually.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Additionally, staff will advocate for alternative invasive management strategies to limit large-scale herbicide use to reduce further water quality declines.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- With the majority of land use in the drainage basin being residential, public education should be prioritized to increase residents' knowledge of best stormwater practices and ways they can collectively reduce their pollutant load.
- The loss in submerged vegetation may require supplemental planting efforts to restore the SAV habitat. City staff will explore potential funding avenues through FWC.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	0	1	1	1	3	1	0	**1.3**
2019	3	0	0	1	1	3	0	2	**1.3**
2020	3	0	0	1	0	3	0	1	**1.0**
2021	3	0	0	0	0	3	0	3	**1.1**
2022	3	0	0	0	0	3	0	2	**1.0**
2023	3	0	0	1	0	2	2	3	**1.4**
2024	3	0	0	1	0	2	3	1	**1.3**
2025	3	0	0	1	0	1	3	3	**1.4**

Table 3-7. Lake Health Index values for Lake Elbert from 2018 to 2025.

Lake Eloise

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	2	3	2	2	3	1	2.0

Features & Statistics:

Surface area	1,185 acres
Mean depth	13 feet
Maximum depth	20 feet
Volume	15,544 acre-feet
Drainage basin area	1,981.4 acres
Annual TN Load	3,875.2 lbs
Annual TP Load	665.4 lbs
Limiting nutrient	Phosphorus

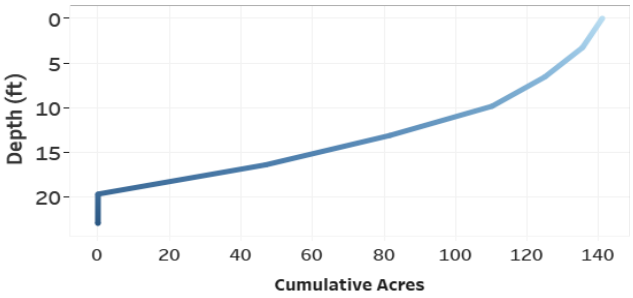


Figure 3-53. Hypsograph of Lake Eloise depicting the depth profile and morphology of the lake bed.

Hydrology:

At over 1,100 acres, Lake Eloise is the largest waterbody on Winter Haven's Chain of Lakes. Its mean depth is somewhat deeper than the regional average of 8.4 feet; and it has deeper areas exceeding 20 feet (Figure 3-53). Despite its depth, Lake Eloise's immense area allows for increased sediment suspension due to wind and wave action.

Stormwater is conveyed to this waterbody from a 1,981 acre drainage basin—of which the lake makes up the majority (Figure 3-54). The terrestrial areas of the basin are comprised mostly of residential land uses, with some agricultural in small quantities. These land uses contribute up to 3,875 lbs of TN and 665 lbs of TP to the lake annually. There are 186 septic systems within this basin—mostly congregated in the north and south areas of the basin. There exist few City-owned roadways with stormwater infrastructure that drain to the lake. As a result, the City does not conduct street sweeping services in this basin.



Figure 3-54. Map of Lake Eloise's drainage basin and nearby septic systems.

Lake Eloise is part of the South Chain of Lakes with navigable connections to Lakes Lulu, Summit, and Winterset. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-55). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Eloise's surface level do not correlate with water quality.

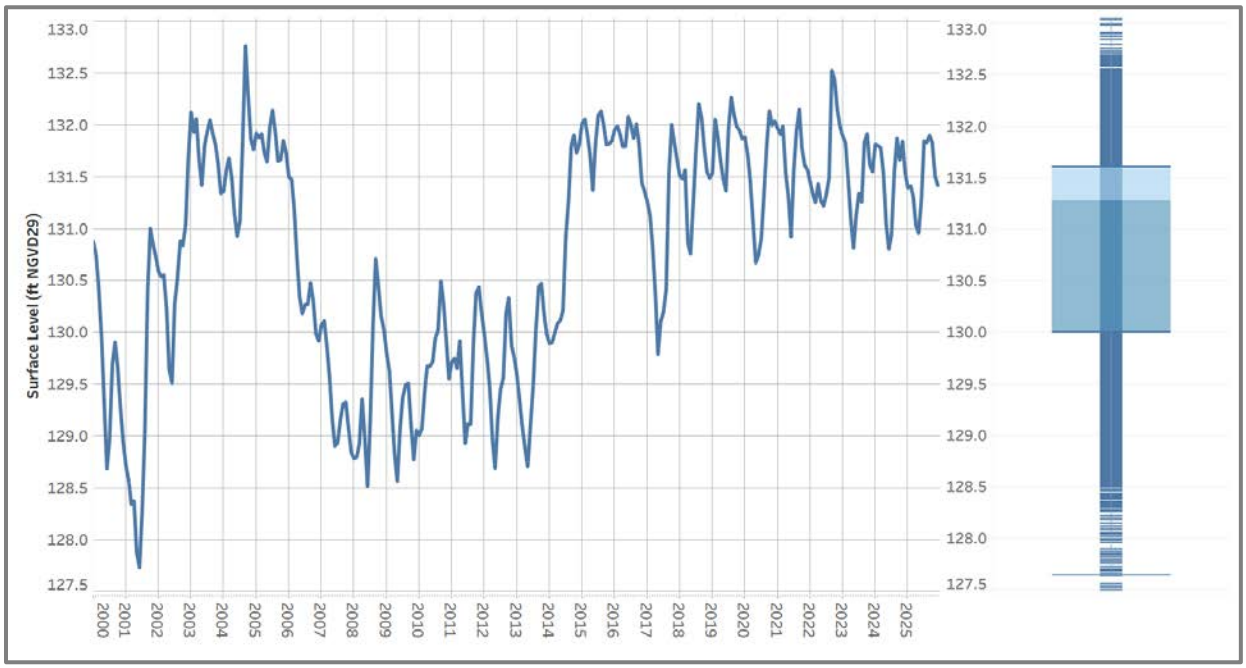


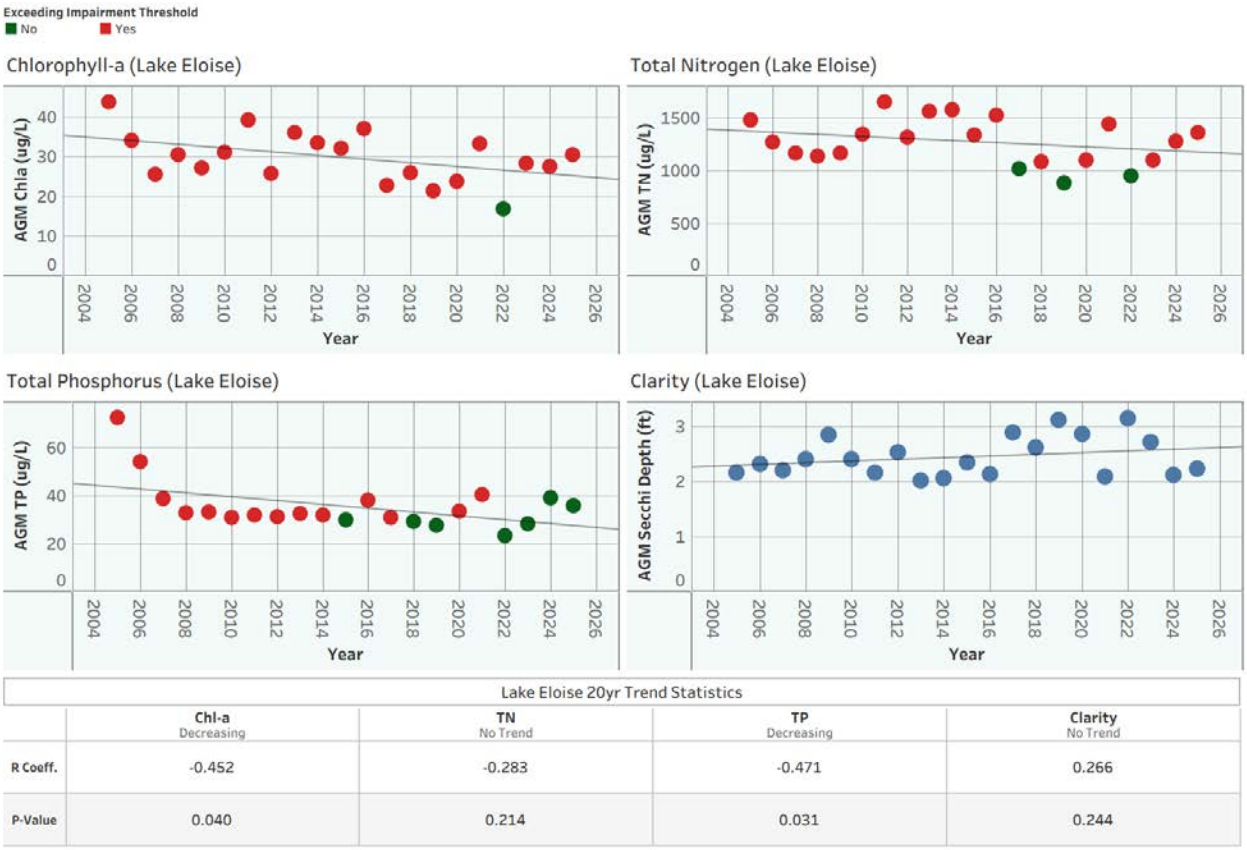
Figure 3-55. Hydrograph of the South Chain of Lakes depicting monthly surface level readings from 2000 to 2025. A box & whisker plot details the total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Eloise is categorized as a clear, alkaline waterbody. Based on NNC exceedances most years during the assessment period, Lake Eloise is considered impaired for Chl-a, TN, and TP—earning it an impairment criterion score of 0 (Figure 3-56). In 2019, the FDEP established a total maximum daily load (TMDL) for Lake Eloise stipulating a 39% reduction in TN in order to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the trend data, Chl-a and TP exhibited significant improving trends. Total nitrogen and Secchi depth exhibit a non-significant improving trends. These trend statistics equate to Chl-a, TN, TP, and Clarity trend scores of 3, 2, 3, and 2, respectively.



Lake Eloise 20yr Trend Statistics

	Chl-a Decreasing	TN No Trend	TP Decreasing	Clarity No Trend
R Coeff.	-0.452	-0.283	-0.471	0.266
P-Value	0.040	0.214	0.031	0.244

Figure 3-56. Lake Eloise AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Eloise on 11/25/2025. The PAC during this survey was 16.9% and the total BV was 3% (Figure 3-58). A comparison of abundance metrics since 2018 indicates some fluctuation in PAC. While general abundance values peaked above 25% in 2020 and 2021, measurements in 2018 and 2019 were between 12% and 17%--consistent with abundance values during the last four years. There is little indication that Lake Eloise's vegetation community is experiencing a decline, but subsequent monitoring is important to better understand these fluctuations.

Invasive Species Management:

Based on 2025 species data, the native eelgrass tied with cypress trees as the most abundant species in Lake Eloise—each making up 15% of the vegetation community (Figure 3-57). The remaining plants were comprised of a good mix of submerged and emergent species. No managed invasive plant species were detected in 2025—earning Lake Eloise an invasive presence score of 3. Hydrilla has historically been a very minor issue and is considered controlled in Lake Eloise. However, since eradication is practically impossible, it is critical to continue monitoring to detect any rapid expansion of invasive plant infestations.

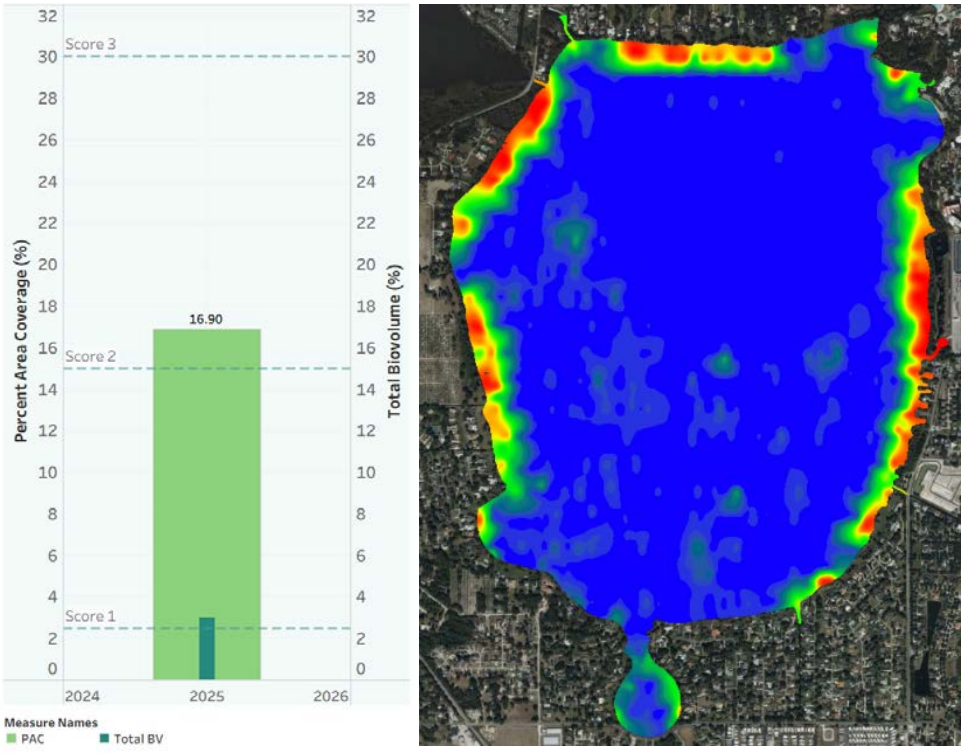


Figure 3-58. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Eloise; biovolume values range from green (lowest) to red (highest).

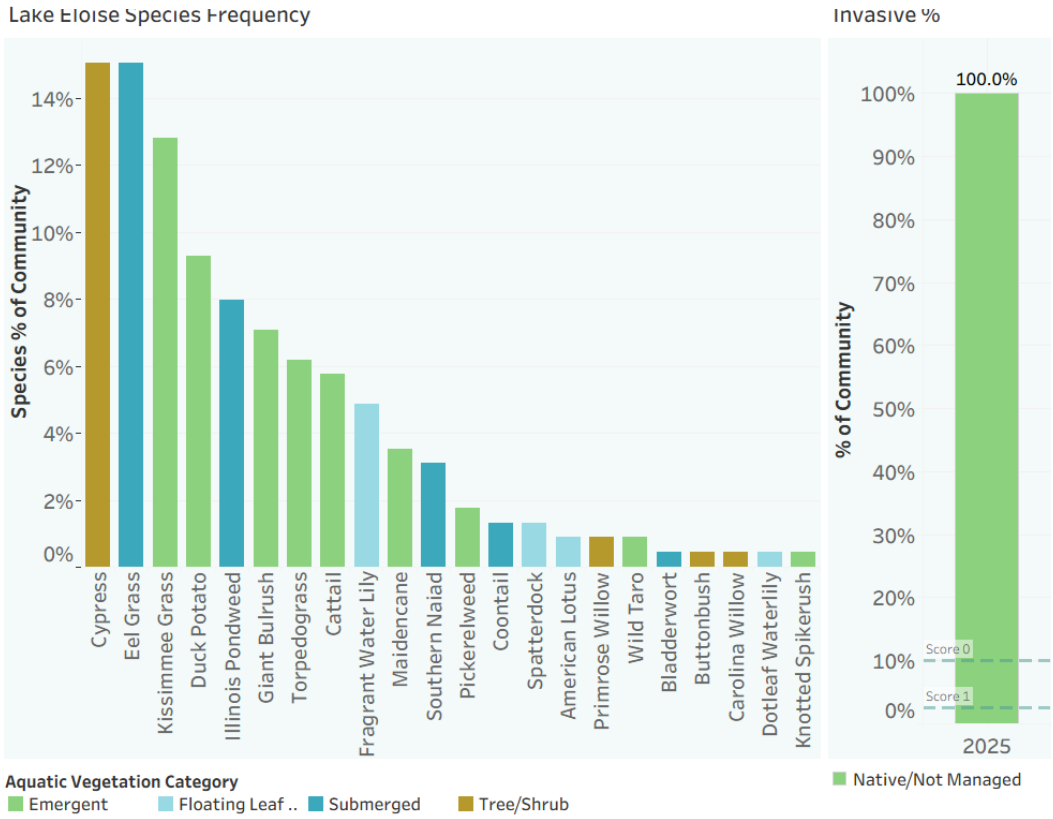


Figure 3-57. Chart depicting species frequency and invasive species percentage of Lake Eloise

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, richness was the only index that met or exceeded its median value—earning Lake Eloise a diversity criterion score of 1 (Figure 3-59). This is the third straight year that species evenness and overall diversity were below the lake's median. However, these changes are likely natural fluctuations in community dynamics. It should be noted that Lake Eloise's species diversity is not greatly impacted by active management efforts due to a lack of invasive species presence. The vegetation community in this lake largely self-regulates.

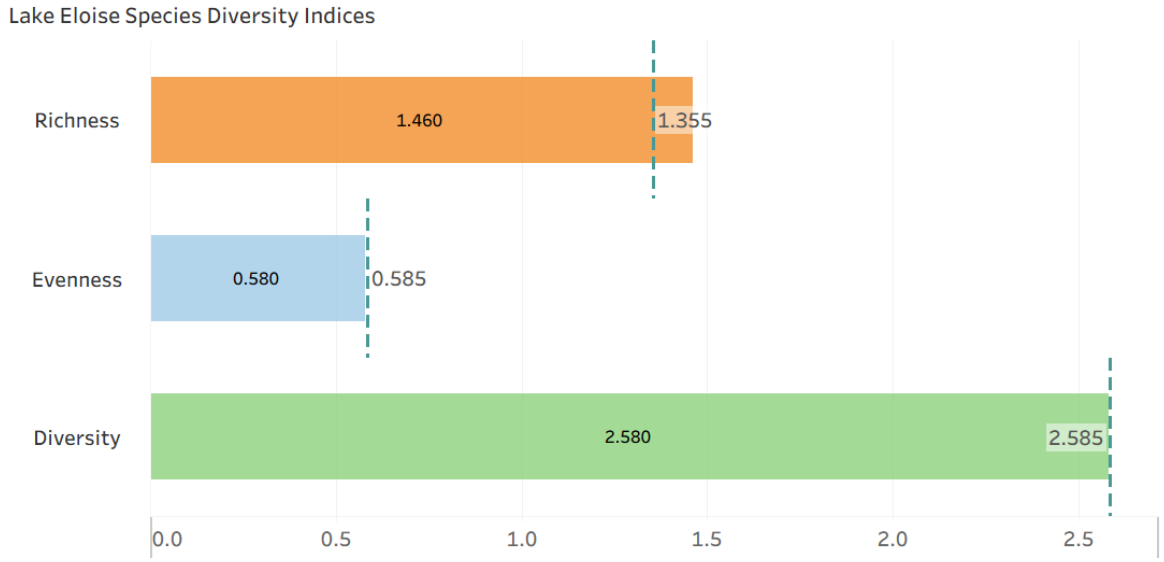


Figure 3-59. Chart depicting 2025 diversity indices for Lake Eloise. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Eloise's health index scores from 2018 to 2025 shows relative consistency with scores from 1.8 to 2.0 (Table 3-8). Eloise's 2025 lake health index score was 2.0—tied with 2023 for the highest on record. Since the City began documenting lake health, most of the changes to Lake Eloise's scores have come from the biological criteria. As stated previously, invasive species have not been a large component of the vegetation community and the vegetation community typically fluctuates naturally with minor management input. While the lake has remained impaired, the trends are showing gradual improvement in all water quality metrics.

Lake Health Impacts/Challenges:

- In addition to the stormwater pollutant loads, Lake Eloise has had historic point source loading from the Cypress Gardens Wastewater Treatment Plant as late as 1975. There is potential for these legacy nutrients to be embedded in the lake sediments.
- While invasive species like hydrilla are generally in check, it can only take a single season for even a small population to take over large areas of a waterbody.
- The presence of OSTDs (septic) systems in the drainage basin could have potential impacts if they are leaching into the water table. Though with the lake being phosphorus-limited, the nitrogen leaching from septic systems are less of a concern.

Lake Management Strategy:

- With the majority of the drainage basin comprised of residential housing, public education and outreach is a viable strategy for mitigating stormwater pollutant loading. Staff have worked with individual communities and homeowner's associations within the basin to suggest the use of green infrastructure in their private stormwater systems.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.
- The City may explore source analysis to determine if septic systems in the drainage basin may be contributing nutrient loads to Lake Eloise. Further management may involve septic-to-sewer conversions in areas where the City provides sewer service.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	2	2	3	1	2	2	**1.8**
2019	0	2	2	2	3	2	2	2	**1.9**
2020	0	2	2	2	3	3	2	1	**1.9**
2021	0	2	2	2	3	2	2	2	**1.9**
2022	0	2	2	2	3	2	2	1	**1.8**
2023	0	3	2	3	3	2	2	1	**2.0**
2024	0	3	2	3	2	2	2	1	**1.9**
2025	0	3	2	3	2	2	3	1	**2.0**

Table 3-8. Lake Health Index values for Lake Eloise from 2018 to 2025.

Lake Fannie

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	2	3	3	0	2	2.4

Features & Statistics:

Surface area	800.3 acres
Mean depth	7.6 feet
Maximum depth	10.75 feet
Volume	5,828.2 acre-feet
Drainage basin area	2,208.8 acres
Annual TN Load	4,133.2 lbs
Annual TP Load	717.7 lbs
Limiting nutrient	Co-limited (N & P)

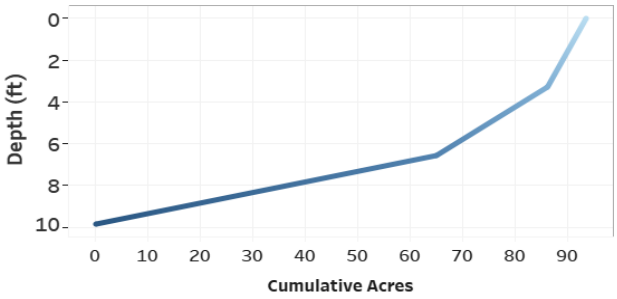


Figure 3-60. Hypsograph of Lake Fannie depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Fannie is a large, but shallow waterbody at 800 acres, with an average depth of 7.6 feet, and a maximum depth of only 10.75 feet (Figure 3-60). This makes it highly susceptible to sediment suspension via wind and wave action. Stormwater is conveyed to this waterbody from a 5,800 acre, mostly rural drainage basin (Figure 3-61); though the previously agricultural land uses are shifting more toward residential. These land uses contribute 4,133 lbs of TN and 717 lbs of TP to the lake annually. By area, however, these loads rank 35th compared to the other lakes in the region. There are 33 septic systems within this drainage basin. However, due to their low density, this isn't a major concern from a pollutant loading standpoint. There is also very little stormwater infrastructure present within the drainage basin—likely contributing to its relatively low pollutant loads.

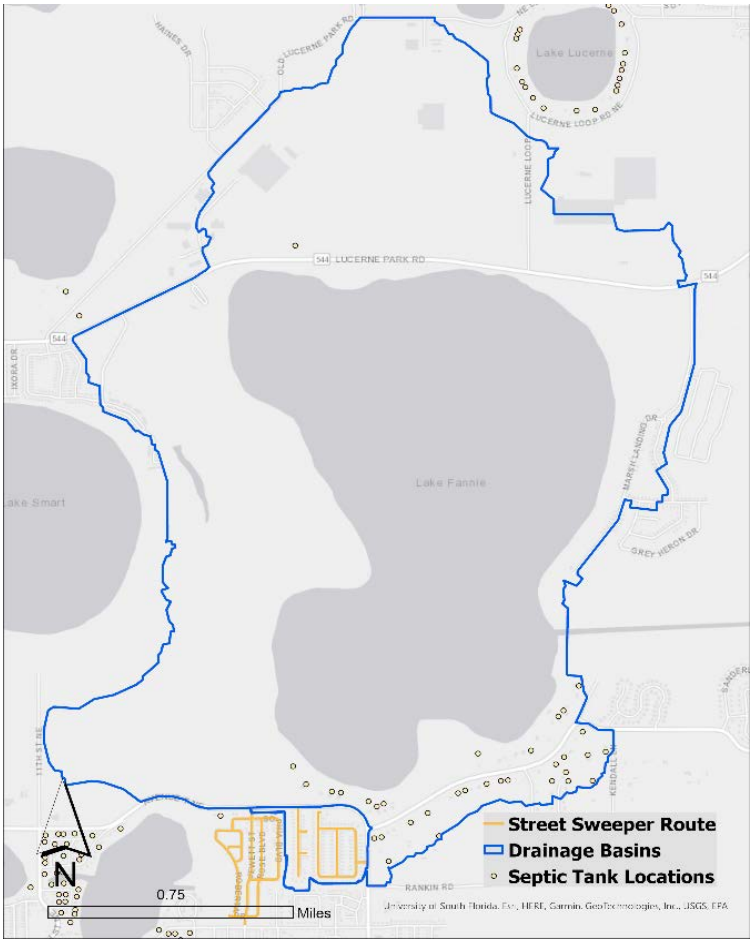


Figure 3-61. Map of Lake Fannie's drainage basin, City street sweeping services, and nearby septic systems.

Hydrology:

Lake Fannie is located within the North Chain of Lakes, but sits at a different elevation compared to its neighbors—Lake Smart to the west and Lake Hamilton to the east. Over its period of record, Lake Fannie's surface level has fluctuated between 119.8 and 128 feet above sea level. The normal range is between 121.4 and 125.1 feet (Figure 3-62). Though, since 2014, the amount of annual fluctuation has stabilized toward the high end of the normal range. During 2025, Lake Fannie dropped to a dry season low of 124.7 feet in April and reached a wet season peak of 125.4 feet in October. At the end of 2025, the surface level was 125.23 feet; slightly above the high range of levels. With District managed control structures on its upstream and downstream flow pathways, Lake Fannie's level is managed quite closely. Since 2014, Lake Fannie has been maintained close to its high normal range. According to 2019 regression analyses, changes in Lake Fannie's surface level significantly correlate with Chl-a, TN, TP, and clarity such that higher levels should result in improved water quality.

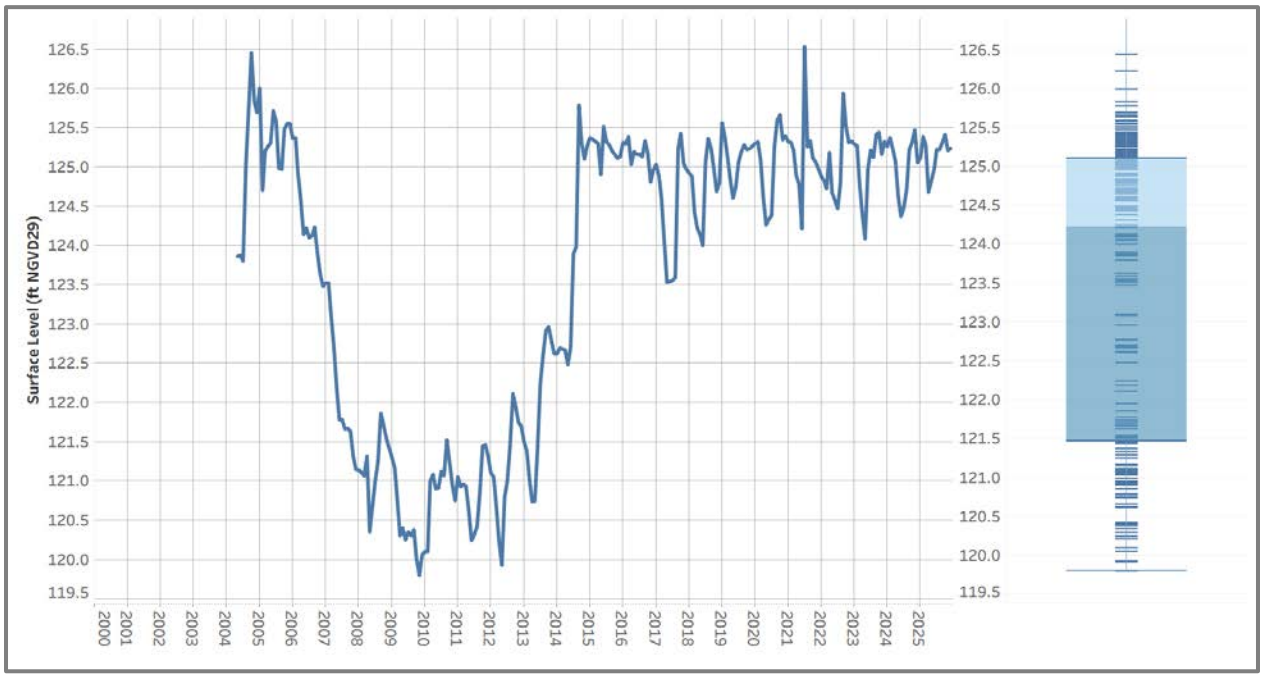


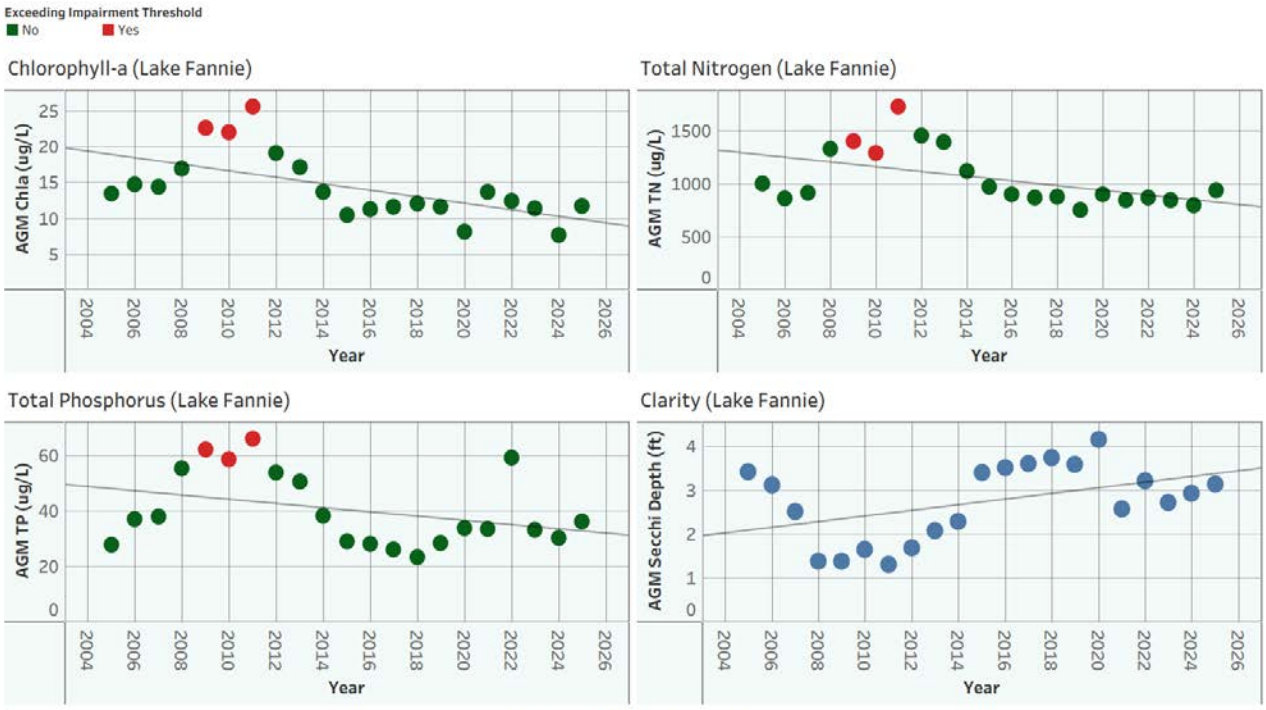
Figure 3-62. Hydrograph of Lake Fannie depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Fannie is categorized as a high color waterbody. Due to a lack of NNC exceedances in Chl-a, TN, and TP during the assessment period, Lake Fannie is considered unimpaired (Figure 3-63). The last exceedances recorded were in 2011; as a result, Lake Fannie has received an impairment criterion score of 3 since 2019.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the water quality data, Chl-a, TN and clarity exhibited significant improving trends—earning trend criterion scores of 3. The non-significant trend for TP equates to a trend score of 2. Overall, Lake Fannie appears to be mostly trending in an improving direction.



Lake Fannie 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity Increasing
R Coeff.	-0.600	-0.514	-0.348	0.455
P-Value	0.004	0.017	0.123	0.038

Figure 3-63. Lake Fannie AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Fannie on 10/17/2025. The PAC during this survey was 36.3% and the total BV was recorded at 7.6% (Figure 3-64). The 2025 abundance was moderately higher than during the previous years—in fact, the highest abundance values in Lake Fannie's historical record. These PAC and BV values equate to an abundance criteria score of 3. This significant increase in vegetation abundance may result in a benefit to water quality.

Invasive Species Management:

Based on the 2025 data, floating-leaf and emergent plant species heavily dominated Lake Fannie's vegetation community (Figure 3-65). Spatterdock was the most dominant plant at over 18% of the population, followed closely by cattail and the invasive burhead sedge at 15% and 10%, respectively. Over the last five years, submerged species have increased in abundance; likely a result of gradually improving water clarity. Coontail, eel grass, and southern naiad made up over 16% of the community. Invasive species like burhead sedge and water hyacinth saw an increase in abundance—going from 12% in 2024 to 19% in 2025. This places the invasive presence criterion score at 0. While this increase marks the highest invasive presence on record, it should be noted that Lake Fannie has historically had issues managing invasive plants. This indicates the need for more impactful invasive plant management efforts and increased monitoring frequency to identify where invasive species are expanding.

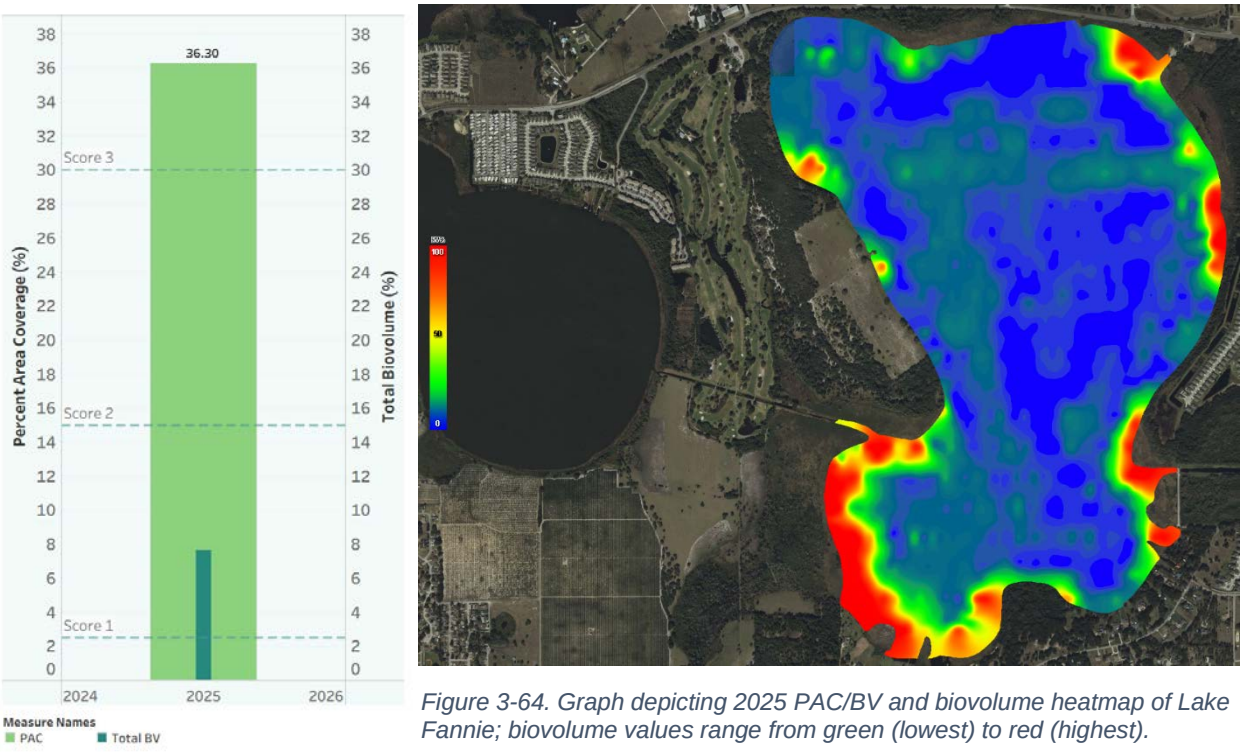


Figure 3-64. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Fannie; biovolume values range from green (lowest) to red (highest).

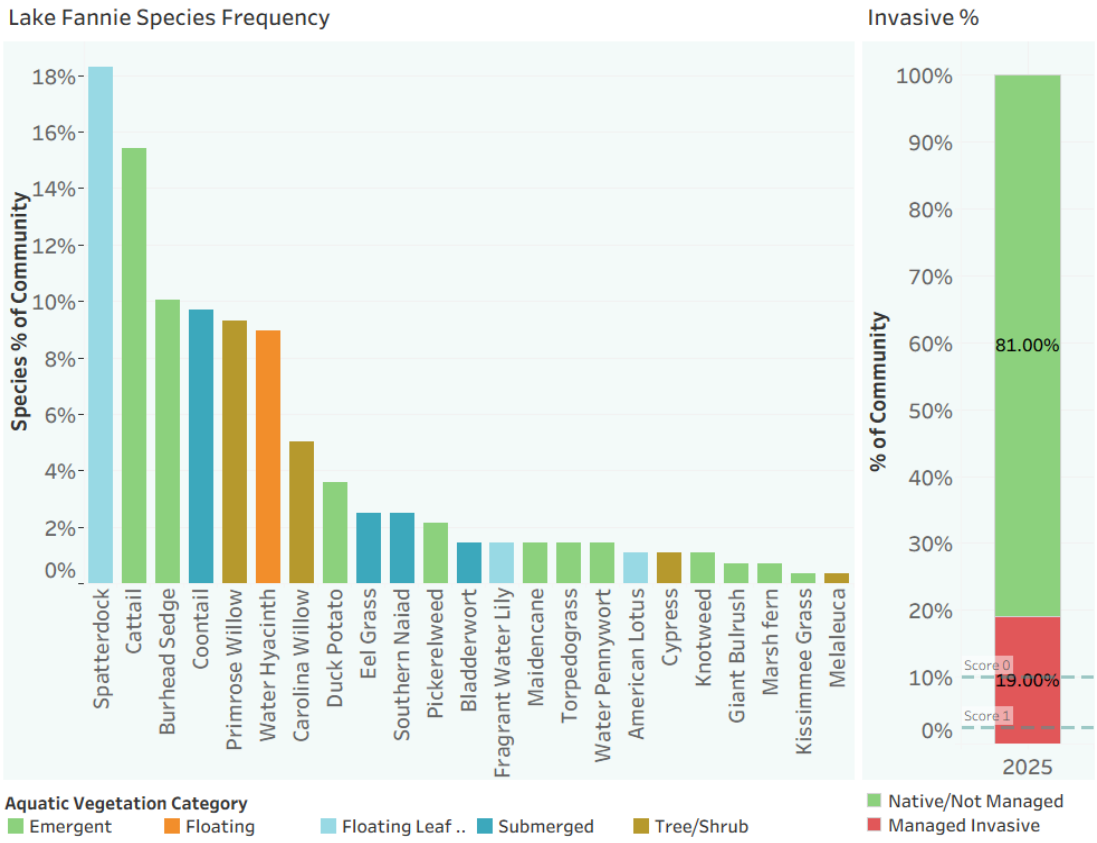


Figure 3-65. Chart depicting species frequency and invasive species percentage of Lake Fannie during 2025.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake Fannie's evenness and diversity indices exceeded their respective long-term medians—resulting in a diversity criterion score of 2 (Figure 3-66). In 2024, all three indices exceeded median levels. It is likely that the decline of the invasive species, hydrilla, resulted in the marginal decrease in species richness. Continued management of invasives should hopefully allow other native species to fill ecological niches currently occupied by invasive plants like burhead sedge and water hyacinth.

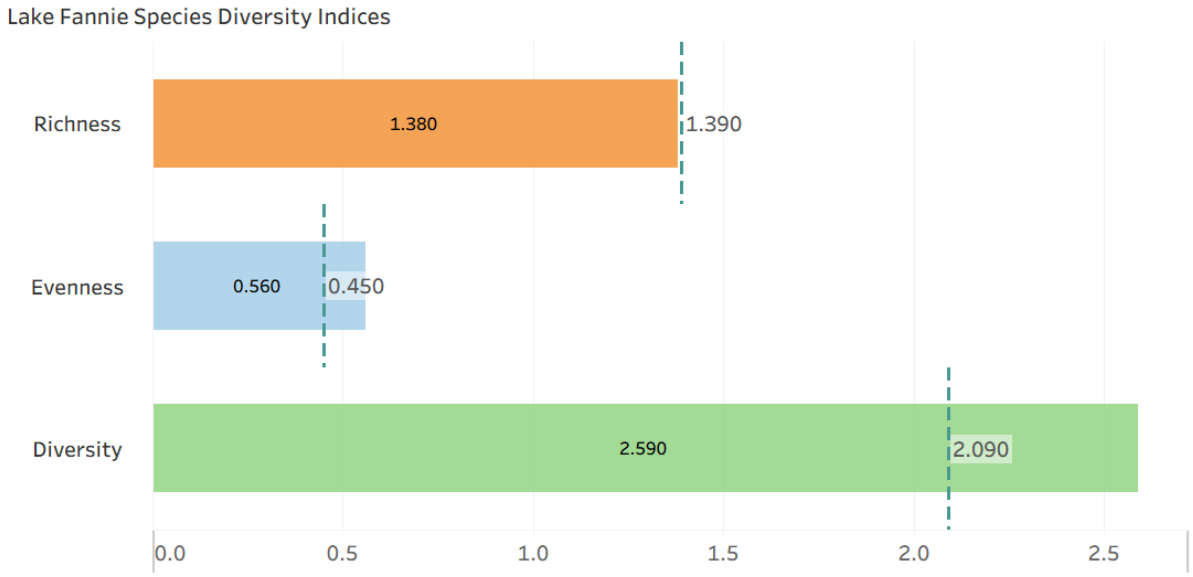


Figure 3-66. Chart depicting 2025 diversity indices for Lake Fannie. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Fannie's health index scores from 2018 to 2025 shows a significant improvement since monitoring began (Table 3-9). The large jump in 2019 was due to water quality meeting NNC guidelines, while subsequent improvements are mostly due to positive shifts in the trend directions and significance. Despite invasive species score consistently underperforming, the other biological criteria have exhibited much better scores. Overall, Lake Fannie is doing substantially better than it was seven years ago—reaching its highest LHI score in 2025 on record.

Lake Health Impacts/Challenges:

- While the majority of the drainage basin is undeveloped, new housing in the area carries potential for added stormwater pollutant loading. Fortunately, the majority of these newer developments are required to include stormwater treatment in their site plans.
- The management of invasive species like water hyacinth and burhead sedge is a constant concern. Management that foregoes large-scale herbicide treatments is advised in order to prevent water quality decline.
- Lake Fannie's water quality metrics are significantly correlated with its surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in further water quality decline.

Lake Management Strategy:

- As the Lake Fannie drainage basin continues to develop into residential land uses, public education efforts aimed at improving residents' knowledge of proper stormwater management practices can help to ensure water quality continues to trend in a positive direction.
- Street sweeping services run within the small portion of the drainage basin that lies within City limits.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.
- Due to correlation between surface level and water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	1	2	2	2	0	2	**1.3**
2019	3	2	2	2	3	2	0	1	**1.9**
2020	3	2	2	2	3	1	0	1	**1.8**
2021	3	2	2	2	3	2	0	2	**2.0**
2022	3	2	2	2	3	2	0	3	**2.1**
2023	3	3	2	2	3	2	0	3	**2.3**
2024	3	3	3	2	2	2	0	3	**2.3**
2025	3	3	3	2	3	3	0	2	**2.4**

Table 3-9. Lake health index scores for Lake Fannie from 2018 to 2025.

Lake Haines

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	2	2	1	2	3	0	2	1.5

Features & Statistics:

Surface area	687.5 acres
Mean depth	9.6 feet
Maximum depth	15.5 feet
Volume	7,380.9 acre-feet
Drainage basin area	2,317.8 acres
Annual TN Load	5,701 lbs
Annual TP Load	1,055.9 lbs
Limiting nutrient	Co-limited (N & P)

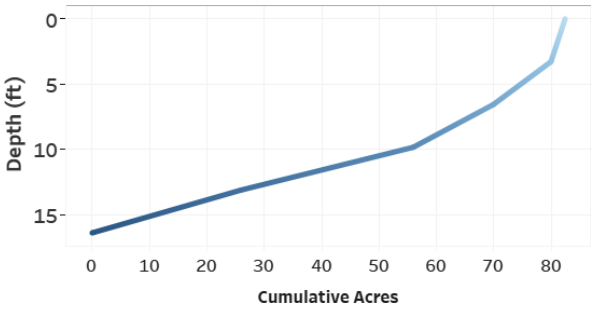


Figure 3-67. Hypsograph of Lake Haines depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Haines is one of the larger waterbodies in the region at nearly 700 acres in area. With a mean depth of 9.6 feet, Haines is somewhat deeper than other lakes in the North Chain, but is only slightly above the regional average depth of 8.5 feet (Figure 3-67). Like many other large and relatively shallow waterbodies, Lake Haines is more suceptible to sediment suspension via wind and wave action. Stormwater is conveyed to this waterbody from a massive and mostly rural drainage basin with a total area of 2,317 acres (Figure 3-68). The majority of the basin is comprised of wetland and agricultural land uses. This basin contributes 5,701 lbs of TN and 1,055 lbs of TP to the lake annually. However, on a per acre basis, these loads rank relatively low compared with other drainage basins in the area. There are 14 septic systems within the basin; not at a density to cause potential harm via leaching to the water table.

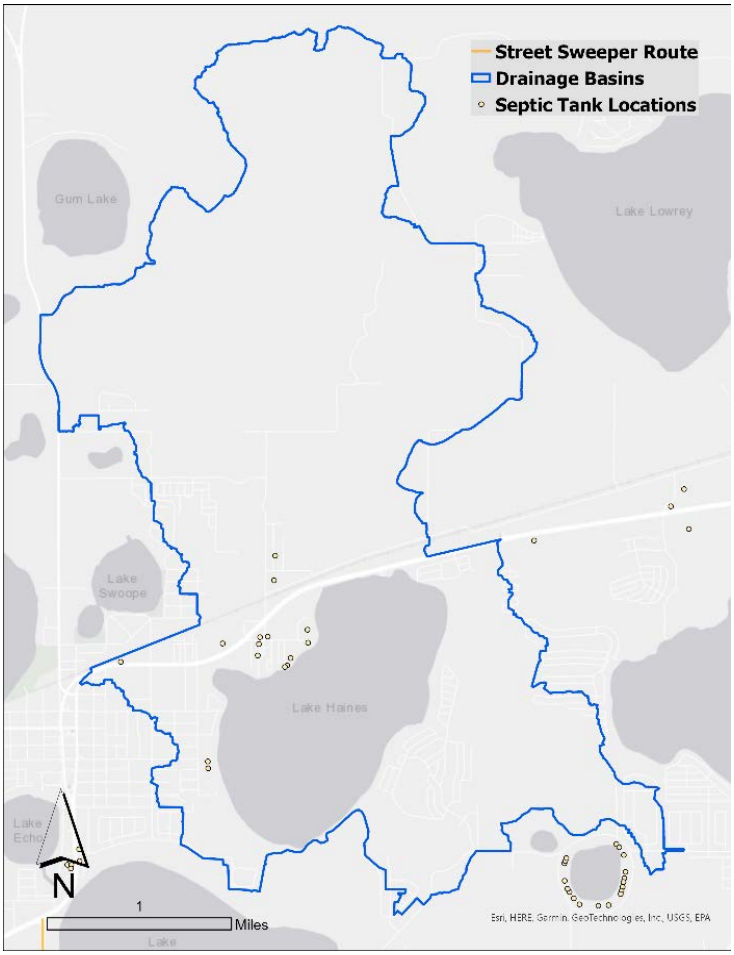


Figure 3-68. Map of Lake Haines' drainage basin and nearby septic systems.

As part of the Northern Chain, Lake Haines is connected via navigable canal to Lake Rochelle. Excess water from the North Chain eventually drains via the SWFWMD-managed P-8 control structure at the south of Lake Hamilton and enters the Peace Creek.Over the period of record, surface levels in this section of the North Chain (Lakes Conine, Haines, Rochelle, and Smart) have fluctuated between 122 and 129.5 feet above sea level. The normal range fluctuates much less between 126.1 and 128.2 feet (Figure 3-69). During 2025, Lake Haines reached a peak of 128.5 feet in February and a low of 127.6 feet in December. The surface level generally declined throughout the year—likely due to the low annual rainfall as well as hydrologic management by the SWFWMD. While the North Chain surface level did not drop below its long-term median, 2025 marks the lowest this chain has reached since the 2017 dry season. Changes in Lake Haines' surface level are directly correlated with water clarity and indirectly correlated with TN (see appendix). It is likely that the abundance of wetlands surrounding Lake Haines contributes to these relationships as higher surface levels would increase wetland inundation and the benefits they provide. This carries management implications as maintaining a higher surface level should result in improvements in these metrics.

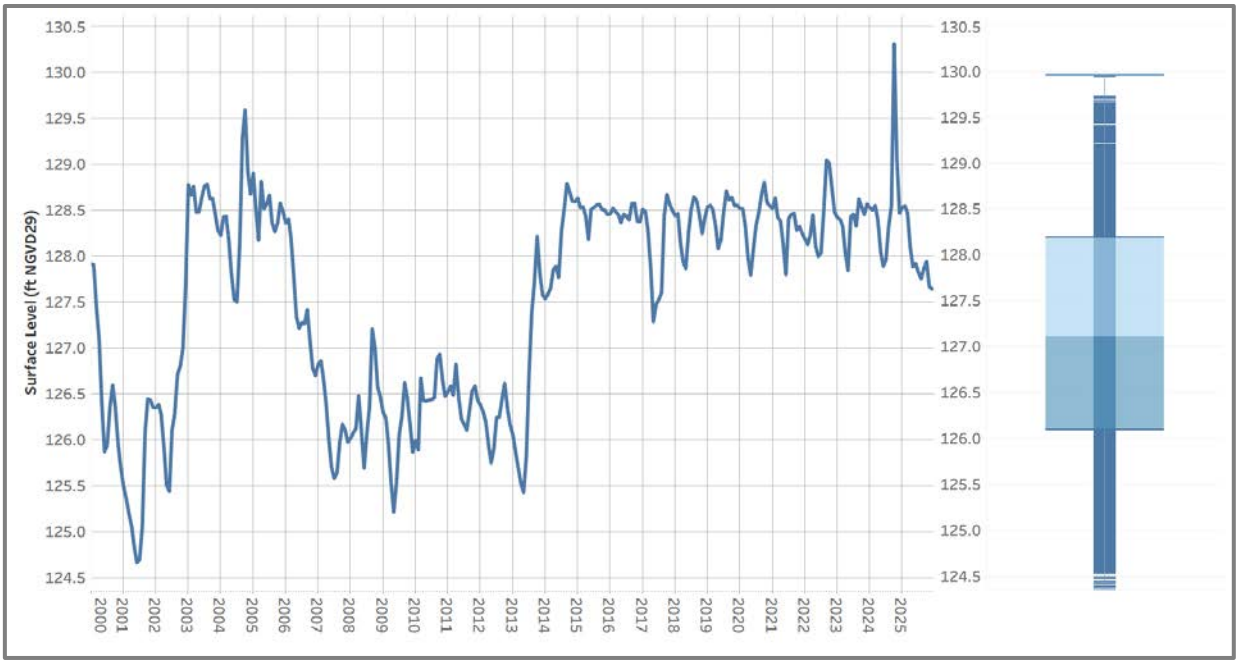


Figure 3-69. Hydrograph of Lake Haines depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

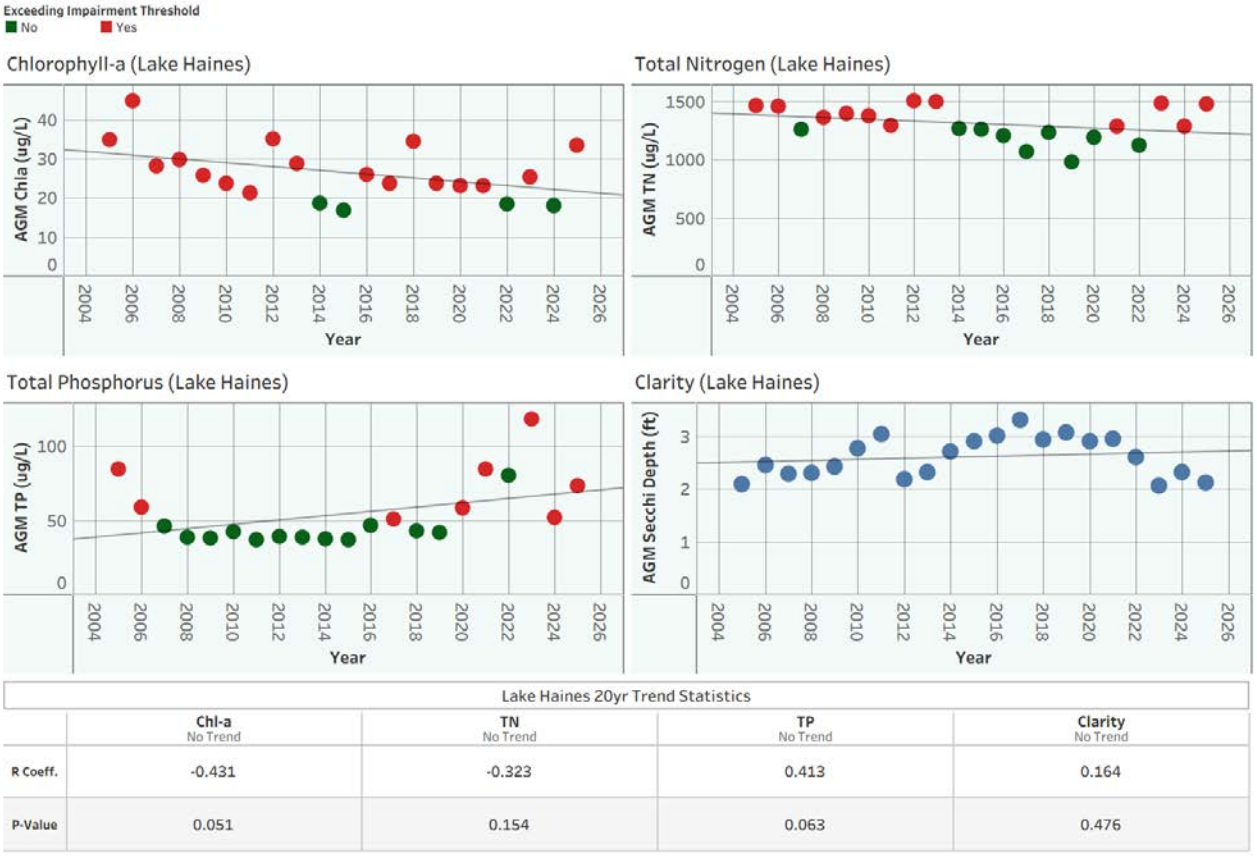
Water Quality Impairment:

To determine water quality impairments based on the Numeric Nutrient Criteria (NNC), Lake Haines is categorized as a high-color waterbody. Based on multiple NNC exceedances during the assessment period, Lake Haines is considered impaired for Chl-a, TN, and TP—equating to an impairment score of 0 (Figure 3-70). While TN was not previously impaired since 2015, consecutive exceedances in the last three years have resulted in a lowering of the impairment score. In 2018, the FDEP established a total maximum daily load (TMDL) for Lake Haines stipulating a 33% reduction in TN to achieve NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the water quality data, Lake Haines exhibits

no significant trends in Chl-a, TN, TP, or Clarity. Non-significant improving trends were observed for Chl-a, TN, and Secchi depth—equating to trend criteria scores of 2. Whereas TP exhibited a non-significant deteriorating trend—for a trend score of 1. Previously, Chl-a, TN, and Secchi depth exhibited significant improving trends. This indicates a recent shift toward poorer water quality for Lake Haines.



Lake Haines 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.431	-0.323	0.413	0.164
P-Value	0.051	0.154	0.063	0.476

Figure 3-70. Lake Haines' AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Haines on 10/23/2025. The PAC during this survey was 38.5% and the total BV was 4.6% (Figure 3-72). These abundance values equate to a criterion score of 3. This marks a considerable increase in coverage from the previous year and more in-line with abundance values during 2020 and 2023. These abrupt changes in coverage are likely due to efforts in controlling invasive weeds like hydrilla. More frequent, less intensive invasive management efforts would likely minimize these wild swings in abundance.

Invasive Species Management:

Based on 2025 species data, emergent vegetation remains the most dominant vegetation type in Lake Haines. Cattail alone made up over 25% of the community (Figure 3-71). Submerged species followed, making up nearly 40% of the population. The invasive species, hydrilla and water hyacinth made up almost 20% of the population—for an associated criterion score of 0. While SAV species surged in abundance the last two years, the tremendous abundance value exhibited likely came from the hydrilla infestation. This indicates the need to continue management efforts.

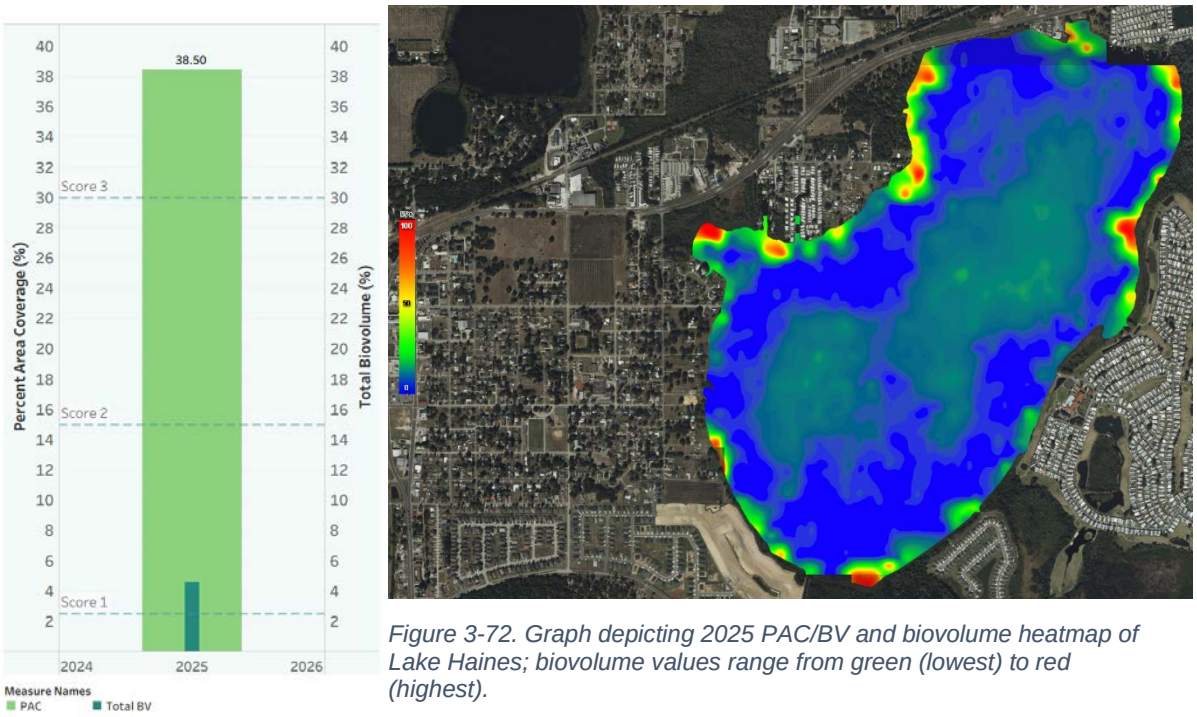


Figure 3-72. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Haines; biovolume values range from green (lowest) to red (highest).

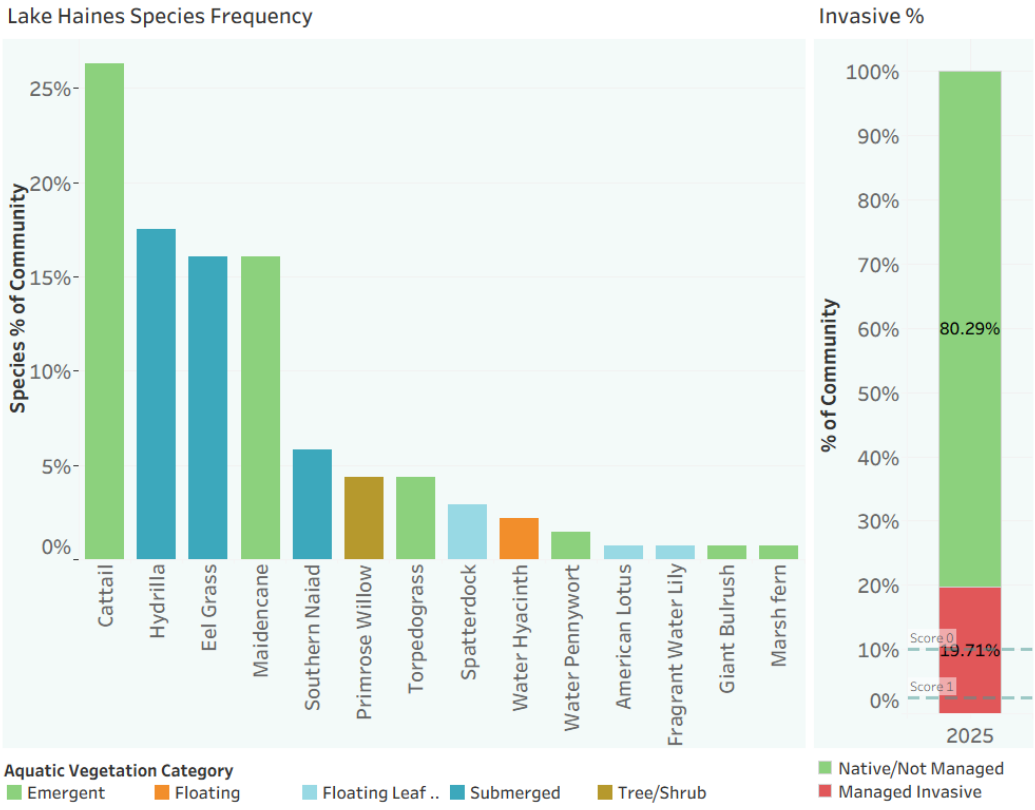


Figure 3-71. Chart depicting species frequency and invasive species percentage of Lake Haines during 2025.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, the species richness and overall diversity indices exceeded their respective median values (Figure 3-73). This equates to a diversity score of 2. While the number of unique species remains high, the massive differences in the distribution of individual species has resulted in continually low evenness index values. The hope is that proper invasive management efforts will allow for less abundant species to fill in the ecological niches currently occupied by plants like hydrilla and water hyacinth.

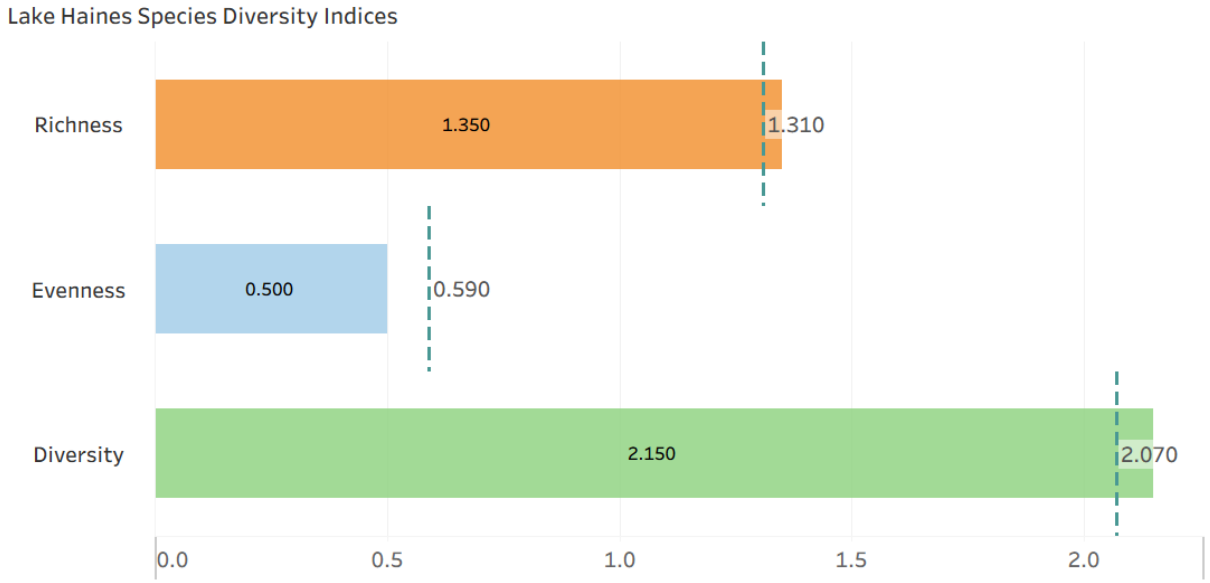


Figure 3-73. Chart depicting 2025 diversity indices for Lake Haines. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Haines' health index scores from 2018 to 2025 shows some variability over time (Table 3-10). Despite meeting NNC targets for TN and TP in previous years, recent shifts in water quality have resulted in full impairment. Water quality trends have also been variable, with improvement in Chl-a, but recent declines in TP and clarity. Vegetation abundance and diversity have fluctuated wildly, most likely due to repeated invasive plant infestations and subsequent large-scale treatment efforts. Unfortunately, the near eradication of hydrilla in 2024 was short-lived as a massive infestation reapeared the following year. Lake Haines remains an important waterbody to focus management efforts on. However, Winter Haven's jurisdictional authority on this waterbody is limited. Efforts should be made to work with other municipal agencies to address these issues.

Lake Health Impacts/Challenges:

- Due to the low density of urban development in the drainage basin, the per acre stormwater pollutant loading is relatively low. That said Lake Haines may possess some legacy nutrients from historic point-source loading via the Lake Alfred Wastewater Treatment Facility.
- The correlation between surface level and water quality is likely due in part to Lake Haines' morphology. As a large, shallow waterbody, it is more susceptible to sediment suspension from wind and wave action. This is exacerbated when lake levels are lower. The presence

of large swathes of wetlands surrounding this lake also provide additional benefits when the lake level is higher.

- The management of invasive species like hydrilla is a constant concern. Even though it was not detected, these plants are never truly eradicated; it is expected they will return. Large-scale herbicide treatments may also impact both native vegetation and water quality.

Lake Management Strategy:

- Due to correlations between surface level and water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Additionally, staff will advocate for invasive management actions that limit the large-scale use of herbicides. Grass carp have been utilized in the Northern Chain to supplement herbicide treatments and to reduce the amount of chemicals needed to manage invasives in these lakes.
- Staff can support Polk County and the City of Lake Alfred in efforts to mitigate pollutant loading. Either through source analysis or guidance on the use of green infrastructure within the drainage basin.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	3	2	3	2	0	1	**1.6**
2019	1	2	3	2	3	2	0	2	**1.9**
2020	2	2	3	2	3	3	0	2	**2.1**
2021	1	2	3	1	3	1	1	2	**1.8**
2022	1	2	3	1	3	1	1	1	**1.6**
2023	1	3	3	1	3	3	1	0	**1.9**
2024	0	3	3	1	2	1	3	2	**1.9**
2025	0	2	2	1	2	3	0	2	**1.5**

Table 3-10. Lake health index scores for Lake Haines from 2018 to 2025.

Lake Hamilton

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	0	0	3	0	2	1	3	1.1

Features & Statistics:

Surface area	2,168.7 acres
Mean depth	6.39 feet
Maximum depth	17 feet
Volume	13,662.9 acre-feet
Drainage basin area	4,177.6 acres
Annual TN Load	6,701.7 lbs
Annual TP Load	1,167.8 lbs
Limiting nutrient	Phosphorus

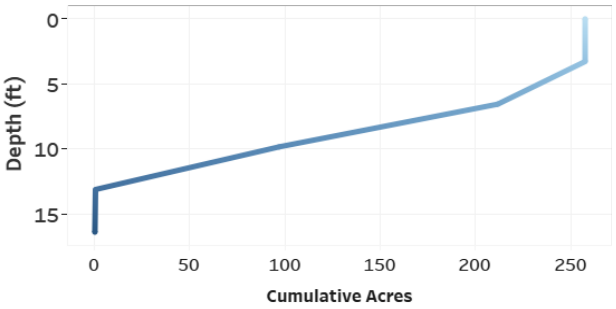


Figure 3-74. Hypsograph of Lake Hamilton depicting the depth profile and morphology of the lake bed.

Hydrology:

At 2,168 acres, Lake Hamilton is the largest lake within the study area. That said, it is one of the shallower waterbodies, with an average depth of just over 6 feet and a maximum depth of 17 feet (Figure 3-74). This makes it extremely susceptible to sediment suspension in windy conditions. Stormwater is conveyed to this waterbody from a 4,177 acre drainage basin comprised primarily of residential and wetland land uses which contributes 6,701 lbs of TN and 1,167 lbs of TP to the lake annually. On a per acre basis, these loading rates are some of the lowest in the study area. There are approximately 62 septic systems within this drainage basin—a relatively low density for its size (Figure 3-75). Lacking City roads and stormwater infrastructure conveying runoff to the lake, Winter Haven does not conduct any street sweeping services within this basin nor are there many stormwater improvements to be made.

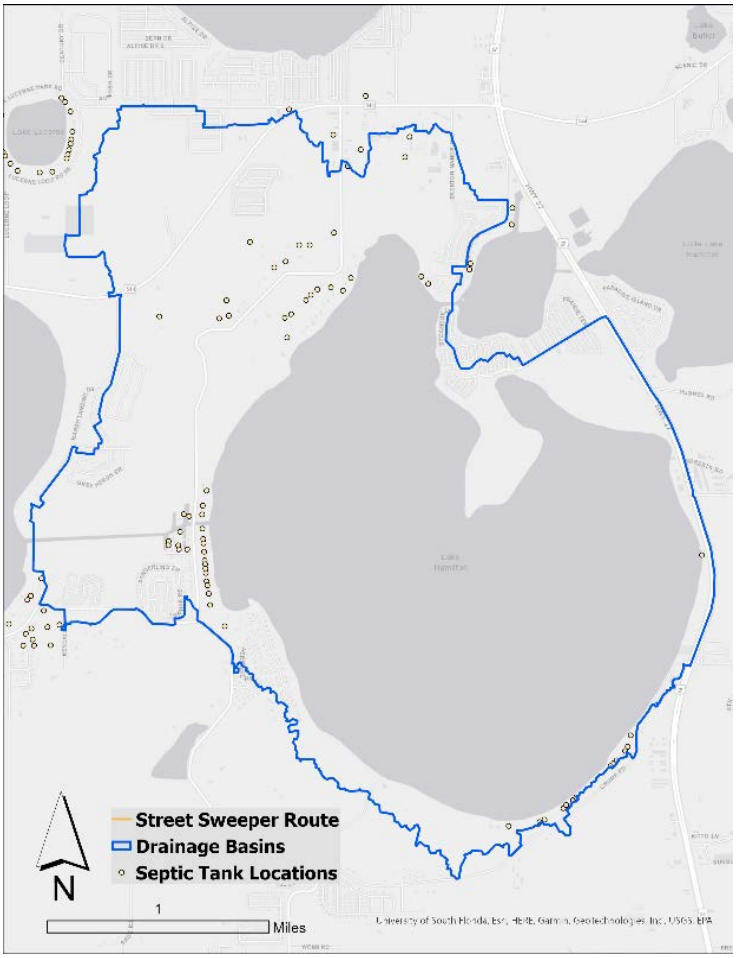


Figure 3-75. Map of Lake Hamilton's drainage basin and nearby septic systems.

Lake Hamilton is part of the North Chain of Lakes and receives excess water from Lake Fannie and Lake Henry—discharging its own excess water to the Peace Creek. Hamilton actually sits at the lowest level of all lakes within the study area. Over its period of record, Lake Hamilton's surface level has fluctuated between 117.5 and 123.6 feet above sea level. The normal range of fluctuation is between 119 and 121 feet (Figure 3-76). In 2017, the SWFWMD enacted new water level management protocols with the intent to restore seasonal level fluctuations within the lake's normal range. This is accomplished by releasing water downstream during the rainy season and storing water during the dry season. During 2025, Lake Hamilton dropped to a dry season low of 120.4 feet in April and reached a wet season peak of 121.3 feet in September. Lake Hamilton ended the year near the high end of the normal range at 120.9 feet. Since 2015, the SWFWMD has maintained Lake Hamilton's level consistently near this upper quartile range. Changes in Lake Hamilton's surface level are not correlated with Chl-a, TN, TP, or clarity (see appendix).

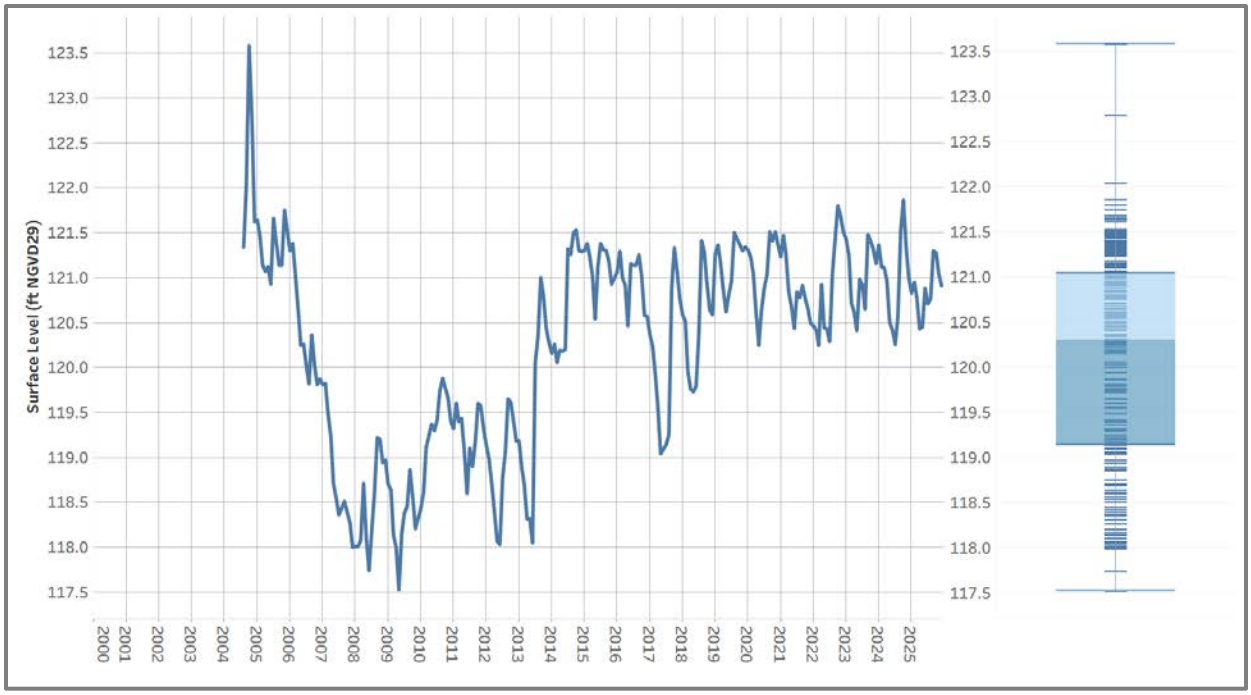


Figure 3-76. Hydrograph of Lake Hamilton depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

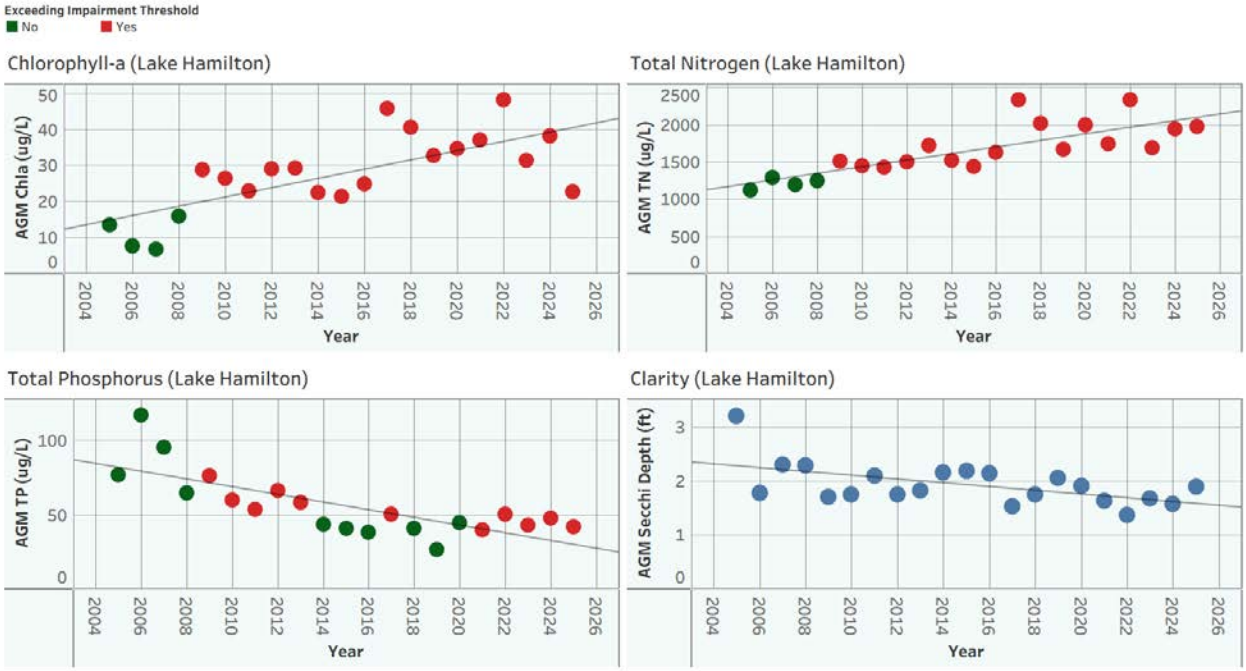
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Hamilton is categorized as a clear, alkaline waterbody. Based on multiple consecutive NNC exceedances during the assessment period, Lake Hamilton is considered impaired for Chl-a, TN, and TP (Figure 3-77). This equates to an impairment criterion score of 0. While the FDEP began developing a total maximum daily load (TMDL) for Lake Hamilton in 2020, an alternative restoration plan was adopted by the FDEP and associated management strategies are being executed by Polk County staff.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Chl-a, TN, and Secchi depth each exhibited significant deteriorating trends—earning trend criteria scores of 0. Surprisingly, TP continues to

exhibit a significant improving trend, for a criterion score of 3. These trends are indicative of a cycle of nitrogen-fixing cyanobacteria blooms occuring in Lake Hamilton—increasing Chl-a and TN concentrations while decreasing TP and clarity. Further study is needed to assess other potential drivers of these trends.



Lake Hamilton 20yr Trend Statistics

	Chl-a Increasing	TN Increasing	TP Decreasing	Clarity Decreasing
R Coeff.	0.711	0.797	-0.758	-0.554
P-Value	0.000	0.000	0.000	0.009

Figure 3-77. Lake Hamilton AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Hamilton on 12/5/2025. The PAC during this survey was 17.9% and the total BV was recorded at 2.6%--equating to an abundance criterion score of 2 (Figure 3-78). Lake Hamilton's vegetation abundance has steadily increased since 2018, with 2025 marking the highest PAC and BV values on record. Based on Lake Hamilton's shallow morphology and water clarity, these relatively low abundance values are expected. However, the gradual increase over time indicates incremental improvement and a positive outlook on overall lake health.

Invasive Species Management:

Based on 2025 species data, the dominant plant type in the lake was emergent, with giant bulrush comprising over 25% of the community (Figure 3-79). While SAV species have historically occupied much lower percentages, the native Illinois pondweed was the second most abundant species in 2025—a positive shift in the vegetation community. Invasive floating plants (water hyacinth & water lettuce) comprised 2.5% of the community—a reduction of over 50% from the previous year. This reduction of invasive percentage coupled with the increase in overall abundance indicates improvement.

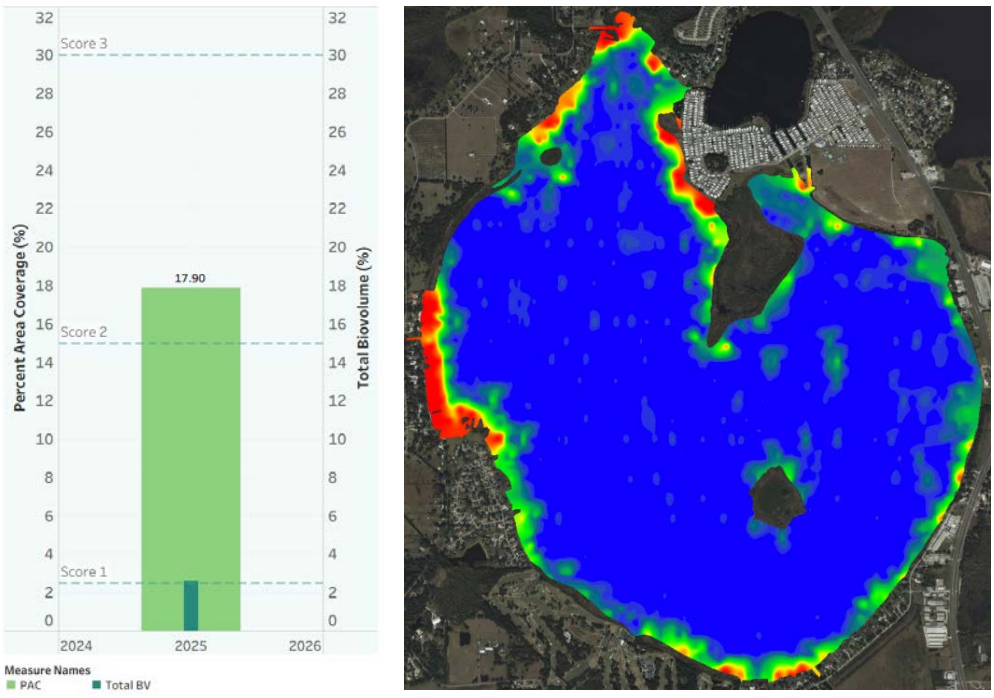


Figure 3-78. Graph depicting 2025 PAC/BV and biovolume of Lake Hamilton; biovolume values range from green (lowest) to red (highest).

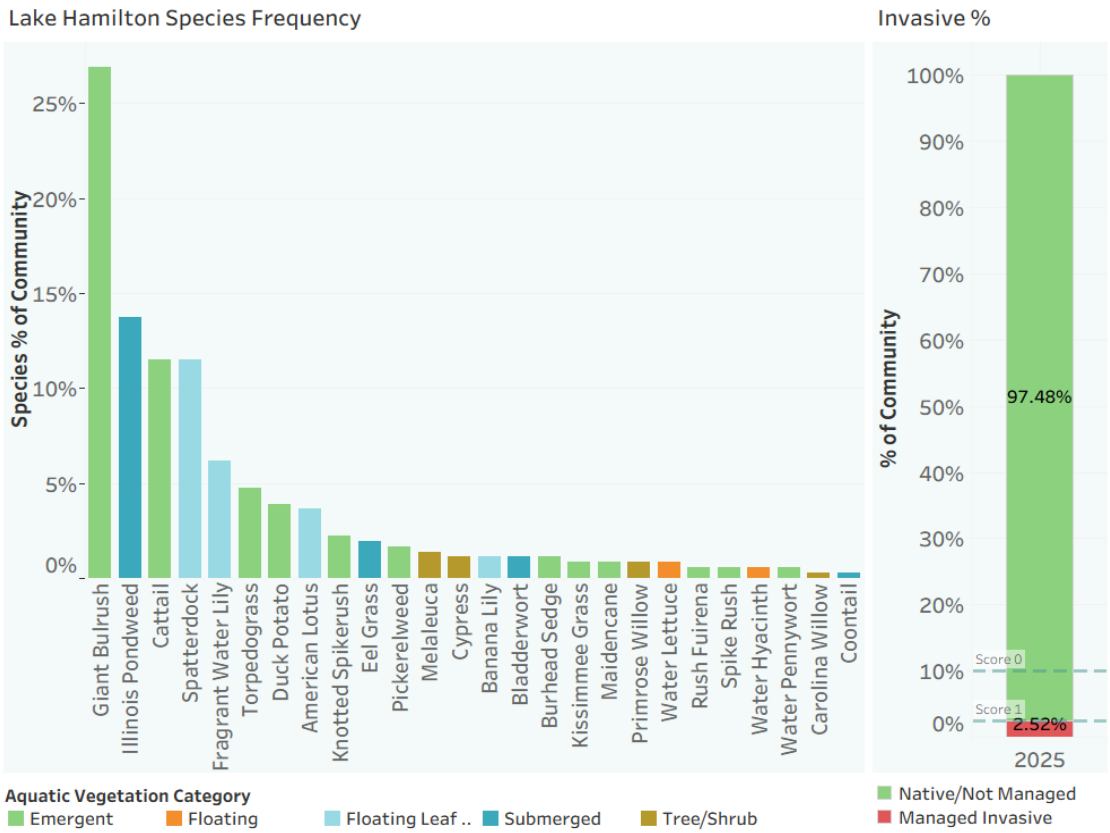


Figure 3-79. Chart depicting species frequency and invasive species percentage of Lake Hamilton during 2025

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Hamilton's diversity indices exceeded their respective median values (Figure 3-80). This marks the third consecutive year exhibiting above-average species diversity. Maintaining this level of diversity may be accomplished through continued monitoring and management of invasive species in order to protect the native plants present.

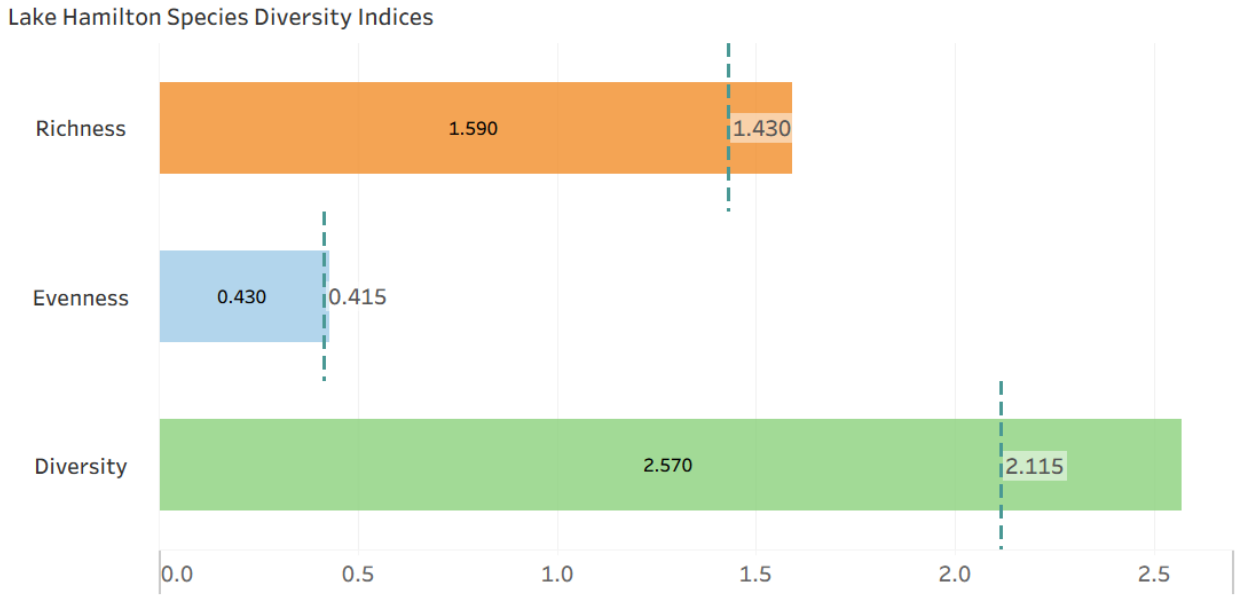


Figure 3-80. Chart depicting 2025 diversity indices for Lake Hamilton. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Hamilton's health index scores from 2018 to 2025 demonstrates why this waterbody is a high management priority with LHI values between 0.8 and 1.3 (Table 3-11). Besides an instance of TP meeting NNC guidelines for a year in 2021, Lake Hamilton has been consistently impaired with water quality trending in a poor direction. Regarding the biological criteria, vegetation abundance has remained the same until 2024 where it saw a slight increase. Unfortunately, the presence of non-native species dropped the invasive score down this year. Diversity has remained unchanged since 2021. Continued vegetation management is required to improve the invasive presence score with the goal of maintaining higher vegetation abundance and diversity scores as well.

Lake Health Impacts/Challenges:

- Lake Hamilton's water quality is continuing to decline. The likely existence of nitrogen-fixing bacteria is a notable result of these issues. It is unclear if this is due to stormwater, OSTDs, or other sources.
- Lake Hamilton continues to lack an abundance of aquatic vegetation. An increase in coverage could improve nutrient sequestration in the future.

Lake Management Strategy:

- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection will help to prevent a resurgence of invasive species.

- As part of the pollutant load reduction plan submitted by the County, there are several projects underway and planned that are intended to reduce the pollutant load to Lake Hamilton. These include:
    - Stormwater treatment BMPs at Lake Eva, Lake Conine (i.e. Lake Conine Nature Park), and a proposed treatment wetland on the west side of Lake Hamilton;
    - Street sweeping in the Haines City area;
    - Seepage study and septic-to-sewer conversion project proposed for the City of Lake Hamilton
    - Installation of bioactive media in stormwater features along US Hwy 27.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	0	0	3	0	1	2	0	**0.8**
2019	0	0	0	3	0	1	2	2	**1.0**
2020	0	0	0	3	0	1	1	1	**0.8**
2021	1	0	0	3	0	1	1	3	**1.1**
2022	0	0	0	3	0	1	3	3	**1.3**
2023	0	0	0	3	0	1	3	3	**1.3**
2024	0	0	0	3	0	2	1	3	**1.1**
2025	0	0	0	3	0	2	1	3	**1.1**

Table 3-11. Lake health index scores for Lake Hamilton from 2018 to 2025.

Lake Hartridge

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	1	1	2	0	3	3	3	1.6

Features & Statistics:

Surface area	446.4 acres
Mean depth	9 feet
Maximum depth	22 feet
Volume	4,462.7 acre-feet
Drainage basin area	920 acres
Annual TN Load	2,658.3 lbs
Annual TP Load	458.9 lbs
Limiting nutrient	Phosphorus

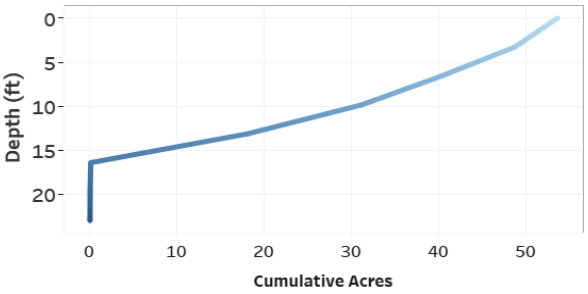


Figure 3-81. Hypsograph of Lake Hartridge depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Hartridge is a moderate-to-large waterbody at 446 acres, an average depth of 9 feet, and a maximum depth of over 20 feet (Figure 3-81). Hartidge's average depth is slightly deeper than the regional mean of 8.5 feet—meaning that sediment suspension is not necessarily a major issue. Stormwater is conveyed to this waterbody from a 920 acre drainage basin made up of a mix of residential, commercial, transportation, and industrial land uses (Figure 3-82). Based on stormwater modelling, Lake Hartridge receives 2,658 lbs of TN and 459 lbs of TP from this basin annually. There are 65 septic systems in the vicinity of the lake that may constitute a source of pollutant loading through groundwater. The City conducts monthly street sweeping services for over 17 miles along Havendale Blvd and US Hwy 17.

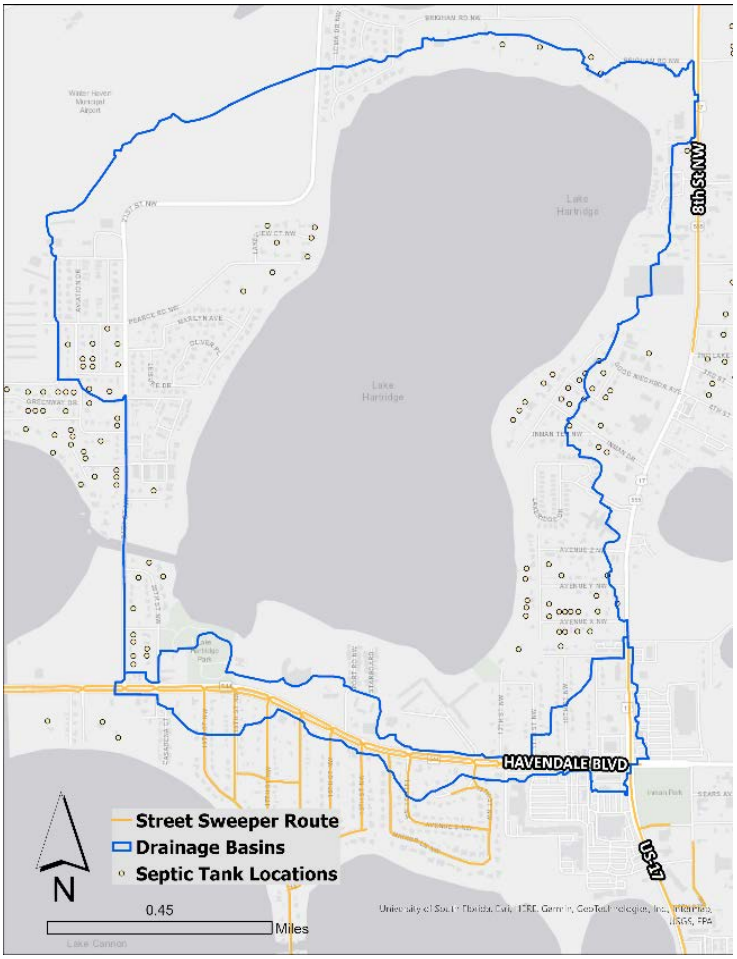


Figure 3-82. Map of Lake Hartridge's drainage basin, City street sweeper routes, and nearby septic systems.

Lake Hartridge is the northernmost waterbody in the South Chain with navigable connections to Lake Idylwild to the west and Lake Conine (via lock) to the north east. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-83). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Hartridge's surface level correlates indirectly with TP—indicating that higher levels should result in lower TP concentrations (see appendix).

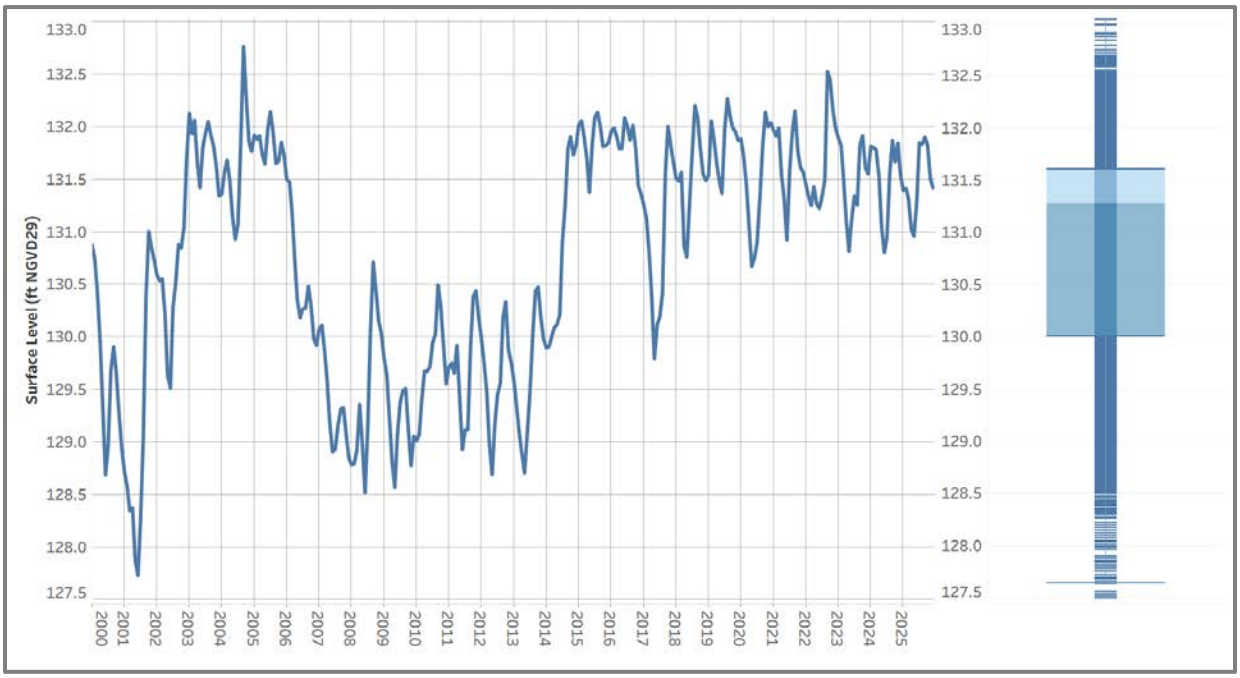


Figure 3-83. Hydrograph of Lake Hartridge depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

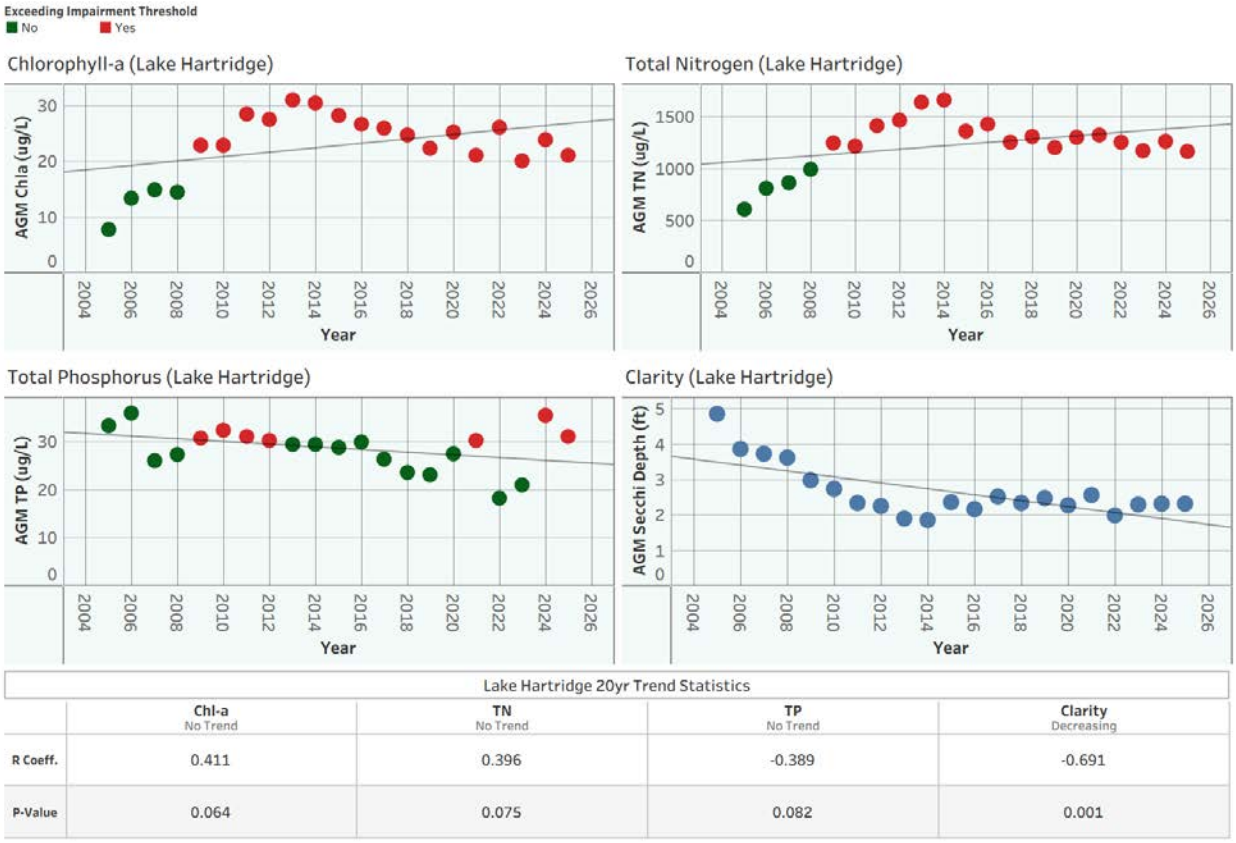
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Hartridge is categorized as a clear, alkaline waterbody. Based on numerous consecutive NNC threshold exceedances during the assessment period, Lake Hartridge is considered impaired for Chl-a, TN, and TP (Figure 3-84). Phosphorus concentrations have exceeded the NNC threshold in 2024 and 2025, resulting in an impairment score of 0.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, Chl-a, TN, and Secchi depth exhibit significant deteriorating trends—equating to trend criteria scores of 0. TP exhibits a non-significant improving trend, for a criterion score of 2. This recent shift in the trend direction may point to the presence of nitrogen-fixing bacteria in Lake Hartridge. Looking specifically at more recent data

(i.e. 2012 – 2024), the trends are much more static or even improving. Future reports may explore these more short-term trends in-depth to provide additional context and nuance to this analysis.



Lake Hartridge 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity Decreasing
R Coeff.	0.411	0.396	-0.389	-0.691
P-Value	0.064	0.075	0.082	0.001

Figure 3-84. Lake Hartridge AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Hartridge on 9/19/2025. The PAC during this survey was 46% and the total BV was 11.9%--equating to an abundance score of 3 (Figure 3-86). A comparison to previous years shows that vegetation abundance has remained relatively consistent since monitoring began; with PAC values above 35%. Lake Hartridge's gently sloping morphology likely allows for a wide littoral zone that aquatic plants can occupy. Lake Hartridge's vegetation abundance has been gradually increasing since 2021.

Invasive Species Management:

Based on the 2025 data, the native Illinois pondweed continues to be the dominant species present, followed by a healthy mix of native emergent and floating leaf plants (Figure 3-85). There were no invasive species detected for the second year in a row; resulting in an invasive score of 3. A comparison to previous years shows that invasives are generally controlled, with total community percentages consistently falling below 2% each year since 2018. Overall, Lake Hartridge possesses a great aquatic plant community of which management efforts should strive to maintain.

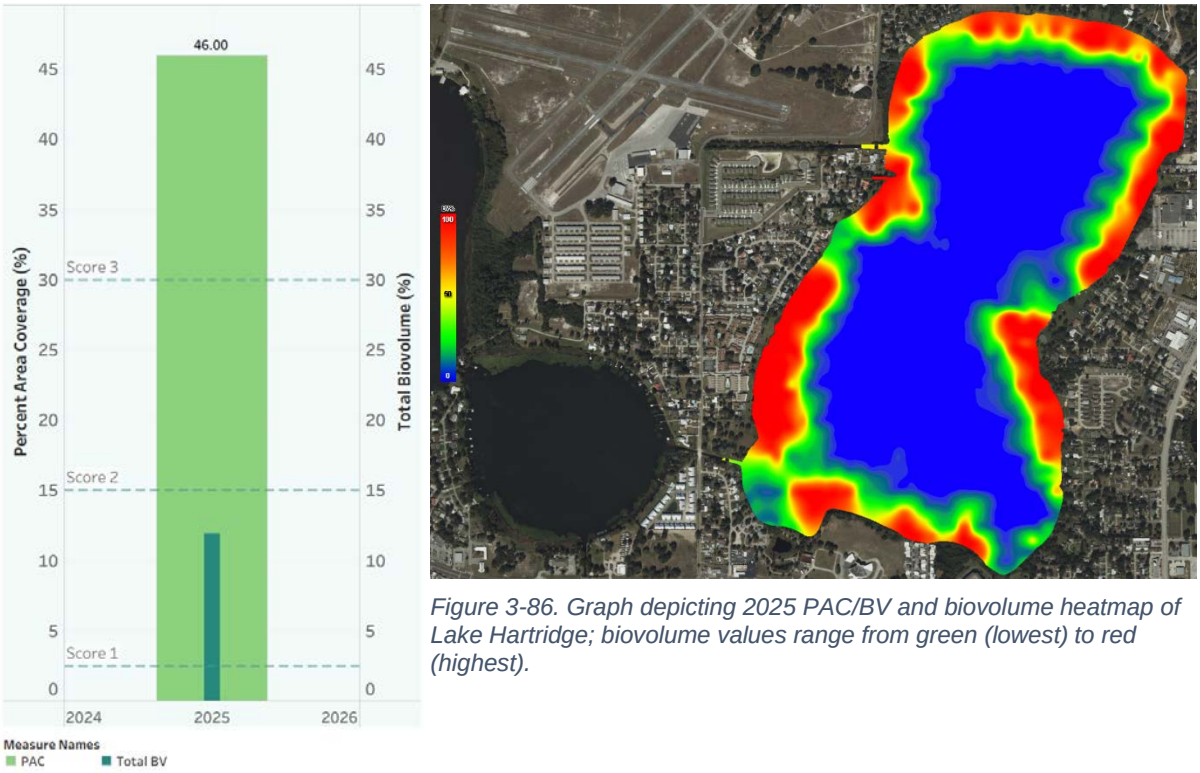


Figure 3-86. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Hartridge; biovolume values range from green (lowest) to red (highest).

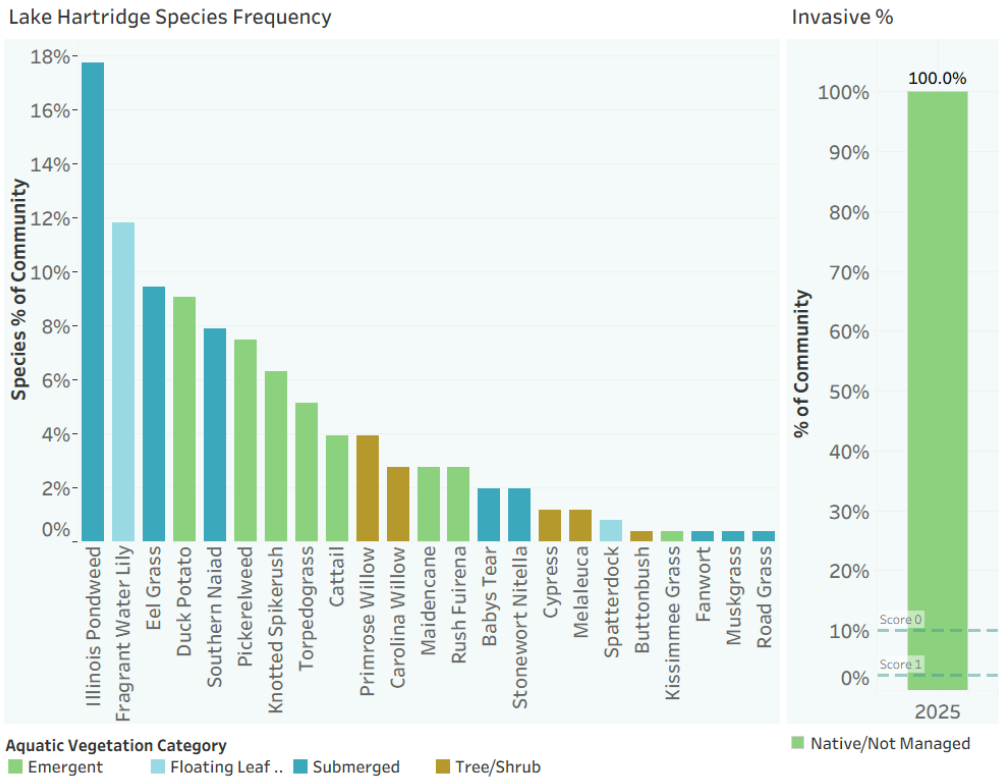


Figure 3-85. Chart depicting species frequency and invasive species percentage of Lake Hartridge during 2025.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Hartridge's diversity indices exceeded their long-term median values—equating to a diversity criterion score of 3 (Figure 3-87). The richness index saw a slight decrease whereas species evenness and overall diversity were either maintained or increased from the previous year. It should be noted that 2025 marks the second year in which Lake Hartridge's diversity score has been good even with the absence of invasive species.

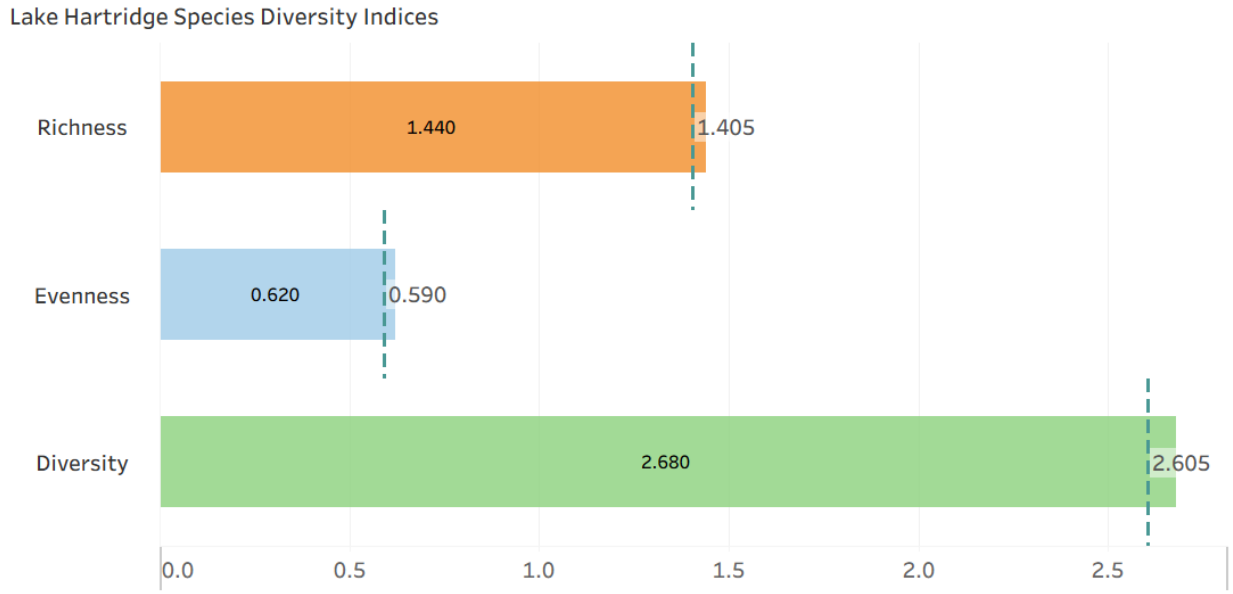


Figure 3-87. Chart depicting 2025 diversity indices for Lake Hartridge. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Hartridge's health index scores from 2018 to 2025 shows some slight improvement from 1.3 to 1.6 (Table 3-12). The impairment criterion score improved in 2019 due to TP no longer exceeding the NNC thresholds, but subsequently declined in 2025. With the exception of TP, trend scores have consistently been pointing to deteriorating water quality. Vegetation abundance has remained high, with invasive and diversity scores exhibiting relative consistency with higher scores. Despite the water quality issues, Lake Hartridge appears to be biologically healthy. That said, the consistently poor water quality places Hartridge near the top of the City's priority list for management action.

Lake Health Impacts/Challenges:

- Stormwater runoff, specifically from Hartridge's highly urbanized southern drainage basins remains one of the primary avenues for pollutant loading to the lake.
- In addition to stormwater, pollutant loading from OSTDs may be a potential contributor to Lake Hartridge's poor water quality. As these septic systems age, they may begin to leach nutrients into the water table—leading to additional water quality issues.
- The management of invasive species like hydrilla is a consistent concern. It can only take a single season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- The City currently conducts street sweeping services in the southern drainage sub-basin that collects water from Havendale Blvd. This is estimated to remove 192 lbs of TN and 104 lbs of TP annually.
- Additionally, a wetland treatment park was constructed in the early 2000s to capture and treat a substantial amount of runoff from this basin as well as litter and other solid debris carried by stormwater runoff. Future studies are required to determine the actual pollutant removal efficiency.
- The City may explore source analysis to determine if OSTD leachate is a contributor of pollutants to the lake. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and the potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	0	0	2	0	3	3	2	**1.3**
2019	1	0	0	1	0	3	2	2	**1.1**
2020	1	0	0	1	0	3	2	3	**1.3**
2021	1	0	0	1	0	3	3	3	**1.4**
2022	1	0	0	1	0	3	2	2	**1.1**
2023	1	0	0	2	0	3	3	2	**1.4**
2024	1	0	0	3	0	3	3	3	**1.6**
2025	0	1	1	2	0	3	3	3	**1.6**

Table 3-12. Lake health index scores for Lake Hartridge from 2018 to 2025.

Lake Howard

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
1	3	3	3	2	3	3	3	2.6

Features & Statistics:

Surface area	631.6 acres
Mean depth	8.71 feet
Maximum depth	16 feet
Volume	5,844.9 acre-feet
Drainage basin area	1,869 acres
Annual TN Load	6,321.3 lbs
Annual TP Load	1,097.5 lbs
Limiting nutrient	Phosphorus

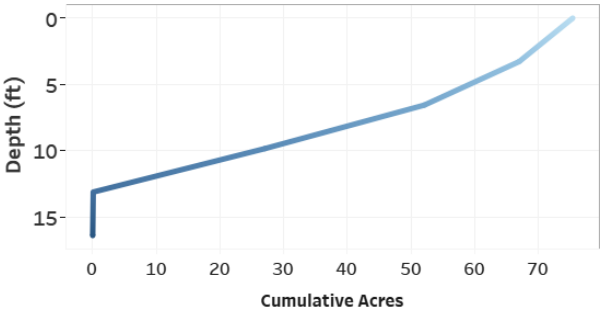


Figure 3-88. Hypsograph of Lake Howard depicting the depth profile and morphology of the lake bed.

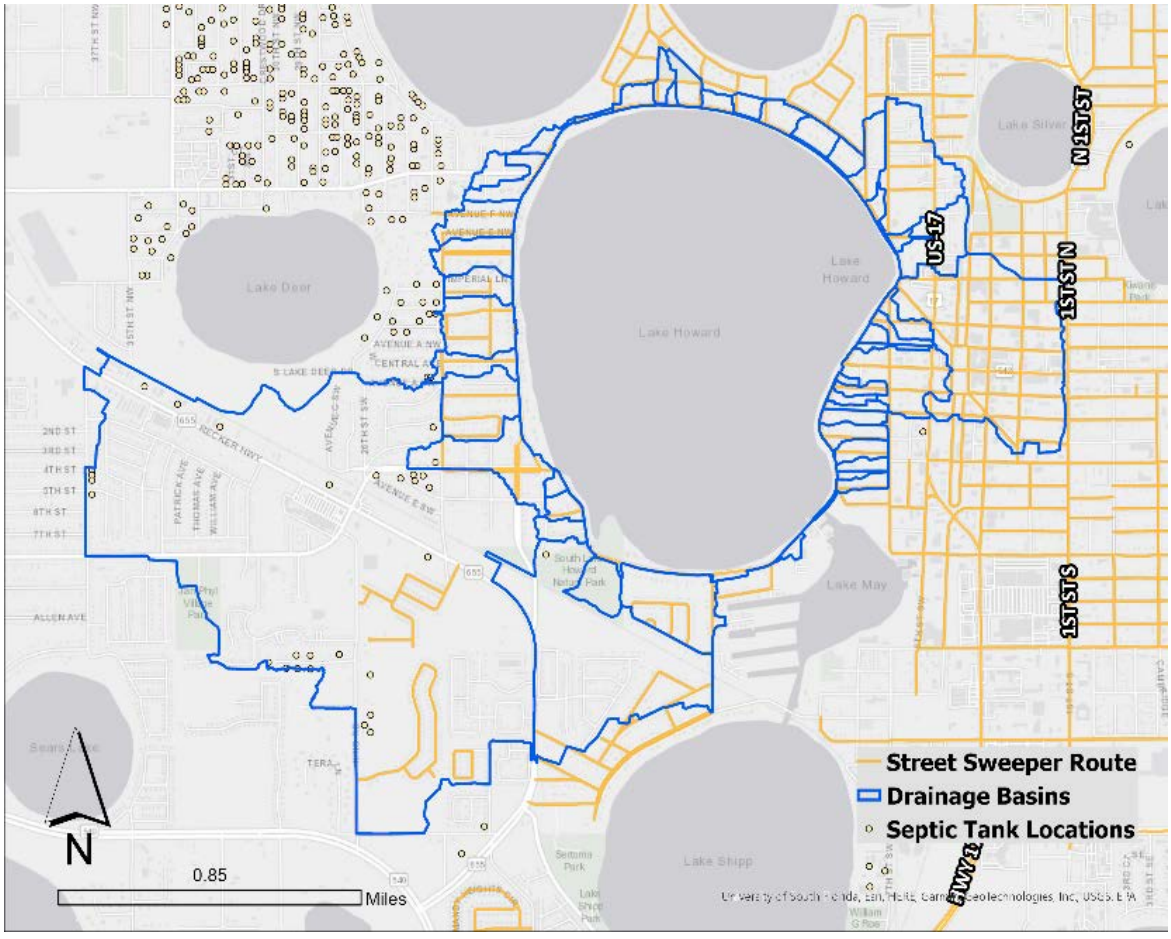


Figure 3-89. Map of Lake Howard's drainage basin, City street sweeping routes, and nearby septic systems.

Hydrology:

Lake Howard is one of the larger lakes in the South Chain at 632 acres. It's average depth of 8.7 feet is just slightly above the regional mean depth for the lakes in the study area; and its shallowly sloping bowl-shaped morphology provides ample littoral zone for aquatic vegetation to grow (Figure 3-88). Stormwater is conveyed to this waterbody from a large and complex drainage basin that is comprised of 53 separate sub-basins (Figure 3-89). Residential land uses make up the majority of this basin, contributing 6,321 lbs of TN and 1,097 lbs of TP to the lake annually. On a per acre basis, these loading rates rank 20th out of the 37 lakes in the study area There are fewer than 30 septic systems present within the drainage basin. This is likely too low of a density to contribute meaningful pollutant loads via septic leaching into the groundwater. Much of the stormwater from downtown streets and surrounding neighborhoods is not captured in traditional stormwater treatment ponds. Therefore, the City conducts monthly street sweeping services for more than 50 miles per month.

Lake Howard is located centrally in the Southern Chain with navigable connections to Lakes May and Cannon. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-90). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Howard's surface level correlate with Chl-a, TN, and clarity (see appendix). This carries management implications as maintaining higher levels should result in improved water quality.

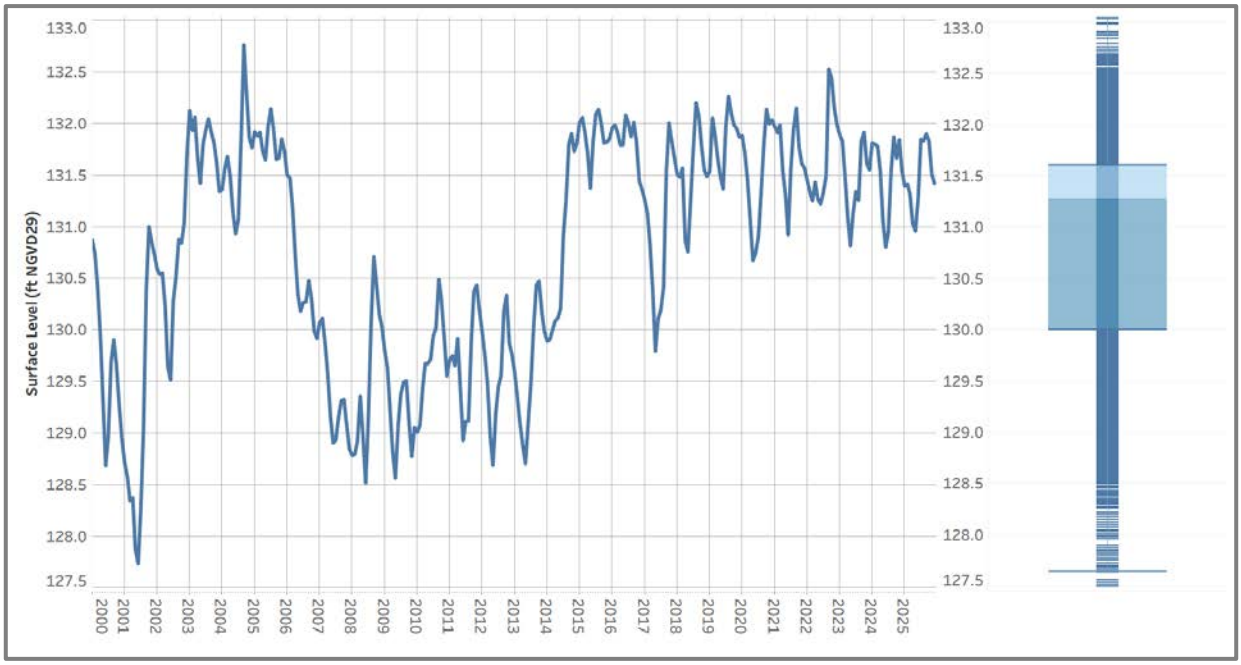


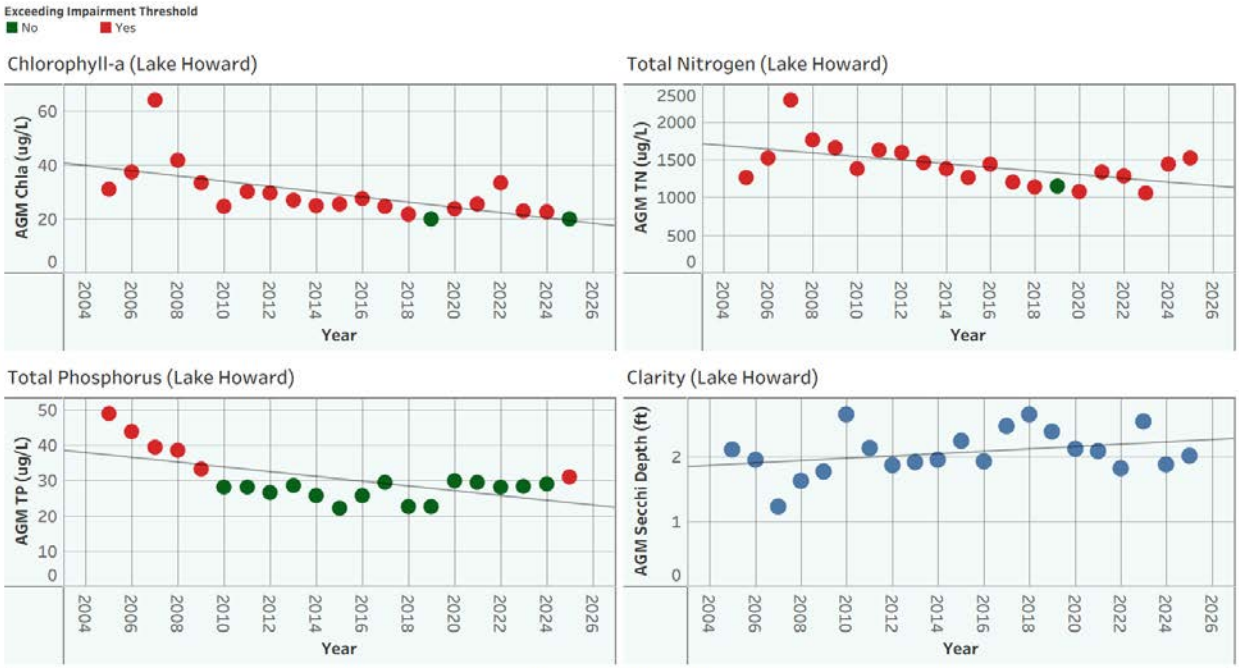
Figure 3-90. Hydrograph of Lake Howard depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Howard is categorized as a clear, alkaline waterbody. Due to numerous consecutive NNC exceedances during the assessment period, Lake Howard is considered impaired for Chl-a and TN (Figure 3-91). There have been no NNC exceedances for TP from 2009 until 2025. In 2019, the FDEP established a total maximum daily load for Lake Howard, stipulating a 39% reduction in TN to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the data, Chl-a, TN, and TP all exhibited significant improving trends—earning trend critera scores of 3. The water clarity trend, while still moving in an upward direction, was not statistically significant—resulting in a trend score of 2. Despite its impairments, Lake Howard is on track to meet water quality targets if these trends continue.



Lake Howard 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity No Trend
R Coeff.	-0.616	-0.537	-0.607	0.322
P-Value	0.003	0.012	0.004	0.155

Figure 3-91. Lake Howard AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Howard on 5/2/2025. The PAC during this survey was 34.1% and the total BV was 5.6% (Figure 3-92). A review of abundance values from previous years shows that Lake Howard's coverage has fluctuated between 27% and 39%; the 2025 PAC value was the second highest on record. Lacking much of an invasive species

presence, the majority of this variance in abundance can be attributed to natural fluctuations. The result of the 2025 values equates to an abundance criterion score of 3.

Invasive Species Management:

Based on data from the 2025 survey, Lake Howard has a healthy mix of native submerged, emergent, and floating leaf plant types (Figure 3-94). Emergent plants, like Kissimmee grass and duck potato were the most dominant, comprising 19% and 15% of the population, respectively. Lake Howard has historically not had issues with invasive plants, but in the previous two years small populations of the floating plant water hyacinth have been detected. Treatment of these invasive populations resulted in their absence in 2025—equating to an invasive presence criterion score of 3. This demonstrates how regular monitoring and rapid invasive response can be an effective management strategy.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. In 2025, all three of these indices exceeded their long-term median values—equating to a diversity criterion score of 3 (Figure 3-93). With over 25 unique plant species present, it comes as no surprise that Lake Howard is one of the most diverse waterbodies in the area. While the relative distribution of these species resulted in a lower evenness index value in 2025, the aquatic plant community remains very rich, diverse, and comparatively equitable.

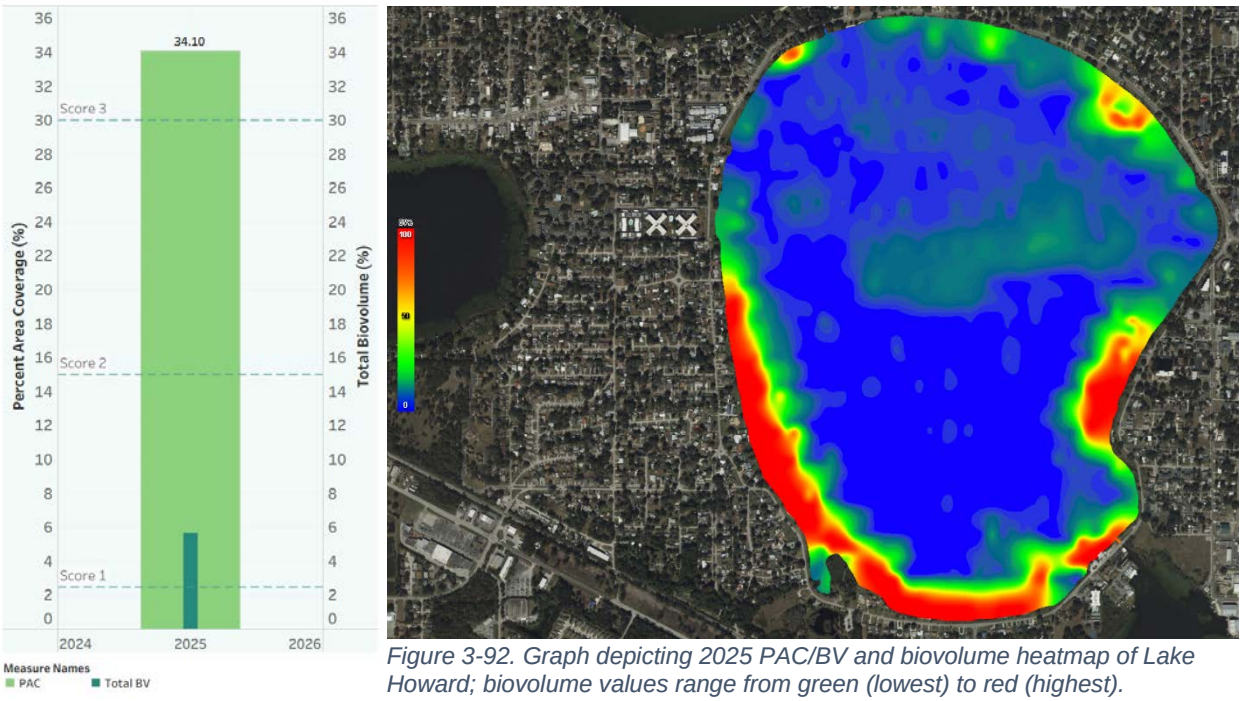


Figure 3-92. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Howard; biovolume values range from green (lowest) to red (highest).

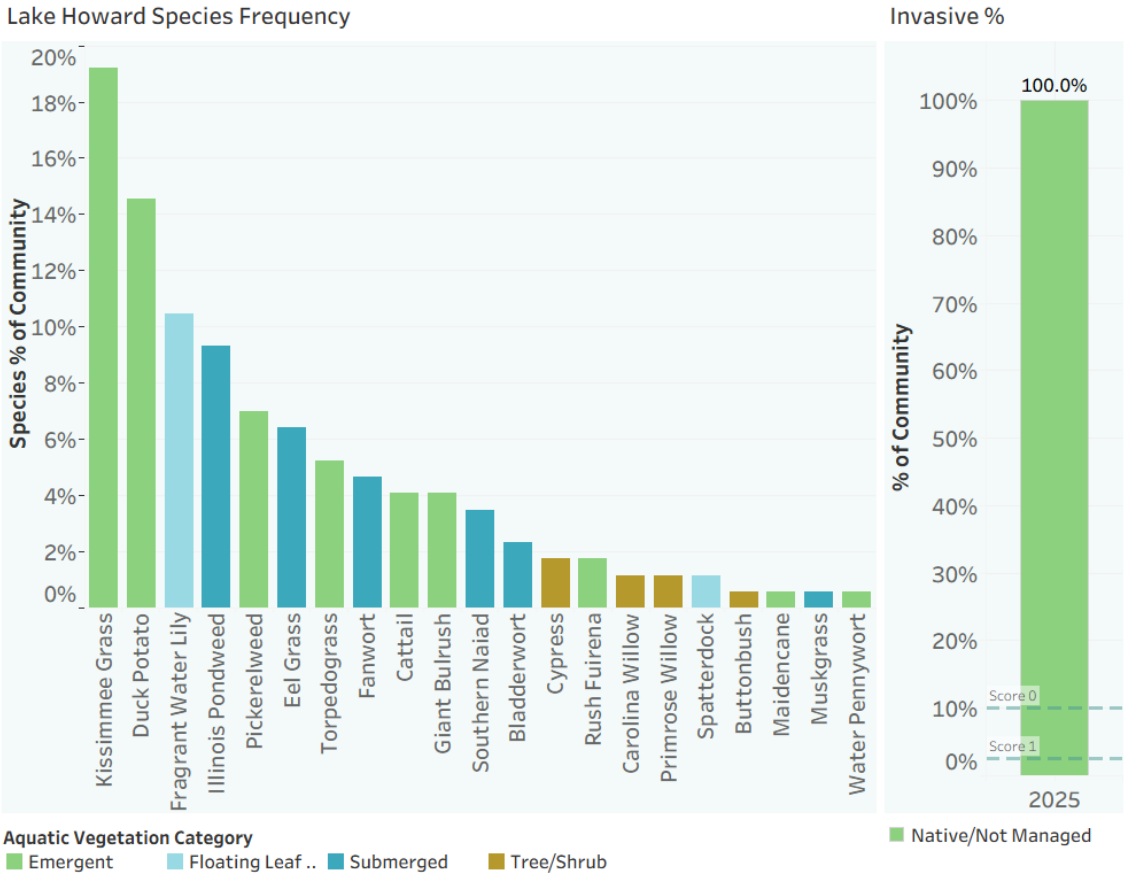


Figure 3-94. Chart depicting species frequency and invasive species percentage of Lake Howard during 2025.

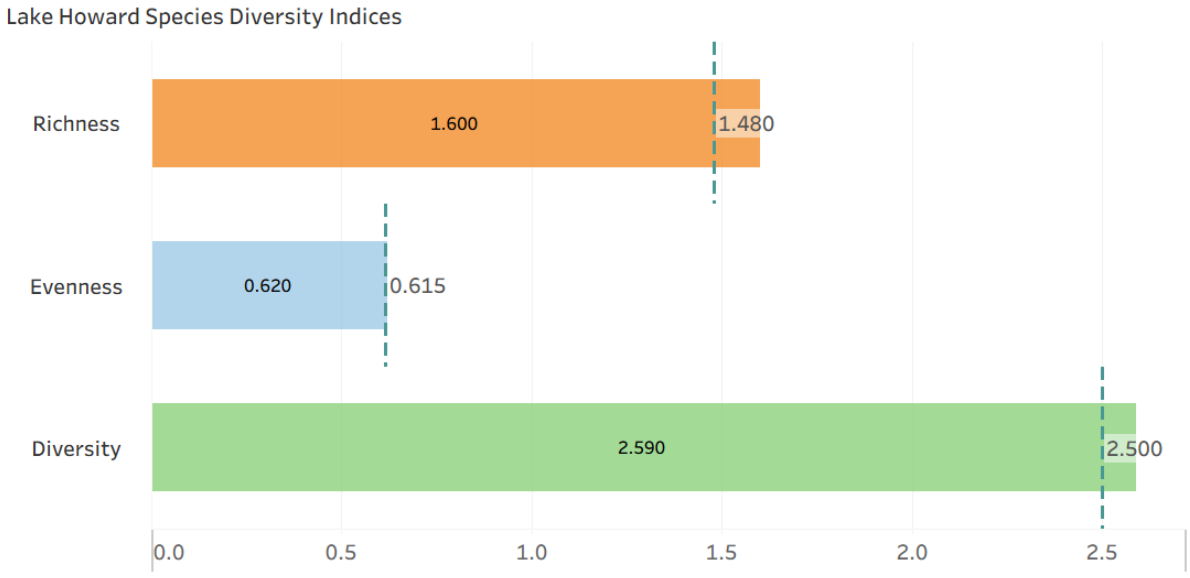


Figure 3-93. Chart depicting 2025 diversity indices for Lake Howard. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Howard's health index scores from 2018 to 2025 shows consistently good values and few changes (Table 3-13). While it is impaired, Lake Howard's water quality is trending in a positive direction. Invasive percentage has remained minimal which indicates that the lake health changes are the result of natural fluctuations in the vegetation community. The 2025 LHI score was the highest on record—indicating how Winter Haven's management efforts have been largely successful.

Lake Health Impacts/Challenges:

- In addition to stormwater inputs to the lake, the now decommissioned Jan Phyl Village Wastewater Treatment Plant was contributing point-source discharges as late as 1977. These discharges could be a source of legacy nutrients.
- Several water quality metrics are significantly correlated with Lake Howard's surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- While not currently an issue, the management of invasive species like water hyacinth is a potential concern. It can only take a single season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- Treating stormwater from the surrounding drainage basin is one of the primary strategies for improving water quality. The City mitigates stormwater through various methods:
    - Street Sweeping over 50 miles per month in the downtown area.
    - Construction of a stormwater treatment/nature park on the south side of Lake Howard in the early 2000s.
    - Construction of an alum injection system around 2005 was estimated to reduce Lake Howard's TN loads by 4% and TP loads by 15% annually.
    - The Stormwater Assessment and Improvement Project: identified priority areas for green infrastructure in southern drainage sub-basins to prevent flooding and improve water quality.
    - Construction and maintenance of other green infrastructure including over 12 raingardens that capture the first flush of stormwater in the downtown area.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC in order to coordinate invasive treatment efforts.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- A trash catchment system was installed at Heritage Park in 2020 to capture floating litter and debris from Lake Howard's largest drainage sub-basin.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	1	3	3	2	3	3	2	NA	**2.4**
2019	1	3	3	2	3	2	3	3	**2.5**
2020	1	3	3	2	3	3	3	1	**2.4**
2021	1	3	3	2	3	3	3	1	**2.4**
2022	1	3	3	2	3	2	3	2	**2.4**
2023	1	3	3	3	3	2	2	2	**2.4**
2024	1	3	3	3	2	2	2	3	**2.4**
2025	1	3	3	3	2	3	3	3	**2.6**

Table 3-13. Lake health index scores for Lake Howard from 2018 to 2025.

Lake Idyl

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	0	0	0	0	3	1	3	0.9

Features & Statistics:

Surface area	19 acres
Mean depth	6.1 feet
Maximum depth	10 feet
Volume	108.1 acre-feet
Drainage basin area	231 acres
Annual TN Load	934.9 lbs
Annual TP Load	154.5 lbs
Limiting nutrient	Co-limited (N & P)

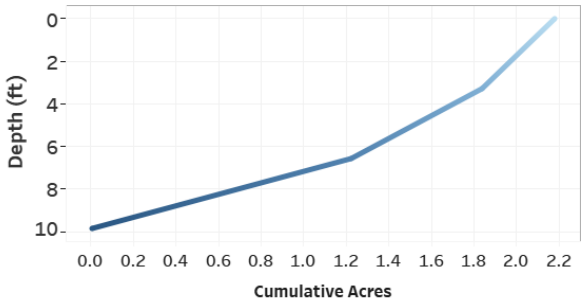


Figure 3-95. Hypsograph of Lake Idyl depicting the depth profile and morphology of the lake bed.

Hydrology:

One of Winter Haven's smallest waterbodies, Lake Idyl is 18 acres, has an average depth of 6.7 feet, and a maximum depth of just under 10 feet (Figure 3-95). With a depth much shallower than the regional average, sediment suspension is an issue for Lake Idyl. Stormwater is conveyed to this waterbody from a 231 acre drainage basin comprised of three separate sub-basins (Figure 3-96). Mostly comprised of residential land uses, the basin contributes 935 lbs of TN and 154 lbs of TP to the lake annually. On a per acre basis, these pollutant loads rank 12th compared with other lakes in the region. There are six septic systems present in the drainage basin. This low density is likely not a major contributor of pollutants via groundwater leaching. Due to stormwater inputs, the City conducts street sweeping services on the majority of roadways in the basin.

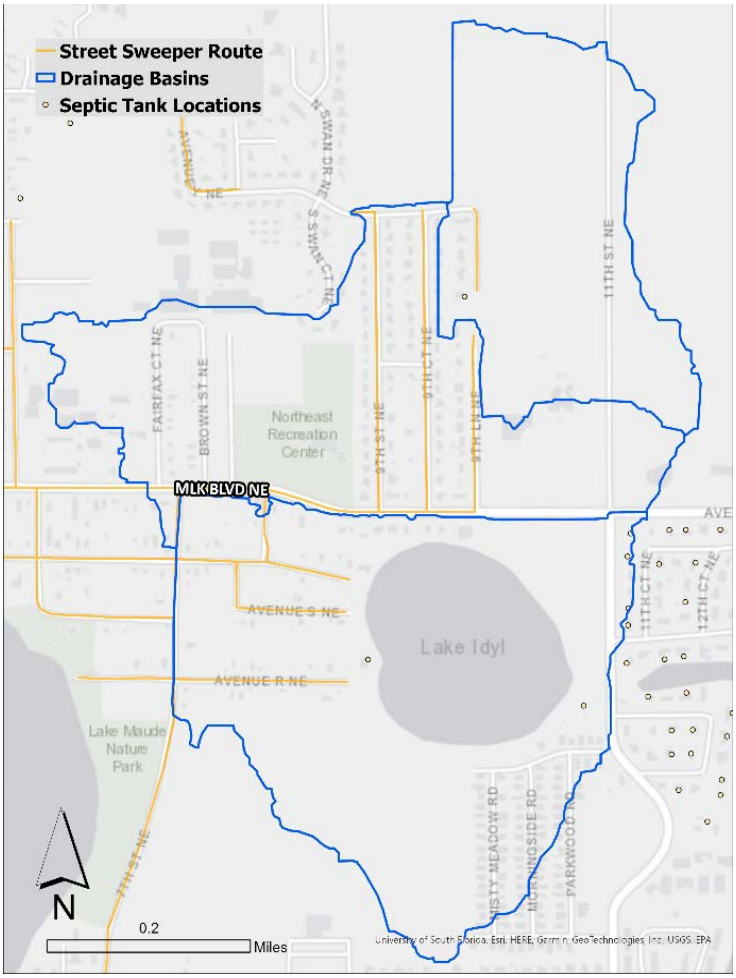


Figure 3-96. Map of Lake Idyl's drainage basin, City street sweeper routes, and nearby septic systems.

Lake Idyl receives excess flow from Lake Maude and discharges its overflow to Lake Buckeye. It's average surface elevation is at about the midway point within the Peace Creek watershed. Over its period of record, Lake Idyl's surface level has fluctuated between 131.3 and 133.9 feet above sea level. The normal level range fluctuates much more narrowly between 132.3 and 132.5 feet (Figure 3-97). During 2025, Lake Idyl dropped to a dry season low of 131.9 feet in May, but then reached a wet season peak of 132.8 feet in September. Idyl ended the year with a surface level near the average of 132.4 feet. Changes in Lake Idyl's surface level are not significantly correlated with any of the primary water quality metrics; likely because it exhibits such minimal fluctuation (see appendix).

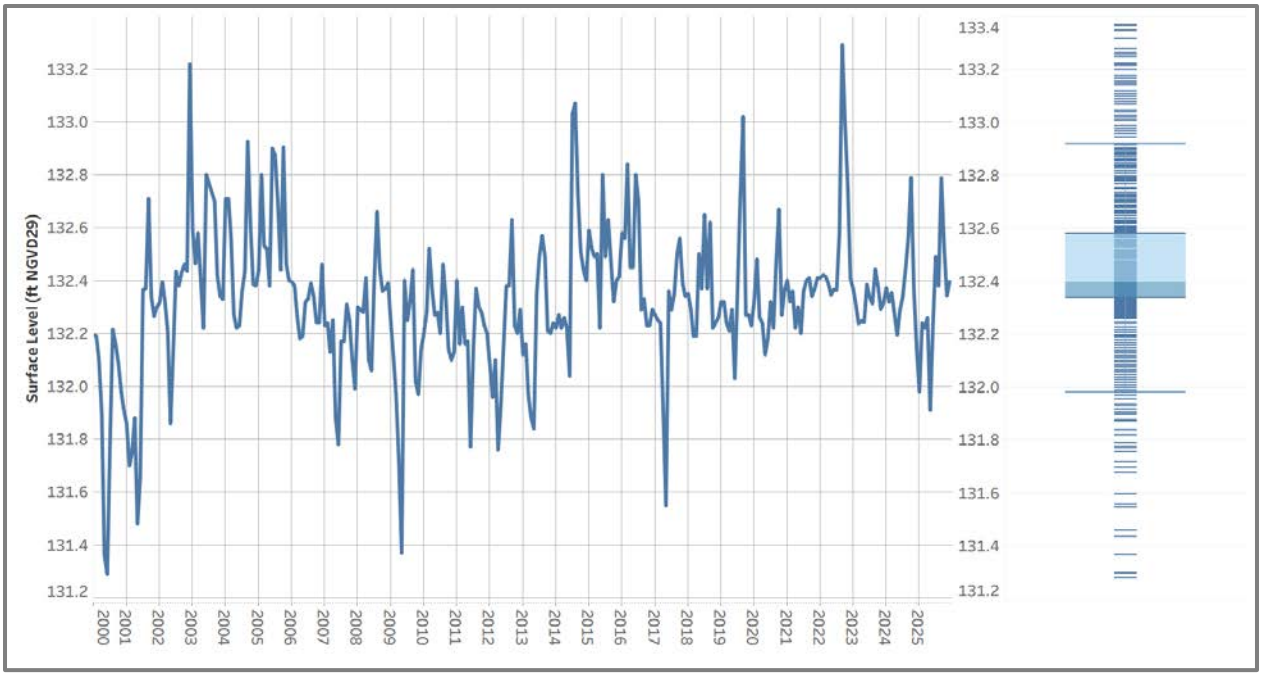


Figure 3-97. Hydrograph of Lake Idyl depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Idyl is categorized as a clear, alkaline waterbody. Due to multiple consecutive NNC exceedances during the assessment period, Lake Idyl is considered impaired for Chl-a, TN, and TP (Figure 3-98). This equates to an impairment criterion score of 0. From 2022 to 2025, Lake Idyl's TN and TP concentrations were below impairment thresholds. The Chl-a concentration was below the impairment threshold in 2022 and 2023, but exceeded it in 2024 and 2025. Due to these impairments, the FDEP approved the City's draft alternative restoration plan for Lake Idyl in lieu of a total maximum daily load (TMDL).

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the data, all four parameters exhibited significant deteriorating trends. These trends underscore the need to address the water quality issues in this lake. It is believed that stormwater pollutant loading has been the primary driver of water quality decline, but impacts from sediment suspension and invasive plant treatments likely contribute to sustained poor water quality in recent years.

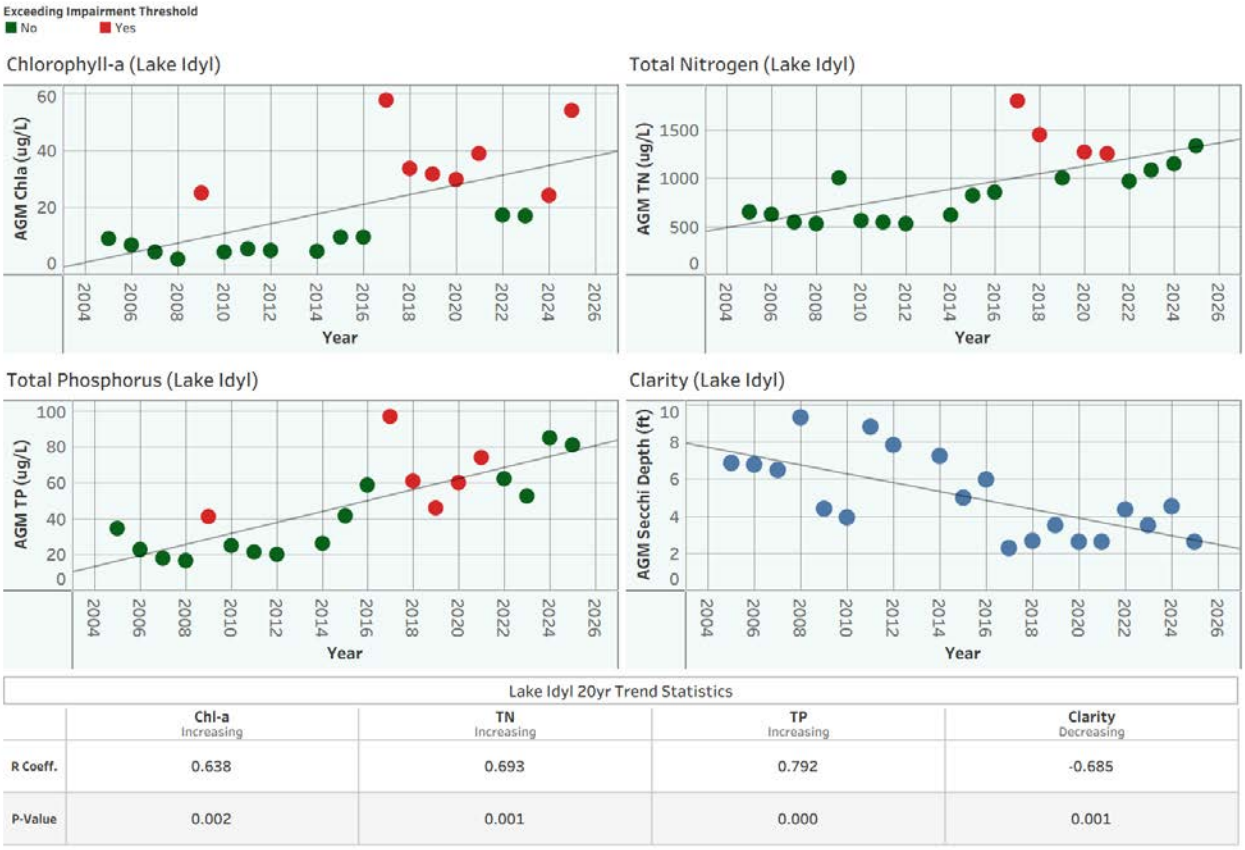


Figure 3-98. Lake Idyl AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are trend lines and box & whisker plots that show relative variance.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Idyl on 2/6/2025. The PAC during this survey was 51% and the total BV was 13.7% (Figure 3-100). A comparison of abundance values from previous years shows that Lake Idyl typically exhibits high vegetation coverage in excess of 35%. Much of the lake is covered by spatterdock; a floating leaf plant that is usually found in shallow waters with mucky substrate. This amount of coverage equates to an abundance score of 3.

Invasive Species Management:

Based on the 2025 data, 35% of the plant community was comprised of spatterdock, followed by a mix of floating and submerged species (Figure 3-99). Managed invasive species such as water hyacinth made up 5% of the community. This was a sharp decline from the previous year where over 25% of the community was invasive. The current invasive percentage earns Lake Idyl an invasive criterion score of 1.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Idyl's diversity indices exceeded their long-term median values—equating to a criterion score of 3 (Figure 3-101). Lake Idyl has traditionally had low species diversity, likely due to the dominance of spatterdock and primrose willow. It is likely that the mucky substrate and low water clarity hinders the growth of most native

submerged species. The introduction of native submerged species would likely benefit Lake Idyl's water quality.

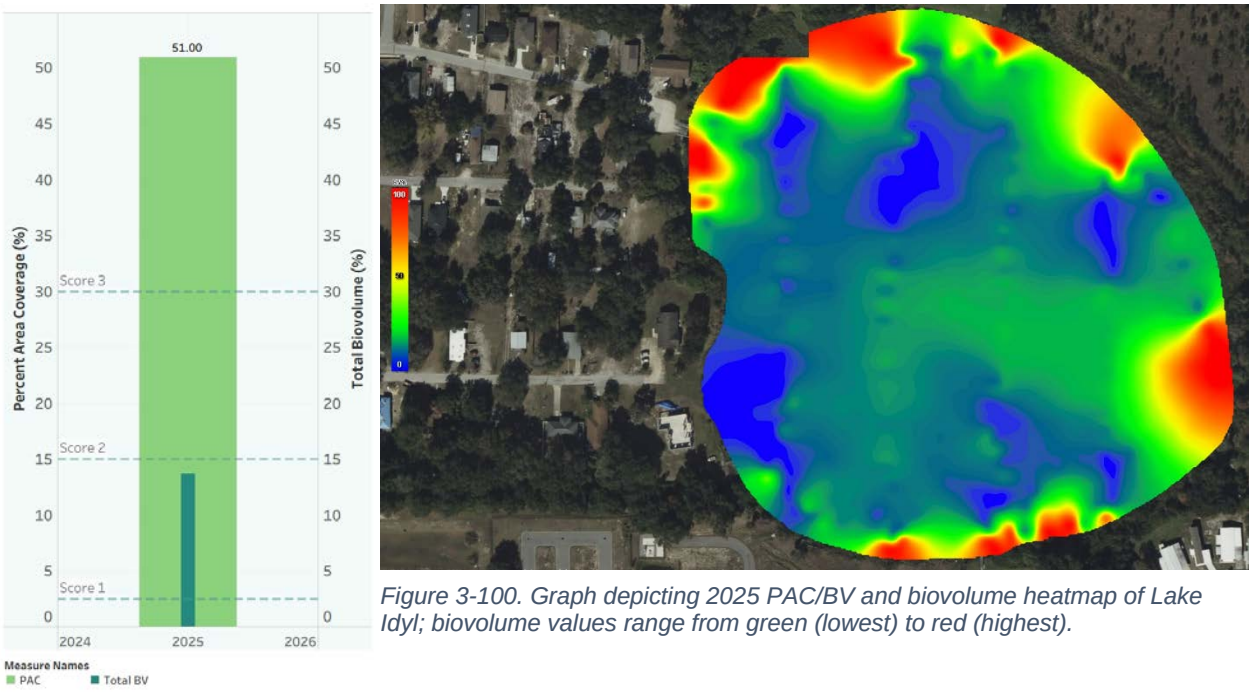


Figure 3-100. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Idyl; biovolume values range from green (lowest) to red (highest).

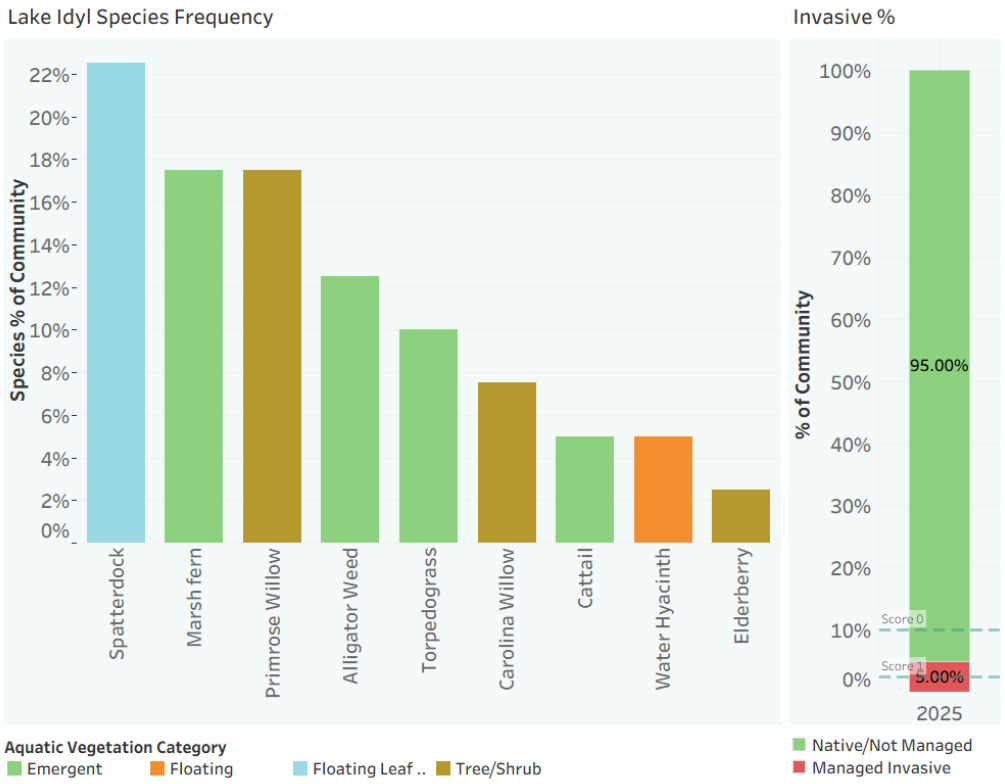


Figure 3-99. Chart depicting species frequency and invasive species percentage of Lake Idyl during 2025.

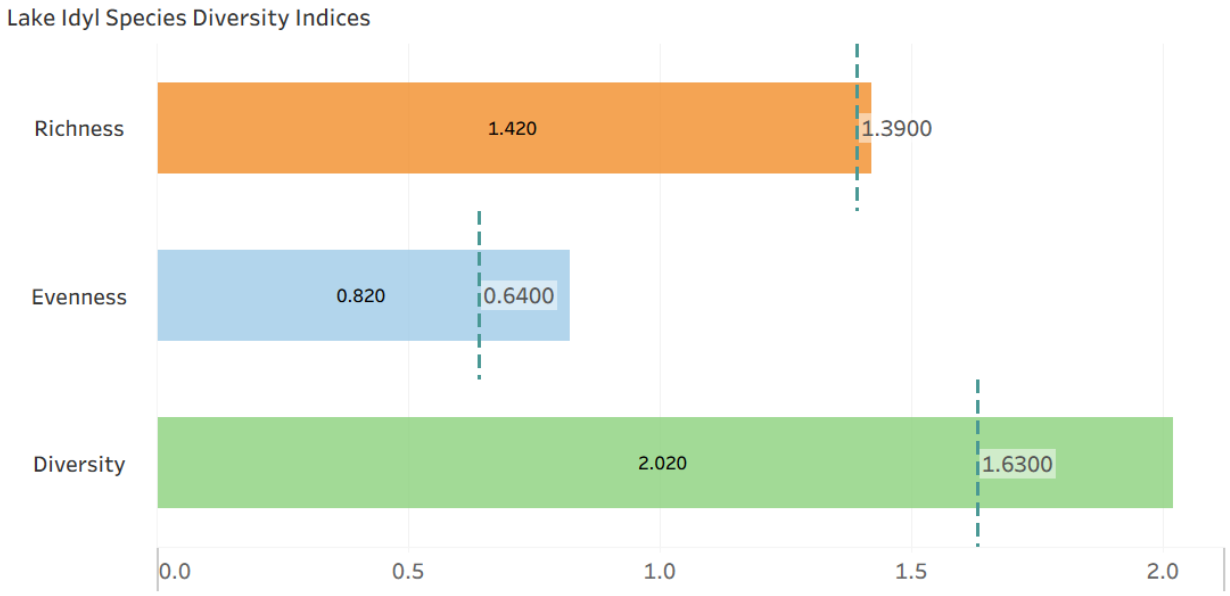


Figure 3-101. Chart depicting 2025 diversity indices for Lake Idyl. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Idyl's health index scores from 2018 to 2025 illustrates consistently poor lake health relative to other waterbodies in the study area (Table 3-14). Since monitoring began, Lake Idyl has remained impaired and exhibited significant delclines in water quality trends. The presence of managed invasive species has also been a consistent issue. Species diversity varies considerably—likely due to changes in the vegetation community as a result of increased invasive species presence and subsequent management efforts. On the whole, Lake Idyl is considered a high-priority lake on which to focus future management efforts.

Lake Health Impacts/Challenges:

- Stormwater pollutant loading is one of the primary factors believed to be driving the decline in water quality.
- The management of invasive species and floating tussocks is a constant concern as these plants can quickly take over large areas of a lake and/or the shoreline in a single growing season.
- The dominance of spatterdock can often result in a higher occurence of tussocks. These tussocks can present navigation, drainage, and habitat problems.

Lake Management Strategy:

- In addition to street sweeping (annual removal of 45 lbs of TN and 25 lbs of TP), the City has submitted a water quality improvement plan to FDEP in 2024. This plan includes:
    - A raingarden at the Recreation & Cultural Center is estimated to remove 17.6 lbs of TN and 0.76 lbs of TP annually.
    - Stormwater improvements in the drainage basin which are estimated to remove 386 lbs of TN and 60 lbs of TP annually.

- Sediment inactivation treatment designed to neutralize 1,113 lbs of bioavailable phosphorus from the lake's sediment and water column.

- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	1	1	2	3	1	1	**1.3**
2019	0	1	1	1	2	1	0	1	**0.9**
2020	0	1	1	1	1	3	0	2	**1.1**
2021	0	1	1	0	1	3	0	0	**0.8**
2022	0	1	1	0	1	3	1	2	**1.1**
2023	0	0	0	0	0	3	0	1	**0.5**
2024	0	0	0	0	0	3	0	2	**0.6**
2025	0	0	0	0	0	3	1	3	**0.9**

Table 3-14. Lake health index scores for Lake Idyl from 2018 to 2025.

Lake Idylwild

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
2	3	2	2	2	3	3	3	2.5

Features & Statistics:

Surface area	95.2 acres
Mean depth	8.3 feet
Maximum depth	14 feet
Volume	834 acre-feet
Drainage basin area	225.4 acres
Annual TN Load	669.14 lbs
Annual TP Load	121.61 lbs
Limiting nutrient	Co-limited (N & P)

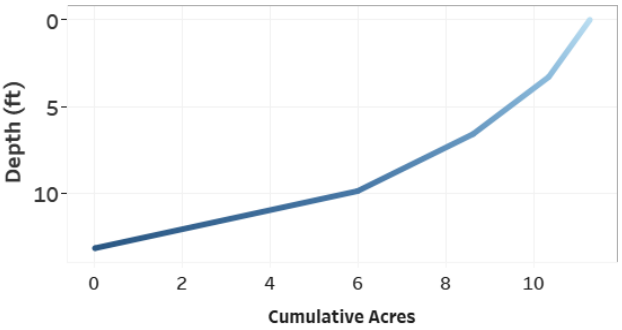


Figure 3-102. Hypsograph of Lake Idylwild depicting the depth profile and morphology of the lake bed.

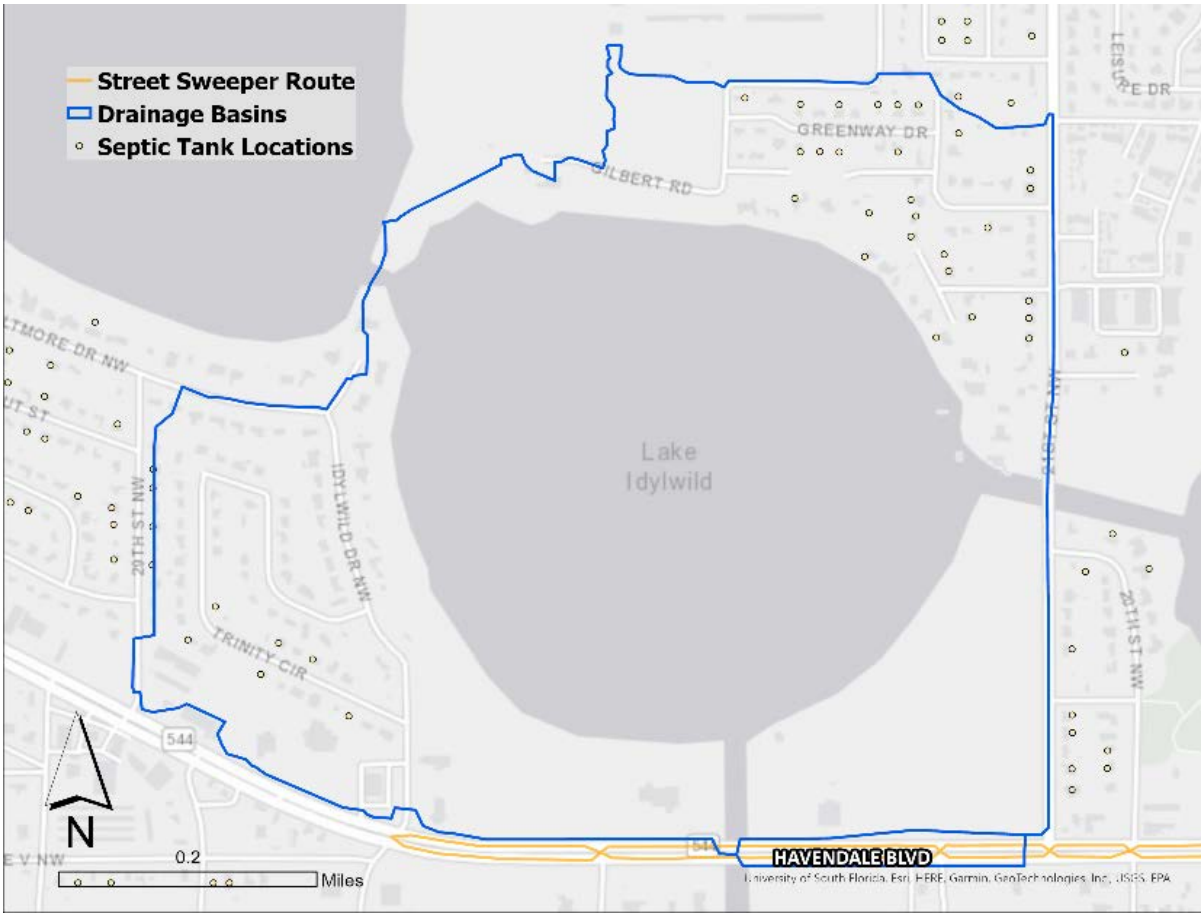


Figure 3-103. Map of Lake Idylwild's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Idylwild is one of the City's smaller lakes at 95 acres. Its depth is right around the regional mean, with an average depth of 8.3 feet and maximum depth approaching 15 feet (Figure 3-102). Stormwater is conveyed to this waterbody from a 225 acre drainage basin made up primarily by residential land uses; though there is a small transportation-heavy sub-basin that includes Havendale Blvd (Figure 3-103). These land uses contribute 669 lbs of TN and 121 lbs of TP to Lake Idylwild annually. On a per acre basis, these pollutant loading rates rank 23rd out of the 37 area lakes. There are 33 known septic systems in this drainage basin; a relatively low density, but septic systems can pose a potential pollutant loading issue. To manage stormwater from the main arterial roads to the south of the lake, the City conducts street sweeping services of up to 6 miles twice per month.

Lake Idylwild is part of the South Chain of Lakes with navigable connections to Lake Cannon, Hartridge, and Jessie. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-104). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Idylwild's surface level correlate with Chl-a, TN, and clarity (see appendix). This carries management implications as maintaining higher levels should correlate with improved water quality.

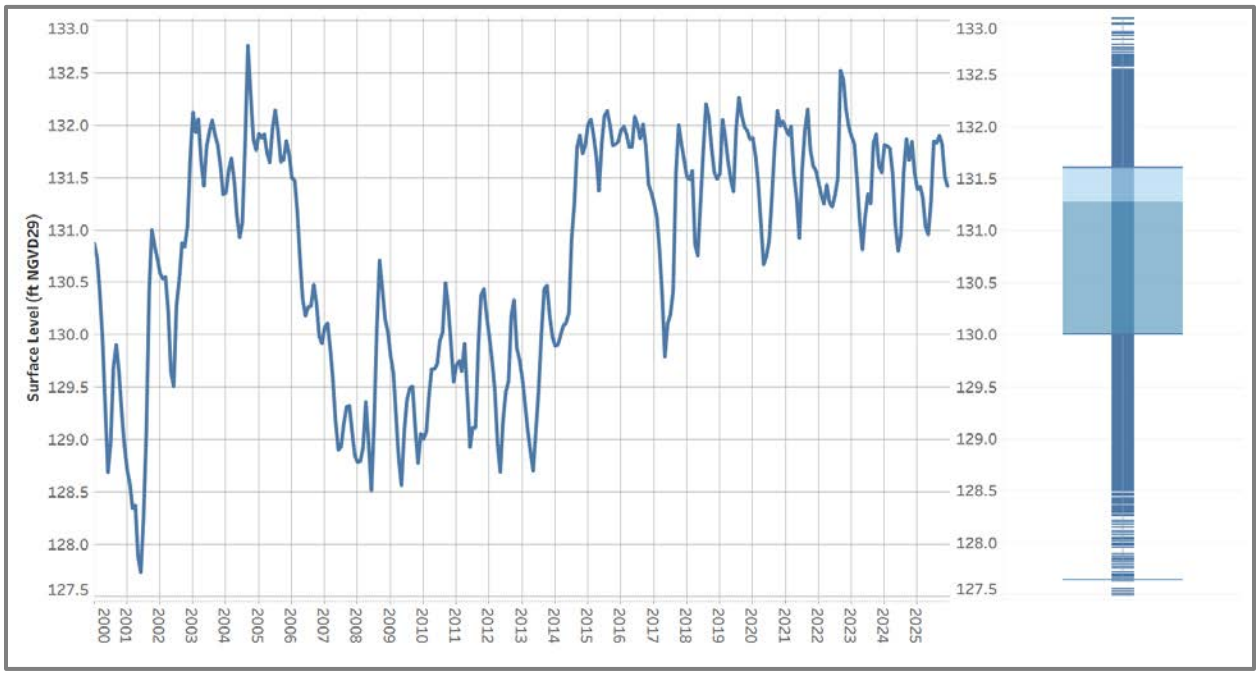


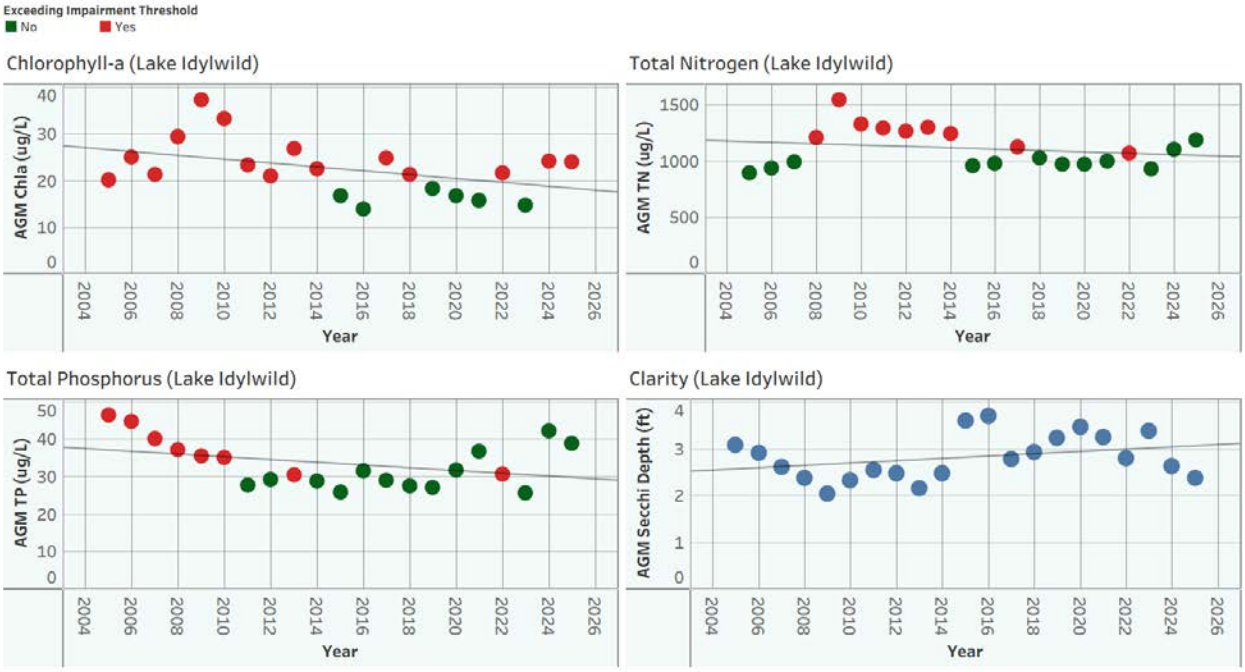
Figure 3-104. Hydrograph of Lake Idylwild depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Idylwild is categorized as a clear, alkaline waterbody. Due to consecutive NNC exceedances in 2017 and 2018, Lake Idylwild is considered impaired for Chl-a (Figure 3-105). This equates to an impairment criterion score of 2. Concentrations of Chl-a also exceeded the NNC threshold in 2022, 2024, and 2025. In 2019, the FDEP established a total maximum daily load for Lake Idylwild, stipulating a 31% reduction in TN to meeting NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the data, Chl-a exhibited the only significant trend—in an improving direction, for a trend score of 3. While not significant, TN, TP, and Clarity each exhibited improving trends, equating to scores of 2. Considering Lake Idylwild's previous impairments, these trends highlight how much the lake has improved in the last two decades.



Lake Idylwild 20yr Trend Statistics

	Chl-a Decreasing	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.437	-0.219	-0.360	0.319
P-Value	0.048	0.341	0.109	0.159

Figure 3-105. Lake Idylwild AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Idylwild on 4/4/2025. The PAC during this survey was 73% and the total BV was 19.7% (Figure 3-106). The 2025 coverage value was the second highest on record and equates to a vegetation abundance criterion score of 3. A comparison of abundance data since 2018 shows that Lake Idylwild consistently maintains high vegetation coverage and biovolume via its large littoral zone in proportion to the entire lake surface

area—demonstrated by the vegetation heatmap. This likely contributes to the water quality improvements observed in recent years.

Invasive Species Management:

Based on the 2025 survey data, native species dominated the vegetation community. Lake Idylwild exhibits a fairly even mix of emergent, submerged, and floating-leaf vegetation (Figure 3-108). Fragrant water lily and eel grass made up nearly 30% of the community, followed by 18 other unique species. No managed invasive species were detected in 2025, resulting in an invasive criterion score of 3. This was a significant reduction from the nearly 7% detected in 2024—indicating that invasive populations are in a relatively controlled state. That said, regular monitoring is necessary to prevent rapid expansion of invasive plants in the future.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Idylwild's diversity indices met or exceeded their respective median values (Figure 3-107). This equates to a diversity criterion score of 3. In general, the shifts in the vegetation community are the result of natural processes since invasive species management is minimal. Continued monitoring should be prioritized to prevent the spread of invasive species in the future.

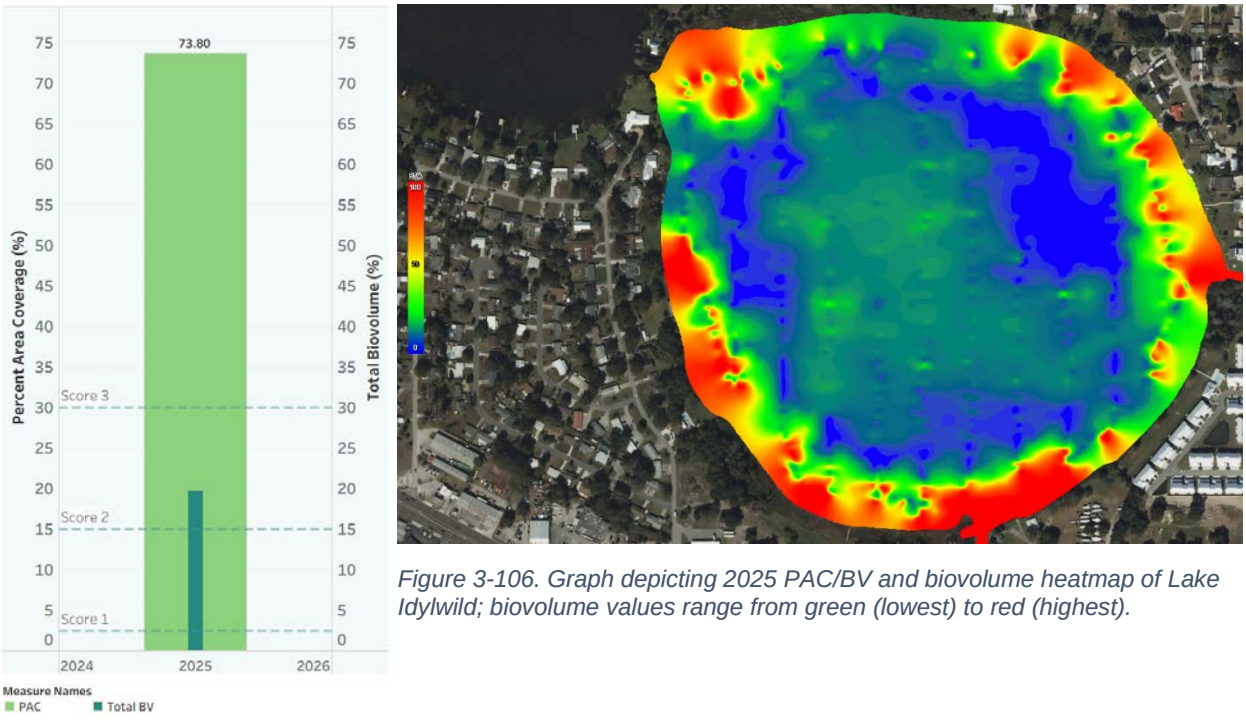


Figure 3-106. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Idylwild; biovolume values range from green (lowest) to red (highest).

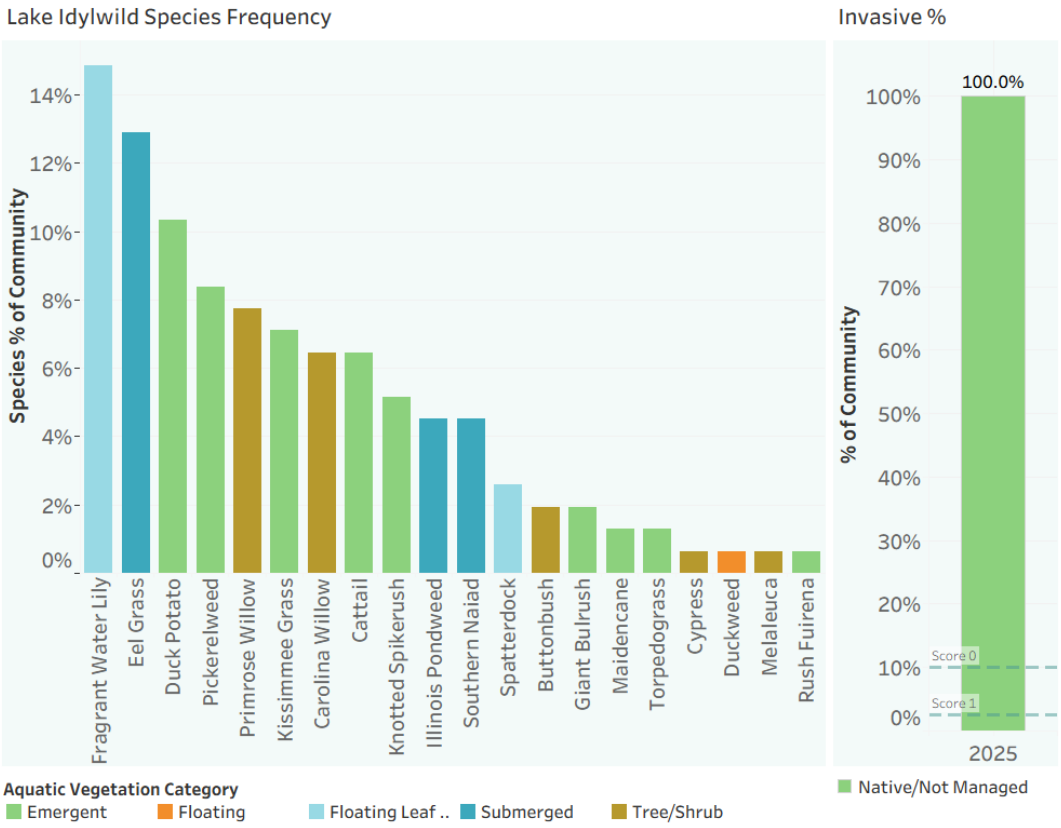


Figure 3-108. Chart depicting species frequency and invasive species percentage of Lake Idylwild during 2025.

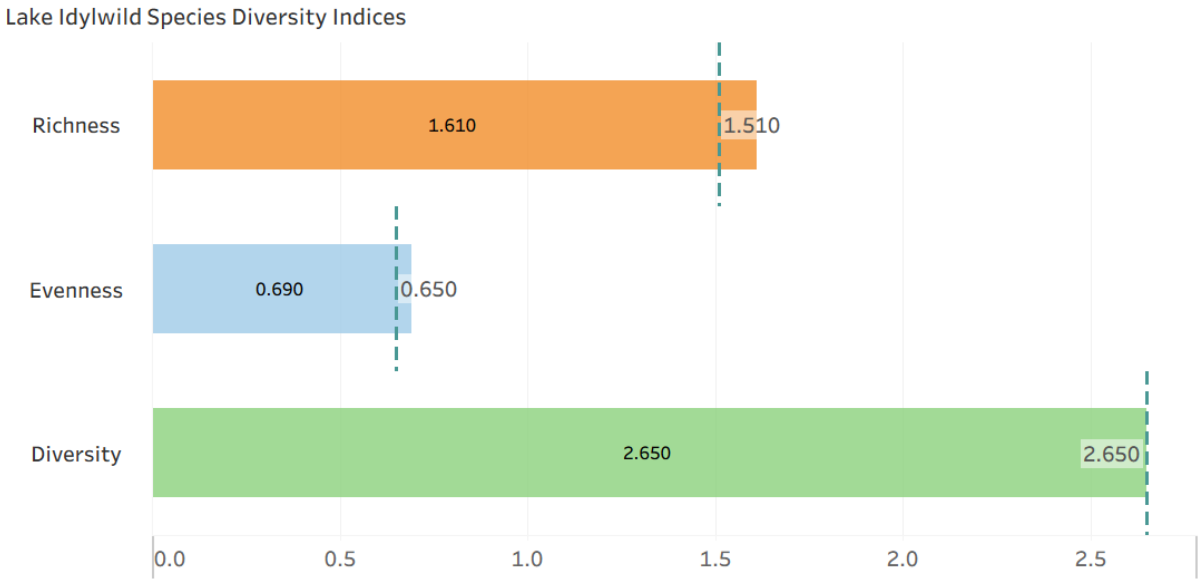


Figure 3-107. Chart depicting 2025 diversity indices for Lake Idylwild. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Idylwild's health index scores from 2018 to 2025 shows general improvement (Table 3-15). The majority of this has come from water quality improvements. TN began meeting the NNC guidelines in 2020—resulting in impairment score increases. The trend scores in all parameters have also improved since monitoring began. Lake Idylwild consistently maintains excellent vegetation abundance. The continual cycle of invasive species resurgence and treatment creates the annual fluctuations in the invasive and diversity scores. Ultimately, Lake Idylwild's lake health scores have been somewhat higher than average—placing it lower on the priority ranking.

Lake Health Impacts/Challenges:

- While water quality is improving, managing stormwater runoff is important for the continued control of nitrogen and phosphorus loading to Lake Idylwild.
- Several water quality metrics are significantly correlated with Lake Idylwild's surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- The management of invasive species like hydrilla is a constant concern. It can only take a single season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and the potential water quality issues that follow.
- The City currently conducts street sweeping in the basin to combat stormwater pollutant loads. Residential education campaigns can be implemented to promote green stormwater infrastructure and reduce pollutant loads from urban stormwater runoff.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	1	2	1	3	2	3	2	1	**1.9**
2019	1	2	1	2	3	3	1	3	**2.0**
2020	1	2	2	2	3	3	1	0	**1.8**
2021	2	2	2	2	3	3	1	2	**2.1**
2022	2	2	2	2	3	3	1	2	**2.1**
2023	2	3	2	3	3	3	1	3	**2.5**
2024	2	3	2	3	3	3	1	3	**2.5**
2025	2	3	2	2	2	3	3	3	**2.5**

Table 3-15. Lake health index scores for Lake Idylwild from 2018 to 2025.

Lake Jessie

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	2	1	2	1	3	2	2	1.6

Features & Statistics:

Surface area	185 acres
Mean depth	7.9 feet
Maximum depth	10 feet
Volume	1,697.1 acre-feet
Drainage basin area	973.4 acres
Annual TN Load	3,871.2 lbs
Annual TP Load	652.3 lbs
Limiting nutrient	Co-limited (N & P)

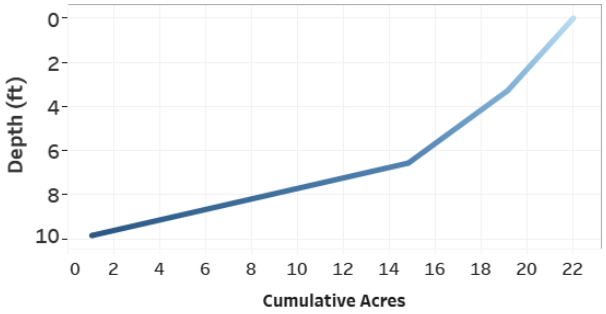


Figure 3-109. Hypsograph of Lake Jessie depicting the depth profile and morphology of the lake bed.

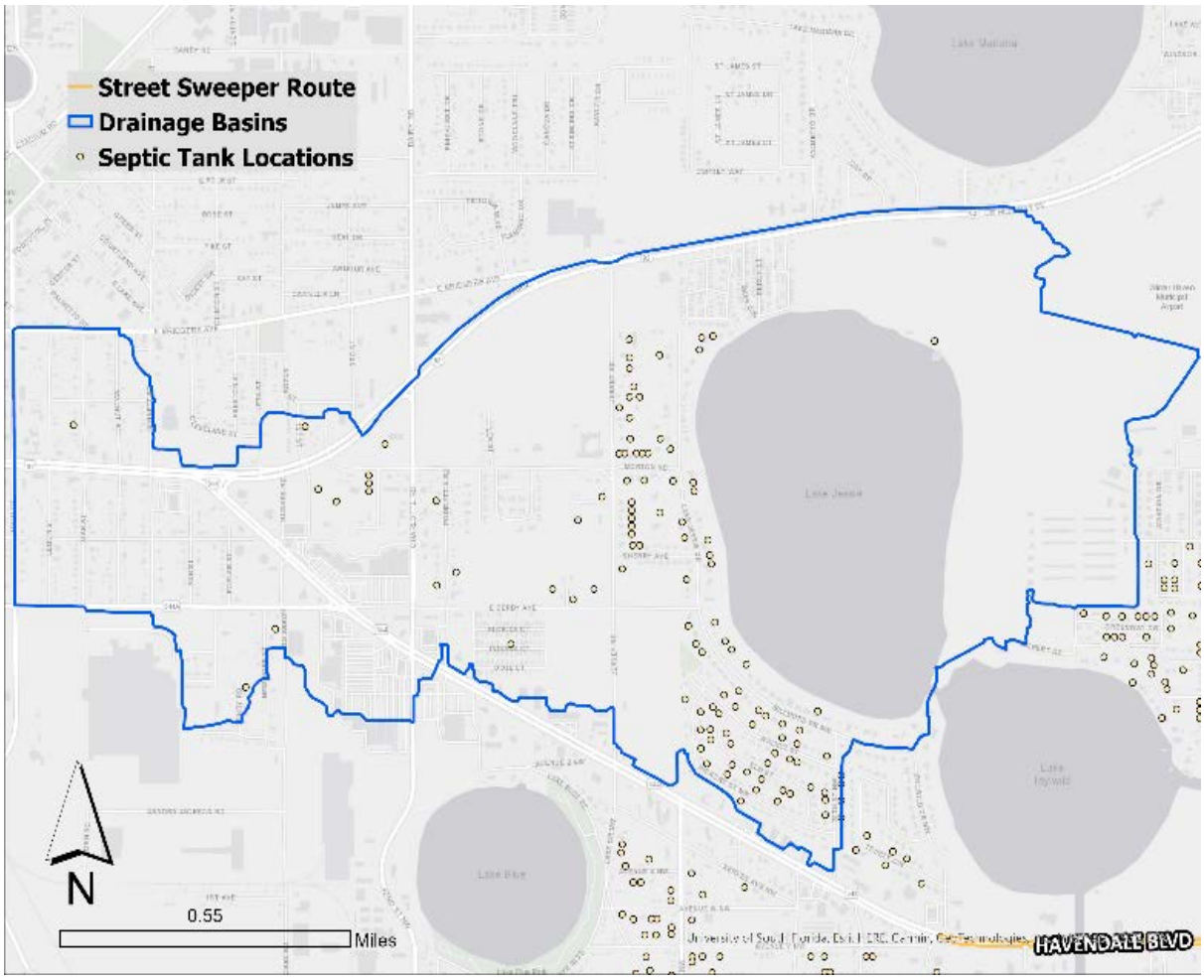


Figure 3-110. Map of Lake Jessie's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Jessie is a moderately sized, but shallow waterbody at 185 acres, an average depth of 8 feet, and a maximum depth of around 10 feet (Figure 3-109). The shallow depth provides ample viable space for aquatic vegetation to grow, but also makes sediment suspension from wind action more likely. Stormwater is conveyed to this waterbody from a 1,600 acre drainage basin comprised of a mix of residential, commercial, and agricultural land uses (Figure 3-110). Based on pollutant load modelling, these land uses contribute 3,871 lbs of TN and 652 lbs of TP to Lake Jessie annually. Due to the size of the drainage basin in relation to the lake, these pollutant loads rank 11th out of 37 on a per acre basis. There are 111 septic systems present within the unincorporated Polk County side of the drainage basin. This constitutes a relatively high density and a potential nutrient source via septic leaching into groundwater. Lacking City-owned roadways or stormwater infrastructure on the east side of the lake, the City does not conduct any street sweeping services within this basin.

Lake Jessie is part of the South Chain of Lakes with a navigable connection to Lake Idylwild to the southeast. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-111). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Jessie's surface level correlate with Chl-a, TN, and clarity (see appendix). This carries management implications as maintaining higher levels should result in improved water quality.

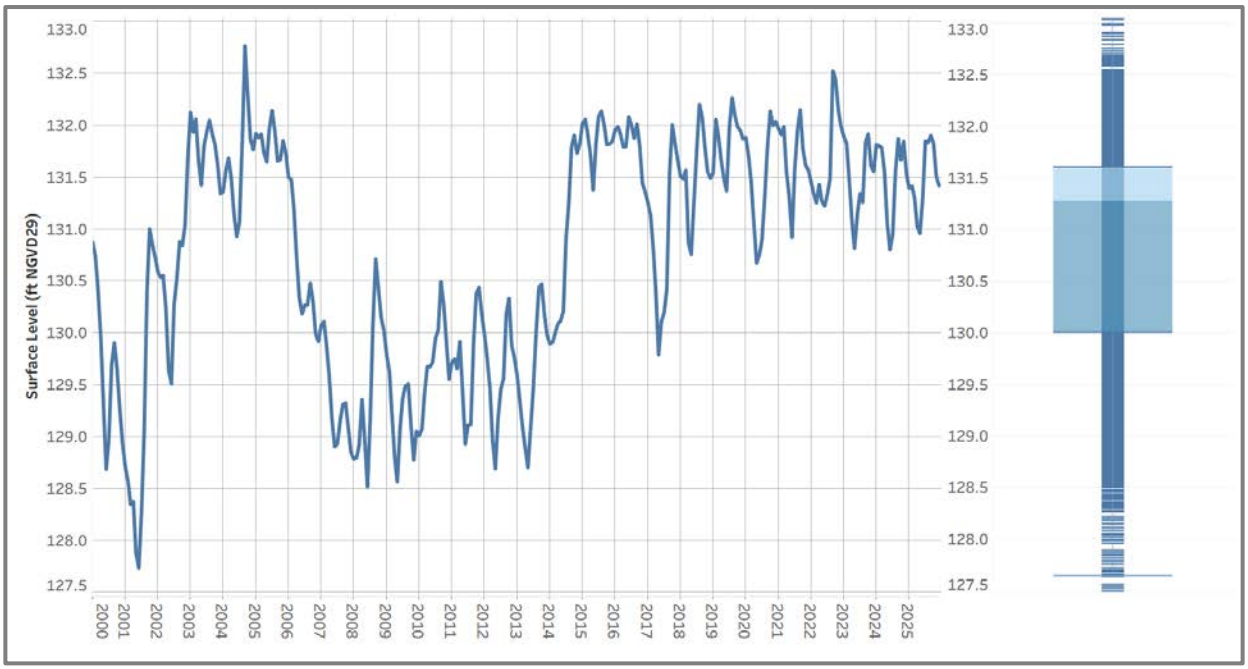


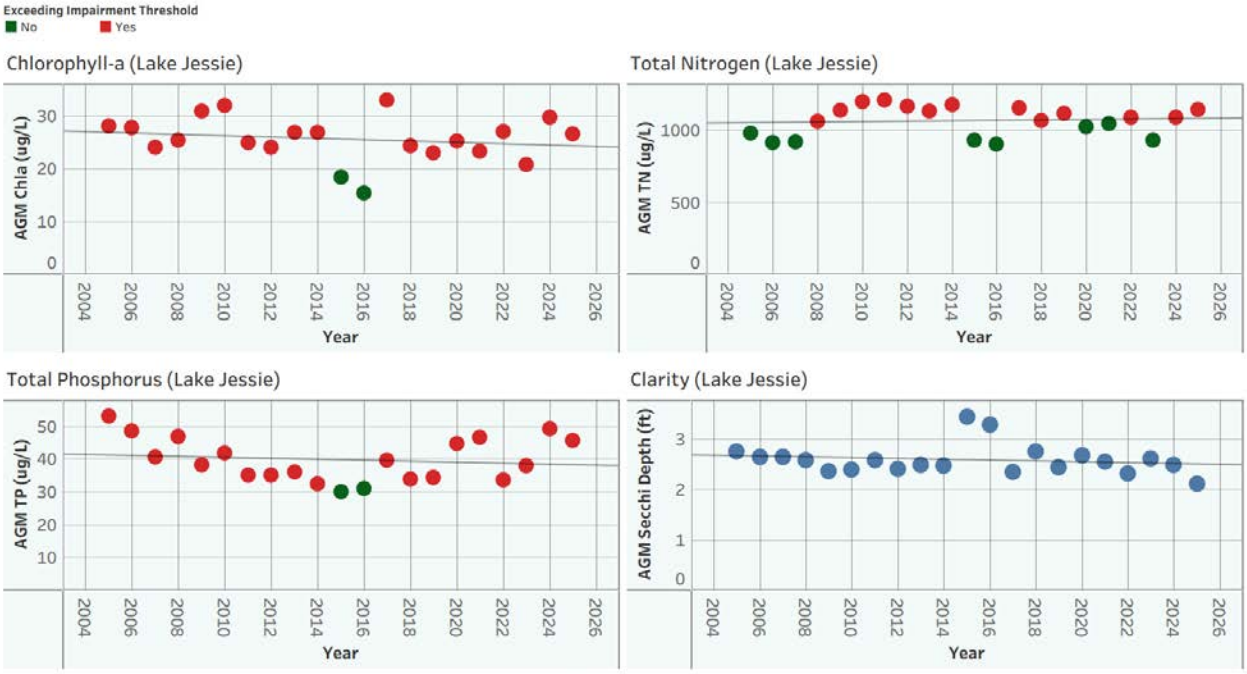
Figure 3-111. Hydrograph of Lake Jessie depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface levels during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Jessie is categorized as a clear, alkaline waterbody. Due to multiple consecutive NNC exceedances during the assessment period, Lake Jessie is considered impaired for Chl-a, TN, and TP. This results in an impairment criterion score of 0 (Figure 3-112). In 2019, the FDEP established a total maximum daily load for Lake Jessie, stipulating a 12% reduction in TN to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. None of these parameters exhibited statistically significant trends. Chl-a and TP earn a trend criteria score of 2 for their non-significant improving trends whereas TN and Clarity receive trend scores of 1 for their trend direction (Figure 3-126). Individual AGM values and trend statistics can be found in the appendix.



Lake Jessie 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.186	0.090	-0.138	-0.167
P-Value	0.419	0.697	0.551	0.469

Figure 3-112. Lake Jessie AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Jessie on 2/13/2025. The PAC during this survey was 91% and the total BV was 12.9%; exhibiting little change from the previous two years (Figure 3-113). A comparison of abundance data from 2018 to 2025 indicates that Lake Jessie consistently maintains coverage above 30%. This is unsurprising due to the gradual slope of the lake bed allowing for a wide littoral zone. The result is a vegetation abundance criterion score of 3.

Invasive Species Management:

Based on data from the 2025 survey, Lake Jessie is substantially dominated by eelgrass, making up 21% of species (Figure 3-115). The remaining plants are comprised of a mix of emergent, submerged, and floating leaf species. Hydrilla was the only invasive species detected in 2025, making up less than 1% of the total population for a criterion score of 2. This was a significant decrease from the 11% invasive percentage recorded in 2024. The 2025 invasive percentage indicates significant improvement and illustrates success of the County's vegetation management effort.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 survey, the species richness and overall diversity indices met or exceeded their long-term median values (Figure 3-114). The number of unique species (i.e. 22) is high compared with the other study lakes. However, the relative distribution of these species is less than equitable—resulting in a lower evenness index value compared to 2024. Despite the reduction of invasive presence, the remaining native plants exhibited an increase in abundance—indicating a health vegetation community.

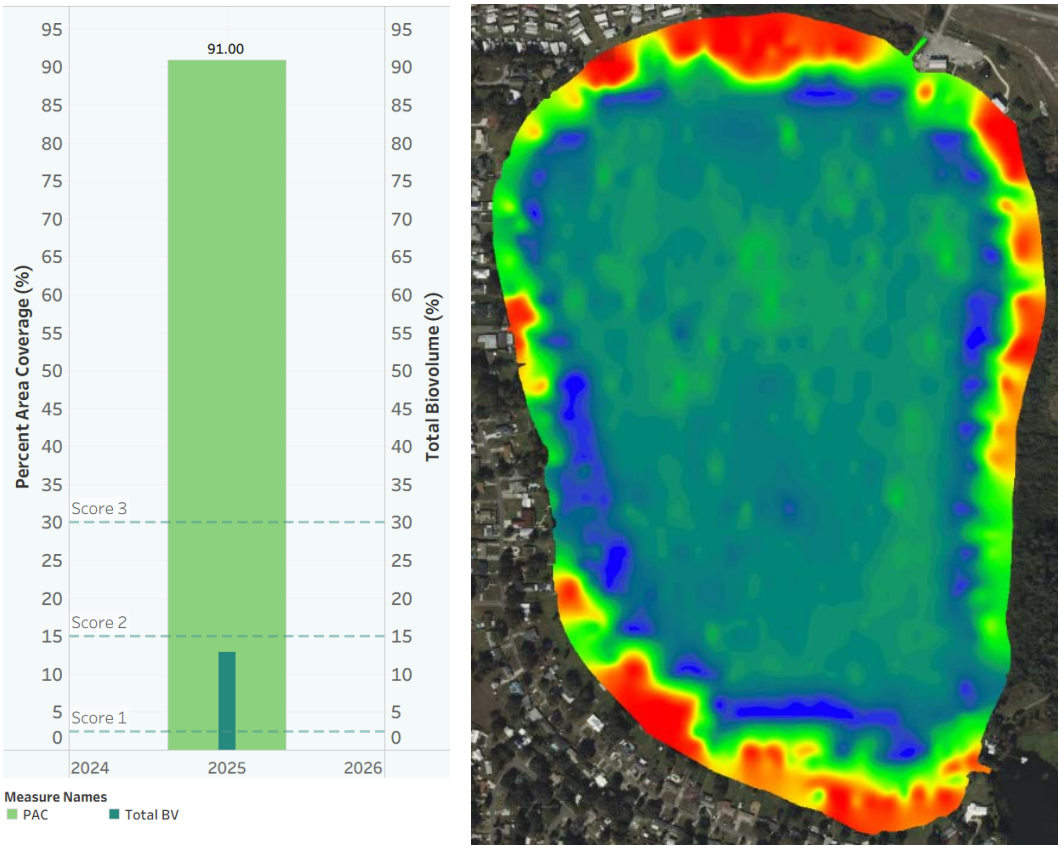


Figure 3-113. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Jessie; biovolume values range from green (lowest) to red (highest).

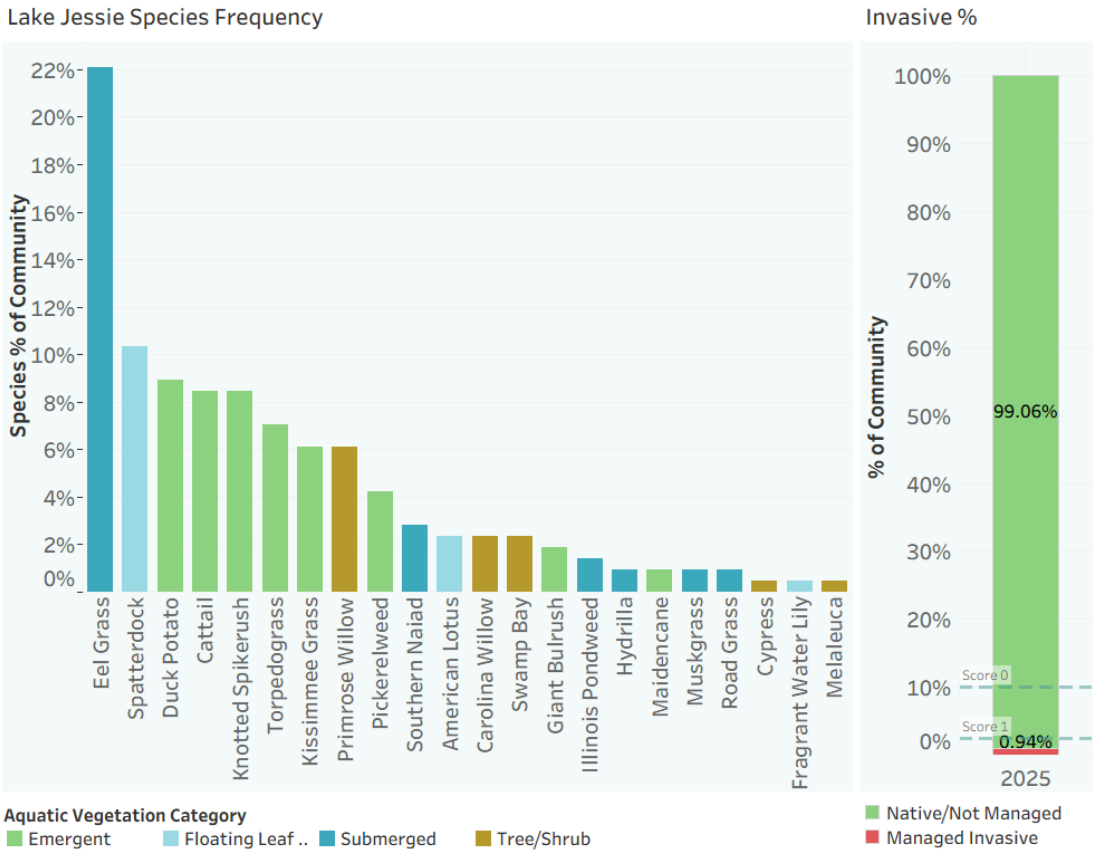


Figure 3-115. Chart depicting species frequency and invasive species percentage of Lake Jessie during 2025.

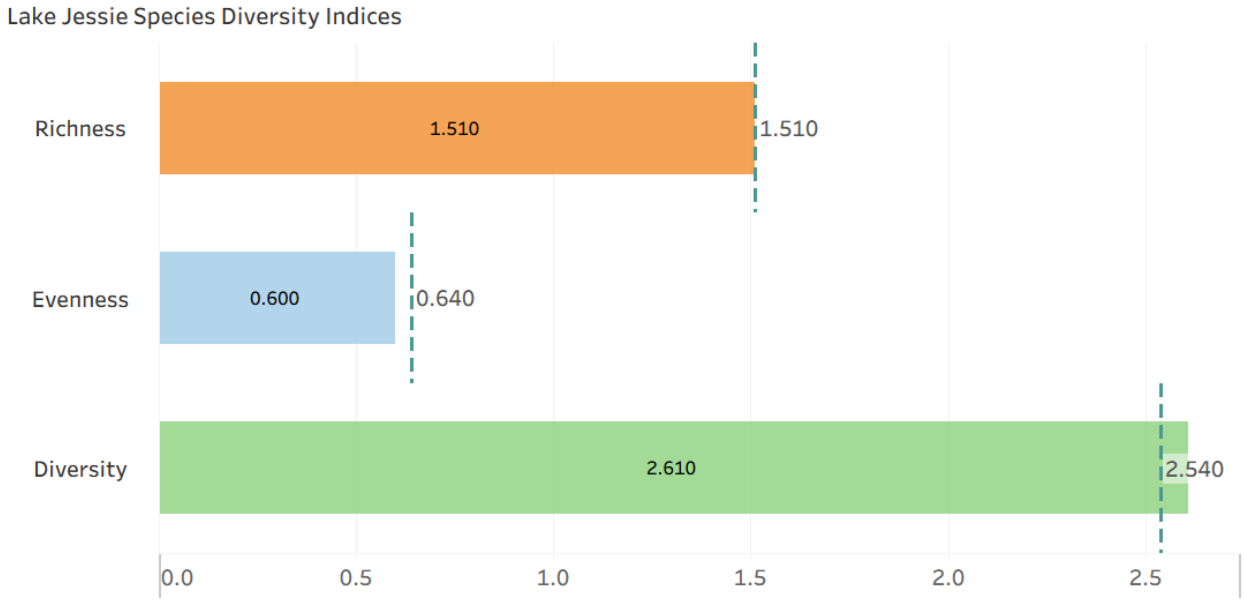


Figure 3-114. Chart depicting 2025 diversity indices for Lake Jessie. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Jessie's health index scores from 2018 to 2025 shows some variability (Table 3-16). While impairment criterion scores have not changed in this five year span, trend scores have fluctuated somewhat. Most notable are the improvement to the Chl-a trend statistics. The majority of the score variance has come from invasive species presence and species diversity. This is likely a reflection of changes in the vegetation community, due in part to the invasive species management efforts. Lake Jessie's water quality and invasive management issues place it higher on the City's priority list for management action.

Lake Health Impacts/Challenges:

- In addition to stormwater pollutant loading, there are reports of historic wastewater treatment plant discharges that could impact water quality. The volume and time frame for these discharges is unconfirmed, however. The density of OSTDs within this basin could be a source for nutrient pollutant loading if they are leaching into the nearby water table.
- Several water quality metrics are significantly correlated with Lake Jessie's surface level likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- The management of invasive species is a constant concern for this waterbody. While invasive presence is low this year, it can take a single growing season for many of these species to take over large areas of the lake.

Lake Management Strategy:

- City staff may explore source analysis of both the historic point source and OSTD pollutant loading. Future management actions may involve sediment removal/inactivation and/or septic-to-sewer conversion.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	1	3	2	3	2	1	**1.6**
2019	0	1	1	2	2	3	1	3	**1.6**
2020	0	1	1	2	2	3	1	0	**1.3**
2021	0	2	1	2	2	3	0	1	**1.4**
2022	0	1	1	2	2	3	1	1	**1.4**
2023	0	2	1	3	2	3	1	2	**1.8**
2024	0	2	1	2	1	3	0	1	**1.3**
2025	0	2	1	2	1	3	2	2	**1.6**

Table 3-16. Lake health index scores for Lake Jessie from 2018 to 2025.

Lake Link

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	0	1	1	0	2	1	2	1.3

Features & Statistics:

Surface area	27.7 acres
Mean depth	8.84 feet
Maximum depth	22 feet
Volume	257 acre-feet
Drainage basin area	63.1 acres
Annual TN Load	197.2 lbs
Annual TP Load	31.7 lbs
Limiting nutrient	Phosphorus

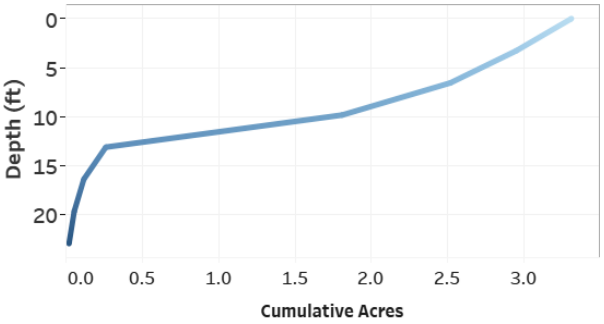


Figure 3-116. Hypsograph of Lake Link depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Link is a small but deep waterbody at 28 acres, an average depth of 8.8 feet, and a maximum depth of 22 feet (Figure 3-116). This is representative of a classic sinkhole lake, but the steep slopes of the lake bed limits the available habitat for aquatic plant growth. Stormwater is conveyed to this waterbody from a 63-acre drainage basin comprised of four separate sub-basins (Figure 3-117). Made up almost entirely of residential land uses, the drainage basin contributes 197 lbs of TN and 32 lbs of TP to Lake Link annually. On a per acre basis, these loading rates rank 25th out of the 37 area lakes. There are 15 septic systems present within Link's drainage basin. This constitutes a low density and likely doesn't contribute much pollutant loading. To combat stormwater loading, the City conducts street sweeping services of 2.9 miles per month along the north side of the drainage basin.

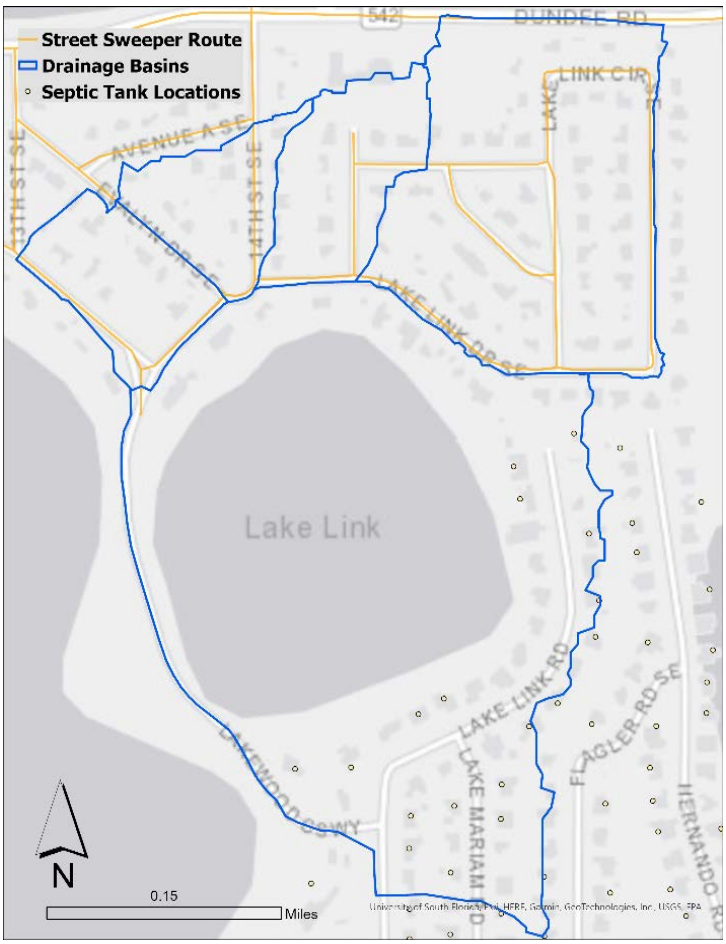


Figure 3-117. Map of Lake Link's drainage basin, City street sweeper routes, and nearby septic systems.

Lake Link is connected to Lake Otis via a navigable canal and overflows via underground pipe to Lake Mariam. The surface elevation of these two lakes sites near the bottom of the Peace Creek watershed. Over its period of record, the shared surface level of Lakes Link and Otis has fluctuated between 120.3 and 128.8 feet above sea level. The wide range of fluctuation is possible because of the steep-sloped morphology of these lakes. The normal range of fluctuation is much narrower—between 124.9 and 127.2 feet (Figure 3-118). During 2025, Lake Link dropped to a dry season low of 125.8 feet in April and reached a wet season peak of 127.6 feet in September. Link ended the year near the high end of the normal range. According to linear regression analysis, changes in Lake Link's surface level are inversely correlated with TN and TP concentrations (see appendix). This carries management implications as an increase in lake level should result in improved water quality.

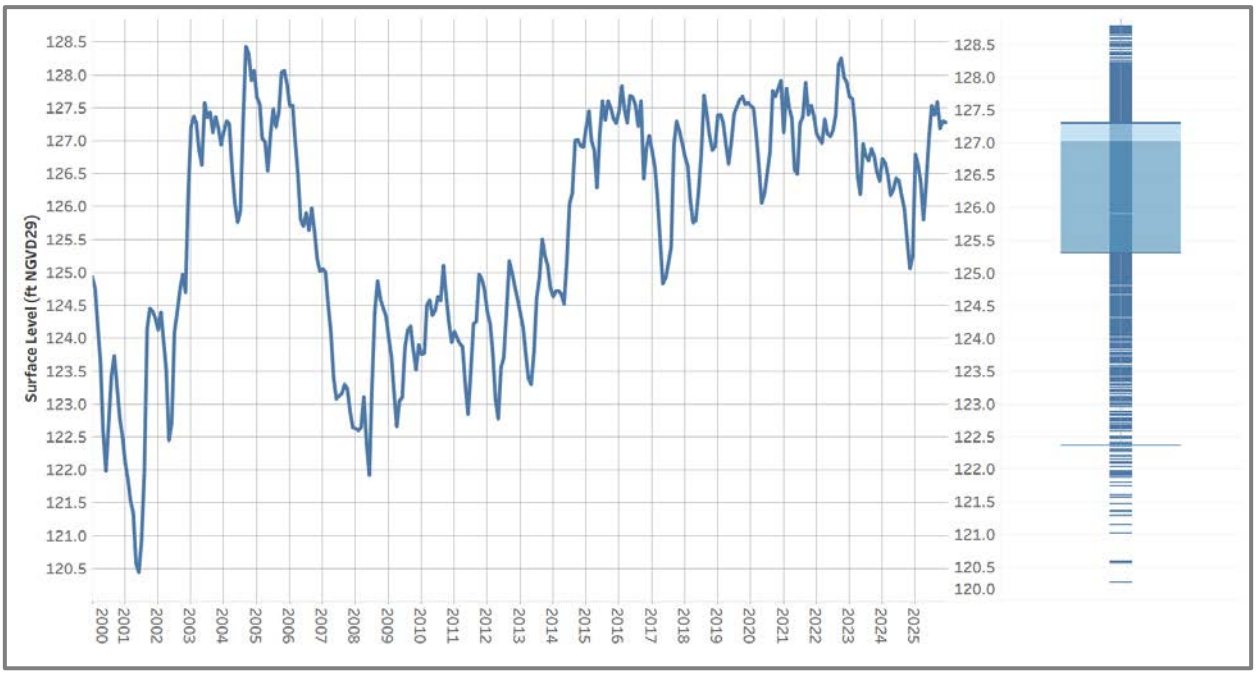


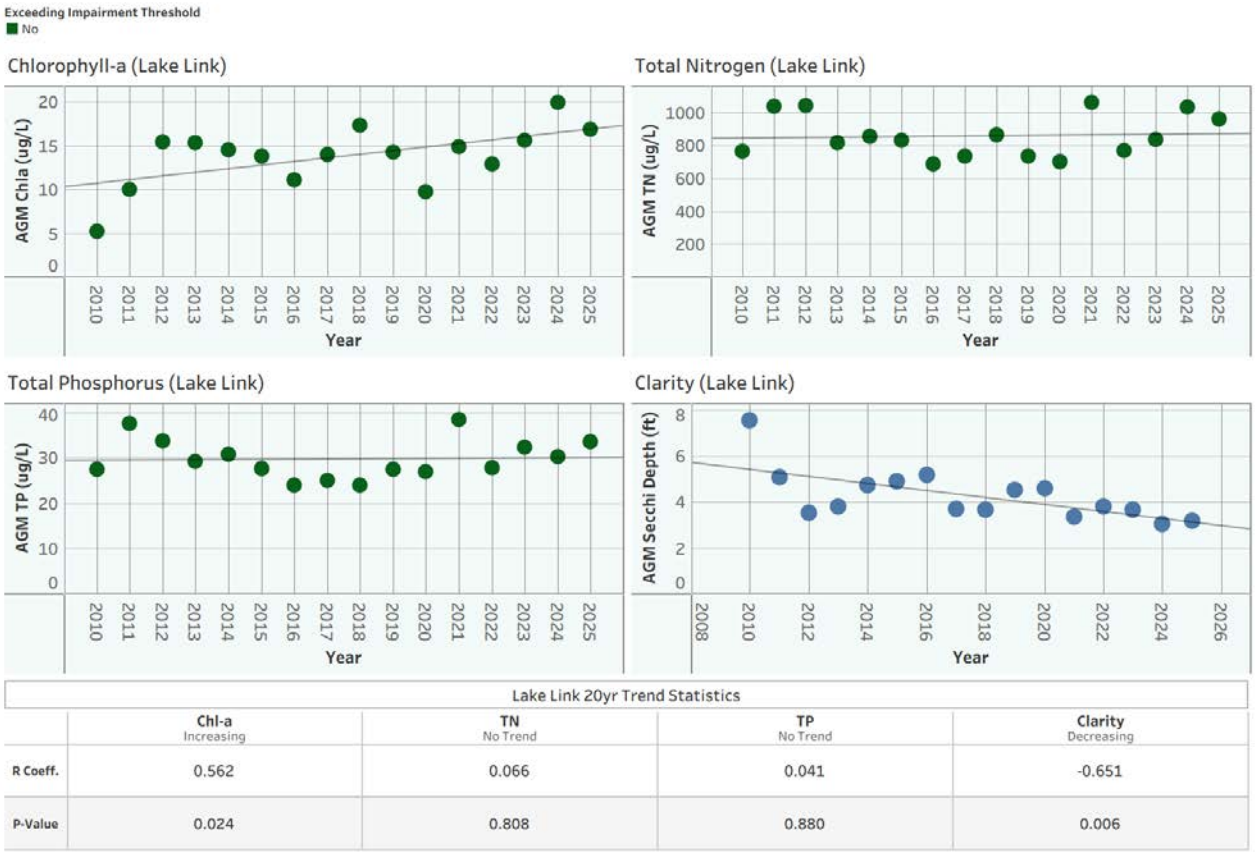
Figure 3-118. Hydrograph of Lake Link depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria, Lake Link is categorized as a clear, alkaline waterbody. Based on the water quality data, Lake Link has not exhibited NNC exceedances in any of the primary water quality parameters during the assessment period (Figure 3-119). This equates to an impairment criterion score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. The Chl-a and Clarity metrics exhibited significant deteriorating trends, equating to trend criteria scores of 0; whereas TN and TP exhibited non-significant increasing trends, for trend scores of 1. These trends are a departure from previous years where water quality was moving in a generally improving direction. Continued monitoring is necessary to determine if these trends are an anomaly or indicative of a significant lake health decline.



Lake Link 20yr Trend Statistics

	Chl-a Increasing	TN No Trend	TP No Trend	Clarity Decreasing
R Coeff.	0.562	0.066	0.041	-0.651
P-Value	0.024	0.808	0.880	0.006

Figure 3-119. Lake Link AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Link on 8/22/2025. The PAC during this survey was 23.2% and the total BV was 3.1% (Figure 3-121). This was a slight decrease in coverage from the previous year, equating to an abundance criterion score of 2. Over the period of record, Lake Link has had generally high abundance values, but coverage has been gradually decreasing since 2021. The lack of aquatic vegetation provides less ability for Link to mitigate the increased pollutant concentrations in recent years.

Invasive Species Management:

Based on the 2025 survey, Lake Link possessed a fairly even mix of emergent, floating-leaf and submerged species. While SAV was previously much more prominent, fragrant water lily was the most dominant in 2025 (Figure 3-120). The invasive hydrilla was present in relatively high numbers: 4.3%. This equates to an invasive criterion score of 1. Invasive treatment is necessary to prevent further population growth.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Species richness and overall diversity index values met or exceeded their long-term medians, for a diversity score of 2 (Figure 3-122). The evenness index value was slightly lower than in previous years. This is likely due to prior invasive treatments allowing for the dominance of a few species in 2025.

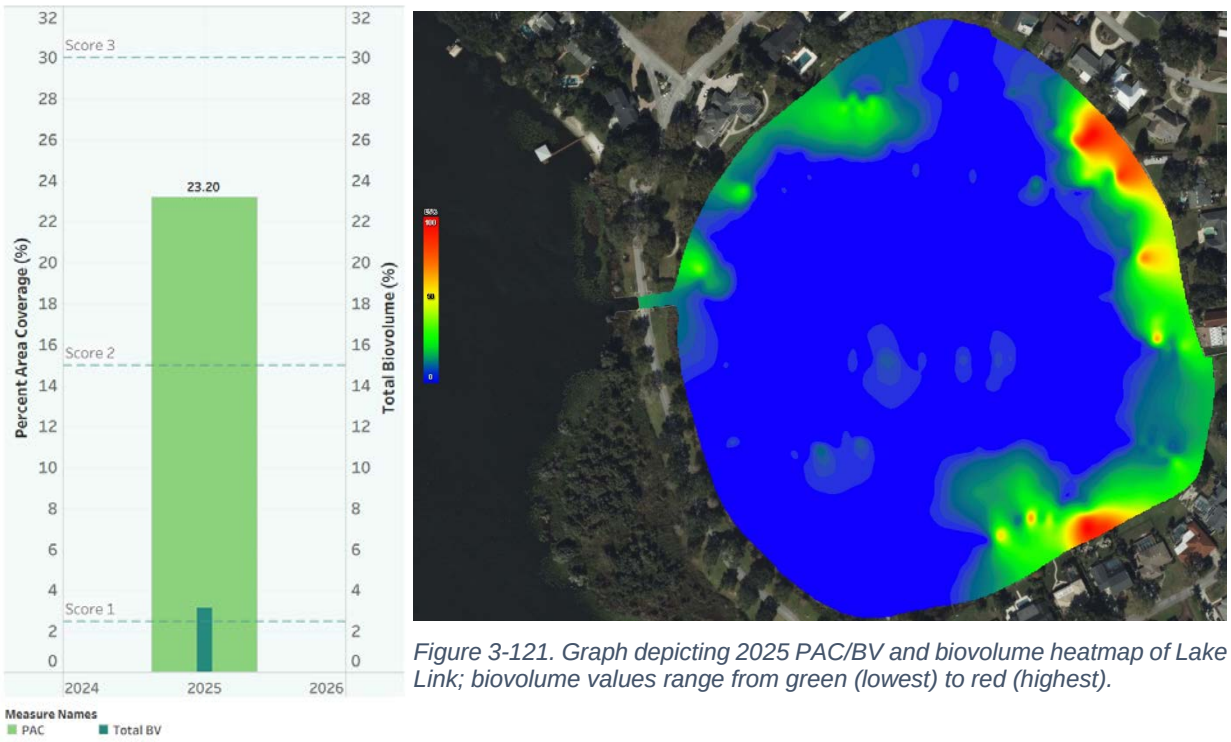


Figure 3-121. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Link; biovolume values range from green (lowest) to red (highest).

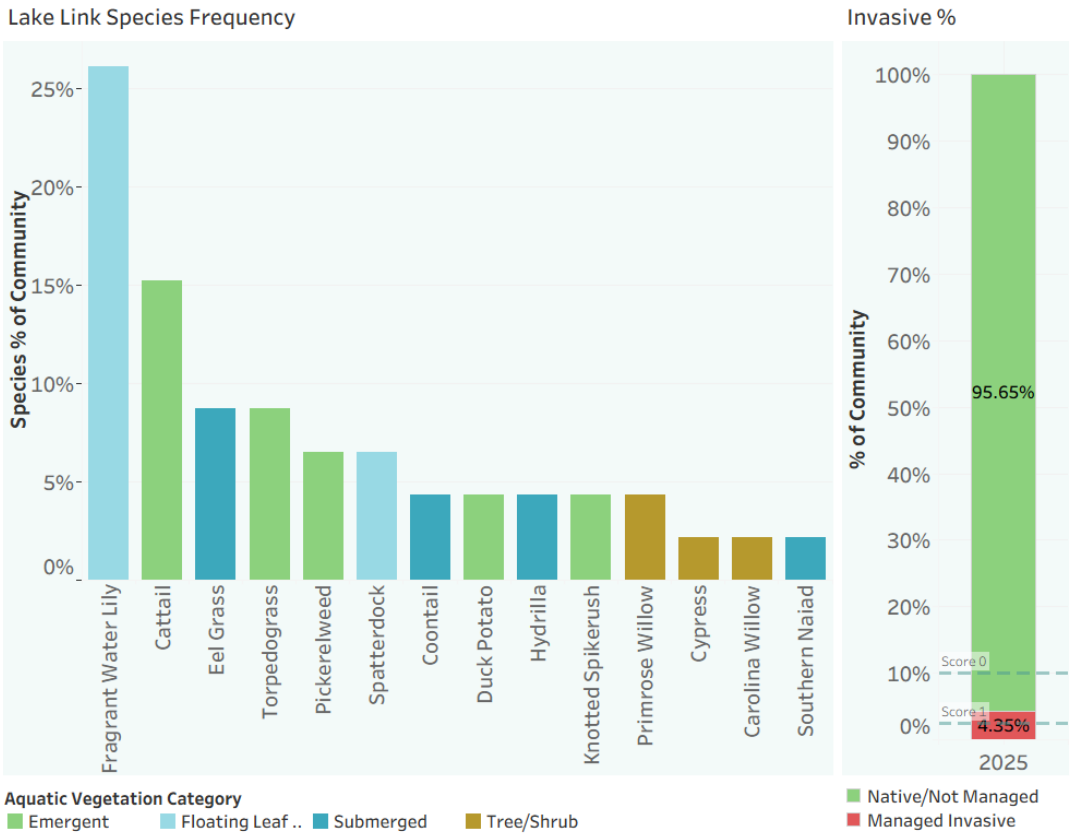


Figure 3-120. Chart depicting species frequency and invasive species percentage of Lake Link during 2025

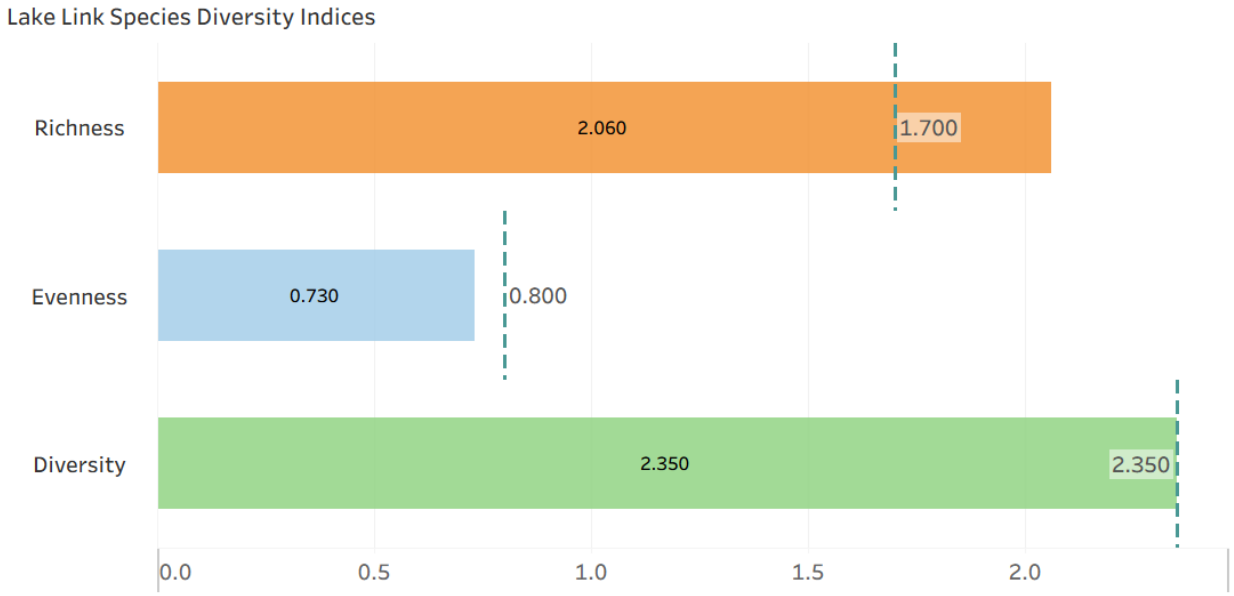


Figure 3-122. Chart depicting 2025 diversity indices for Lake Link. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Link's health index scores from 2018 to 2025 shows some decline over time (Table 3-17). While this is a decrease in overall lake health, it should be noted that the 2019 and 2020 scores were artificially higher due to a lack of biological data to balance the water quality scores. Despite this, a clear declining shift in water quality trends has emerged. Other issues include the consistent battle with invasive aquatic plants and the shifts in abundance and diversity scores that result. The 2025 LHI score was the lowest on record—indicating a significant need to address these water quality issues before Lake Link becomes impaired.

Lake Health Impacts/Challenges:

- Lake Link currently exhibits healthy water quality. However, pollutant loading via stormwater is a potential concern if water quality trends continue to deteriorate.
- The management of invasive species like hydrilla has been a consistent concern. It can only take a single growing season for even a small population to take over large areas of a waterbody.
- Several water quality metrics are significantly correlated with Lake Link's surface level likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- The City currently conducts street sweeping in the northern drainage sub-basins. Since much of the zoning in this basin is residential, public outreach and education are ideal management strategies. Education aims to increase residents' knowledge of best stormwater practices and ways they can collectively reduce their pollutant load.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response is the best management strategy

to prevent large-scale herbicide treatments and the potential water quality issues that follow.

- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	2	3	2	2	3	0	2	**2.1**
2019	3	2	3	2	2	NA	NA	NA	**2.4**
2020	3	2	3	2	2	3	NA	NA	**2.5**
2021	3	2	3	2	2	2	1	1	**2.0**
2022	3	2	3	2	2	2	1	1	**2.0**
2023	3	1	2	1	1	3	2	1	**1.8**
2024	3	1	2	1	2	2	3	1	**1.9**
2025	3	0	1	1	0	2	1	2	**1.3**

Table 3-17. Lake health index scores for Lake Link from 2018 to 2025.

Lake Lulu

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	3	3	3	3	2	2	2.4

Features & Statistics:

Surface area	307.5 acres
Mean depth	6.8 feet
Maximum depth	10 feet
Volume	2,093.6 acre-feet
Drainage basin area	1,006.5 acres
Annual TN Load	2,791.5 lbs
Annual TP Load	483 lbs
Limiting nutrient	Phosphorus

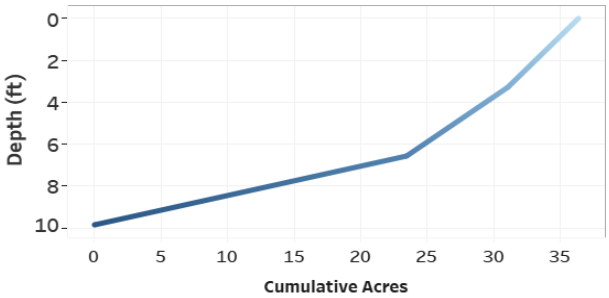


Figure 3-123. Hypsograph of Lake Lulu depicting the depth profile and morphology of the lake bed.

Hydrology:

One of the larger waterbodies on the South Chain, Lake Lulu has a total area of 307 acres. While large, Lulu is one of the shallower lakes with a mean depth of 6.8 feet and a maximum depth of 10 feet (Figure 3-123). The shallowness of the lake makes it much more susceptible to sediment suspension via wind and wave action. Stormwater is conveyed to this waterbody from a 1,006 acre drainage basin comprised of 13 individual sub-basins (Figure 3-124). The primary land uses in this drainage area are commercial, wetlands and residential which contribute 2,791 lbs of TN and 483 lbs of TP to Lake Lulu annually. Though these loads rank on the low side compared with the 37 lakes in the study area. There are 46 septic systems located within the County portion of the basin. This constitutes a moderate density which can have potential impacts on water quality. To combat stormwater pollutant loading, the City conducts 11.6 miles of street sweeping monthly for residential roads and twice monthly for larger roadways.

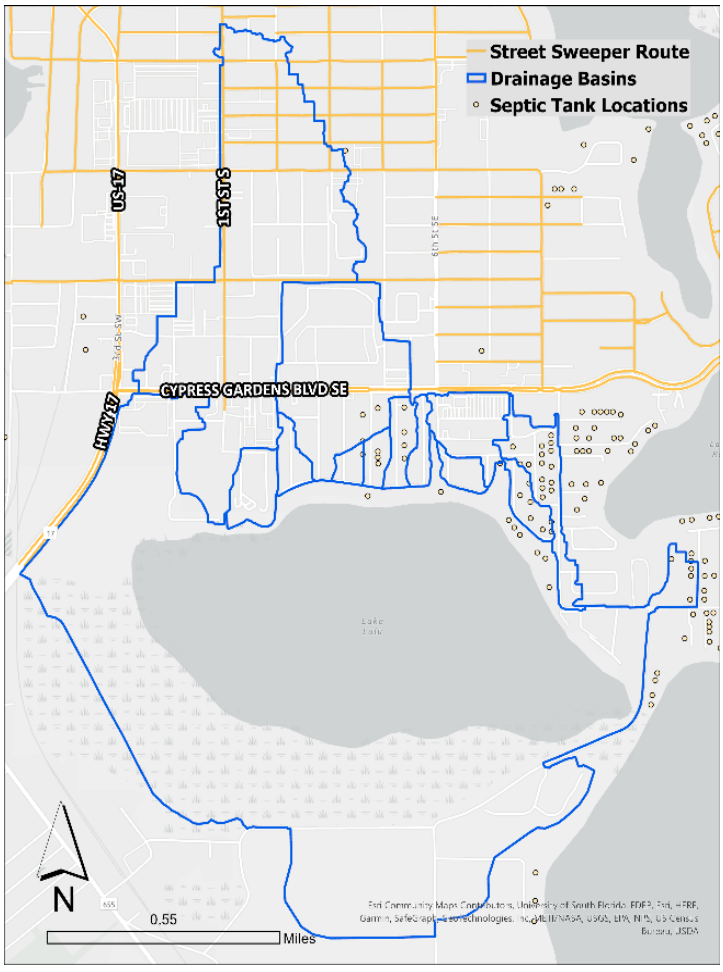


Figure 3-124. Map of Lake Lulu's drainage basin, City street sweeper routes, and nearby septic systems.

Lake Lulu is centrally located on the South Chain with navigable connections to Lakes Eloise and Shipp. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-125). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Lulu's surface level correlate with TN and clarity (see appendix). This carries management implications as an increase in levels should result in improved water quality.

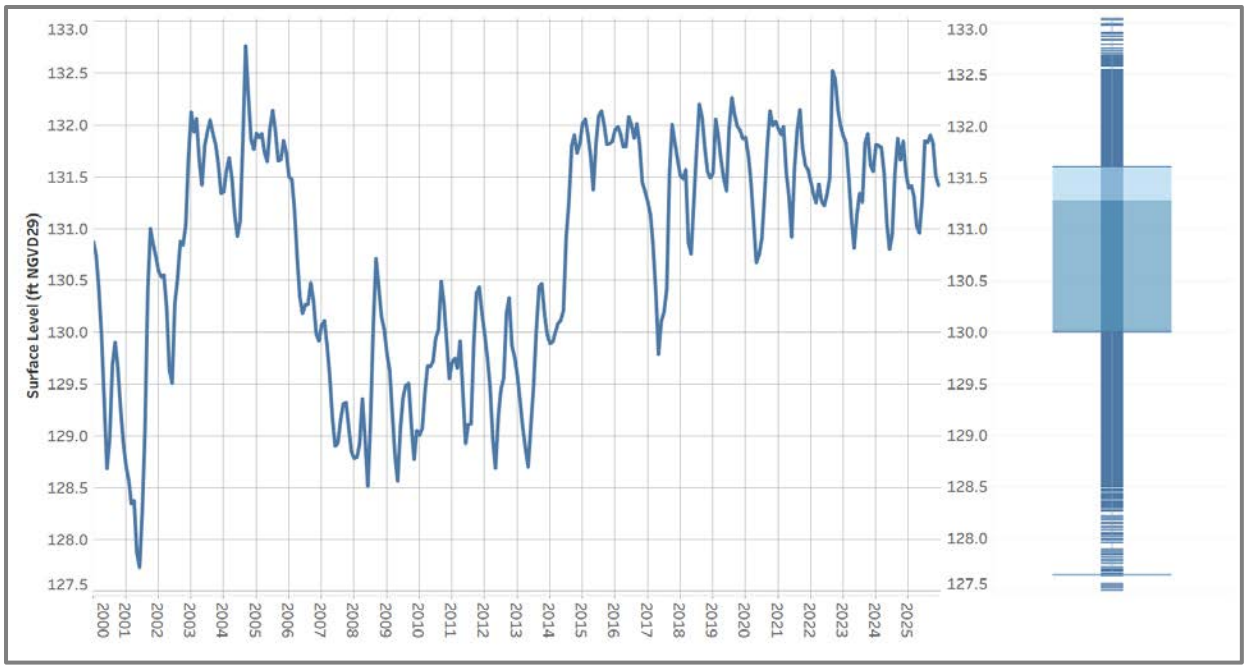


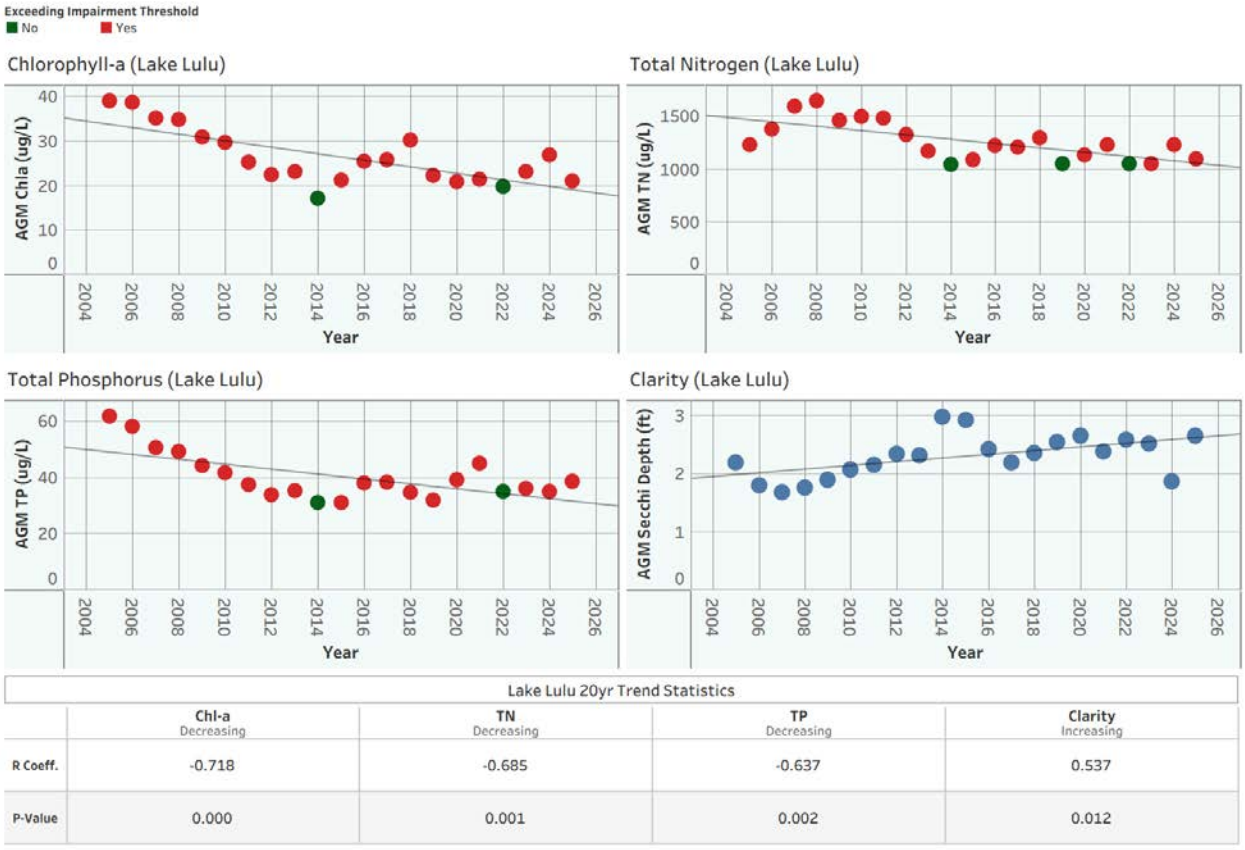
Figure 3-125. Hydrograph of Lake Lulu depicting monthly surface level readings from 2000 to 2025. A box and whisker plot detail total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Lulu is categorized as a clear, alkaline waterbody. Due to consistent NNC exceedances during the assessment period, Lake Lulu is considered impaired for Chl-a, TN, and TP (Figure 3-126). This equates to an impairment criterion score of 0. In 2019, the FDEP established a total maximum daily load for Lake Lulu stipulating a 35% reduction in TN in order to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on these data, all four parameters exhibited significant improving trends, equating to criterion scores of 3. While these long-term trends illustrate improvement from early 2000s water quality, Lake Lulu's trends appear to have plateaued since 2014. This indicates the need to explore alternative management strategies that will help to reduce pollutant loads in the future.



Lake Lulu 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.718	-0.685	-0.637	0.537
P-Value	0.000	0.001	0.002	0.012

Figure 3-126. Lake Lulu AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Lulu on 7/10/2025. The PAC during this survey was 37.5% and the total BV was 5.2%, equating to a vegetation criterion score of 3 (Figure 3-128). Lake Lulu has traditionally supported high vegetation abundance due to its shallow depth and gradually sloping lake bed. However, 2025's PAC value was marginally lower than in the three prior years.

Invasive Species Management:

Based on data from the 2025 survey, Lake Lulu maintains a healthy mix of submerged, emergent, and floating leaf plants. The most dominant species present is the native fragrant water lily around 14% (Figure 3-127). While hydrilla was previously present in high numbers during the 2024 survey, a small percentage of water hyacinth (less than 1%) was the only invasive species presence during 2025. This indicates improvement and illustrates how Lake Lulu's invasive populations are generally maintained..

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake Lulu's species richness and overall diversity indices exceeded their long-term medians—for a diversity score of 2 (Figure 3-129). The overall vegetation community has been relatively diverse through the period of record, with over 22 unique species detected. The relative distribution of plant species appeared to be somewhat less equal than prior years. However, this slight shift isn't cause for alarm.

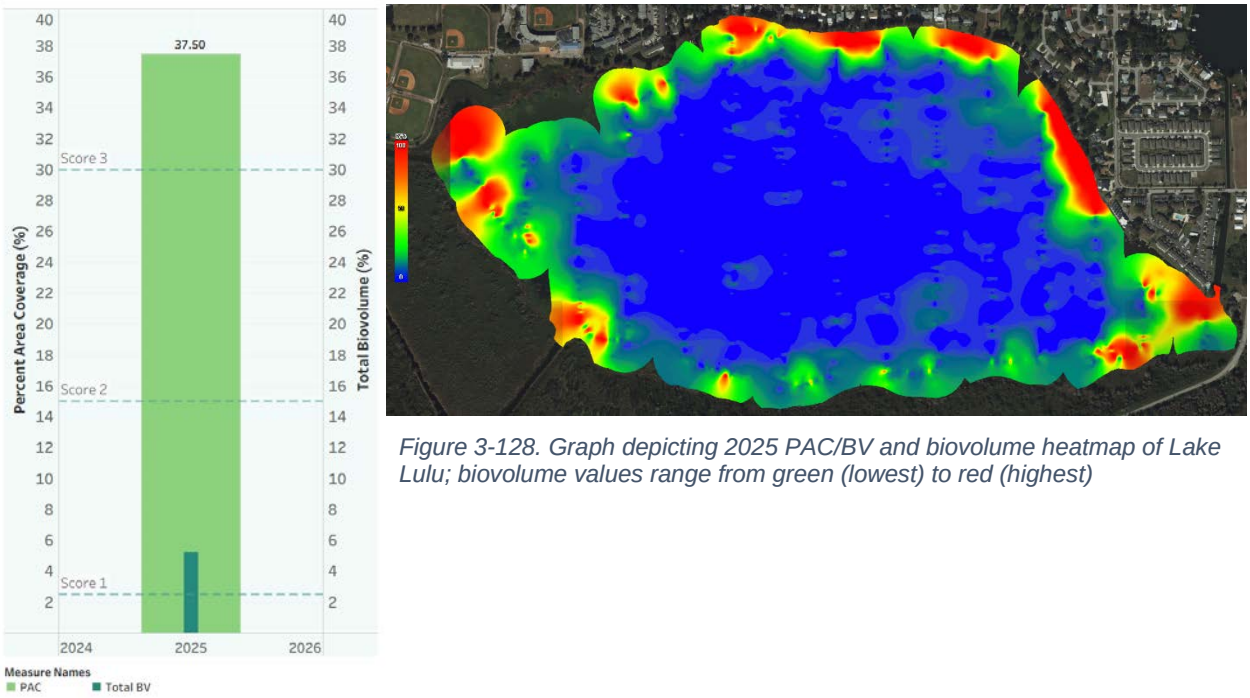


Figure 3-128. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Lulu; biovolume values range from green (lowest) to red (highest)

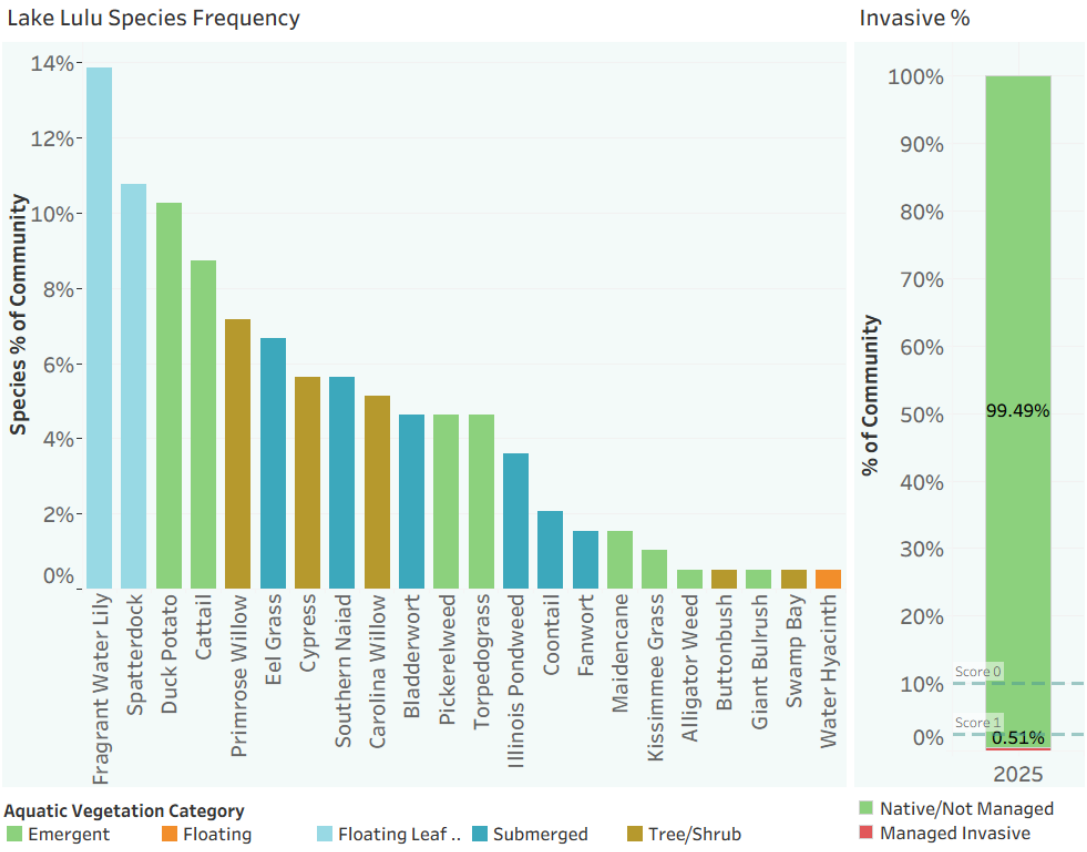


Figure 3-127. Chart depicting species frequency and invasive species percentage of Lake Lulu during 2025.

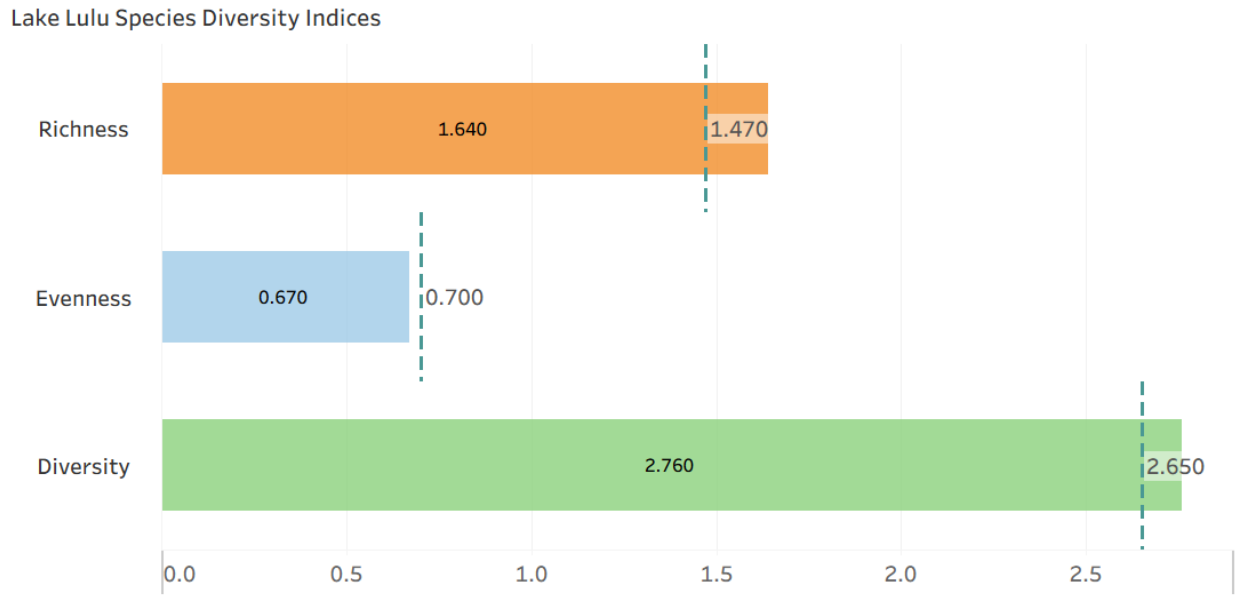


Figure 3-129. Chart depicting 2025 diversity indices for Lake Lulu. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Lulu's health index scores from 2018 to 2025 shows some improvement, increasing from 2.1 to 2.4 (Table 3-18). Regarding the water quality metrics, impairment hasn't changed. However, TN concentrations began to exhibit significant improving trends starting in 2020. From a biological perspective, Lake Lulu has consistently maintained high vegetation abundance. However, the invasive presence and diversity metrics have been the largest source of score fluctuation. This is mostly due to cycles of invasive expansion and subsequent management efforts. Overall, Lake Lulu is lower on the priority list, but also a lake to closely monitor to ensure that it continues to improve.

Lake Health Impacts/Challenges:

- In addition to stormwater and potential septic pollutant loads, Lake Lulu received historic point-source discharges from a now defunct City wastewater treatment plant as well as several citrus fertilizer processing facilities. These historic pollutant loads may contribute to internal nutrient loading from the legacy sediments.
- The management of invasive species remains a consistent concern. Species like hydrilla can take over large areas of a waterbody in a single growing season.
- Several water quality metrics are significantly correlated with Lake Link's surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- City staff may explore source analysis of both the historic point-source and septic pollutant loading. Future management actions may involve sediment removal/inactivation, septic-to-sewer conversion, and stormwater infrastructure improvements.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response is the best management strategy

to prevent large-scale herbicide treatments and the potential water quality issues that follow.

- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- In addition to street sweeping, the City combats stormwater loading through an alum injection system designed to reduce TN loads by 8% and TP loads by 21% annually. The

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	3	2	3	3	3	1	1	**2.0**
2019	0	3	2	3	3	3	2	1	**2.1**
2020	0	3	3	3	3	3	3	1	**2.4**
2021	0	3	3	3	3	3	2	3	**2.5**
2022	0	3	3	3	3	3	1	3	**2.4**
2023	0	3	3	3	3	3	1	3	**2.4**
2024	0	3	3	3	3	3	1	3	**2.4**
2025	0	3	3	3	3	3	2	2	**2.4**

Table 3-18. Lake health index scores for Lake Lulu from 2018 to 2025.

Lake Mariam

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	1	2	1	1	3	2	3	2.0

Features & Statistics:

Surface area	203.7 acres
Mean depth	4.65 feet
Maximum depth	6.5 feet
Volume	820.9 acre-feet
Drainage basin area	622.1 acres
Annual TN Load	1,609.45 lbs
Annual TP Load	274.8 lbs
Limiting nutrient	Co-limited (N & P)

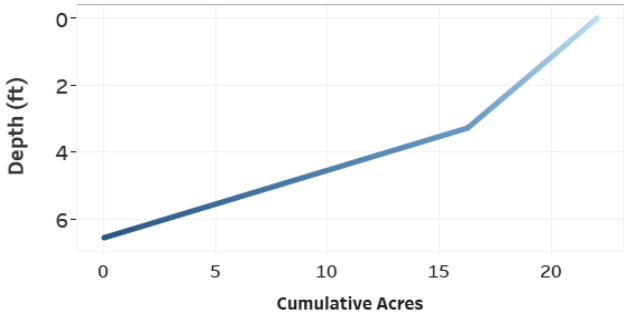


Figure 3-130. Hypsograph of Lake Mariam depicting the depth profile and morphology of the lake bed.

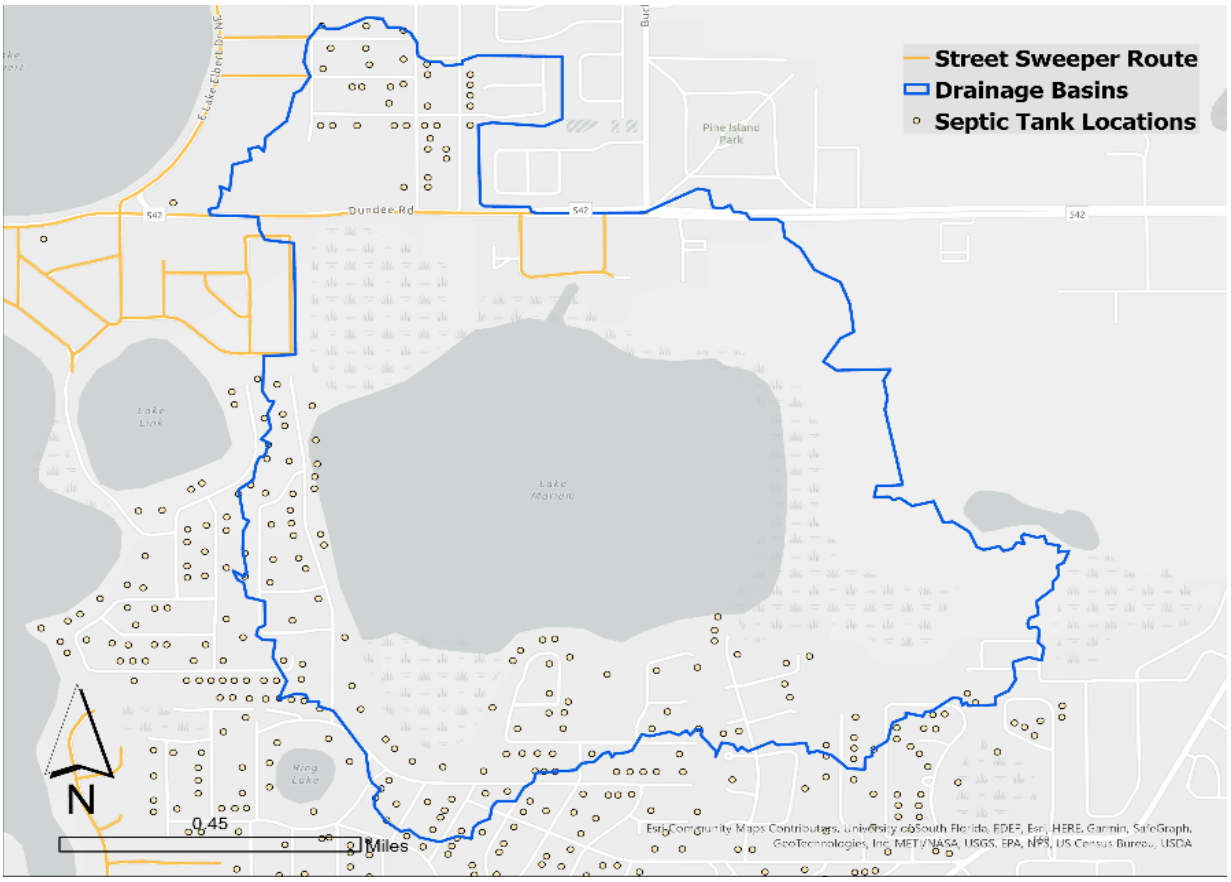


Figure 3-131. Map of Lake Mariam's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Mariam is a moderately sized, but very shallow waterbody at 203 acres, an average depth of 4.6 feet, and a maximum depth of around 7 feet (Figure 3-130). The shallow nature of this waterbody likely contributes to higher sediment suspension and while it should support a large amount of vegetation, the higher turbidity likely prevents many species from receiving sunlight through the water column. Stormwater is conveyed to this waterbody from a 622 acre drainage basin comprised of wetlands, residential and commercial land uses (Figure 3-131). This basin contributes 1,609 lbs of TN and 275 lbs of TP to Lake Mariam annually; but on a per acre basis, these pollutant loads rank 32nd out of 37 lakes. There are 132 septic systems located within this drainage area which is fairly dense and may be a potential contributor of nutrient loading via groundwater leaching. To combat stormwater loading, the City conducts 1.9 miles of street sweeping twice monthly on Dundee Rd.

Lake Mariam receives excess water from Lake Link and discharges overflow to the Peace Creek via a network of ditches. Its surface elevation sits second lowest within the Peace Creek watershed. Over the period of record, Lake Mariam's surface level has fluctuated between 120.5 and 125.8 feet above sea level. The normal range for this waterbody is between 122.2 and 124.5 feet (Figure 3-132). During 2025, Lake Mariam's level dropped to a dry season low of 122.8 feet in May and rose to a wet season high of 124.9 feet in July—ending the year above the high end of the lake's normal range. Changes in Lake Mariam's surface level are not correlated with its water quality metrics.

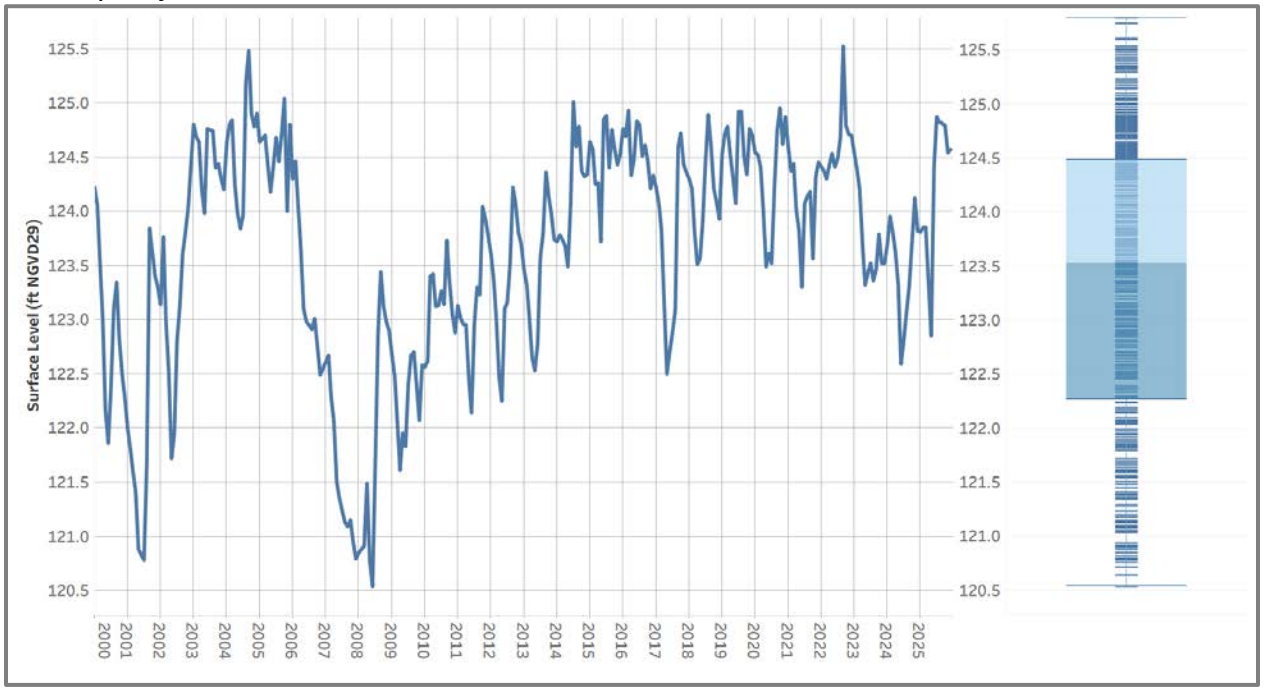


Figure 3-132. Hydrograph of Lake Mariam depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

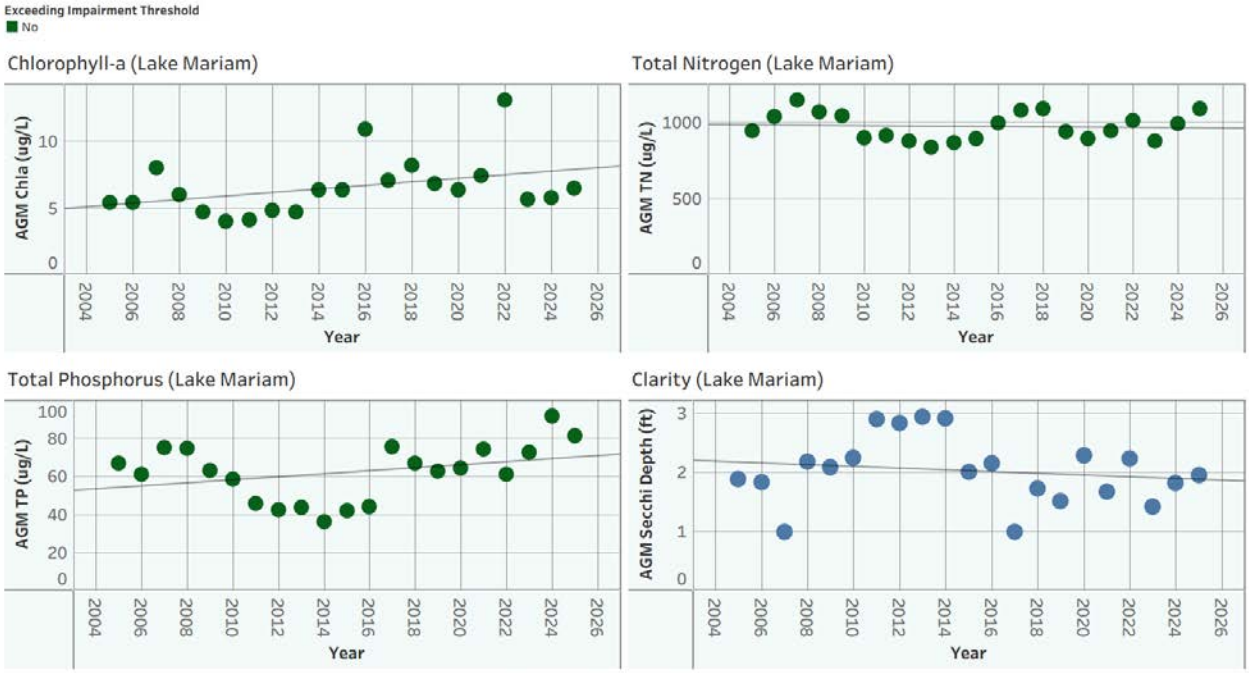
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Mariam is categorized as a high-color waterbody; likely due to its large connected wetland that contributes tannins to the water column. Based on the water quality data, Lake Mariam exhibited

no NNC exceedances during the assessment period (Figure 3-133). This equates to an impairment criterion score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression of AGM Chl-a, TN, TP, and Secchi depth values from 2004 to 2024. Based on these data, Chl-a exhibits a significant deteriorating trend, earning a score of 0. The remaining parameters exhibit non-significant trends—TP and Secchi in deteriorating directions and TN with an improving direction. The Chl-a trend remains the only concern as it could be highlighting potential impairment in the future. That said, the Chl-a concentrations are currently well below the impairment threshold.



Lake Mariam 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	0.380	-0.068	0.330	-0.161
P-Value	0.089	0.770	0.145	0.486

Figure 3-133. Lake Mariam AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Mariam on 5/23/2025. The PAC during this survey was 67.8% and the total BV was 27.4% (Figure 3-135). However, these abundance values almost certainly contain errors during the SONAR mapping as there is little to no submerged vegetation growing in the center of the lake. That said, there is a considerable amount of emergent vegetation present along the periphery due to the extensive wetland areas surrounding this lake. Therefore, Lake Mariam receives an abundance score of 3. It should be noted that the turbidity and high color present in Lake Mariam are not likely factors related to poor water quality, but more likely side effects from the lake's morphology and surrounding habitat. While more SAV presence would be beneficial, these water clarity conditions would prevent the introduction of meaningful SAV abundance.

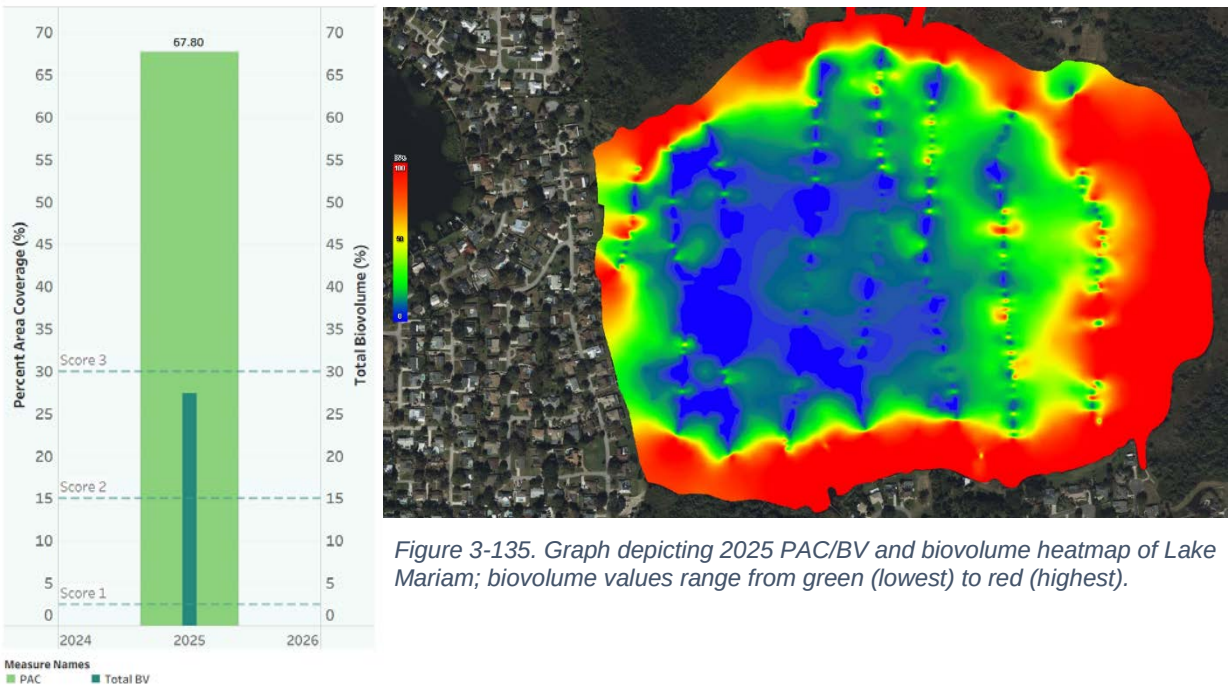


Figure 3-135. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Mariam; biovolume values range from green (lowest) to red (highest).

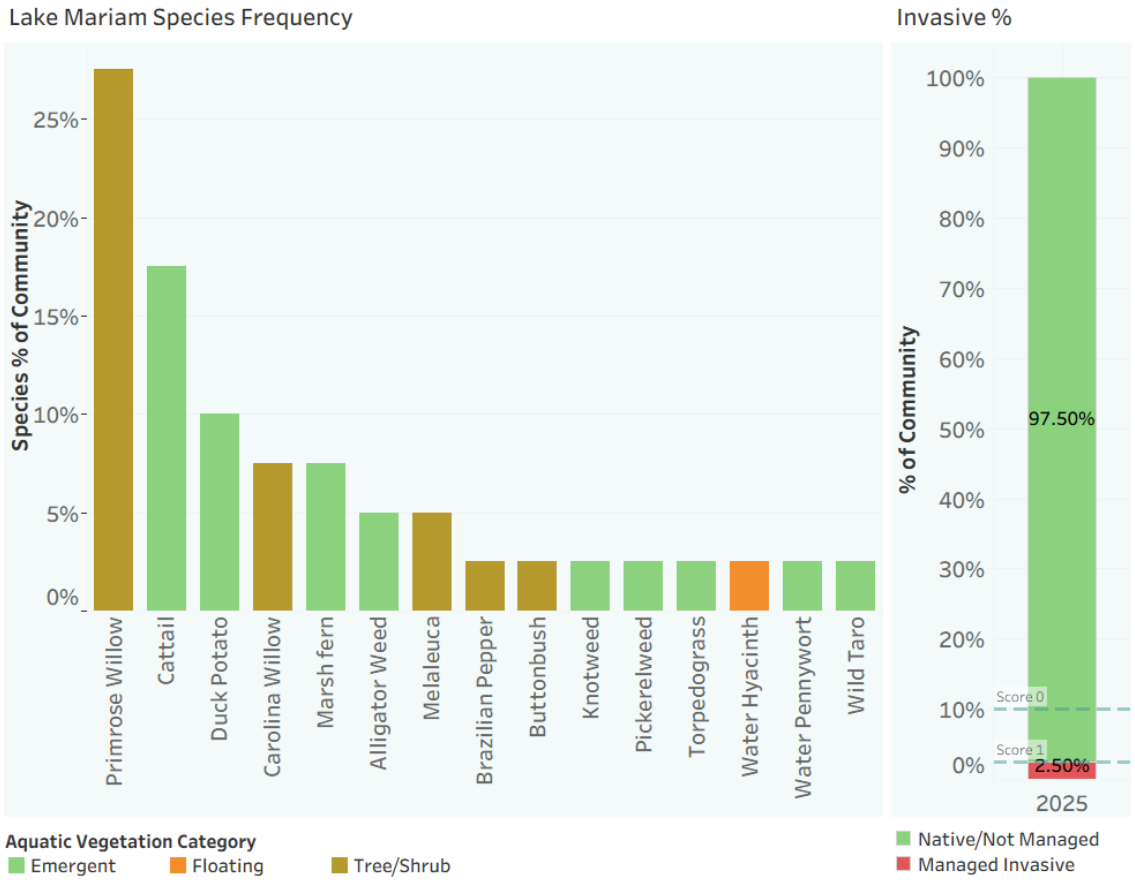


Figure 3-134. Chart depicting species frequency and invasive species percentage of Lake Mariam during 2025.

Invasive Species Management:

Based on Lake Mariam's high color concentration, it is dominated by emergent species like cattail and primrose willow with no submerged plants present in the lake (Figure 3-134). Invasive presence in Mariam has undergone a boom and bust cycle in recent years. A large percentage of the community (11.3%) was comprised of burhead sedge and water hyacinth in 2023, but these numbers have dropped down to just 6.8% in 2024 due to management efforts. In 2025, the burhead sedge was not detected and water hyacinth made up just 2.5% of the community. This indicates substantial improvement.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Mariam's diversity indices met or exceeded their long-term values (Figure 3-136). Relative to other waterbodies, Lake Mariam has low species richness since it can mostly only support emergent plant types. Despite the loss of burhead sedge, several other emergent plants were detected—significantly raising this metric and bumping the other two indices. This demonstrates how proper invasive management can benefit the vegetation community.

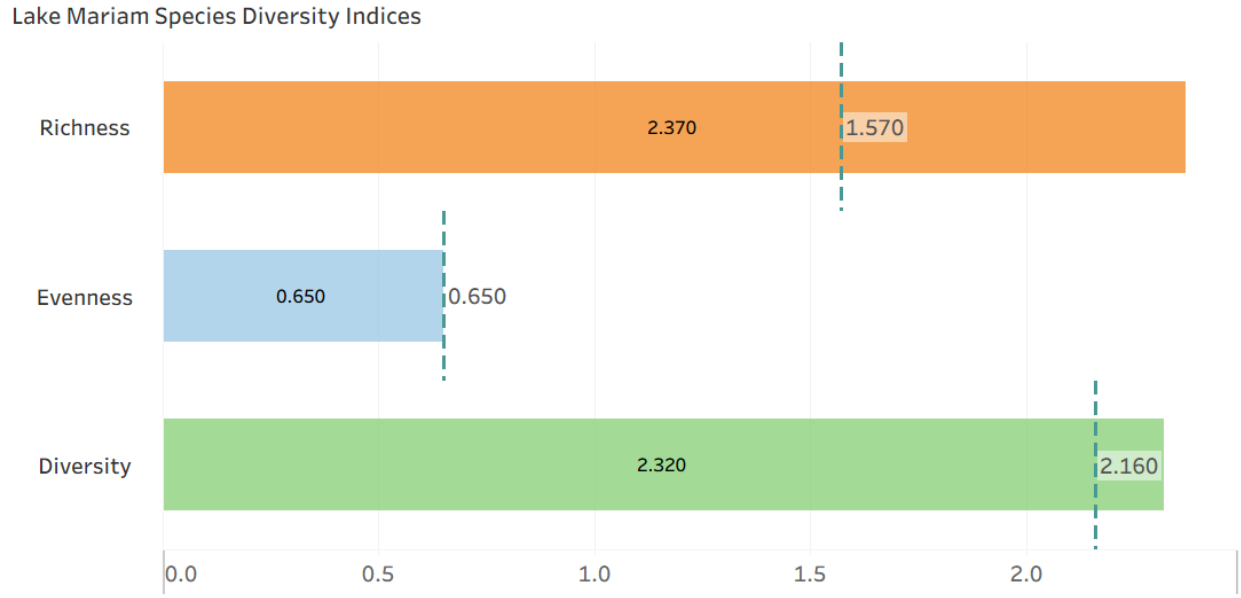


Figure 3-136. Chart depicting 2025 diversity indices for Lake Mariam. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Mariam's health index scores from 2018 to 2025 show some variation (Table 3-19). While the impairment score has remained stable over the last six years, the water quality trend scores have shifted somewhat toward a declining direction. That said, these trends are still not significant—indicating relative stability in Lake Mariam's water quality. Vegetation abundance has increased, but this may be due to some errors with the SONAR detection in such turbid and highly colored water. The invasive presence has decreased considerably since monitoring began while diversity has gotten better in the last few years. Overall, Lake Mariam is in the middle of the priority rankings. It may not currently be impaired, but it is important to continue monitoring the water quality trends as well as the presence of invasive species.

Lake Health Impacts/Challenges:

- In addition to the moderate level of stormwater runoff from the drainage basin, the presence of so many septic systems may be a contributing factor for nutrient pollutant loading. As these systems age, they may begin to leach nutrients into the water table—leading to water quality declines.
- The management of invasive species is a consistent concern for this waterbody. It can only take a single growing season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- City staff may explore source analysis to determine if OSTD leachate is a potential contributor of nutrient pollutant loading. Further management action may involve working with Polk County in septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicde treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	1	2	2	3	1	0	1	**1.6**
2019	3	1	2	2	2	2	0	2	**1.8**
2020	3	1	2	1	2	1	1	1	**1.5**
2021	3	1	2	1	2	3	3	2	**2.1**
2022	3	1	2	1	2	3	2	2	**2.0**
2023	3	0	2	1	2	3	0	3	**1.8**
2024	3	0	2	1	1	3	1	1	**1.5**
2025	3	1	2	1	1	3	2	3	**2.0**

Table 3-19. Lake health index scores for Lake Mariam from 2018 to 2025.

Lake Mariana

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	1	1	2	0	3	2	2	1.4

Features & Statistics:

Surface area	515.6 acres
Mean depth	8.99 feet
Maximum depth	20 feet
Volume	5,228.9 acre-feet
Drainage basin area	1,935.7 acres
Annual TN Load	6,530.8 lbs
Annual TP Load	1,160.6 lbs
Limiting nutrient	Phosphorus

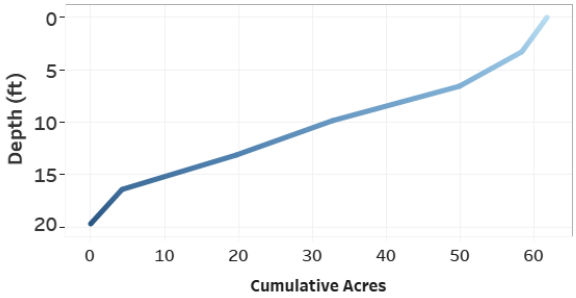


Figure 3-137. Hypsograph of Lake Mariana depicting the depth profile and morphology of the lake bed.

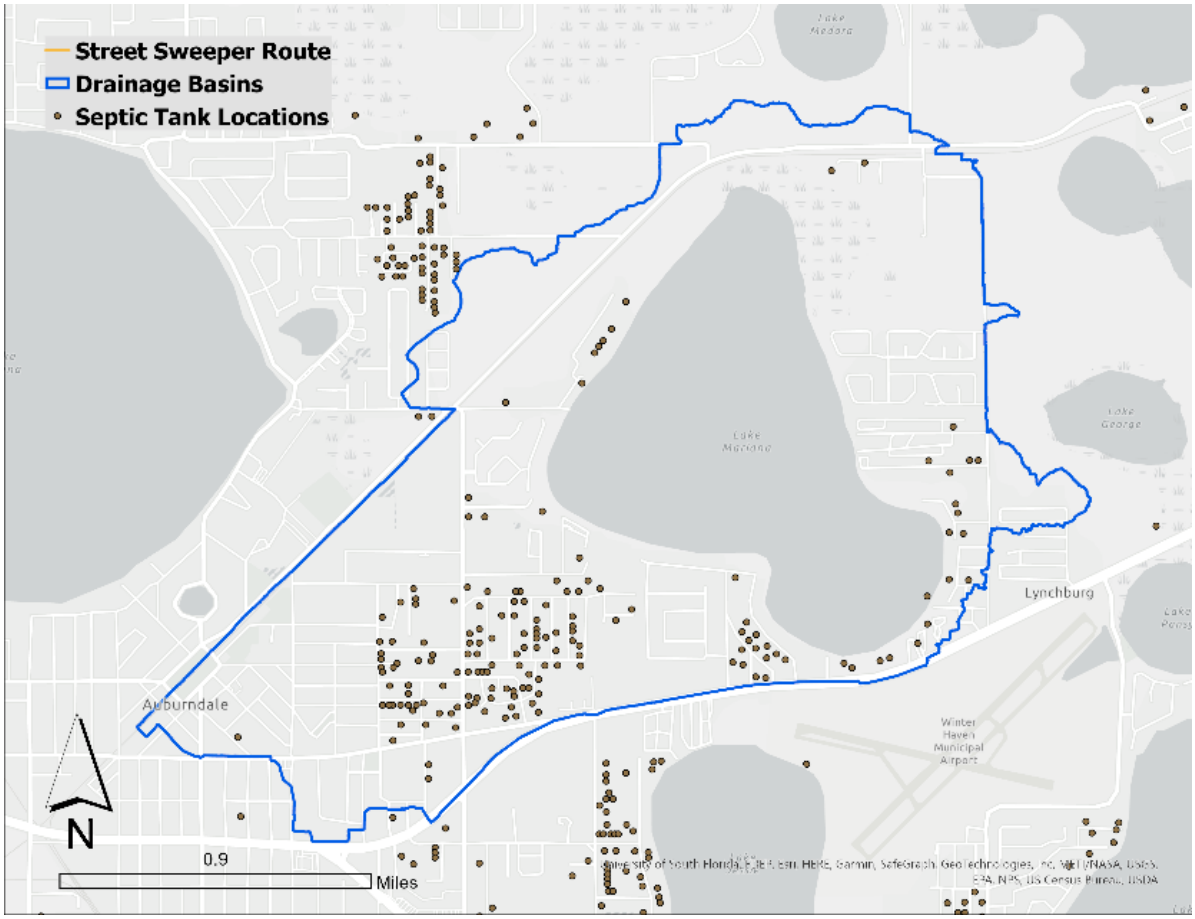


Figure 3-138. Map of Lake Mariana's drainage basin and nearby septic systems.

At over 515 acres in surface area, Lake Mariam is one of the larger lakes in the study area. It has an average depth of 9 feet and a maximum depth of over 20 feet (Figure 3-137). Stormwater is conveyed to this waterbody from a 1,935 acre drainage basin which includes residential,

commercial, industrial, and agricultural land uses (Figure 3-138). The drainage basin contributes 6,530 lbs of TN and 1,160 lbs of TP annually; these pollutant loads rank around 20th out of 37 on a per acre basis. There are 158 known Onsite Sewage Treatment and Disposal (OSTD/septic) systems within this basin. This constitutes a high density and could be a potential contributor to nutrient loading via groundwater leaching.

Lake Mariana is located mostly outside Winter Haven limits to the northwest of the city center. The lake discharges excess water via a ditch to Lake Jessie with a range of surface elevations that sit higher in the Peace Creek watershed. Over its period of record, Lake Mariana's surface level has fluctuated between 135.7 and 137.8 feet above sea level. The normal range for this lake is 136.6 and 137.3 feet (Figure 3-139). During 2025, Lake Mariana saw a considerable drop in surface level from a February high of 137.6 feet to a November low of 136.4 feet; ending the year below the normal range with an elevation of 136.5 feet. Changes in this lake's level are not correlated with the primary water quality metrics.

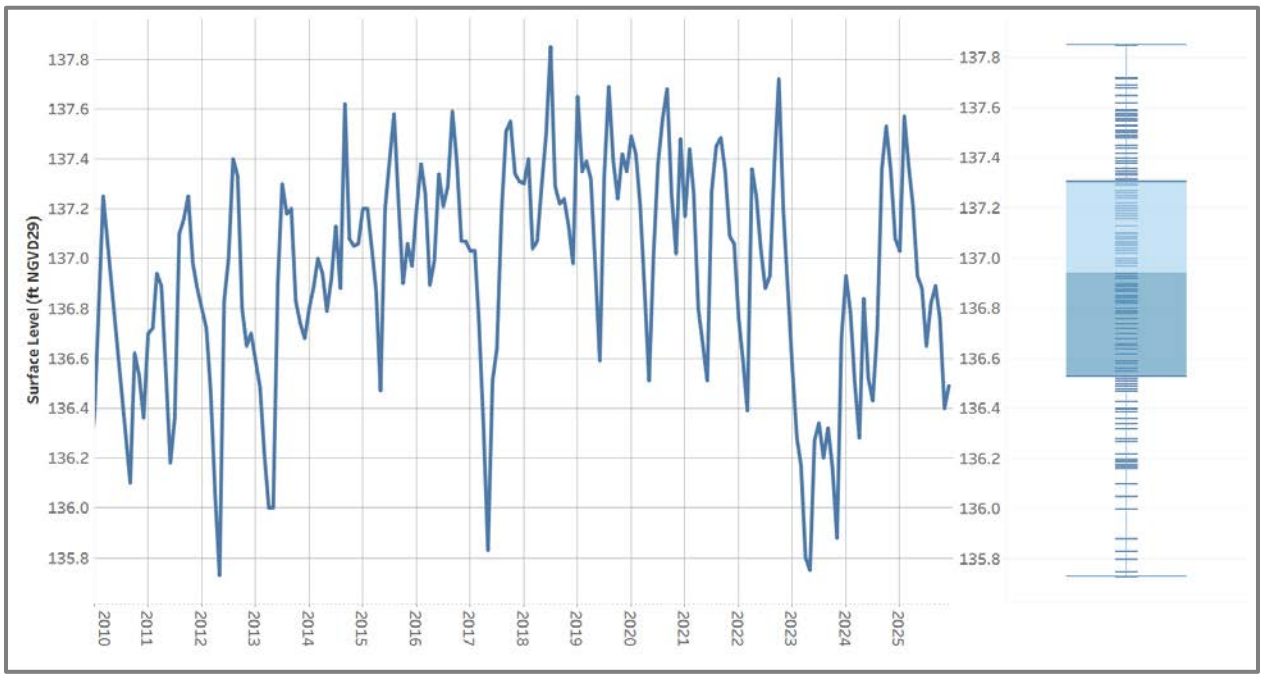


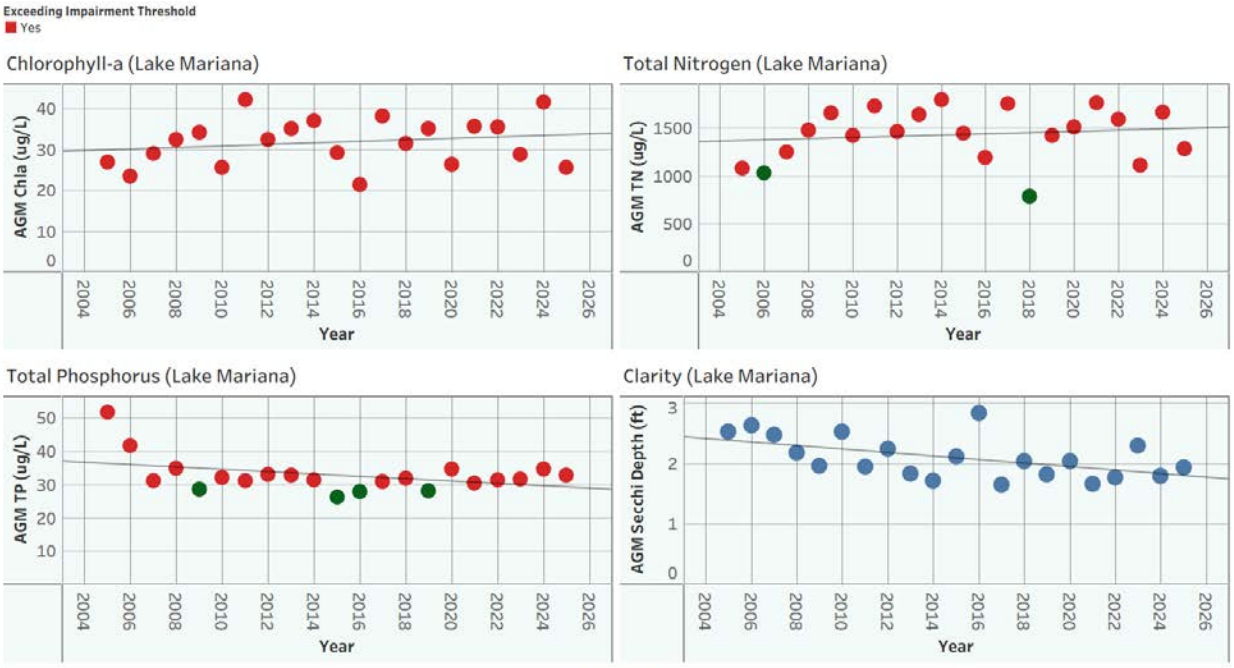
Figure 3-139. Hydrograph of Lake Mariana depicting monthly surface level readings from 2010 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairments:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Mariana is categorized as a clear, alkaline waterbody. Due to numerous, consecutive NNC exceedances during the assessment period, Lake Mariana is considered impaired for Chl-a, TN, and TP (Figure 3-140). This equates to an impairment criterion score of 0. In 2018, the FDEP established a total maximum daily load for this lake, stipulating a 44% reduction in TN loading in order to meet NNC guidelines. It should be noted that while Chl-a and TN concentrations have fluctuated widely over the period of record, TP concentrations have remained relatively static over the last 15 years.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. According to the data, only Secchi depth exhibited a significant deteriorating trend for a score of 0. Chl-a and TN exhibited non-significant deteriorating trends and the TP trend as non-significant in an improving direction—resulting in trend scores of 1, 1, and 2, respectively.



Lake Mariana 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity Decreasing
R Coeff.	0.198	0.141	-0.408	-0.523
P-Value	0.390	0.542	0.067	0.015

Figure 3-140. Lake Mariana AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Mariana on 11/7/2025. The PAC during this survey was 30% and the total BV was 5.5% (Figure 3-141). The 2025 coverage value increased slightly from the previous year, pushing to the abundance threshold for a score of 3. Throughout the monitoring period, Lake Mariana has maintained vegetation coverage between 22% and 31%. Due to its morphology, Lake Mariana has ample habitat space for submerged aquatic vegetation, but low clarity prevents growth in deeper areas of the lake. According to the BV heatmap, the denser vegetation areas are concentrated along the eastern and northwestern shorelines.

Invasive Species Management:

Based on data from the 2025 survey, Lake Mariana was dominated by the native submerged plant: Illinois pondweed; followed by a variety of submerged and emergent plants (Figure 3-143). This is consistent with previous years. Small populations of hydrilla and water hyacinth were the only invasive species detected during 2024. These plants only made up 1% of the community,

resulting in an invasive score of 2. It is important that these plants are managed before they are able to expand in coverage and impact the native plants present.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, two of Lake Mariana's diversity indices met or exceeded their long-term median values—for a diversity score of 2 (Figure 3-142). The species richness and overall diversity indices were slightly higher than long-term averages. Despite the species evenness index being below-average, this fluctuation is consistent with normal changes in the plant community. This inference is supported by the fact that invasive species treatment did not occur since the previous year. Overall, Lake Mariana has a robust and health plant community.

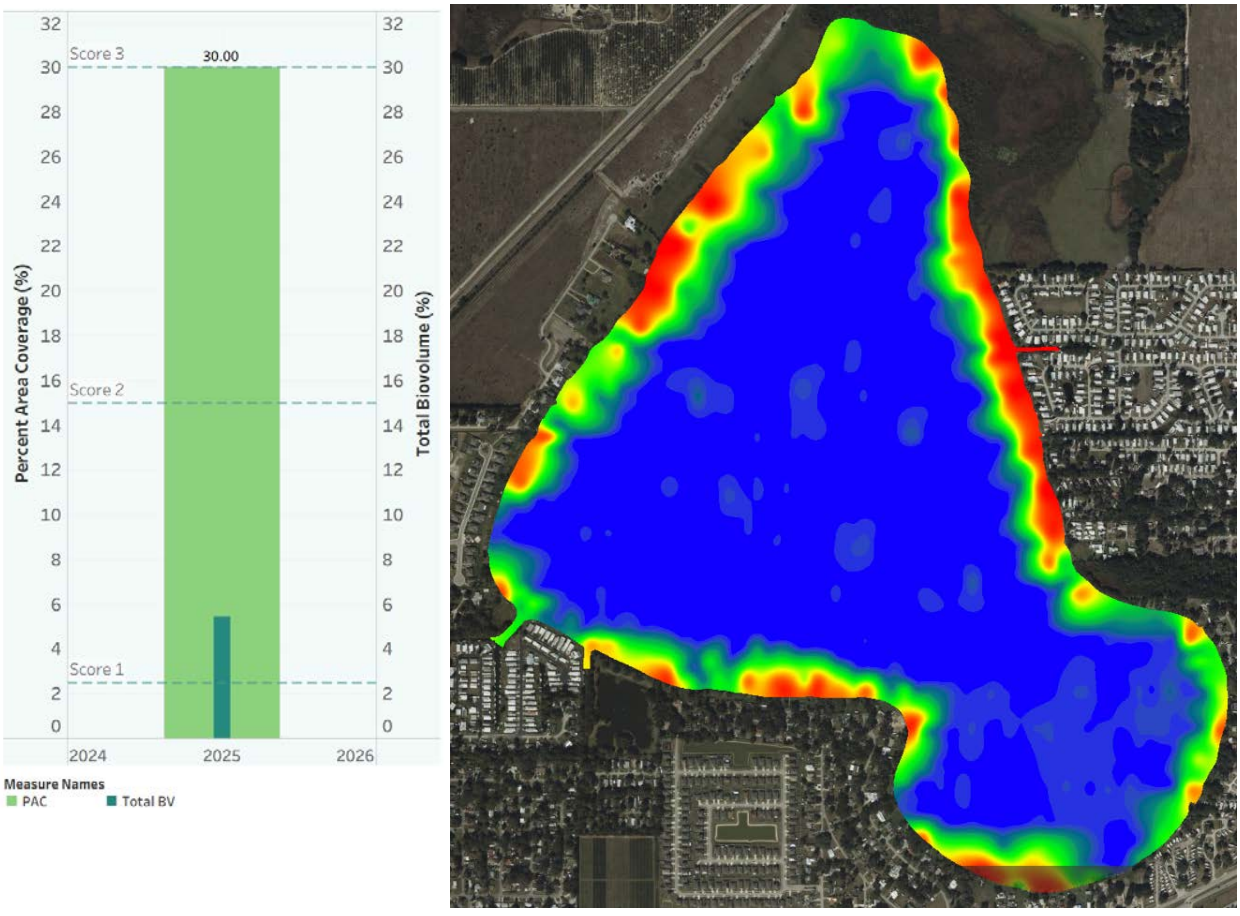


Figure 3-141. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Mariana; biovolume values range from green (lowest) to red (highest).

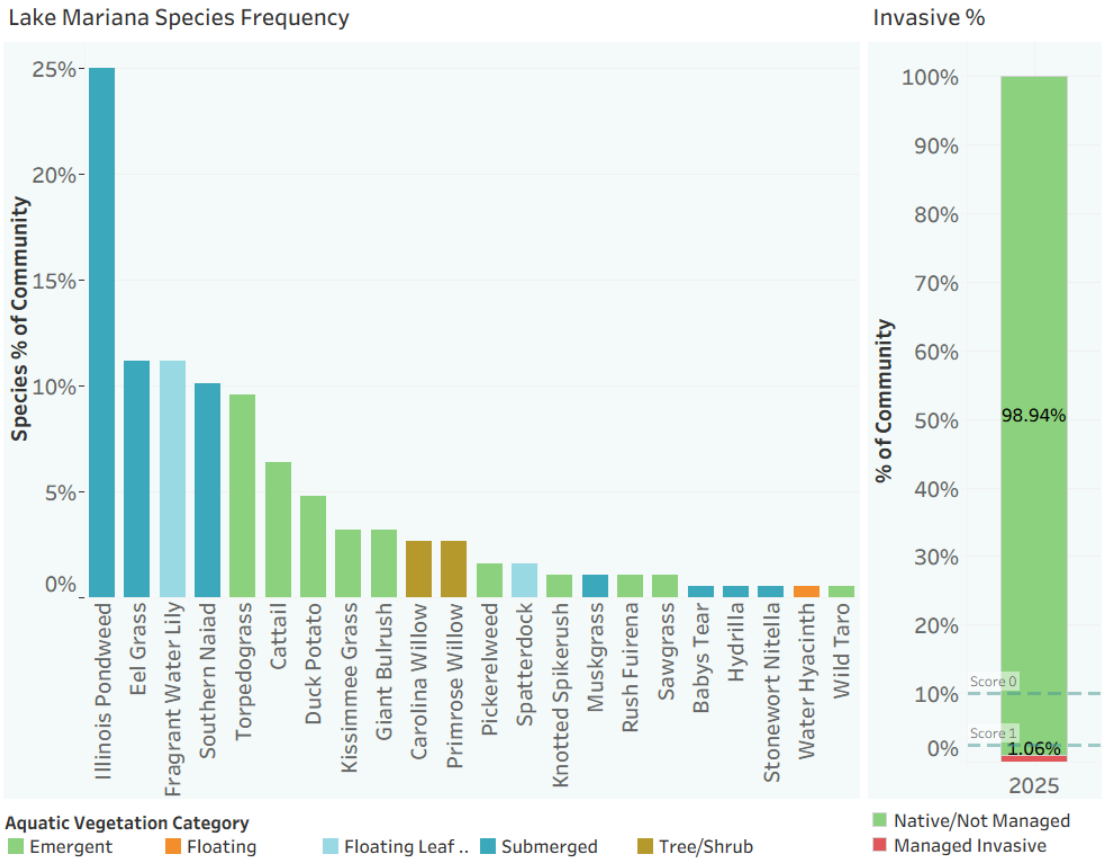


Figure 3-143. Chart depicting species frequency and invasive species percentage of Lake Mariana during 2025.

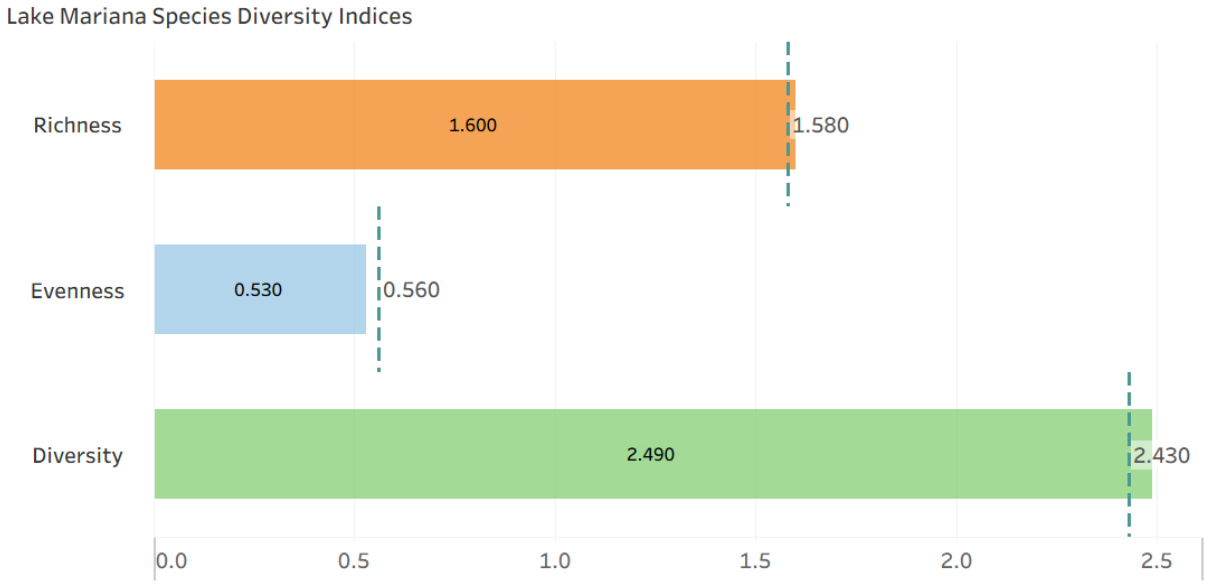


Figure 3-142. Chart depicting 2025 diversity indices for Lake Mariana. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Mariana's health index scores from 2018 to 2025 shows relative consistency (Table 3-20). The impairment scores have remained static over this span and there have been minimal changes to the trend statistics. Vegetation abundance has remained high and invasive presence has remained low. Much of the lake health index variability has been due to fluctuations in vegetation diversity scores. With that, Lake Mariana is not a top priority, but its relatively poor water quality indicates that it may require some corrective management action.

Lake Health Impacts/Challenges:

- The presence of such a high density of OSTDs in the drainage basin is currently one of the larger concerns regarding water quality. That said, stormwater runoff presents another form of pollutant loading to the lake.
- While invasive species aren't currently an issue, management of these is a consistent concern. It can only take a single growing season for even a small population to take over large areas of a waterbody.
- One major potential challenge in managing Lake Mariana is the coordination and collaboration between the various municipalities responsible for it. Unfortunately, many of the OSTDs in the basin aren't within the Winter Haven limits. Management efforts will require strong direction to implement basin-wide improvements.

Lake Management Strategy:

- The City plans to provide what support it can to manage the water quality issues in this basin. This may involve exploring source analysis of the nutrients in the water to identify the cause of water quality deterioration. Staff will also advocate for septic-to-sewer conversions where appropriate.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	1	2	1	2	2	1	**1.3**
2019	0	1	1	2	0	2	3	2	**1.4**
2020	0	1	1	2	0	2	3	1	**1.3**
2021	0	1	1	2	0	2	2	2	**1.3**
2022	0	0	0	3	0	2	3	1	**1.1**
2023	0	1	1	3	0	3	3	2	**1.6**
2024	0	1	1	3	0	2	3	0	**1.3**
2025	0	1	1	2	0	3	2	2	**1.4**

Table 3-20. Lake health index scores for Lake Mariana from 2018 to 2025.

Lake Martha

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	0	1	1	0	0	3	1	1.1

Features & Statistics:

Surface area	82.5 acres
Mean depth	10.21 feet
Maximum depth	19 feet
Volume	1,141.8 acre-feet
Drainage basin area	307.5 acres
Annual TN Load	1,217.1 lbs
Annual TP Load	199.1 lbs
Limiting nutrient	Phosphorus

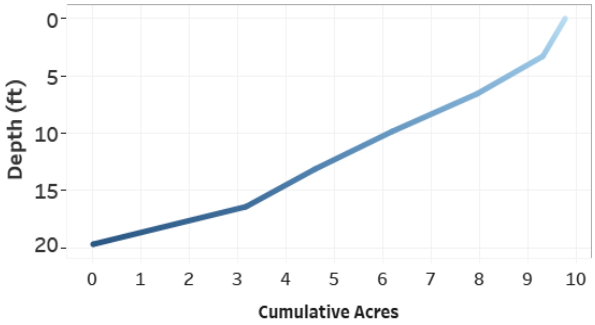


Figure 3-144. Hypsograph of Lake Martha depicting the depth profile and morphology of the lake bed.

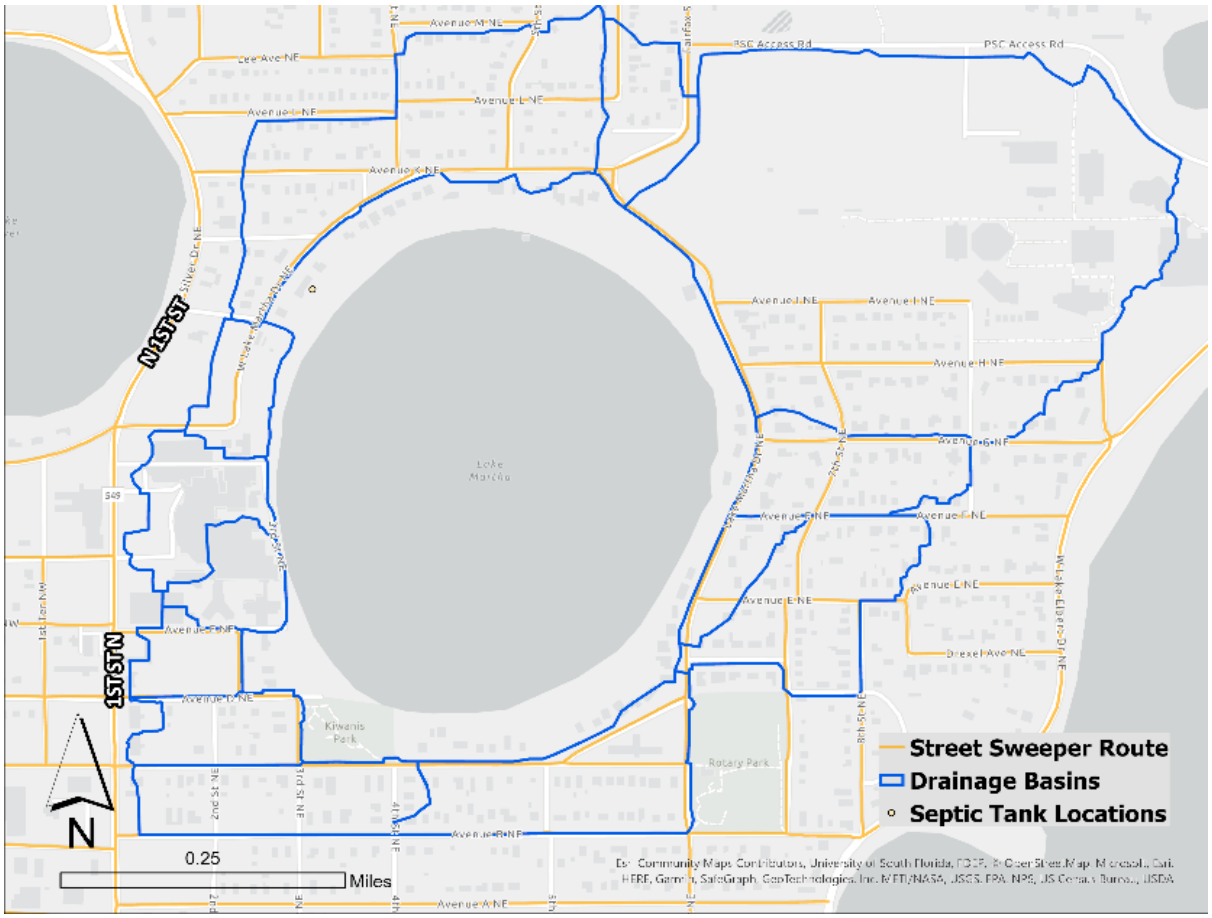


Figure 3-145. Map of Lake Martha's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Martha is a smaller, but deeper waterbody at 82 acres, an average depth of 10.2 feet, and a maximum depth of about 20 feet (Figure 3-146). This lake morphology is indicative of a classic sinkhole lake. Despite Martha's average depth being almost two feet deeper than the regional mean lake depth, the slope of its lake bed should still support a healthy abundance of aquatic vegetation. Stormwater is conveyed to this waterbody from a 307 acre drainage basin comprised of 14 individual sub-basins (Figure 3-145). Located in a mostly residential area, the primary land uses in this basin are medium density residential and institutional (e.g. schools). This basin contributes 1,217 lbs of TN and 199 lbs of TP to the lake annually; which ranks 13th out 37 lakes on a loading per acre basis. The City combats the local stormwater pollutant loading by conducting 7.15 miles of street sweeping in this basin per month.

In the heart of downtown Winter Haven, Lake Martha receives overflow from Lake Silver and discharges excess water to Lake Maude. Martha's surface elevation sits near the top of the Peace Creek watershed. Over its period of record, Lake Martha's surface level has fluctuated between 136.7 and 142.6 feet above sea level. The normal range is much narrower—between 139.7 and 141.2 feet (Figure 3-146). During 2025, Lake Martha's surface level dropped to a dry-season low of 140.5 feet in May and rose to a wet season high of 142.1 feet in July. The surface level ended the year above the normal range at 141.9 feet. Based on linear regression analysis, Chl-a rises as Lake Martha's surface level increases; which is opposite to what would be expected. This correlation is most likely coincidental and has minimal impact on management efforts.

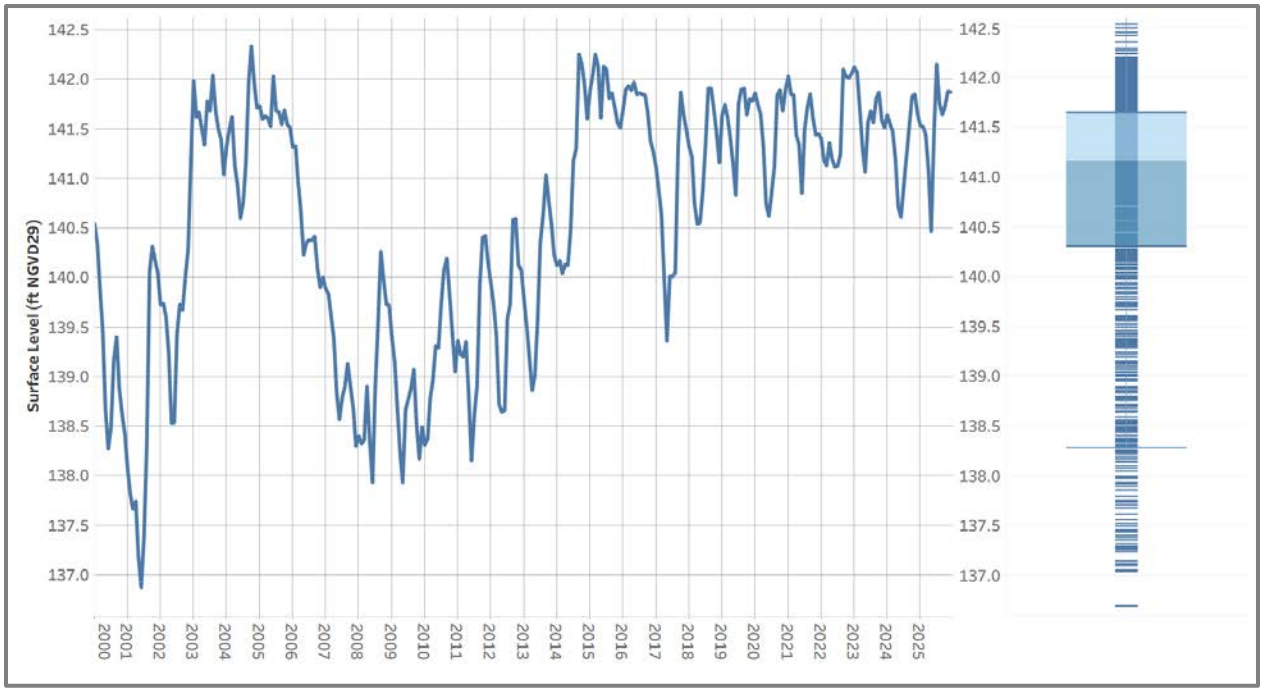


Figure 3-146. Hydrograph of Lake Martha depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

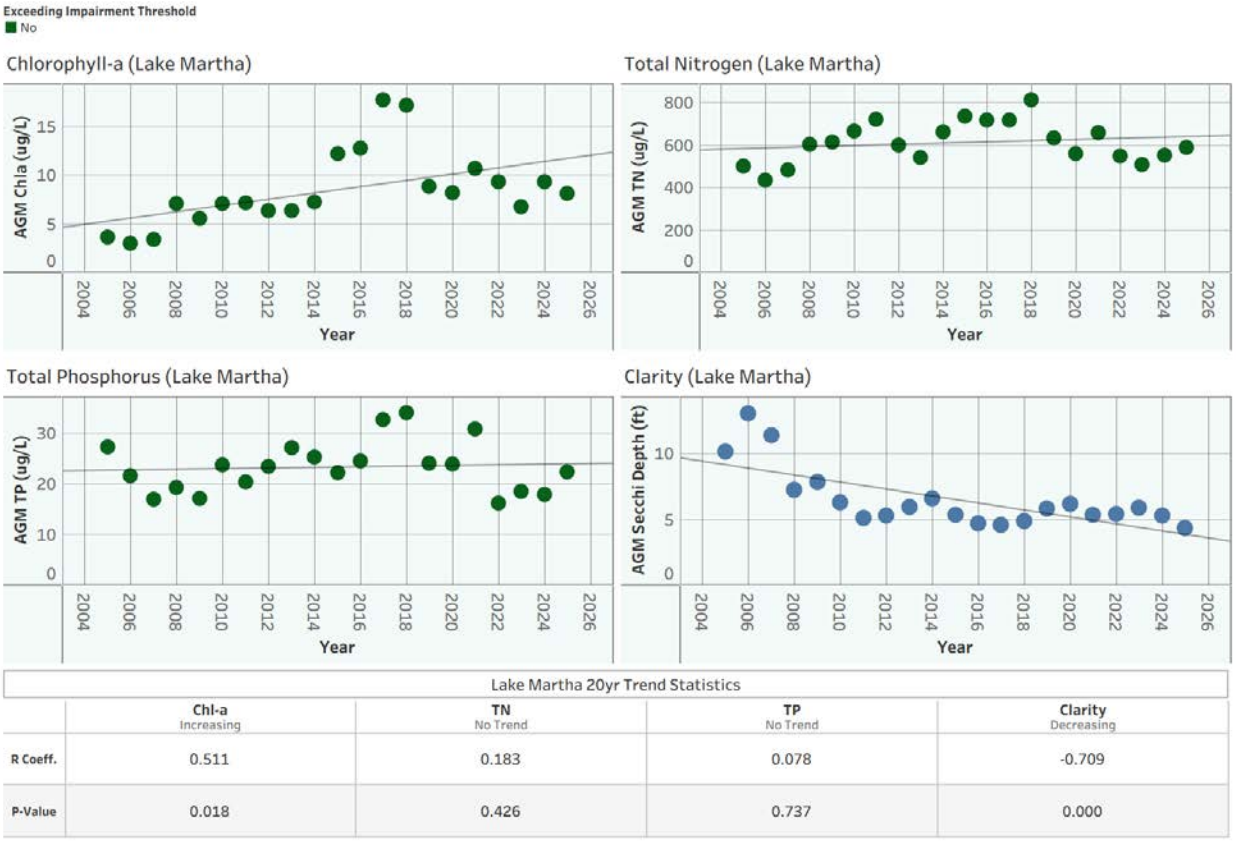
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Martha is categorized as a clear, alkaline waterbody. Throughout recent monitoring, Lake Martha has not exhibited any NNC exceedances in Chl-a, TN, or TP (Figure 3-147). This equates to an impairment score of 3. It should be noted that these parameters have remained relatively low

since 2019. If these low concentrations continue, it could shift Lake Martha's trends into a positive direction.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. According to the data, Chl-a and Secchi depth exhibited significant deteriorating trends. These equate to trend criteria scores of 0. The TN and TP trends, while in a deteriorating direction, were not significant—earning scores of 1. This is consistent with the trends exhibited during the previous report year. Over the short term, these parameters have remained relatively static, with not significant upward or downward movement. This indicates that Martha's water quality is somewhat stable, with minimal likelihood of impairment in the near future.



Lake Martha 20yr Trend Statistics

	Chl-a Increasing	TN No Trend	TP No Trend	Clarity Decreasing
R Coeff.	0.511	0.183	0.078	-0.709
P-Value	0.018	0.426	0.737	0.000

Figure 3-147. Lake Martha AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Martha on 7/3/2025. The PAC during this survey was 0.5% and the total BV was 0.16% (Figure 3-148). These extremely low abundance values equate to a score of 0. A review of Lake Martha's abundance scores from 2018 to 2024 shows a consistent lack of vegetation coverage and biovolume. While the lake bed steeply slopes into deeper water, its relatively high water clarity should support much more vegetation than is currently present. The reason for this lack of aquatic plants still remains unclear. The City attempted to plant some native SAV species near the Martha boat ramp in 2024, but grazing by waterfowl and grass carp led to a lack of survival.

Invasive Species Management:

Based on data from the 2025 survey, emergent plant species dominated the community with torpedograss exceeding all other species by far (Figure 3-150). While there are several exotic species present, they aren't considered invasive enough to warrant active management. The result is an invasive presence criterion score of 3. The lack of submerged vegetation is much more concerning since this lake should support it. The leading theory for this lack of abundance is that grass carp were stocked in the 2010s in an effort to biologically control hydrilla in the lake. The density of carp was likely higher than needed and this population has since denuded the lake of SAV and prevented its subsequent growth and reintroduction via planting.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, two of Lake Martha's three diversity indices failed to meet or exceed their long-term median values—resulting in a diversity score of 1 (Figure 3-149). Species richness decreased slightly from the previous year, while species evenness experienced an increase. Since the evenness index increase exceeded the richness decrease, the overall diversity index value slightly increased from the previous year. Since there are no managed invasive species present, these changes have occurred due to natural fluctuations in the community.

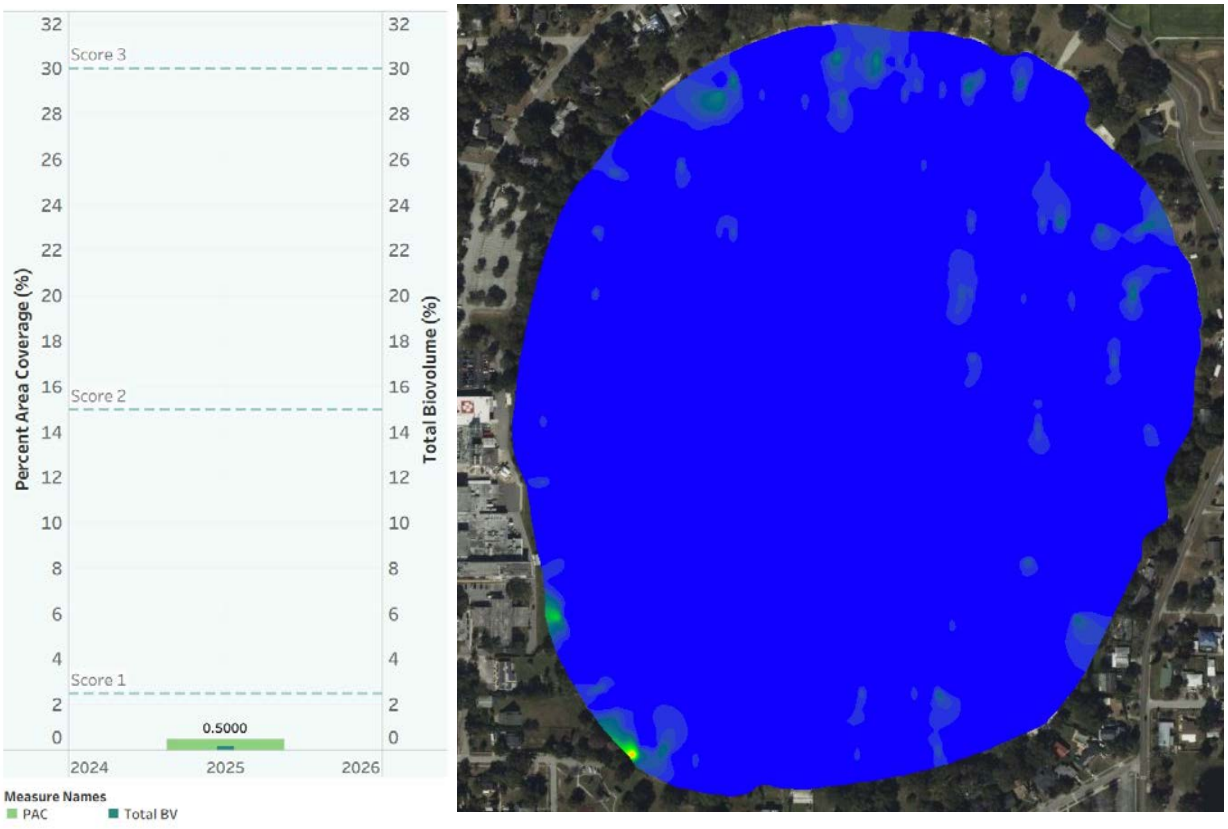


Figure 3-148. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Martha; biovolume values range from green (lowest) to red (highest).

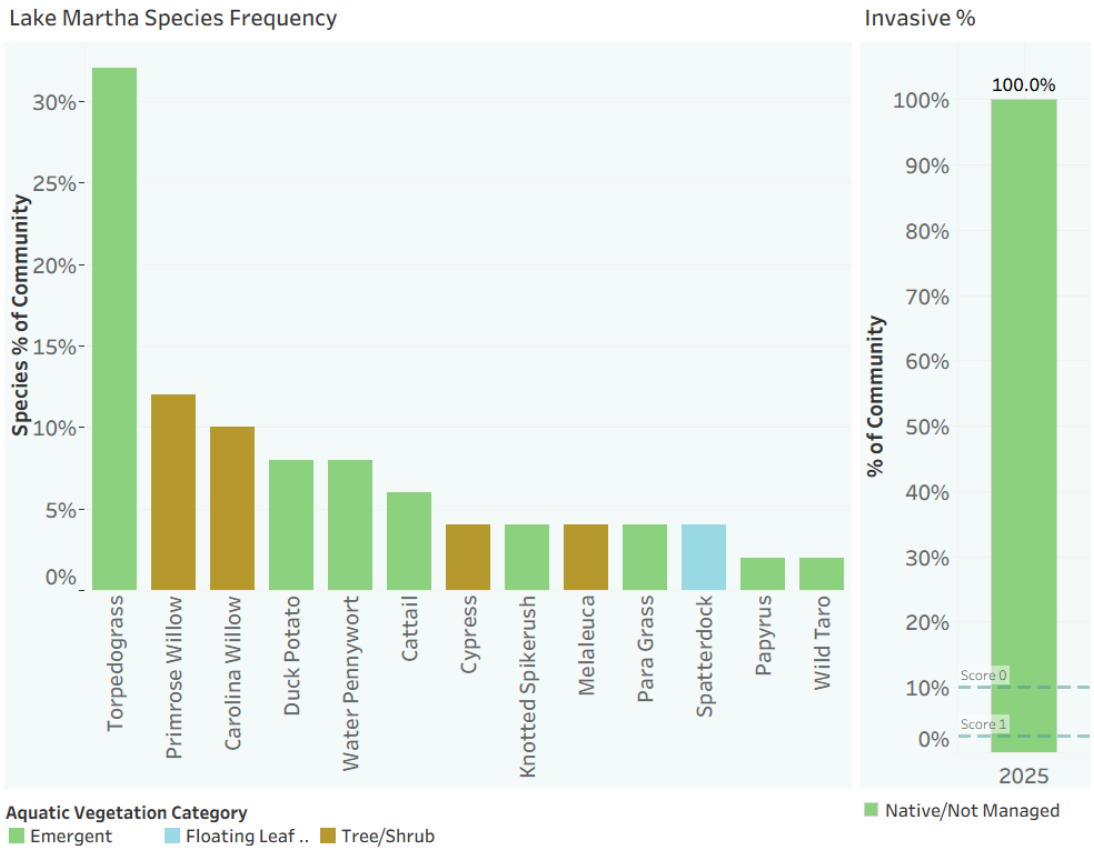


Figure 3-150. Chart depicting species frequency and invasive species percentage of Lake Martha during 2025.

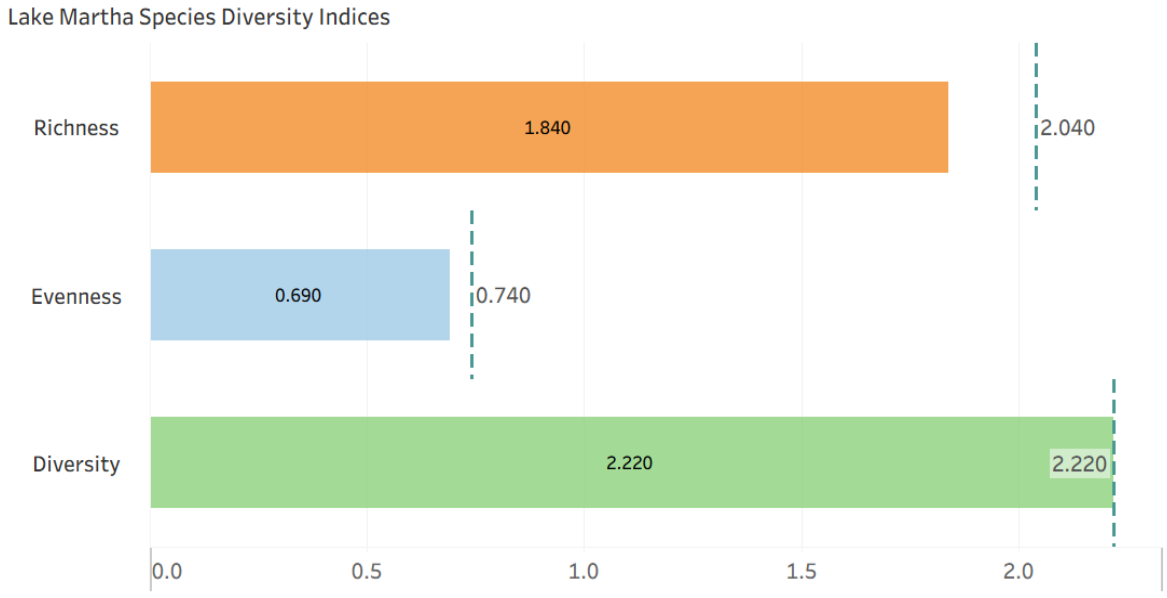


Figure 3-149. Chart depicting 2025 diversity indices for Lake Martha. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Martha's health index scores from 2018 to 2025 shows relative consistency (Table 3-21). Since the City began documenting lake health, Lake Martha has exhibited no changes in impairment but has undergone some positive changes in the trend scores. Vegetation abundance and invasive presence have remained consistently low. The diversity scores have contributed most to overall health scores over time. Ultimately, introducing SAV to the lake would help to improve water quality trends and set Martha on a positive trajectory.

Lake Health Impacts/Challenges:

- Despite Lake Martha not being impaired, its water quality trends are concerning. Stormwater pollutant loading from the surrounding drainage basin is one of the City's primary management concerns for combating these water quality issues.
- A healthy, robust vegetation community is considered to provide a buffer against changes in water quality from increased nutrient loading. The lack of submerged vegetation and overall abundance is a concern. However, efforts to increase vegetation abundance through planting are curtailed by the presence of grass carp in the waterbody.
- In 2019, Lake Martha experienced a diesel fuel spill. While likely not a contributor to increased Chl-a or nutrient concentrations, this event led to a significant ecological disturbance. Fortunately, remediation efforts were successful at removing petroleum from the lake.

Lake Management Strategy:

- Implementing stormwater infrastructure improvements to address the water quality trends is an ongoing goal.
- With the majority of the drainage basin comprised of residential housing, public education and outreach is a valid management strategy. These efforts aim to increase residents' knowledge of best stormwater practices and ways they can individually reduce their pollutant load.
- City staff have explored habitat restoration via vegetation planting initiatives. However, the presence of grass carp poses a significant roadblock to successful implementation. Staff will continue to monitor vegetation and work with the FWC to track the presence of grass carp until such a time that planting becomes a viable solution.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	0	0	0	0	0	3	0	**0.8**
2019	3	0	0	0	0	1	2	3	**1.1**
2020	3	0	0	0	0	1	3	1	**1.0**
2021	3	0	0	0	0	1	3	2	**1.1**
2022	3	0	1	0	0	1	3	2	**1.3**
2023	3	0	1	1	0	1	3	2	**1.4**
2024	3	0	1	1	0	1	3	0	**1.1**
2025	3	0	1	1	0	0	3	1	**1.1**

Table 3-21. Lake health index scores for Lake Martha from 2018 to 2025.

Lake Maude

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	2	2	3	2	3	2.6

Features & Statistics:

Surface area	51 acres
Mean depth	8.18 feet
Maximum depth	14 feet
Volume	413.4 acre-feet
Drainage basin area	385.75 acres
Annual TN Load	1,900.5 lbs
Annual TP Load	320.03 lbs
Limiting nutrient	Co-limited (N & P)

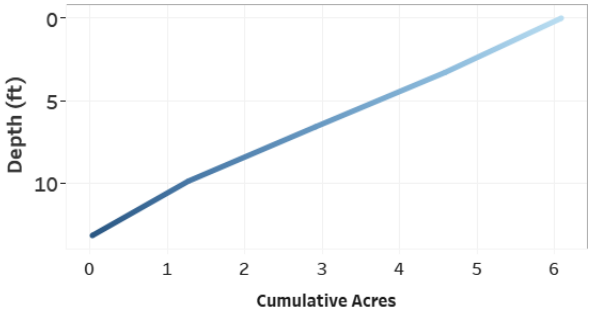


Figure 3-151. Hypsograph of Lake Maude depicting the depth profile and morphology of the lake bed.

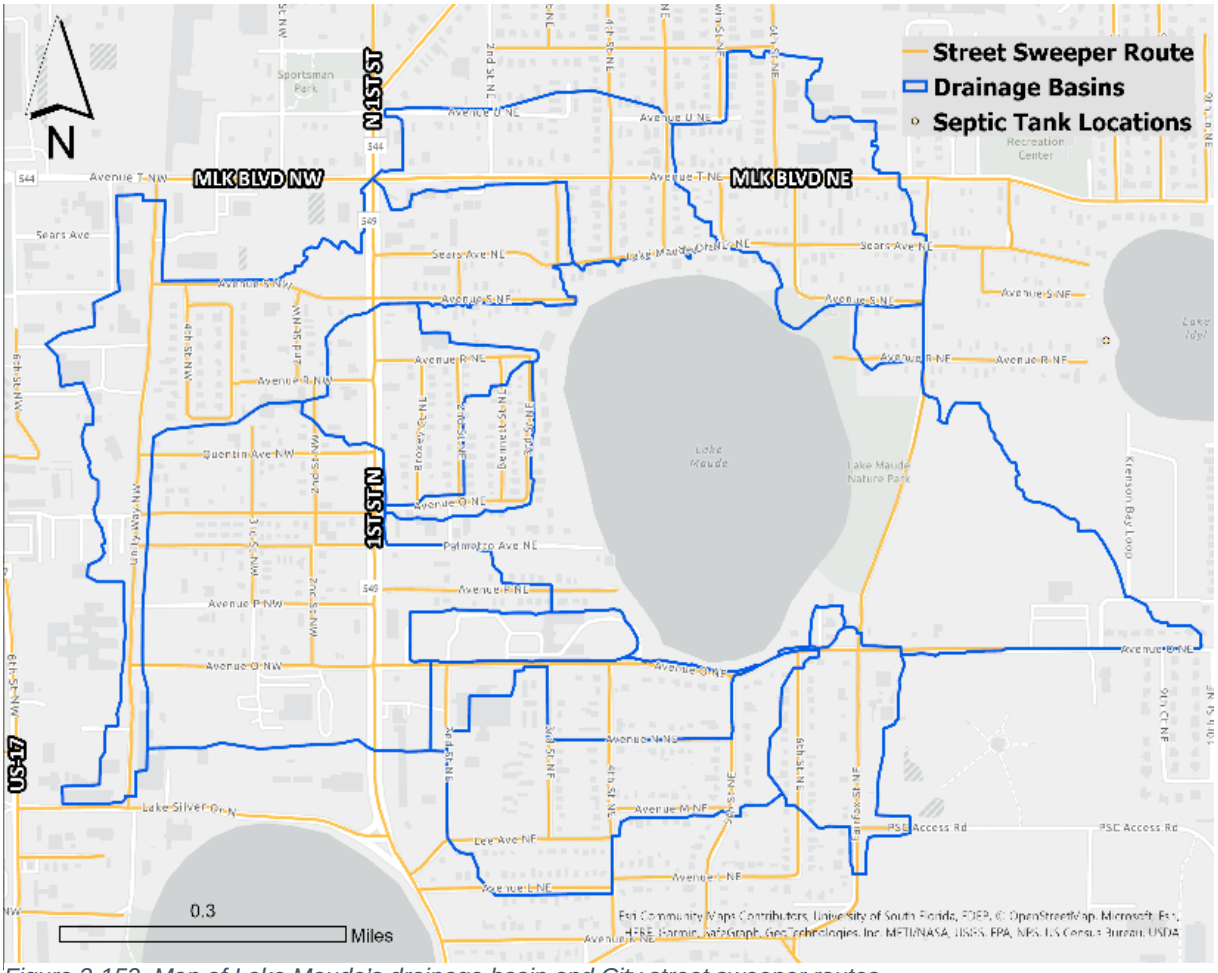


Figure 3-152. Map of Lake Maude's drainage basin and City street sweeper routes.

Hydrology:

Lake Maude is a smaller waterbody at 51 acres, an average depth of 8.2 feet, and a maximum depth of 14 feet in deeper areas (Figure 3-151). The shallowness of the lake provides ample habitat for aquatic vegetation to grow. Stormwater is conveyed to this waterbody from a 385 acre drainage basin, comprised of 14 individual sub-basins (Figure 3-152). The primary land uses within this basin include residential, recreational, and commercial—contributing 1,900 lbs of TN and 320 lbs of TP to the lake annually. These pollutant loads rank very high on a per acre basis. To combat stormwater pollutant loading, the City conducts 15.7 miles of street sweeping in this basin on a monthly frequency.

Lake Maude is near to Winter Haven's downtown, receiving excess water from Lake Martha and discharging overflow to Lake Idyl. The mean surface elevation for the lake sits relatively high in the entire Peace Creek watershed. Over its period of record, Lake Maude's surface level has fluctuated between 136 and 140.9 feet above sea level. The normal range is much narrower—between 138.9 and 139.5 feet (Figure 3-153). During 2025, Lake Maude dropped to a dry season low of 138.9 feet in May then rose to a wet season peak of 139.9 feet in November. The surface level ended the year near the high end of its normal range at 139.8 feet. Changes in Lake Maude's surface level are weakly correlated with TN (see appendix). This carries some management considerations as maintaining higher surface levels should result in a decrease in TN concentrations.

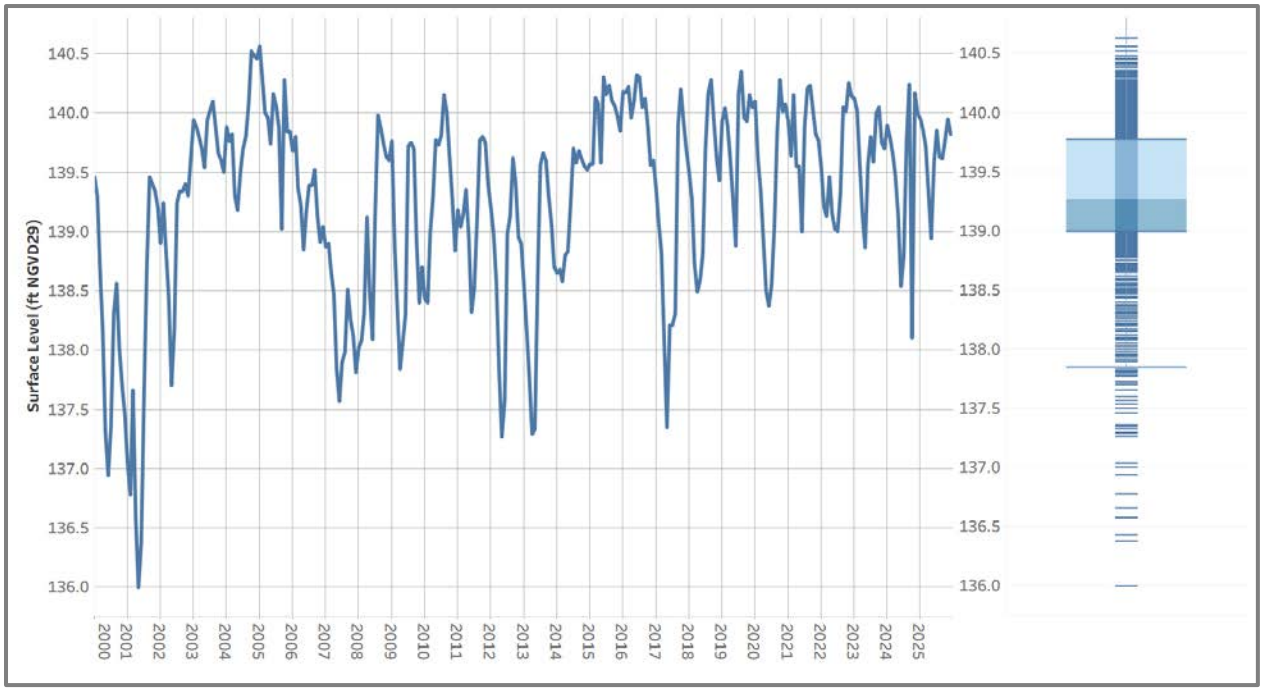


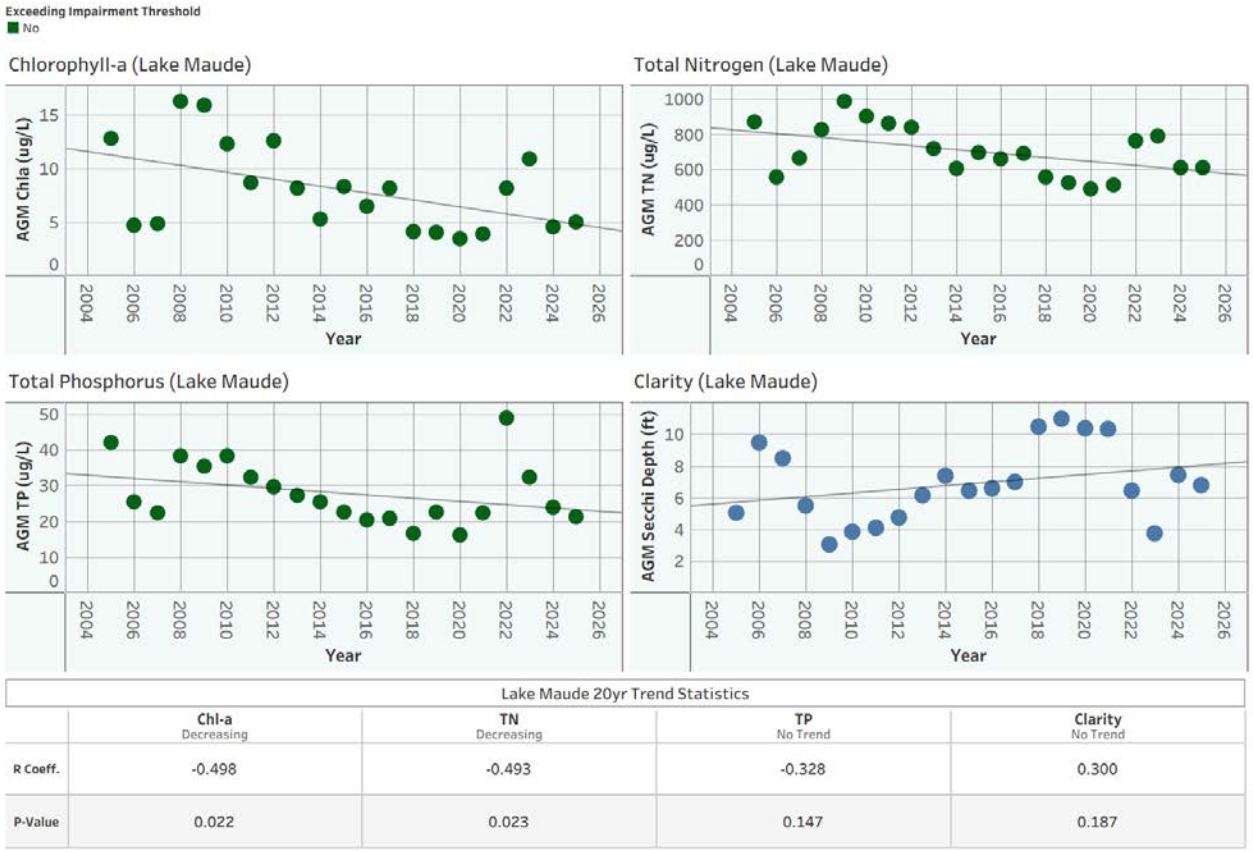
Figure 3-153. Hydrograph of Lake Maude depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Maude is categorized as a clear, alkaline waterbody. Lake Maude has not exhibited any NNC exceedances during the assessment period (Figure 3-154). This equates to an impairment criterion score of 3. While the 2023 water quality parameters were poorer than usual, in 2024 these returned to more normal and preferable levels.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the data, Chl-a and TN exhibited significant improving trends—earning trend criteria score of 3. Lake Maude's TP and Secchi depth trends, while not statistically significant, are also moving in a positive direction. This equates to trend criterion scores of 2. While Secchi depth was previously trending upward, the recent change to the statistical significance indicates that some recent activities have negatively impacted water clarity. This is something to monitor, but is not a an inherently concerning shift.



Lake Maude 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity No Trend
R Coeff.	-0.498	-0.493	-0.328	0.300
P-Value	0.022	0.023	0.147	0.187

Figure 3-154. Lake Maude AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Maude on 1/29/2025. The PAC during this survey was 64.3% and the total BV was 6% (Figure 3-155). This equates to a vegetation abundance criterion score of 3. After the previous year, Lake Martha's vegetation abundance exhibited a significant increase. However, coverage still remains lower than what it has been historically; with PAC values above 90% from 2018 to 2021. This recent decline in vegetation abundance could explain the lower water clarity values in the last few years.

Invasive Species Management:

Based on the data from the 2025 survey, Lake Maude's vegetation community was dominated by submerged species (Figure 3-157). Coontail and southern naiad made up over 40% of the community. The remaining vegetation types include an even mix of submerged and emergent

plants. Regarding managed invasive species, hydrilla made up 2.4% of the total population. This equates to an invasive presence criterion score of 2 and constitutes a slight decrease from the previous year. While currently in a managed state, the presence of invasives requires constant management to keep under control.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Maude's diversity indices met or exceeded their long-term median values (Figure 3-156). This equates to a diversity criterion score of 3. Since the previous year, species richness and overall diversity exhibited a slight decrease while species evenness experienced a marginal increase. It can be inferred that at least a portion of these changes have been the result of invasive plant management efforts. However, these diversity changes were not dramatic and could also be the result of natural community fluctuations.

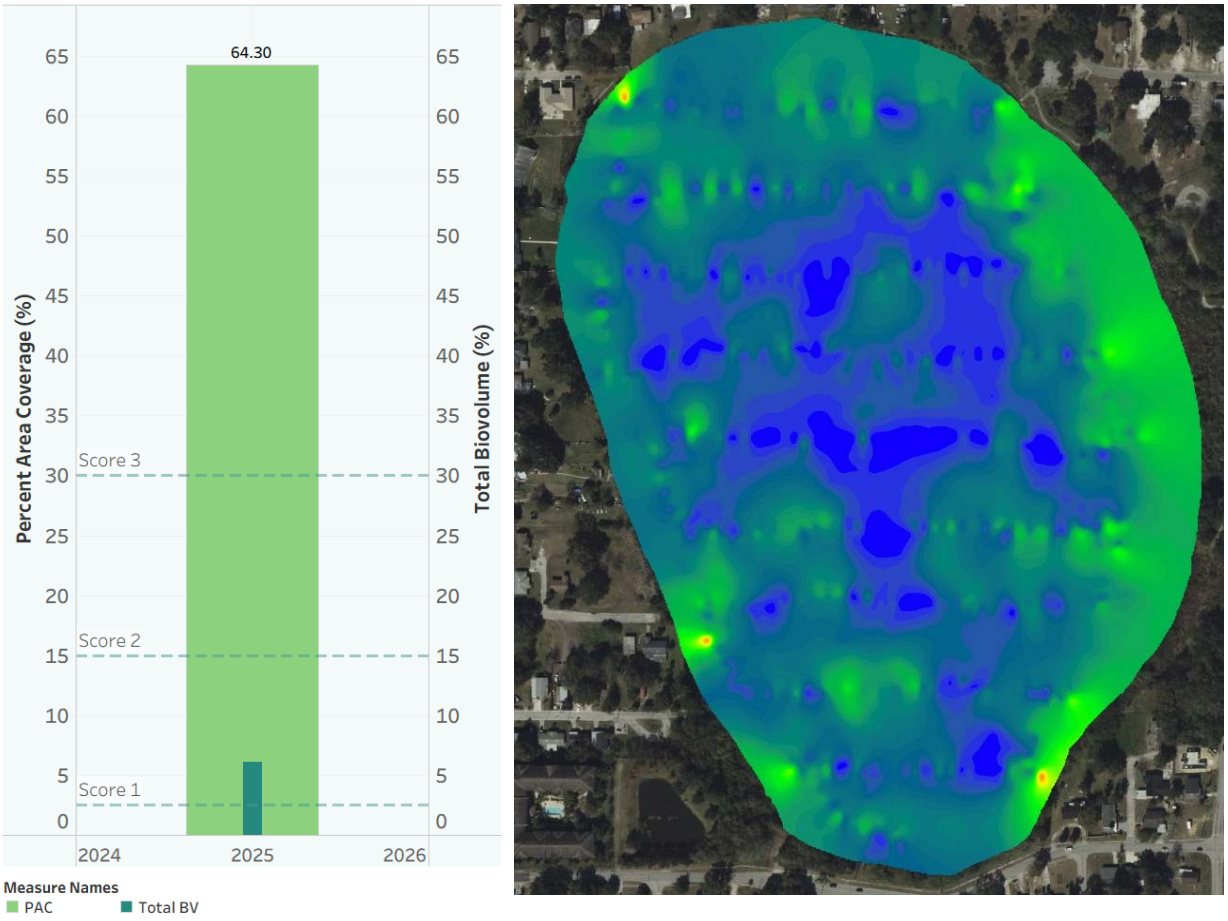


Figure 3-155. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Maude. Biovolume values range from green (lowest) to red (highest).

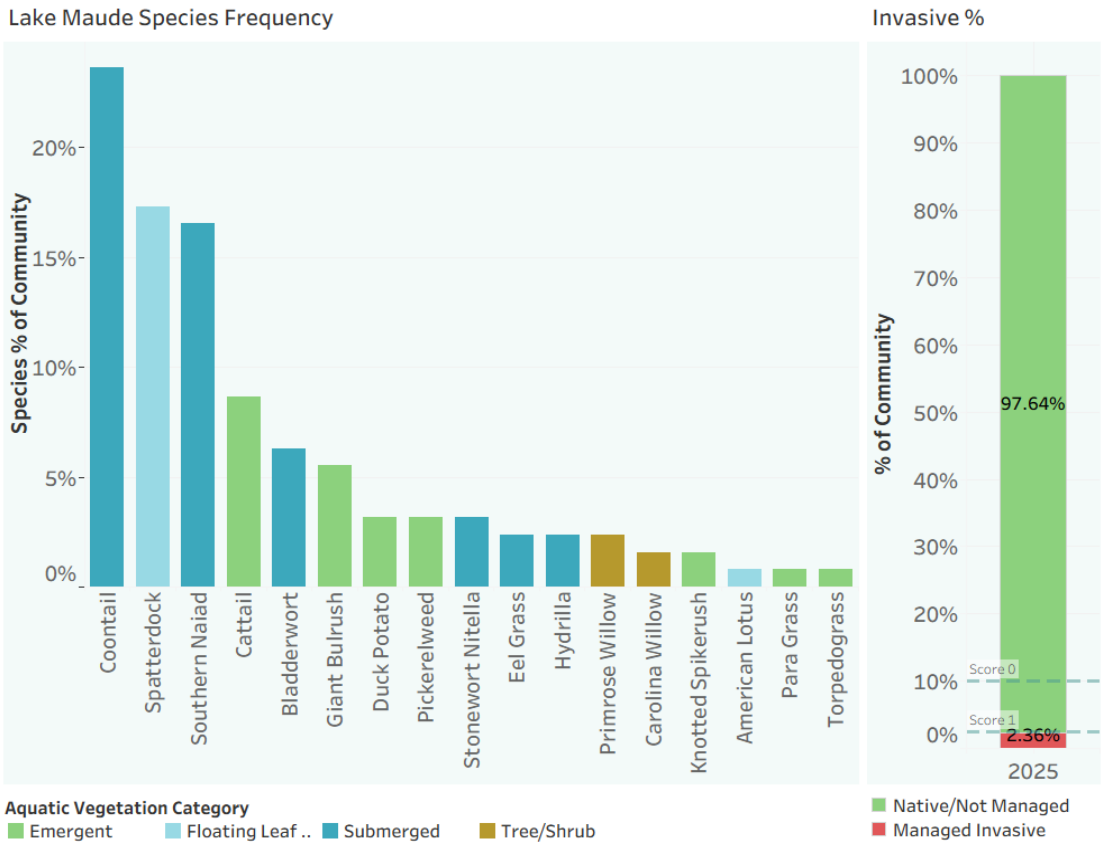


Figure 3-157. Chart depicting species frequency and invasive species percentage of Lake Maude during 2025.

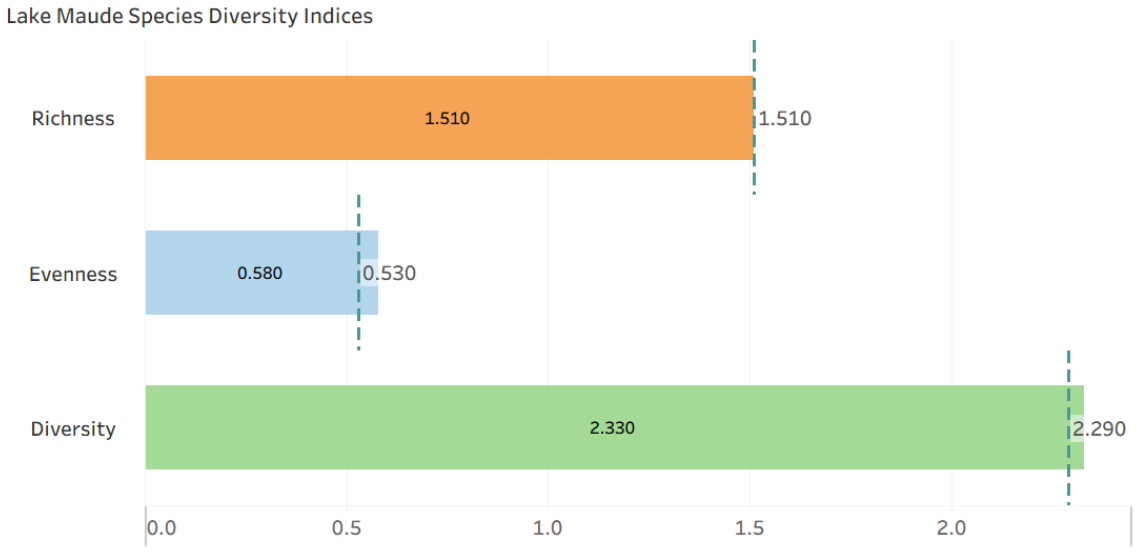


Figure 3-156. Chart depicting 2025 diversity indices for Lake Maude. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Maude's health index scores from 2018 to 2025 shows relatively good and stable lake health with scores from 2.4 to 2.8 (Table 3-22). Throughout the monitoring period, water quality impairment, trends, and vegetation abundance have remained largely positive. However, there have been some minor changes in the statistical significance of the TP and Secchi depth trends. The majority of the score changes are from the invasive species presence and species diversity scores. This is to be expected as invasive plant populations expand and are treated. Overall, Lake Maude falls lower on the priority ranking due to its excellent water quality and robust vegetation community.

Lake Health Impacts/Challenges:

- Lake Maude currently exhibits excellent water quality. However, stormwater pollutant loading is a potential concern if water quality trends begin to deteriorate.
- The management of invasive species like burhead sedge and hydrilla is a consistent concern. It can only take a single growing season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- The City already mitigates quite a bit of stormwater pollutant loading through extensive street sweeping as well as the construction and maintenance of the Lake Maude Stormwater Treatment Park—a form of green stormwater infrastructure.
- With so much residential housing in the basin, public education and outreach is another viable strategy. Education aims to increase residents' knowledge of best stormwater practices and ways they can individually reduce their pollutant load.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	2	3	3	1	3	**2.6**
2019	3	3	3	2	3	3	1	1	**2.4**
2020	3	3	3	3	3	3	2	1	**2.6**
2021	3	3	3	3	3	3	1	0	**2.4**
2022	3	3	3	2	3	3	2	3	**2.8**
2023	3	3	3	2	2	3	1	2	**2.4**
2024	3	3	3	2	2	3	2	3	**2.6**
2025	3	3	3	2	2	3	2	3	**2.6**

Table 3-22. Lake health index scores for Lake Maude from 2018 to 2025.

Lake May

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	3	3	3	3	1	2	2.3

Features & Statistics:

Surface area	50.5 acres
Mean depth	5.28 feet
Maximum depth	10 feet
Volume	196 acre-feet
Drainage basin area	353.6 acres
Annual TN Load	1,732.7 lbs
Annual TP Load	292.9 lbs
Limiting nutrient	Co-limited (N & P)

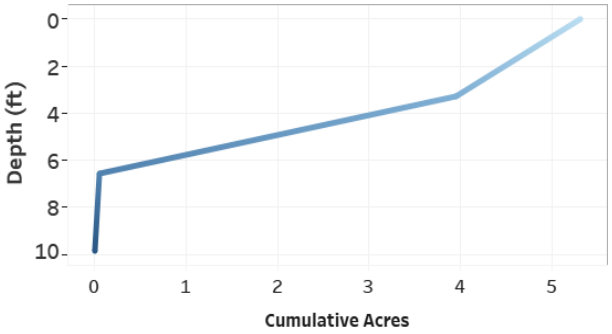


Figure 3-158. Hypsograph of Lake May depicting the depth profile and morphology of the lake bed.

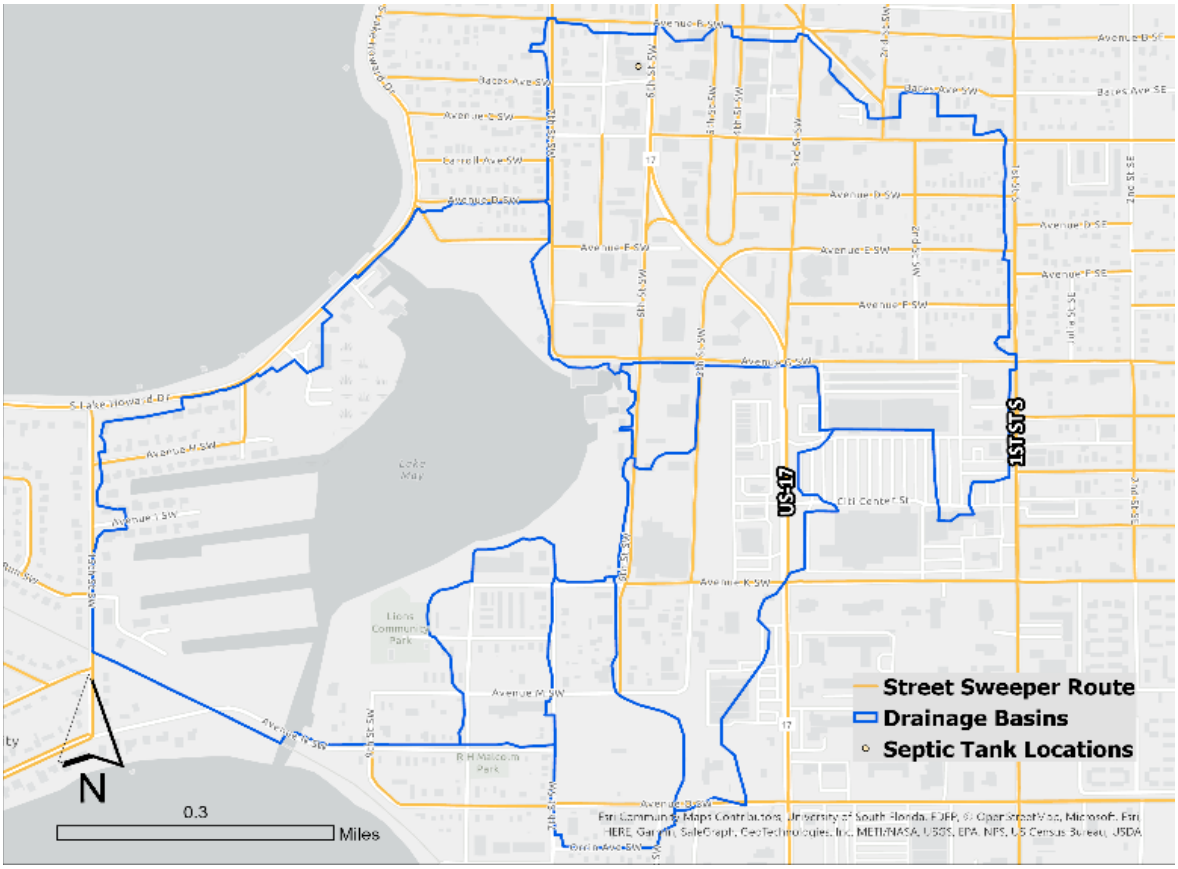


Figure 3-159. Map of Lake May's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake May is a small and shallow waterbody with a surface area of 50 acres, an average depth of 5.3 feet, and a maximum depth of around 10 feet (Figure 3-158). Lake May's shallowness coupled with its high boat traffic means that it likely has low water clarity and poorer water quality due in part to the increase suspended solids. That said, the shallowness of the lake supports an abundance of aquatic vegetation. Stormwater is conveyed to this waterbody from a 353 acre urbanized drainage basin comprised of six individual sub-basins Figure 3-159). The basin is comprised of commercial, industrial, and residential land uses that contribute 1,733 lbs of TN and 293 lbs of TP to the lake annually. On a per acre basis, these pollutant loads rank Lake May 4th out of 37 lakes. To mitigate stormwater nutrient loads, the City conducts 27.3 miles of street sweeping services within the drainage area on a monthly basis and an alum injection system to treat runoff from Lake May's primary drainage sub-basin.

Lake May is centrally located on the South Chain with navigable canals leading to Lake Howard and Lake Shipp. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-160). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake May's surface level correlate with Chl-a, TN, TP, and clarity (see appendix). This carries management implications as an increase in levels should result in improved water quality across the board.

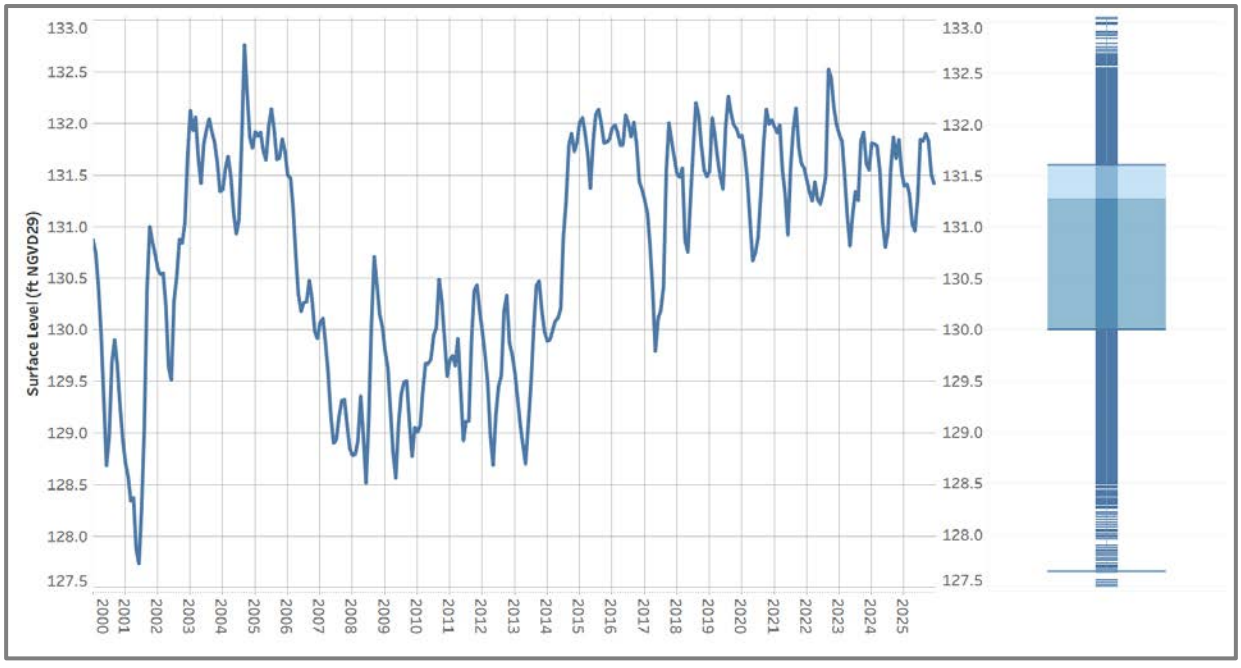


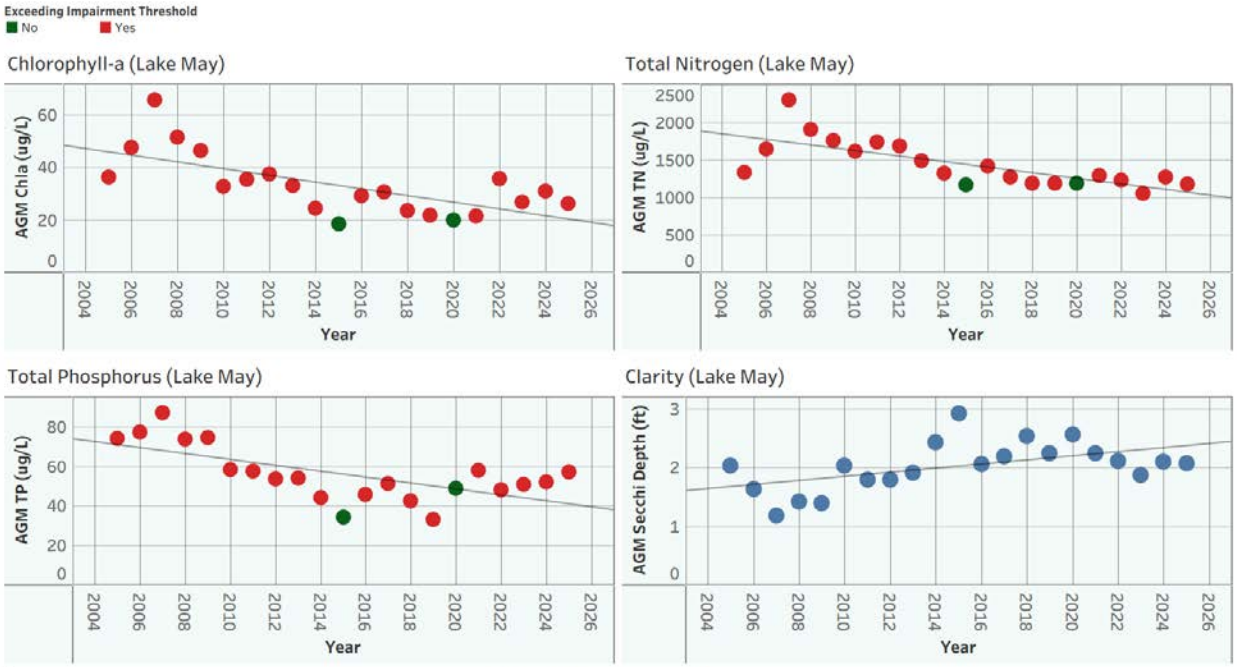
Figure 3-160. Hydrograph of Lake May depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake May is categorized as a clear, alkaline waterbody. Due to numerous consecutive NNC exceedances during the assessment period, Lake May is considered impaired for Chl-a, TN, and TP (Figure 3-161). This equates to an impairment criterion score of 0. In 2019, the FDEP established a total maximum daily load for Lake May, stipulating a 44% TN and 57% TP reduction to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Based on the data, each of Lake May's water quality parameters exhibited significant improving trends. The result is trend criteria scores of 3 for each of these parameters. Over time, with continued improving trends, Lake May should begin to meet the NNC impairment guidelines and exhibit much better water quality than when monitoring began.



Lake May 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.675	-0.743	-0.652	0.521
P-Value	0.001	0.000	0.001	0.015

Figure 3-161. Lake May AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake May on 5/17/2025. The PAC during this survey was 56.1% and the total BV was 22.2% (Figure 3-162). This equates to an abundance criterion score of 3. Lake May has traditionally maintained a high vegetation abundance. Its shallow depth and gradually sloping lake bed lend itself well to a wide littoral zone. This has occasionally raised navigation concerns in the past as over 50% of the surface is occupied by

aquatic plants. Striking a balance between ecology and recreation is one of the City's management goals for this waterbody, but for now the navigational lanes remain open and usable.

Invasive Species Management:

Based on the 2025 survey, the floating-leaf plant spatterdock was the most dominant species in the lake (Figure 3-164). This was followed by a healthy mix of submerged and emergent species. With the amount of boat traffic and commercial land uses surrounding this lake, invasive species have been a constant concern. In 2025, burhead sedge and water hyacinth made up 3.4% of the plant community; resulting in an invasive presence score of 1. Not only did this constitute a third consecutive year of invasive presence reduction, but a previously problematic species (hydrilla) was not detected in 2025. Continued management is still necessary to get these exotic plants into a controlled state, but this was a big success for Lake May.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake May's species evenness and overall diversity indices met or exceeded their long-term median values (Figure 3-163). This equates to a diversity criterion score of 2. While the richness index was slightly below average, this could have been the result of the lack of hydrilla detected. Overall, these plant community changes were not overly dramatic and were to be expected due to the consistent need for invasive species management efforts.

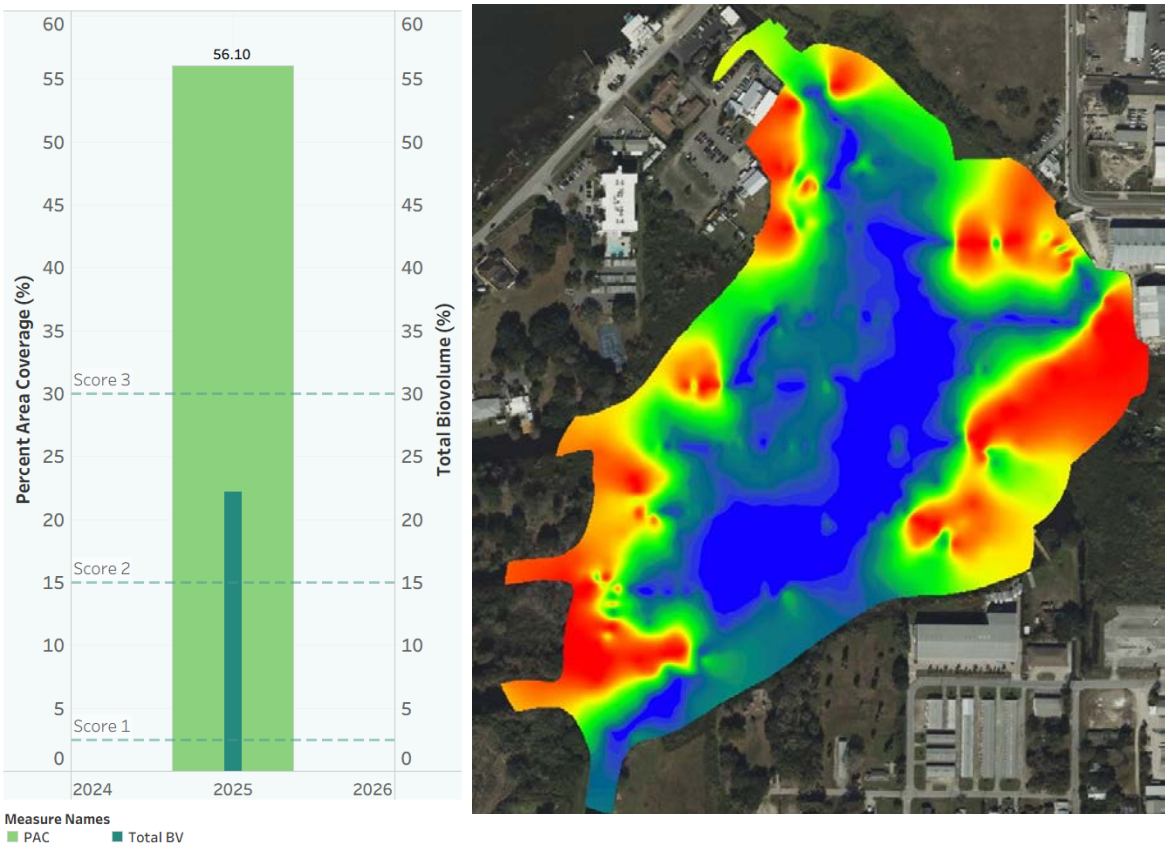


Figure 3-162. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake May; biovolume values range from green (lowest) to red (highest).

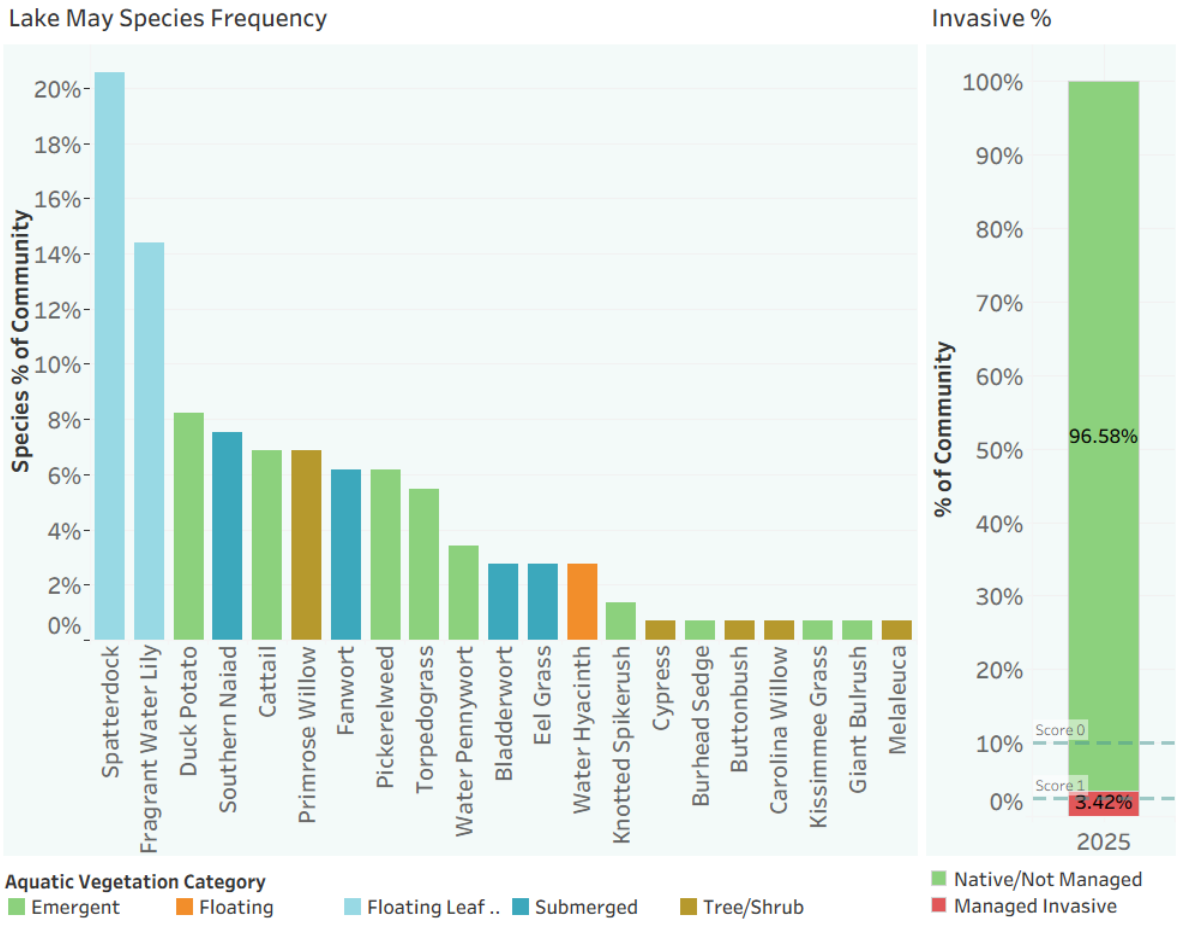


Figure 3-164. Chart depicting species frequency and invasive species percentage of Lake May during 2025.

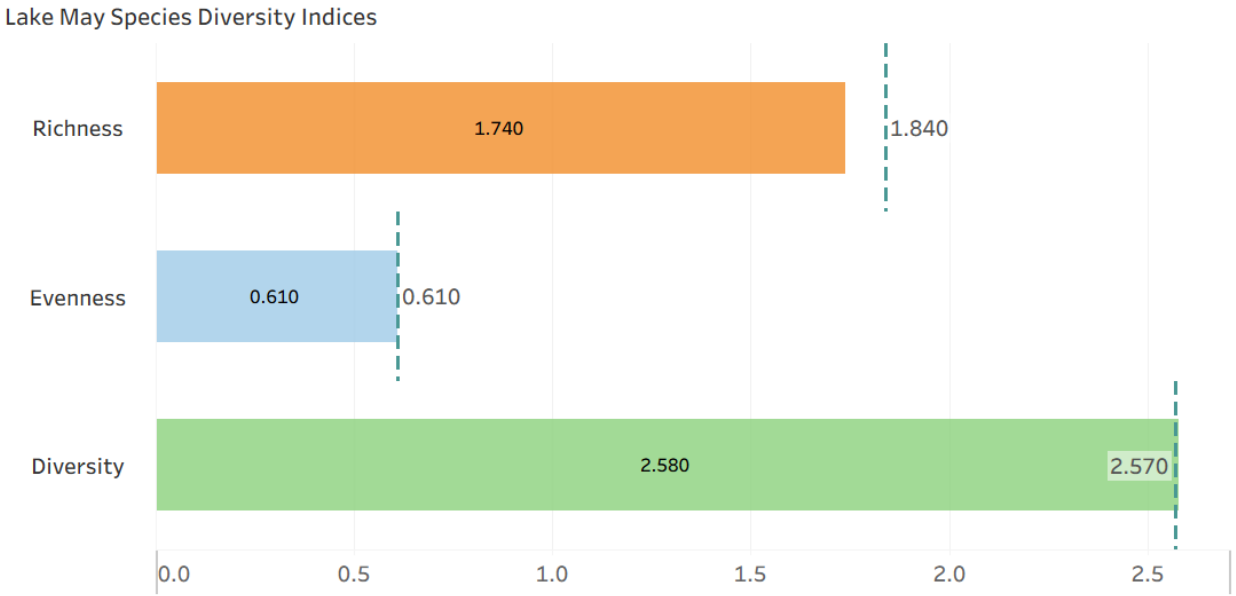


Figure 3-163. Chart depicting 2025 diversity indices for Lake May. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake May's health index scores from 2018 to 2025 shows relative stability—with lake health ranging from 2.0 to 2.3 (Table 3-23). In the seven year span that Lake May has been monitored, the only changes in score have been in the invasive presence and diversity criteria—which are inferred to be related. Overall, Lake May ranks in the middle of the pack with regards to management priority. While it is impaired, its water quality and vegetation abundance indicate that its overall health is improving.

Lake Health Impacts/Challenges:

- In addition to stormwater pollutant loading, Lake May received historic point-source discharges from the Imhoff Wastewater Treatment Plan as well as those from citrus and dairy processing facilities. The sediments in Lake May could house a considerable amount of these legacy nutrients and be a constant source of internal loading.
- Several water quality metrics are significantly correlated with Lake May's surface level; likely due to increased flushing during wetter periods. The means that drought conditions could result in water quality declines.
- Management of invasive species is a consistent concern. Lake May's invasive populations, while lower, still need control efforts to reach a maintained state. The large scale use of herbicides can result in water quality declines. In addition to invasives, tussock formation from the floating-leaf spatterdock can impact recreational navigation.

Lake Management Strategy:

- To mitigate stormwater pollutant loading, the City has implemented street sweeping, an alum injection system designed to reduce TN loads by 10% and TP loads by 45%, and general stormwater infrastructure improvements as part of the 7th Street complete streets project.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC for invasive species management planning.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	3	3	3	3	3	1	0	**2.0**
2019	0	3	3	3	3	3	0	1	**2.0**
2020	0	3	3	3	3	3	0	3	**2.3**
2021	0	3	3	3	3	3	0	2	**2.1**
2022	0	3	3	3	3	3	0	2	**2.1**
2023	0	3	3	3	3	3	0	3	**2.3**
2024	0	3	3	3	3	3	1	2	**2.3**
2025	0	3	3	3	3	3	1	2	**2.3**

Table 3-23. Lake Health Index scores for Lake May from 2018 to 2025.

Lake Mirror

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
1	2	3	2	2	3	1	2	2.0

Features & Statistics:

Surface area	130.1 acres
Mean depth	8.86 feet
Maximum depth	15.5 feet
Volume	1,408.3 acre-feet
Drainage basin area	277.9 acres
Annual TN Load	749.6 lbs
Annual TP Load	120.9 lbs
Limiting nutrient	Co-limited (N & P)

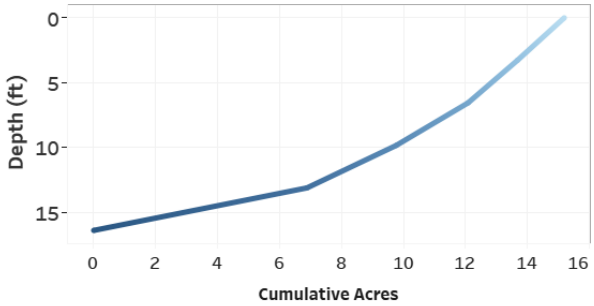


Figure 3-165. Hypsograph of Lake Mirror depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Mirror is a moderately sized waterbody with a surface area of 130 acres. Mirror's mean depth is slightly deeper than the regional average with deeper areas over 15 feet (Figure 3-165). Lake Mirror's bowl-shaped morphology provides adequate habitat for a robust aquatic vegetation community. Stormwater is conveyed to this waterbody from a 278 acre drainage basin comprised of 11 individual sub-basins (Figure 3-166). Residential land uses make up the vast majority of the drainage basin, contributing 750 lbs of TN and 121 lbs of TP to the lake annually—which is relatively low on a per acre basis. To mitigate stormwater loading, the City conducts 6.7 miles of street sweeping in this basin on a monthly basis.

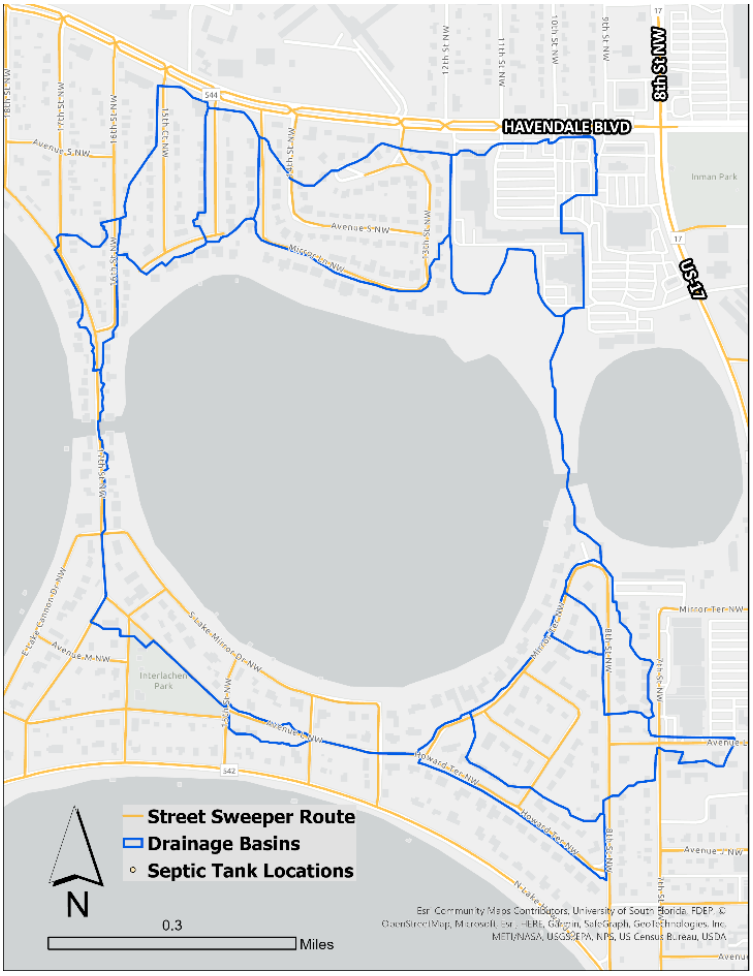


Figure 3-166. Map of Lake Mirror's drainage basin and City street sweeper routes.

Lake Mirror is located on the South Chain with navigable canals conncecting to Lake Cannon and Spring. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface

level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-167). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Mirror's surface level correlate with TN (see appendix). This carries some management implications as maintaining higher levels should result in a decrease in TN concentrations.

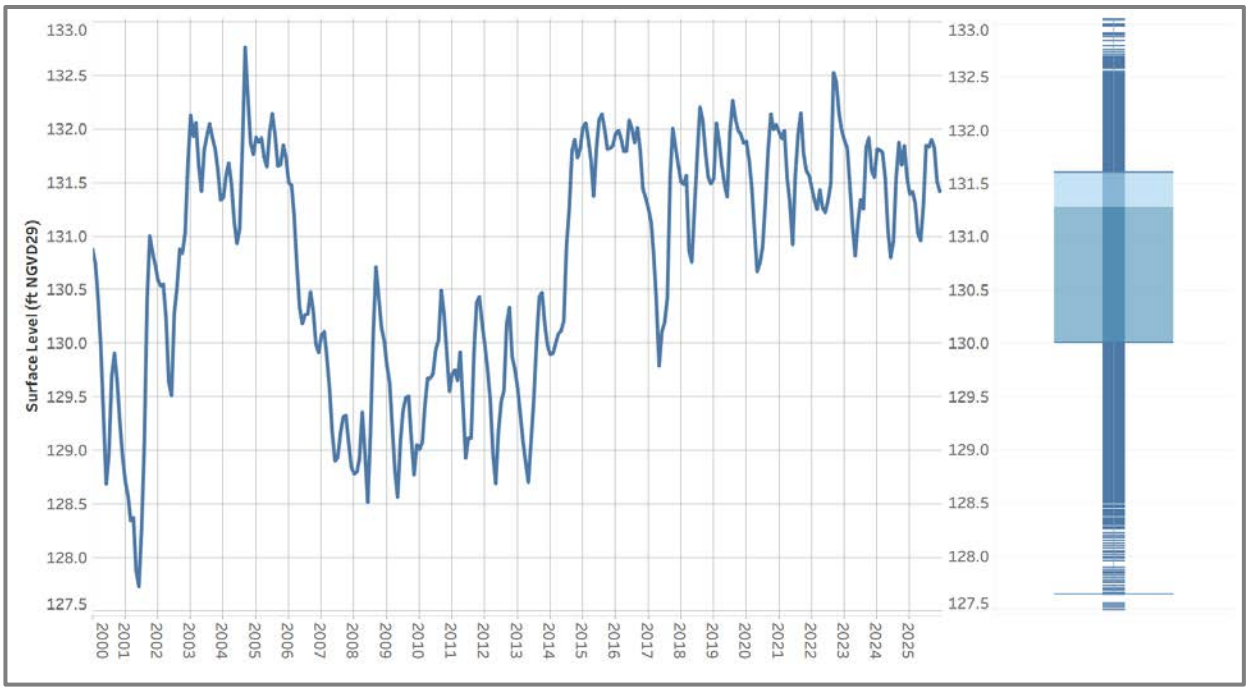


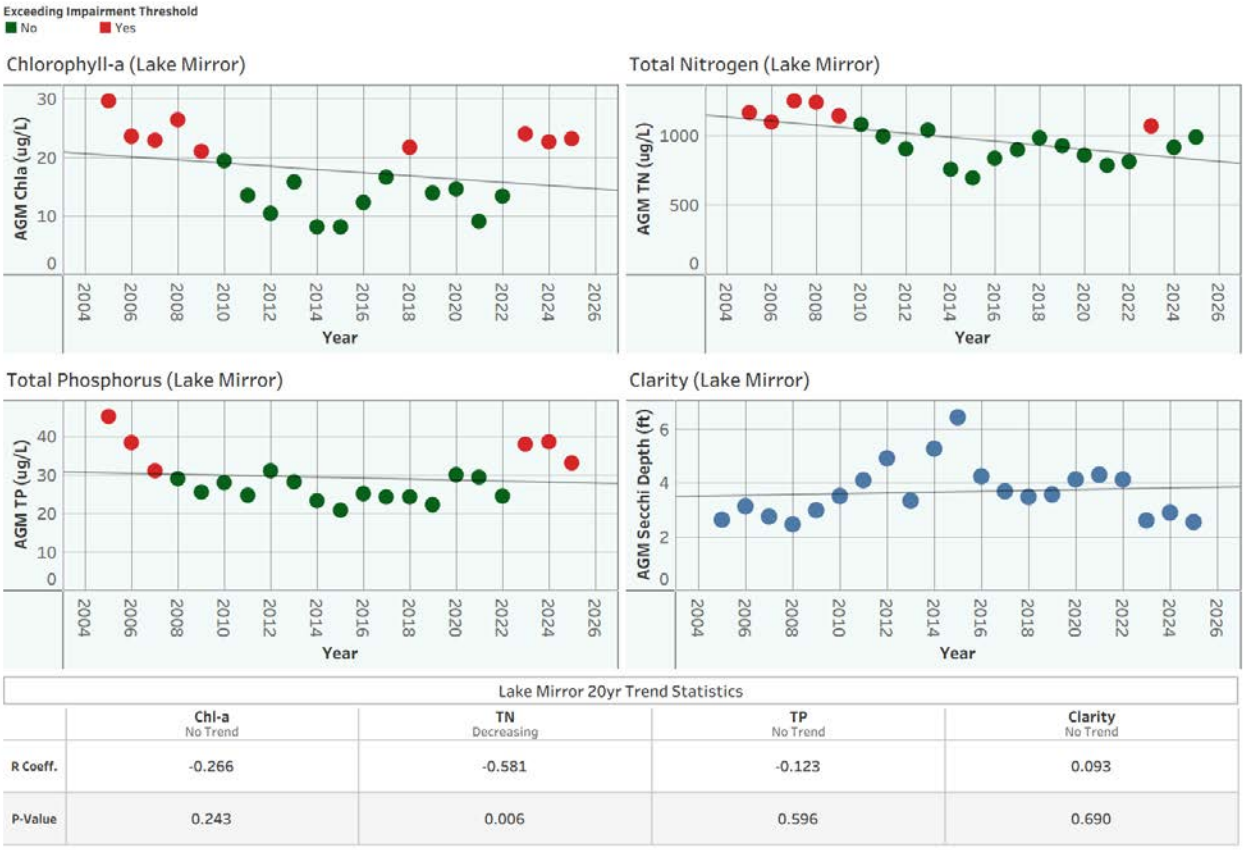
Figure 3-167. Hydrograph of Lake Mirror depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Mirror is categorized as a clear, alkaline waterbody. While previously un-impaired, recent NNC exceedances for Chl-a and TP from 2023 to 2025 have resulted in impairments in those parameters (Figure 3-168). This equates to an impairment score of 1. These recent and uncharacteristic exceedances indicates that Lake Mirror is experiencing some negative impacts that should be identified. The FDEP established a total maximum daily load for Lake Mirror in 2007 in an effort to address prior impairments. However, this TMDL guidance should be followed to address these recent impairments.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2004 to 2024. Lake Mirror exhibited significant improving trends in Chl-a and TN, and non-significant improving trends in TP and Secchi depth. Despite the recent impairment classification, it is a good sign that Mirror's chlorophyll and nitrogen levels are still trending downward.



Lake Mirror 20yr Trend Statistics

	Chl-a No Trend	TN Decreasing	TP No Trend	Clarity No Trend
R Coeff.	-0.266	-0.581	-0.123	0.093
P-Value	0.243	0.006	0.596	0.690

Figure 3-168. Lake Mirror AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Mirror on 1/17/2025. The PAC during this survey was 52.8% and the total BV was 6.8% (Figure 3-169). Not only does this equate to a vegetation abundance criterion score of 3, but these are the second highest coverage and biovolume numbers on record. Throughout the period of record, Lake Mirror has maintained exceptional vegetation abundance; which has likely contributed to its water quality improvements. However, even despite the increase in abundance during the last two years, water quality has still declined—indicating that vegetation has not had a major effect on water quality.

Invasive Species Management:

Based on the 2025 survey, Lake Mirror was dominated by submerged vegetation. Eelgrass, Illinois pondweed, and southern naiad comprised over 40% of the community (Figure 3-171). The remaining plants include a mix of emergent, floating-leaf and submerged species—indicative of high diversity. The invasive burhead sedge and hydrilla were detected in 2025 and combined made up 2.7% of the vegetation community. This is slight increase from the previous year and equates to an invasive criterion score of 1. Hydrilla was absent during 2024—highlighting how invasive treatment efforts have been successful—but has since returned. This highlights the importance of early detection and rapid response efforts since it allows for small-scale treatment before these invasive species can take over the native plant community.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake Mirror's species richness and overall diversity indices met or exceeded their long-term median values (Figure 3-170). This equates to a diversity criterion score of 2. All three of these diversity indices experienced a marginal to moderate decline from 2024 to 2025. This may be indicative of a fundamental shift in the vegetation community or perhaps a natural rebound from the tremendous vegetation growth and diversity increases exhibited during the previous year. Continued monitoring is needed to better understand why this shift occurred and if management action is needed to address it.

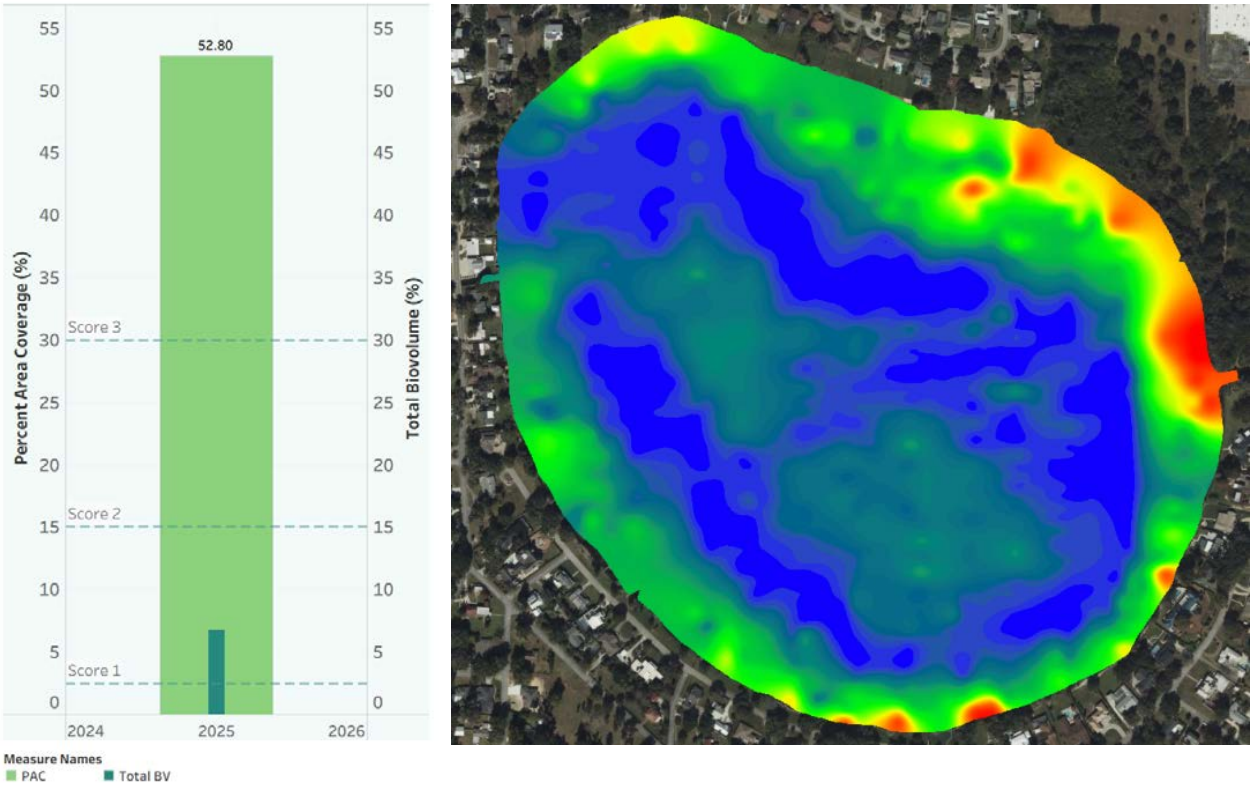


Figure 3-169. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Mirror; biovolume values range from green (lowest) to red (highest).

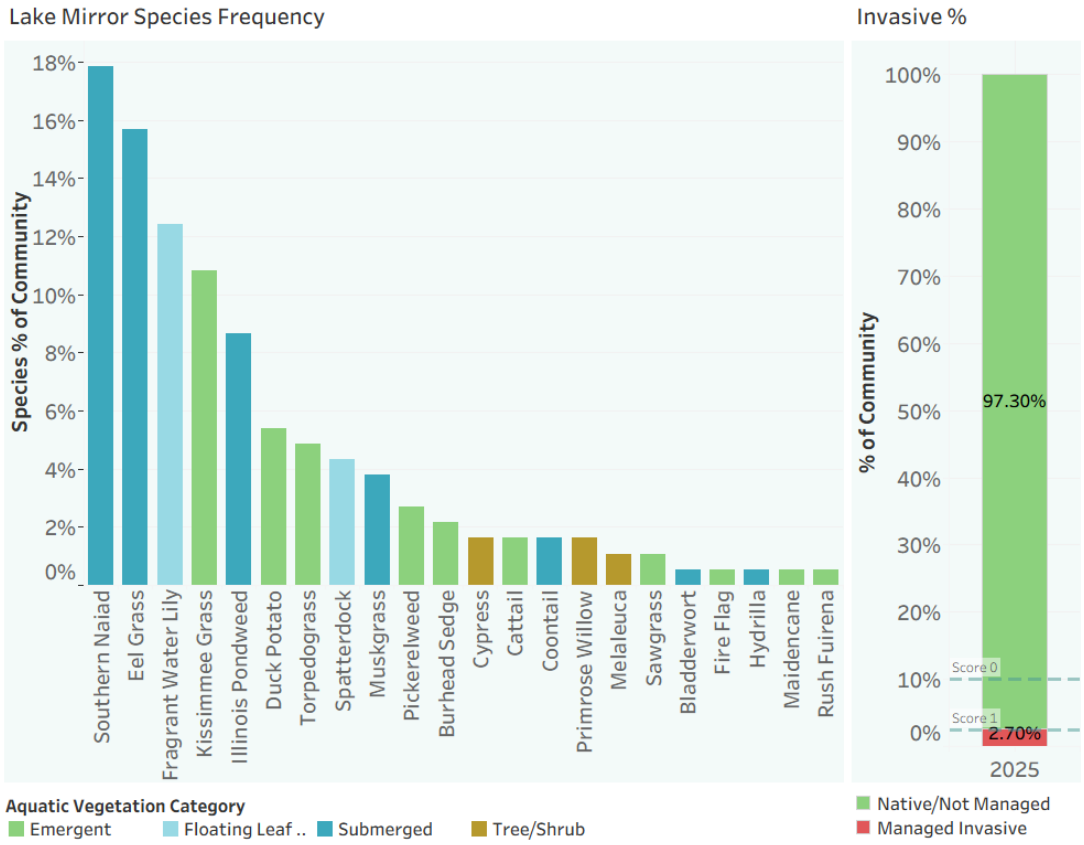


Figure 3-171. Chart depicting species frequency and invasive species presence of Lake Mirror during 2025.

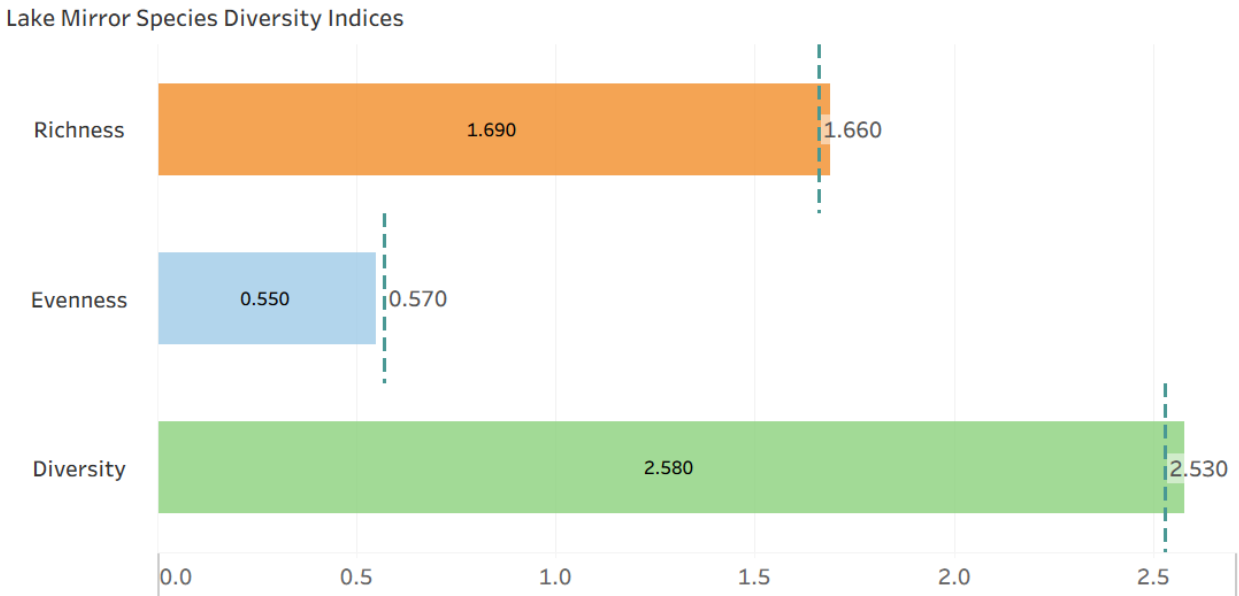


Figure 3-170. Chart depicting 2025 diversity indices for Lake Mirror. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Mirror's health index scores from 2018 to 2025 shows scores undergoing a recent and abrupt decline (Table 3-24). Unfortunately, the latest LHI score is the lowest on record due to the recent impairments in Chl-a and TN and shift in the trend scores. Invasive presence and diversity have vascillated over time, mostly due to invasive management efforts and the resulting impacts on the vegetation community. Lake Mirror was previously lower on the priority list, but recent shifts in water quality require closer inspection to determine the underlying causes and to develop management strategies to address them.

Lake Health Impacts/Challenges:

- Stormwater pollutant loading is one of the primary concerns with regards to water quality decline. While the per acre pollutant loads are relatively low, there are very few structural stormwater practices present in the basin that help to reduce these loads
- The management of invasive species like hydrilla is a consistent concern. As observed in Lake May during 2022, it can only take a single growing season for even a small population to take over large areas of a waterbody.

Lake Management Strategy:

- With the majority of the drainage basin comprised of residential housing, public education and outreach is a valid stormwater management strategy. Education aims to increase residents' knowledge of best stormwater practices and ways they can individually reduce their pollutant load.
- The Stormwater Assessment and Improvement Project has identified a priority area in the southeastern part of Lake Mirror's drainage basin. Implementation of green infrastructure can reduce flooding in addition to stormwater pollutant loads where treatment has historically been lacking. Staff can explore funding opportunities to implement green infrastructure in these areas.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	3	3	3	2	0	**2.5**
2019	3	3	3	3	3	3	1	2	**2.6**
2020	3	3	3	3	3	3	1	1	**2.5**
2021	3	3	3	3	3	3	2	1	**2.6**
2022	3	3	3	3	3	3	1	3	**2.8**
2023	3	3	3	3	3	3	1	1	**2.5**
2024	1	3	3	2	2	3	2	3	**2.4**
2025	1	2	3	2	2	3	1	2	**2.0**

Table 3-24. Lake Health Index scores for Lake Mirror from 2018 to 2025.

Lake Ned

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	0	0	1	0	3	1	2	1.3

Features & Statistics:

Surface area	76.4 acres
Mean depth	7.2 feet
Maximum depth	16 feet
Volume	549.8 acre-feet
Drainage basin area	256.9 acres
Annual TN Load	1,002.9 lbs
Annual TP Load	202.7 lbs
Limiting nutrient	Phosphorus

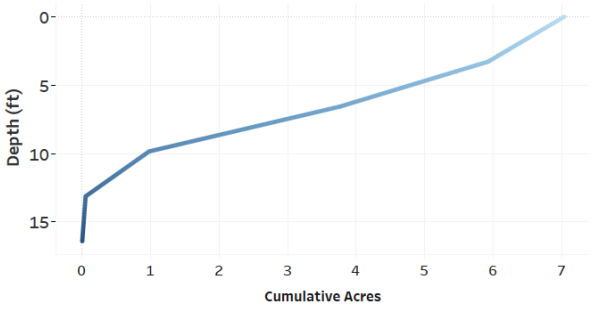


Figure 3-172. Hypsograph of Lake Ned depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Ned is a relatively small waterbody at 76 acres, an average depth of 7.2 feet, and a maximum depth approaching 16 feet (Figure 3-172). This is one of Winter Haven's shallower lakes which not only makes the lake more susceptible to sediment suspension, but should also support a dense aquatic vegetation community. Stormwater is conveyed to this waterbody from a 257 acre drainage basin made up mostly of residential and agricultural land uses (Figure 3-173). Based on stormwater pollutant load modelling, this drainage area contributes 1,003 lbs of TN and 203 lbs of TP to the lake annually. On a per acre basis the TN and TP loads rank 14th and 6th highest, respectively, out of the 37 area lakes. There are 53 known septic systems within the basin. These could be a contributor of pollutant loads via groundwater leaching.

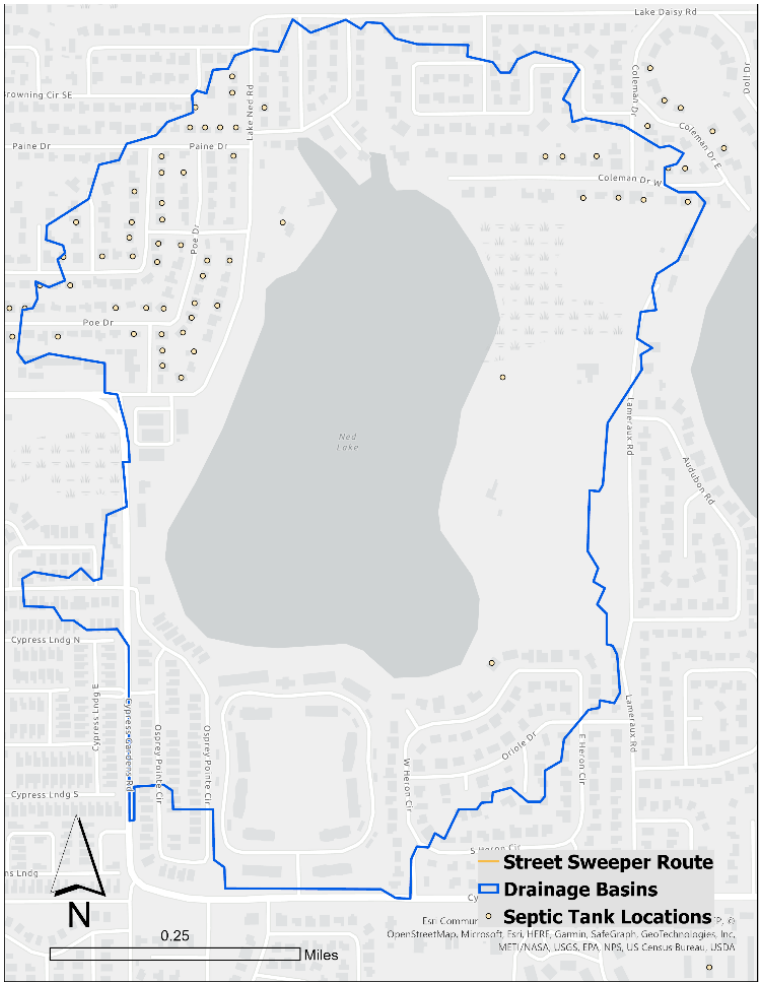


Figure 3-173. Map of Lake Ned's drainage basin and nearby septic systems.

Lake Ned is located almost entirely outside City limits to the southeast of downtown Winter Haven. Its average surface elevation sits relatively low in the Peace Creek watershed when compared to the other study area lakes. Over its period of record, Lake Ned's surface level has fluctuated between 124 and 129.2 feet above sea level. The normal range fluctuates between 126.9 and 128 feet (Figure 3-174). During 2025, Lake Ned's surface level dropped to a dry season low of 127.6 feet in April and subsequently rose to a wet season high of 128.3 feet in June. The surface level ended the year just below the high end of the normal range at 128 feet. Changes in Lake Ned's surface level are not correlated with its primary water quality metrics.

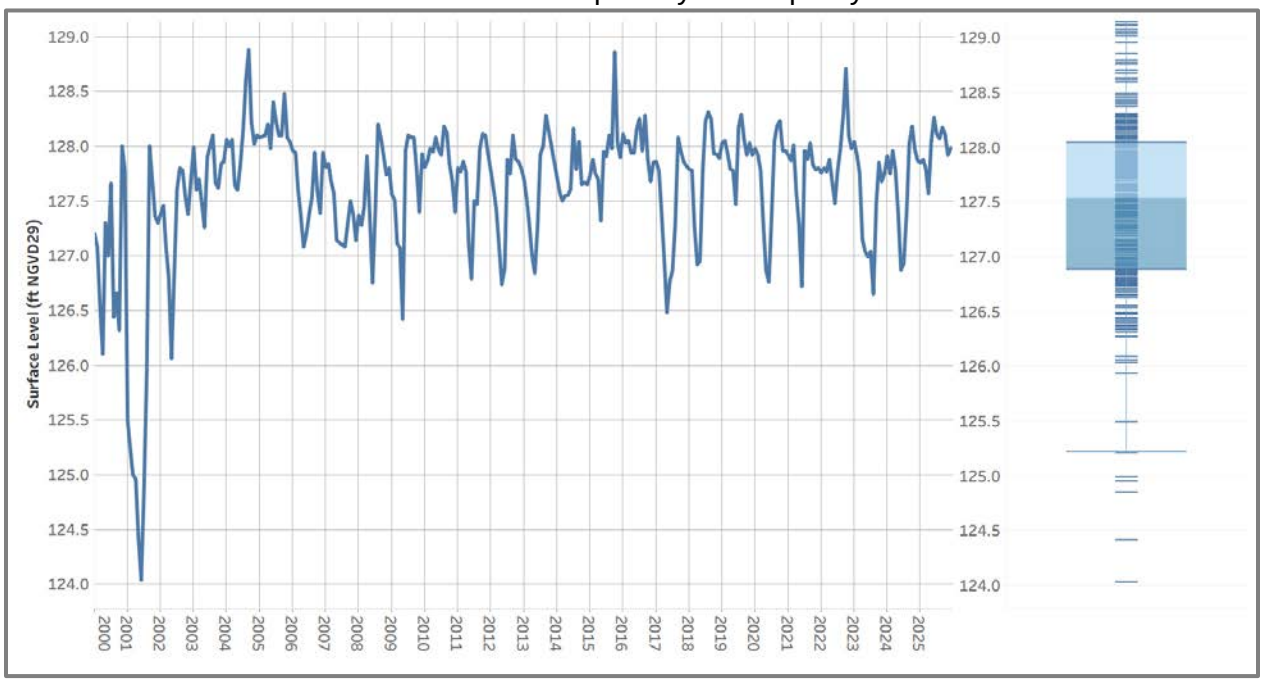


Figure 3-174. Hydrograph of Lake Ned depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Ned is categorized as a clear, alkaline waterbody. Due to a lack of exceedances in any of the NNC parameters during the assessment period, Lake Ned is considered un-impaired (Figure 3-175). This equates to an impairment criterion score of 3. Recently, concentrations of Chl-a, TN, and TP have been higher than normal; with Secchi depths at or below median levels. This is indicative of water quality declines. Generally speaking, most water quality metrics were better in 2025.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Chl-a, TN, and Secchi depth all exhibited significant deteriorating trends. This equates to trend critera scores of 0. While a deterioating TP trend was present in 2023, this shifted to a non-significant deteriorating trend in 2024. In the short-term, most water quality parameters exhibited relatively static trends. However, water clarity exhibited significant declining trends from 2018 to 2023. It is evident that Lake Ned's water quality is trending in a negative trajectory. Management efforts will be critical in order to prevent water quality impairment in the future.

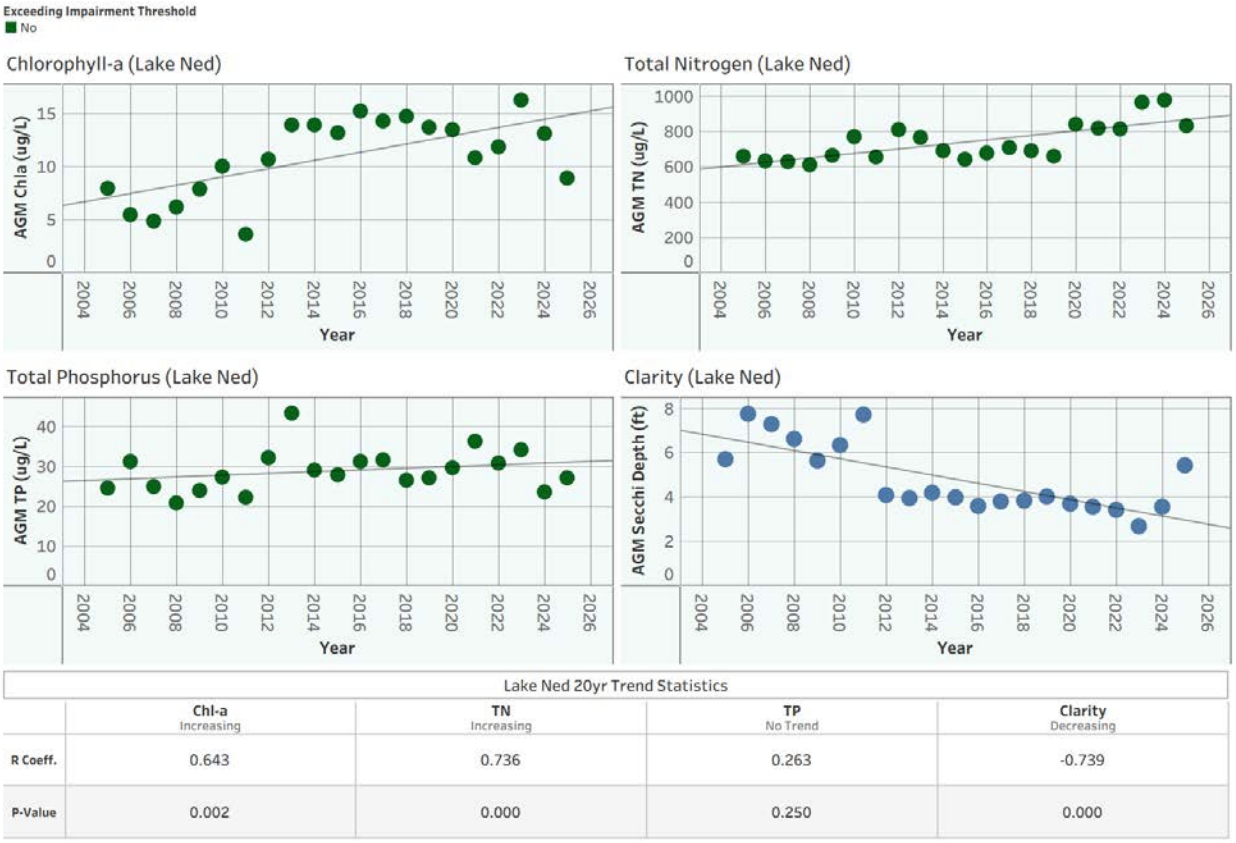


Figure 3-175. Lake Ned AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are trend lines and box & whisker plots showing relative variance.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Ned on 6/6/2025. The PAC during this period was 45.9% and the total BV was 10.5% (Figure 3-176). By exceeding the 30% coverage threshold, Ned receives a vegetation abundance criterion score of 3. Since monitoring began, Lake Ned has consistently had low vegetation abundance scores below 10%. Not only has the vegetation abundance increased in recent years, the PAC has set historic records for the last three years running. Hopefully, these recent changes will result in subsequent water quality improvements

Invasive Species Management:

Based on the 2025 survey data, the vegetation community in Lake Ned has completely shifted away from an emergent dominated lake to one supporting an abundance of submerged species (Figure 3-177). Eelgrass became the most dominant species in the lake in 2024 and continues to dominate—making up over 20% of the community. Behind it, a mix of other submerged, emergent, and floating-leaf plants made up the remainder of the ecosystem. Recently hydrilla and water hyacinth were detected as invasive species—making up 3.3% of the community. This equates to an invasive presence score of 2. Lake Ned has not traditionally had a major issue with invasive plants; never exceeding 6% of the total community since monitoring began. The City has made efforts to coordinate with Polk County to treat these populations before they begin to take over large swathes of habitat.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake Ned's species richness and overall diversity indices met or exceeded long-term median values (Figure 3-178). This equates to a diversity criterion score of 2. Species richness and overall diversity exhibited a substantial increase since the previous year. That said, species evenness experienced a moderate decline. This may be due to the outsized dominance by eelgrass. Overall, it would appear that these changes in the vegetation community have been the result of natural fluctuations as any invasive treatment efforts would have been minor. Again, these recent changes indicate how Lake Ned has recovered biologically. Further study is needed to better understand how a recoving lake community shifts over time.

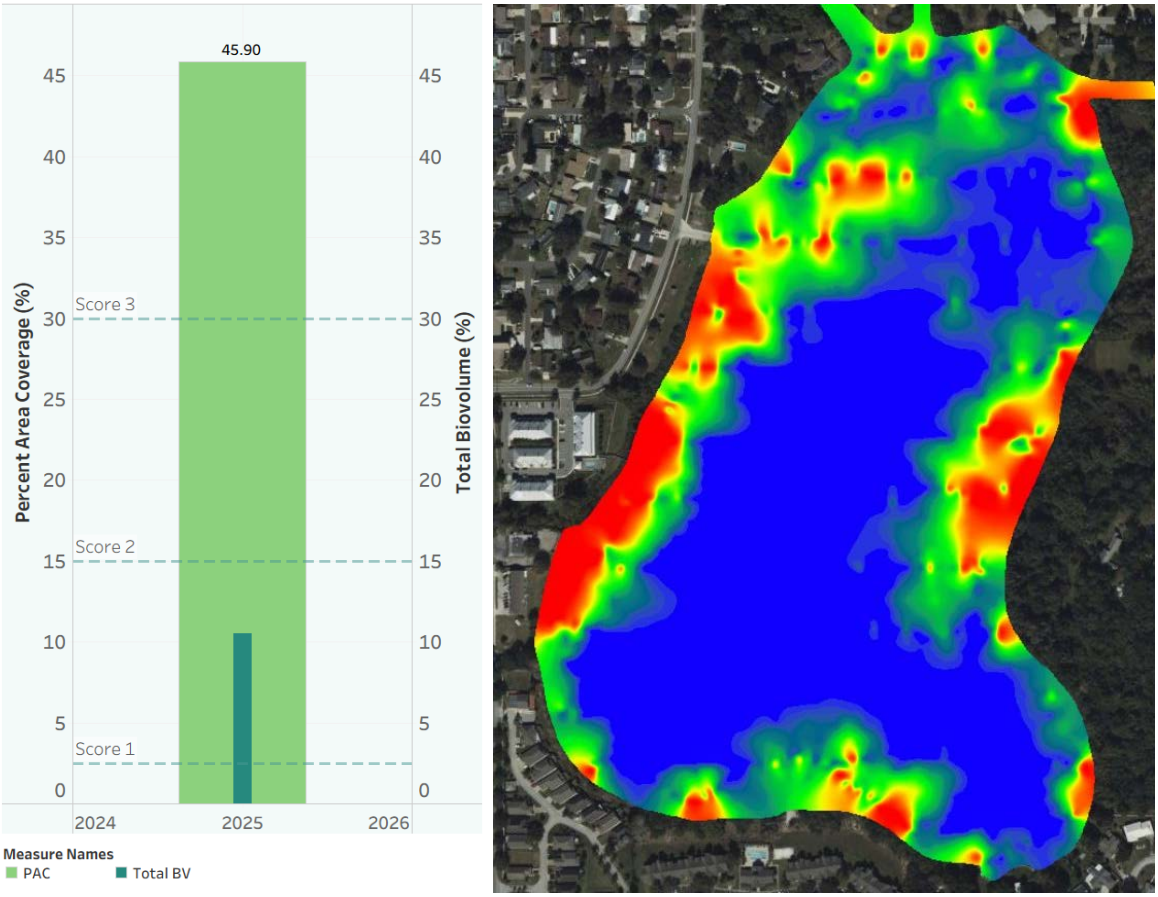


Figure 3-176. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Ned; biovolume values range from green (lowest) to red (highest).

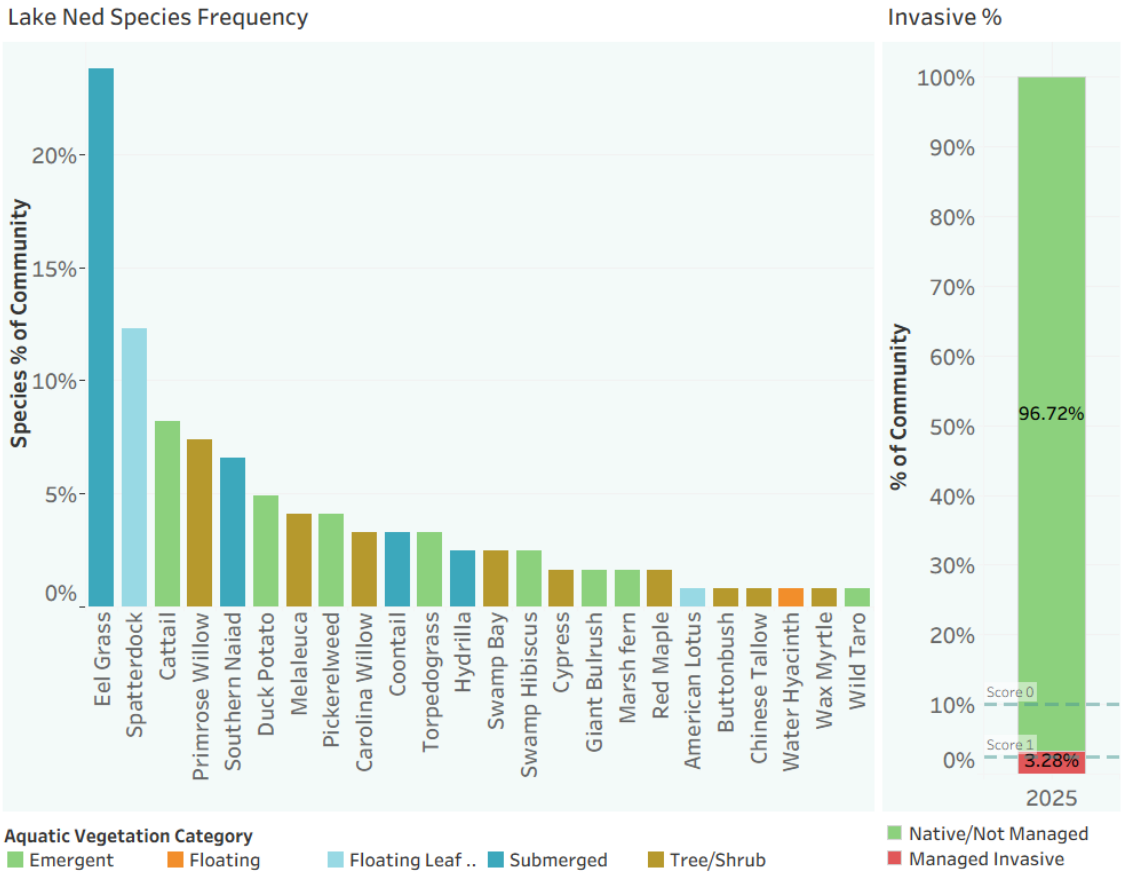


Figure 3-177. Chart depicting species frequency and invasive species percentage of Lake Ned during 2025.

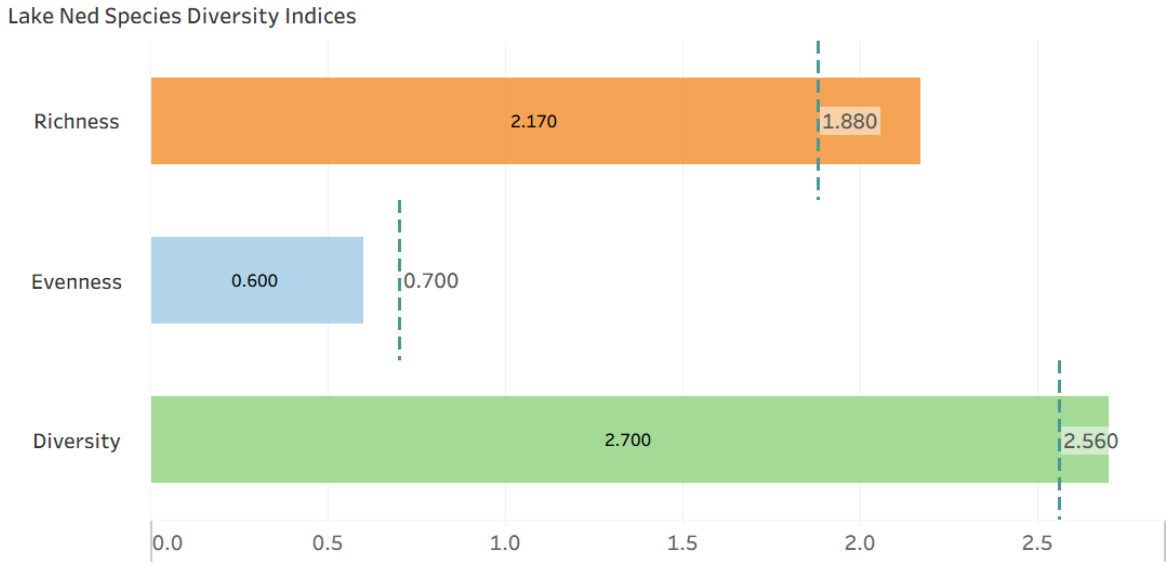


Figure 3-178. Chart depicting 2025 diversity indices for Lake Ned. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Ned's health index scores from 2018 to 2025 shows relatively stability, but consistently low scores (Table 3-25). Water quality is relatively good in Lake Ned with no change to its impairment score. However most of the water quality metrics are trending in a negative direction. Even the TN trend went from being relatively stable to deteriorating since 2023. The majority of the score fluctuation has occurred from the biological criteria. As stated, vegetation abundance is recovering, but invasive presence and diversity have fluctuated widely. Overall, Lake Ned is in the middle of the priority list. Efforts should focus on improving water quality trends before the lake becomes impaired.

Lake Health Impacts/Challenges:

- While stormwater pollutant loading remains a potential concern, the presence of so many OSTDs within the basin may be a contributor of nutrients via groundwater leaching and may be why the TN trend has shifted to the negative.
- The management of the vegetation community includes ensuring adequate abundance and invasive species control. Early detection and rapid response is crucial to keep these invasive plants from becoming a larger problem that would necessitate larger-scale control (which comes with potentially negative impacts). Fortunately, the abundance of SAV has increased temendously in recent years.

Lake Management Strategy:

- City staff can provide support to Polk County in exploring source analysis to determine if the OSTDs are contributing to increased pollutant loads in Lake Ned. Further management efforts may explore septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large scale herbicide treatments and the potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	0	1	0	0	1	1	3	**1.1**
2019	3	0	2	0	0	1	1	3	**1.3**
2020	3	0	2	0	0	1	3	0	**1.1**
2021	3	0	2	0	0	1	3	1	**1.3**
2022	3	0	1	0	0	2	2	3	**1.4**
2023	3	0	0	0	0	2	3	2	**1.3**
2024	3	0	0	1	0	3	2	1	**1.3**
2025	3	0	0	1	0	3	1	2	**1.3**

Table 3-25. Lake Health Index values for Lake Ned from 2018 to 2025.

Lake Otis

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	2	1	2	2	1	2	2.0

Features & Statistics:

Surface area	135 acres
Mean depth	10.63 feet
Maximum depth	32 feet
Volume	1,719.9 acre-feet
Drainage basin area	586.9 acres
Annual TN Load	2,291 lbs
Annual TP Load	372.6 lbs
Limiting nutrient	Co-limited (N & P)

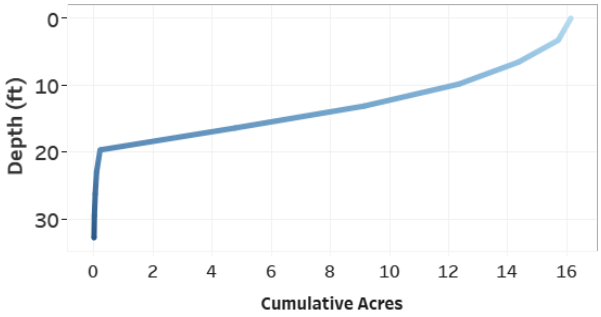


Figure 3-179. Hypsograph of Lake Otis depicting the depth profile and morphology of the lake bed.

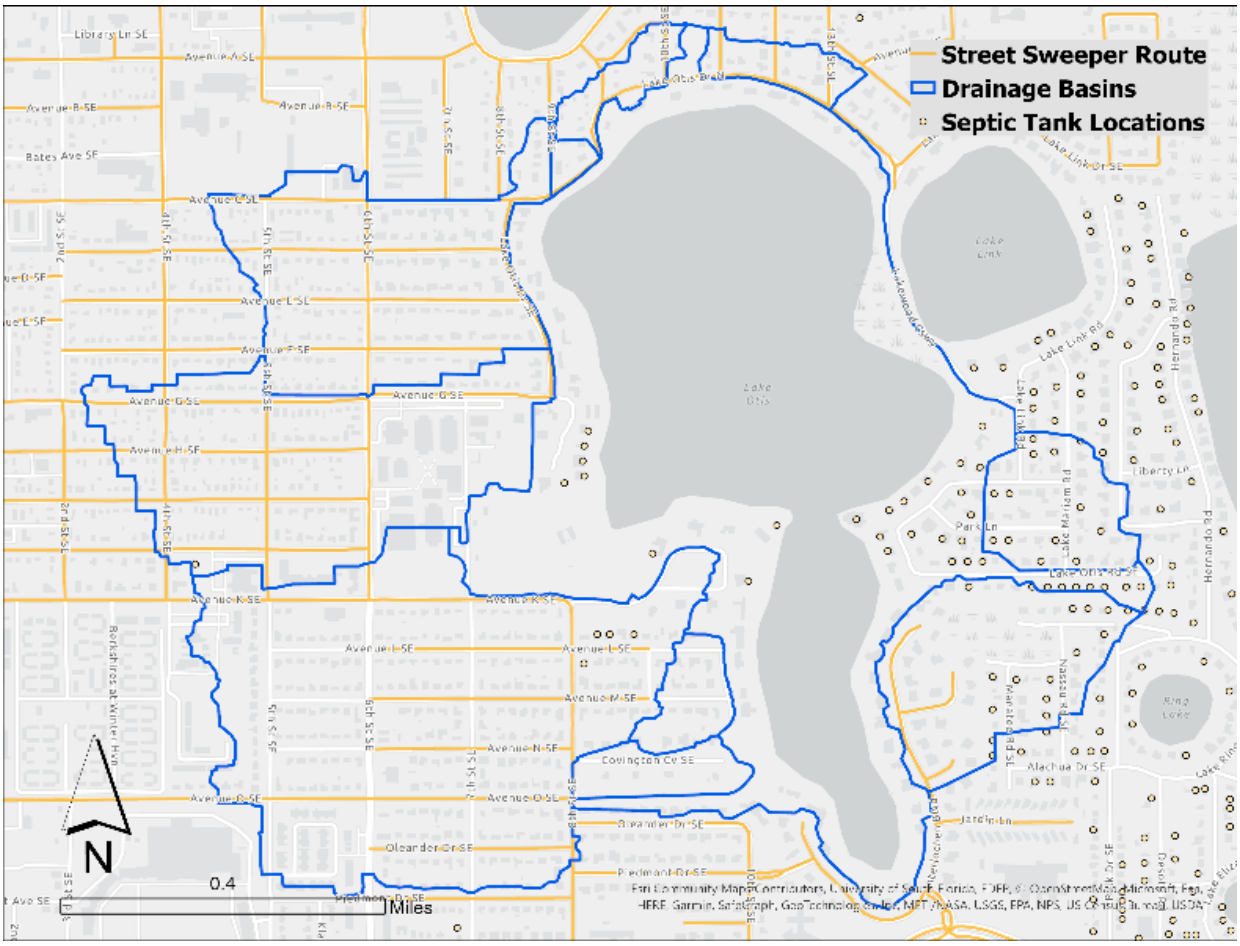


Figure 3-180. Map of Lake Otis' drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Otis is a moderately sized waterbody comprised of a main lake basin and Little Lake Otis to the south. It has a surface area of 135 acres, an average depth of 10.6 feet, and a maximum depth of over 30 feet in deeper areas (Figure 3-179). The average depth of Lake Otis is generally deeper than the regional mean depth, with the deepest sections in Little Lake Otis. The main lake is shallower and should have enough of a littoral zone to support a robust aquatic plant community. Stormwater is conveyed to this waterbody from a 587 acre drainage basin comprised of 11 individual sub-basins (Figure 3-180). By far, the most dominant land uses in this basin are residential which contribute 2,291 lbs of TN and 372 lbs of TP to the lake annually. On a per acre basis, these pollutant loads rank moderately high compared with the other 36 lakes in the study area. There are 66 septic systems located within the drainage basin. These constitute a moderate density and may contribute to pollutant loading via groundwater leaching. To mitigate stormwater loads, the City conducts 12.8 miles of street sweeping within the basin.

Lake Otis and its neighbor, Lake Link, are connected via a navigable canal—indicating that they are held at the same surface level. Excess water discharges from Lake Link to Lake Mariam to the east. The surface elevation of these two lakes sites near the bottom of the Peace Creek watershed. Over its period of record, the shared surface level of Lakes Link and Otis has fluctuated between 120.3 and 128.8 feet above sea level. The wide range of fluctuation is possible because of the steep-sloped morphology of these lakes. The normal range of fluctuation is much narrower—between 124.9 and 127.2 feet (Figure 3-181). During 2025, Lake Otis dropped to a dry season low of 125.8 feet in April and reached a wet season peak of 127.6 feet in September. Link ended the year near the high end of the normal range. According to linear regression analysis, changes in Lake Otis' surface level are correlated with Chl-a, TN, and Secchi depth (see appendix). This carries management implications as maintaining higher levels should result in improved water quality.

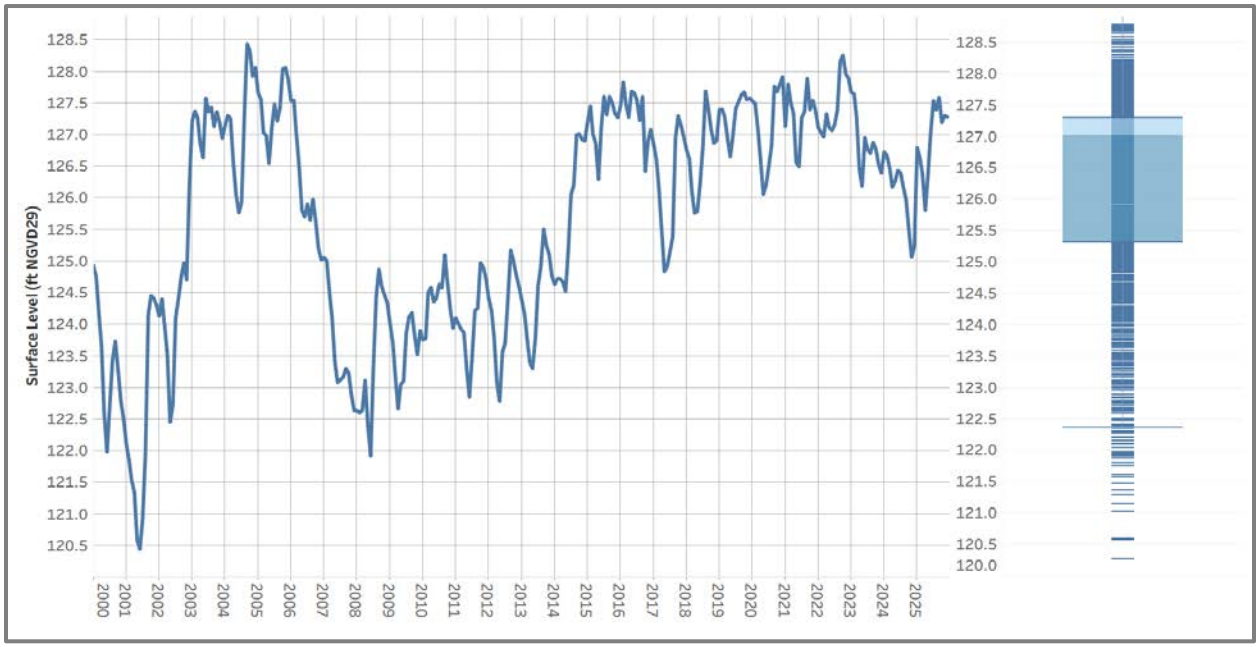


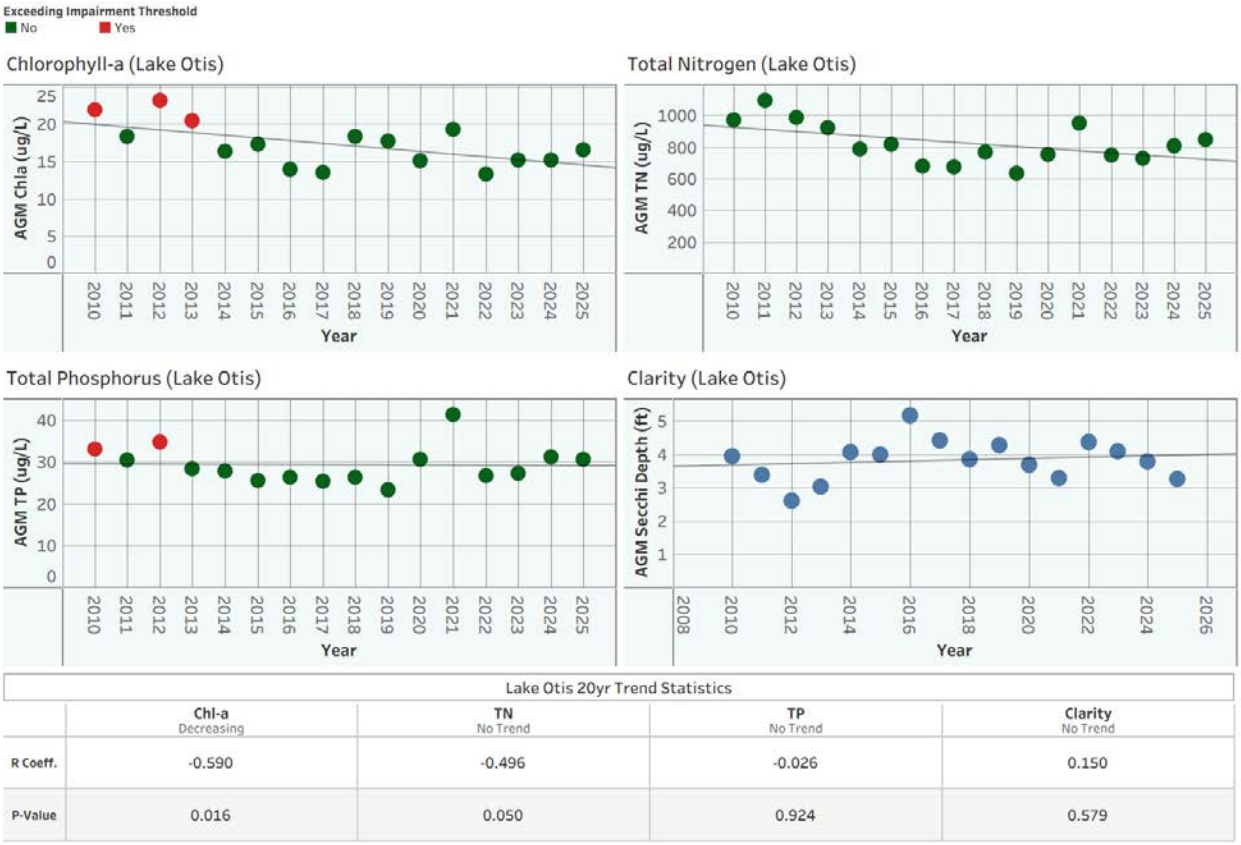
Figure 3-181. Hydrograph of Lake Otis depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

For the purposes of determining water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Otis is categorized as a clear, alkaline waterbody. Due to a lack of NNC exceedances during the assessment period, Lake Otis is considered un-impaired (Figure 3-182). This equates to an impairment criterion score of 3. Lake Otis did exhibit Chl-a impairment as late as 2019, but has since improved to the point of being delisted.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Lake Otis's Chl-a metric exhibited a significant trend in an improving direction for a trend score of 3. The remaining metrics (TN, TP, and Clarity) all exhibited non-significant trends in an improving direciton—each receiving trend scores of 2.



Lake Otis 20yr Trend Statistics

	Chl-a Decreasing	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.590	-0.496	-0.026	0.150
P-Value	0.016	0.050	0.924	0.579

Figure 3-182. Lake Otis AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Otis on 8/22/2025. The PAC during this survey was 29.8% and the total BV was 3.1% (Figure 3-183). A PAC value just below the 30% threshold earns Lake Otis an abundance score of 2. A comparison of abundance records from 2018 to the present shows that Lake Otis' coverage is typically between 15% and 30%. While vegetation abundance descreased somewhat over the last three years, the 2025 PAC value still remains third highest on record. Maintaining vegetation abundance above 30% is the ideal target, but the lake has experienced some ecological recovery since monitoring began.

Invasive Species Management:

Based on the 2025 survey data, Lake Otis maintains a healthy mix of vegetation types, but it is evident that emergent species are the most dominant with duck potato making up over 15% of the population (Figure 3-185). The invasive plants water hyacinth and hydrilla made a return in 2025—comprising nearly 4% of the community. This equates to an invasive presence score of 1. In 2024, invasive species were not detected. The recent resurgence indicates how quickly exotic plants can expand and underscores why early detection and rapid response is necessary.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on 2025 species data, Lake Otis' species richness and overall diversity indices exceeded their long-term median values, equating to a diversity criterion score of 2 (Figure 3-184). Despite richness increasing from 2024, species evenness exhibited a fairly substantial decline. This can be mostly attributed to the duck potato taking such a dramatic dominant role in the community. Despite the reintroduction of invasive species, the relative proportion of these exotic plants was minimal—indicating that the majority of the diversity changes were due to natural fluctuations.

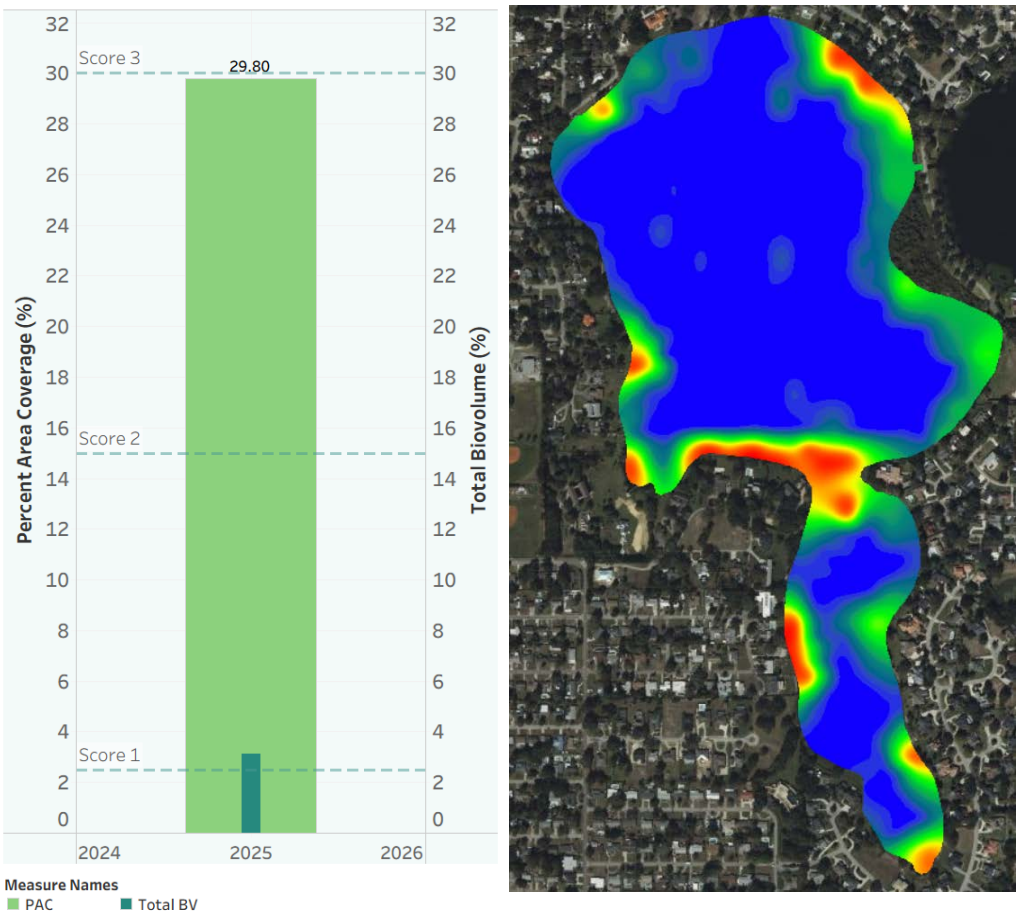


Figure 3-183. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Otis; biovolume values range from green (lowest) to red (highest).

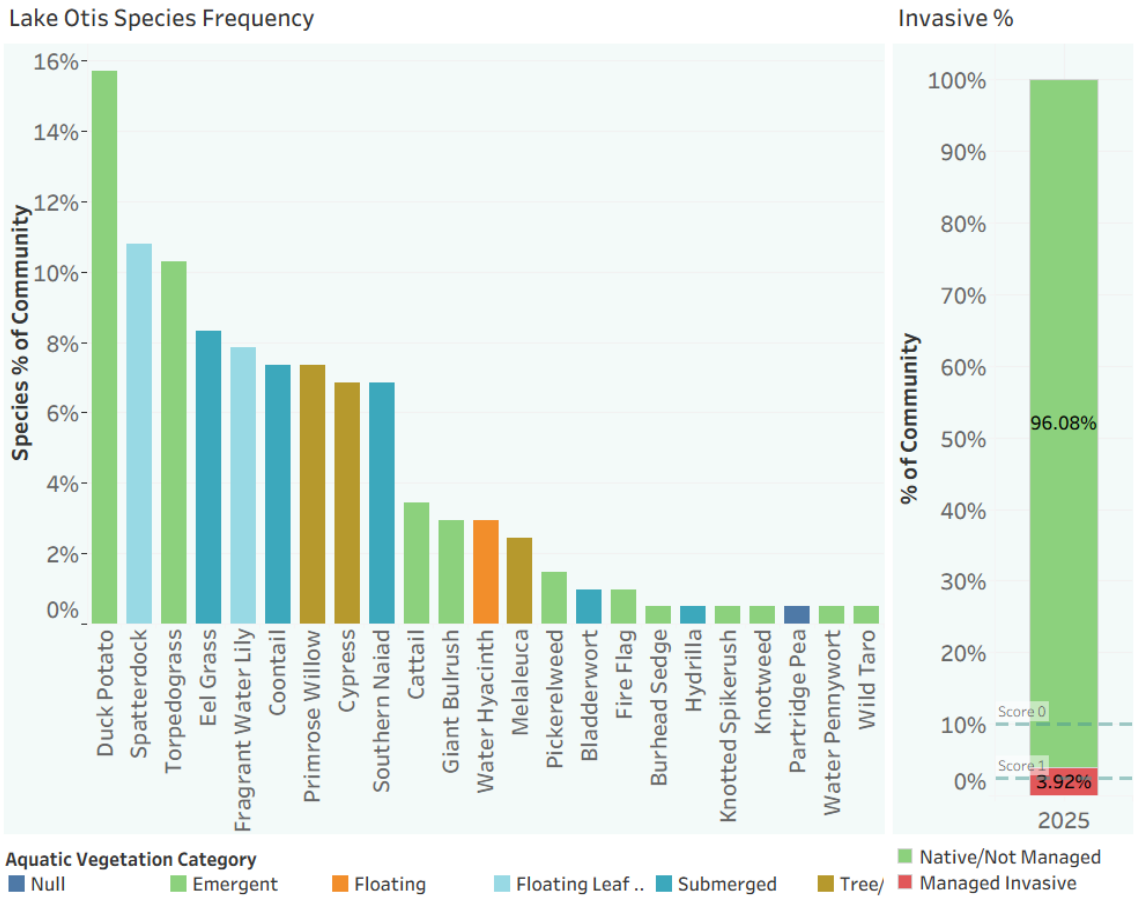


Figure 3-185. Chart depicting species frequency and invasive species percentage of Lake Otis during 2025.

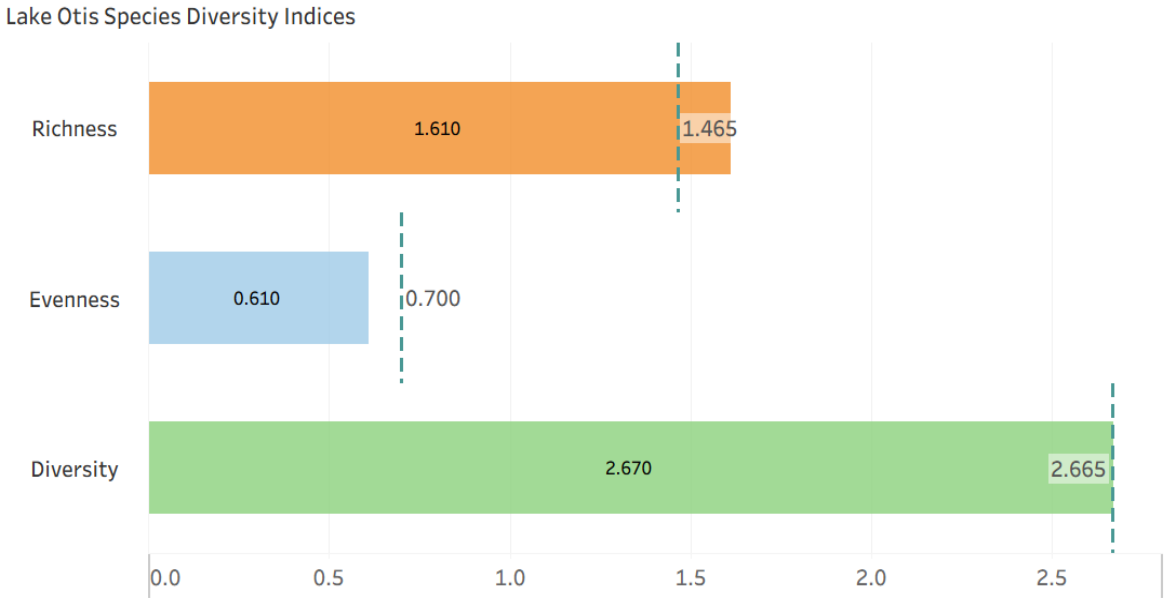


Figure 3-184. Chart depicting 2025 diversity indices for Lake Otis. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Otis' health index scores from 2018 to 2025 shows values ranging from 1.6 to 2.3 (Table 3-26). During this time the impairment criterion has seen improvement while trend scores have vascillated relatively frequently. Despite this, the water quality remains decent. The biological criteria have also fluctuated considerably as abundance, invasive presence and diversity have undergone wild changes. Overall, Lake Otis ranks lower on the priority list.

Lake Health Impacts/Challenges:

- Stormwater pollutant loading from the western portion of the basin is a concern. Additionally, the presence of septic systems on the eastern side of the basin could potentially leach pollutants to the lake via groundwater.
- The management of invasive species like hydrilla is a consistent concern. There are also potential impacts from all types of invasive management strategies. Finding the right balance is important.
- Several water quality metrics are significantly correlated with Lake Otis' surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- The City's current stormwater management strategy includes street sweeping and the implementation of green infrastructure along 6th St SE. The Stormwater Assessment and Improvement Plan has also identified several potential areas in the basin where stormwater improvements can be made.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC.
- The City may explore source analysis to determine if the septic systems in the basin are a contributor of pollutant loading. Further management may involve septic-to-sewer conversions.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	2	2	2	2	2	2	1	2	**1.9**
2019	2	2	2	2	2	2	0	2	**1.8**
2020	3	2	2	2	2	2	NA	NA	**2.2**
2021	3	2	2	1	1	1	2	1	**1.6**
2022	3	2	2	1	2	2	2	2	**2.0**
2023	3	1	2	1	1	3	1	2	**1.8**
2024	3	2	2	1	1	3	3	3	**2.3**
2025	3	3	2	1	2	2	1	2	**2.0**

Table 3-26. Lake Health Index values for Lake Otis from 2018 to 2025.

Lake Pansy

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	1	2	1	1	3	1	1	1.6

Features & Statistics:

Surface area	49.4 acres
Mean depth	6.8 feet
Maximum depth	14 feet
Volume	397 acre-feet
Drainage basin area	243.8 acres
Annual TN Load	880.7 lbs
Annual TP Load	111.2 lbs
Limiting nutrient	Phosphorus

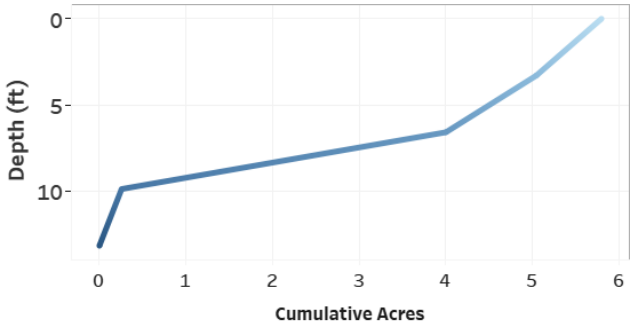


Figure 3-186. Hypsograph of Lake Pansy depicting the depth profile and morphology of the lake bed.



Figure 3-187. Map of Lake Pansy's drainage basin and nearby septic systems.

Hydrology:

Lake Pansy is a relatively small and shallow waterbody at just 49 acres, an average depth of 7 feet, and a maximum depth of 14 feet (Figure 3-186). Such a shallow waterbody should support a robust littoral zone for aquatic vegetation. However, in the absence of vegetation coverage, this shallowness increases susceptibility to sediment suspension via wind and wave action. Stormwater is conveyed to this waterbody from a nearly 400 acre drainage basin that extends to the Winter Haven Gilbert Field Airport (Figure 3-187). The land uses directly surrounding the lake are residential and wetlands while those from the airport section are institutional. Based on stormwater pollutant load modelling, this drainage area contributes 880 lbs of TN and 111 lbs of TP to the lake annually—relatively low pollutant loading rates when compared with the other drainage basins in the study area.

Lake Pansy is considered an isolated waterbody located to the northwest of downtown Winter Haven. It is believed that excess water can discharge from Lake Pansy to Lake Rochelle via the wetland to the east. Pansy's surface elevation sits at a slightly higher level than the North Chain of Lakes. Over its period of record, Lake Pansy's surface level has fluctuated between 124.5 and 129.7 feet above sea level. The normal range of fluctuation is much narrower—between 126.6 and 128.5 feet (Figure 3-188). During 2025, Lake Pansy's surface level only declined from a January high of 128.7 feet and ending the year near the low end of the normal range at 127 feet. Based on these results, it appears that Lake Pansy most closely reflected the dearth of rainfall received in 2025. According to linear regression analysis, changes in Lake Pansy's surface level correlates directly with water clarity (see appendix). This indicates that higher surface levels result in increased flushing and water clarity.

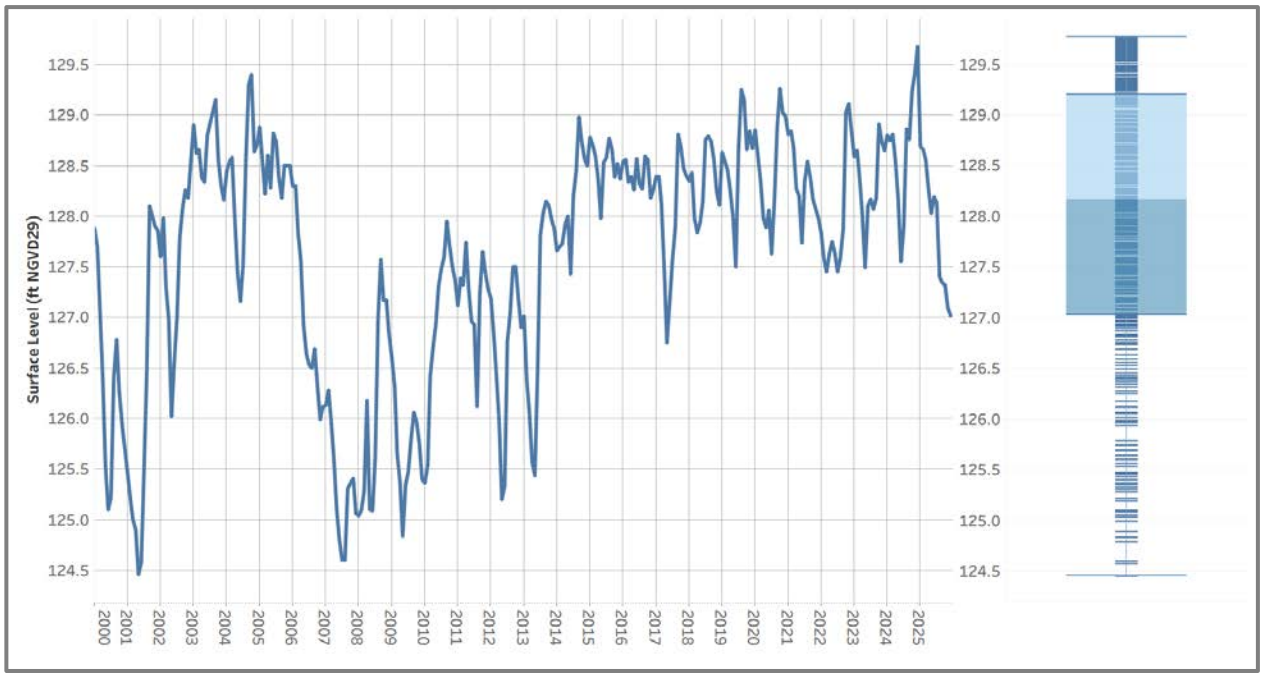


Figure 3-188. Hydrograph of Lake Pansy depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

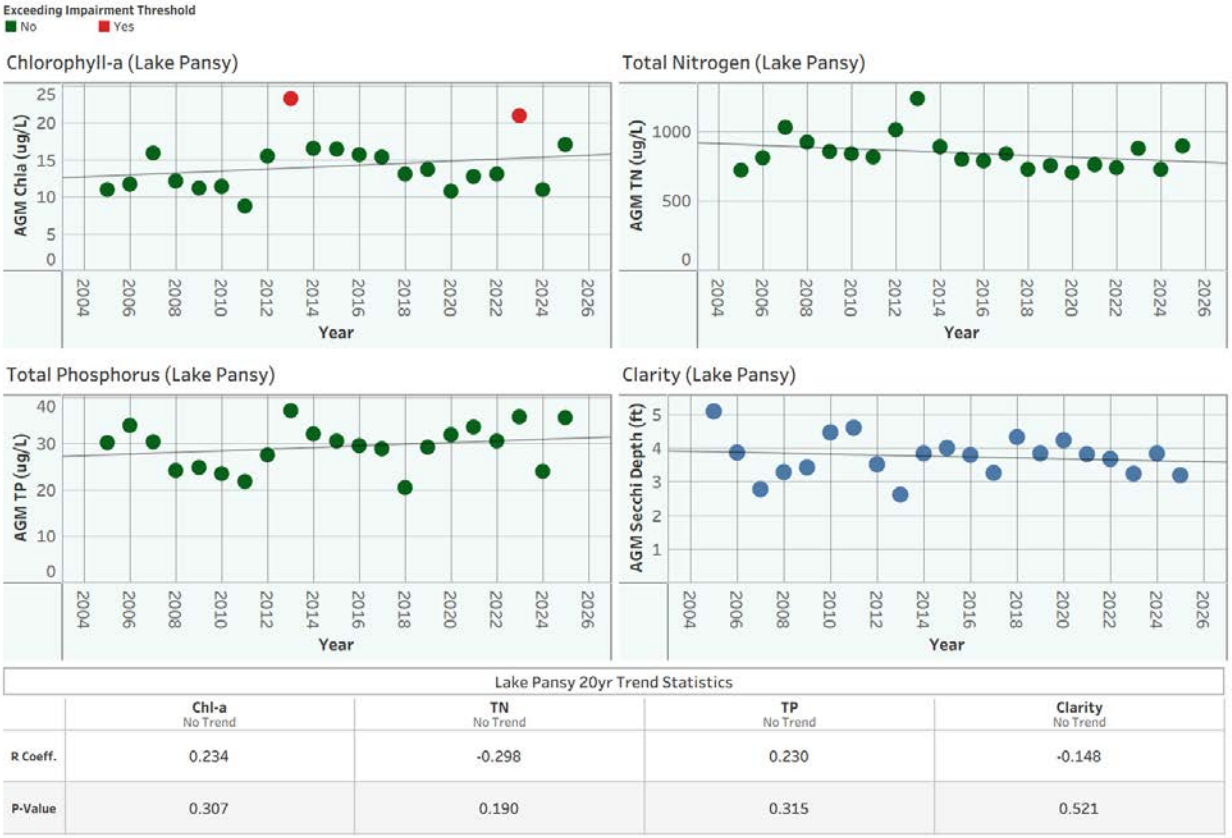
Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Pansy is categorized as a highly colored waterbody. Aside from a single NNC exceedance of Chl-a

during 2023, Lake Pansy's water quality has met the NNC guidelines (Figure 3-189). Pansy's status is currently un-impaired which earns it an impairment criterion score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this time frame, none of the NNC parameters exhibited a statistically significant trend. The trends for Chl-a, TP, and Secchi depth were in a deteriorating direction, earning a trend criterion score of 1; whereas the TN trend was in an improving direction, for a criterion score of 2. Considering the lack of impairments, these trends are not concerning as they don't indicate declining water quality.



Lake Pansy 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	0.234	-0.298	0.230	-0.148
P-Value	0.307	0.190	0.315	0.521

Figure 3-189. Lake Pansy AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Pansy on 8/13/2025. The PAC during this survey was 52.1% and the total BV was 7%; for an abundance criterion score of 3 (Figure 3-190). It should be noted that vegetation coverage more than doubled from the previous year, reaching a period of record high. This substantial change may be due to an expansion of the floating-leaf plant, spatterdock, since the amount of submerged vegetation actually decreased compared to the previous year. Another explanation could be due to an increased detection of detritus. Ultimately, it will be important to continue monitoring the vegetation to pick up on long-term changes in the community.

Invasive Species Management:

Based on the 2025 survey, Lake Pansy exhibited a moderately diverse vegetation community, mostly dominated by floating-leaf and emergent species (Figure 3-191). The native spatterdock was the most dominant species—making up over 30% of the population. Only a small amount of the submerged plant, eelgrass was detected. The invasive sacred lotus and water hyacinth made up nearly 7% of the community—for an invasive score of 1. It will be important to continue managing these exotic plants to prevent further spread.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, only Lake Pansy's species evenness exceeded its long-term median value (Figure 3-192). This equates to a diversity criterion score of 1. A dramatic drop in species richness from the previous year likely caused the slight decline in overall diversity to below-average levels. Compared to previous years, there was a market loss in some relatively uncommon submerged species. This resulting community shift may be due to nearly constant management efforts to control water hyacinth and sacred lotus. Only once these species are in a controlled state will the plant community begin to recover.

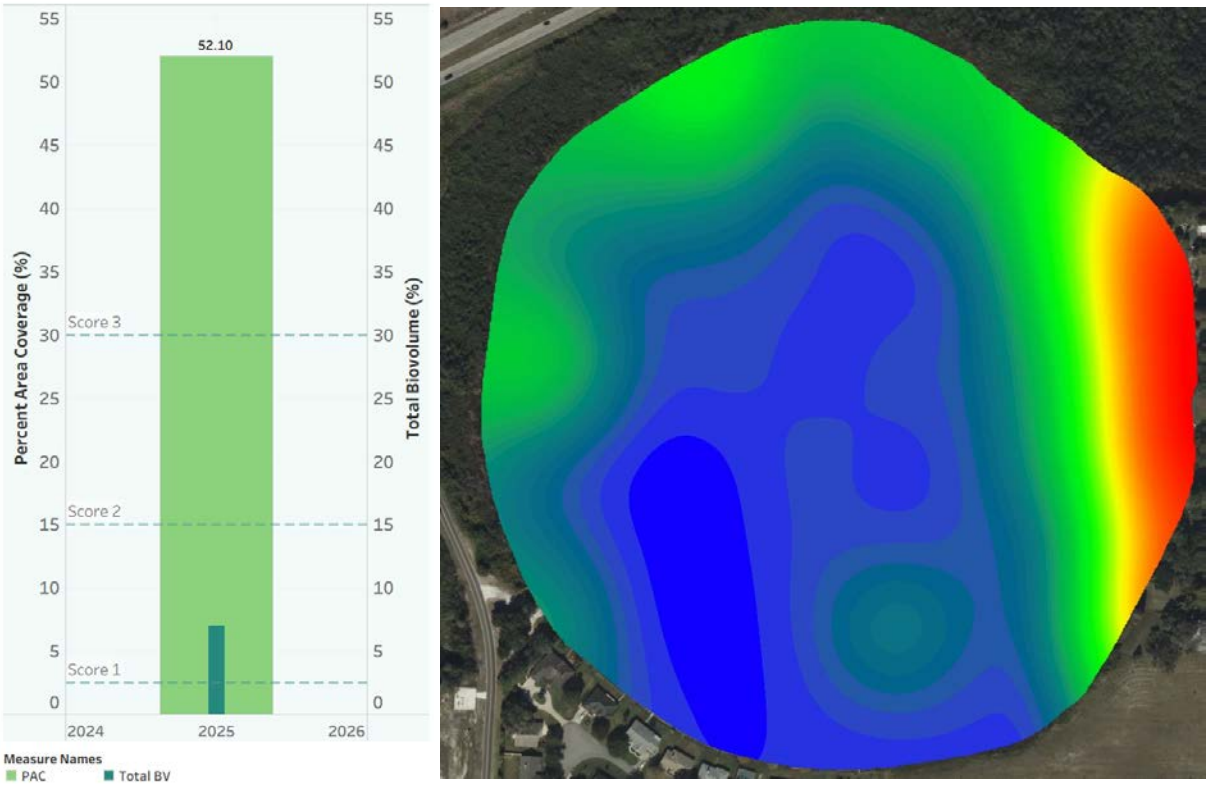


Figure 3-190. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Pansy; biovolume values range from green (lowest) to red (highest).

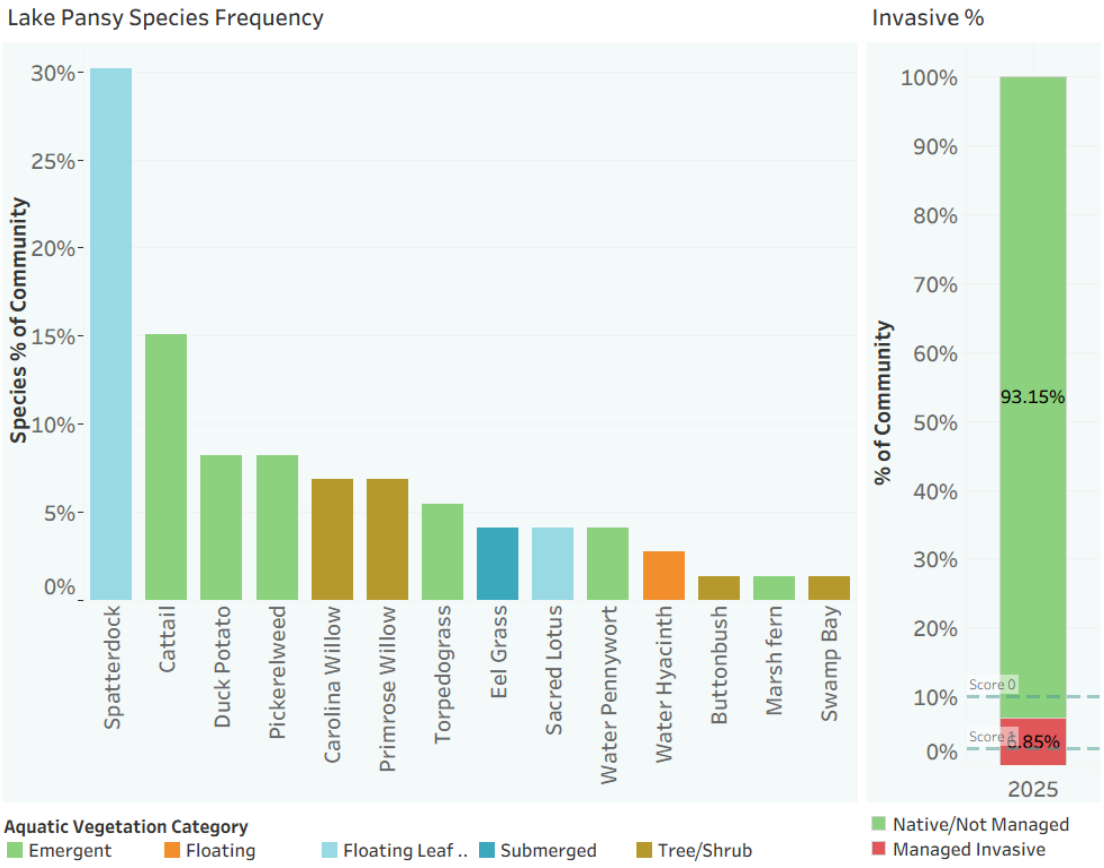


Figure 3-191. Chart depicting species frequency and invasive species percentage of Lake Pansy during 2025.

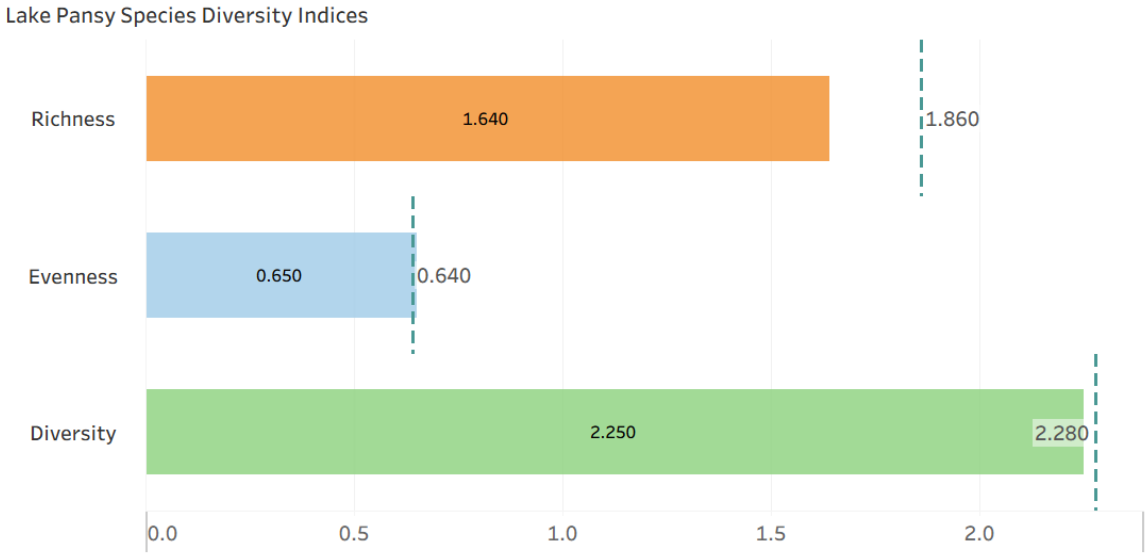


Figure 3-192. Chart depicting 2024 diversity indices for Lake Pansy. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Pansy's health index scores from 2018 to 2025 demonstrates general consistency (Table 3-27). There has been no change in the impairment scores during this time and trend scores have fluctuated somewhat—leading to the assumption that water quality remains static. Each of Pansy's biological criteria have fluctuated considerably during this time—emphasizing how dramatically invasive species can disrupt the natural community. Overall, Lake Pansy sits in the middle of the priority ranking. While it is not currently impaired, its water quality trends are not ideal and the invasive treatments it undergoes could impact water quality and vegetation diversity in the future.

Lake Health Impacts/Challenges:

- Stormwater pollutant loading is one of the primary concerns for water quality management. While the City does not possess much stormwater infrastructure in the area, there is room for measures to reduce pollutant loading in the drainage basin.
- The management of invasive species is a consistent concern. It can only take a single growing season for even a small population to take over large areas of a waterbody.
- Lake Pansy's water clarity is correlated with surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- The City can explore expanding street sweeping services to 21st Street to reduce potential stormwater pollutant loading.
- City staff will continue to monitor aquatic vegetation and share the information with Polk County and the FWC. Staff will also take a more active role in advocating for the most effective, but least impactful invasive management strategies to ensure proper balance of the vegetation community.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	0	1	1	1	2	0	1	**1.1**
2019	3	0	1	1	1	3	0	3	**1.5**
2020	3	0	1	1	2	2	0	3	**1.5**
2021	3	0	1	1	2	3	0	2	**1.5**
2022	3	0	1	1	2	2	1	0	**1.3**
2023	3	0	2	1	1	2	2	1	**1.5**
2024	3	1	2	1	1	2	3	2	**1.9**
2025	3	1	2	1	1	3	1	1	**1.6**

Table 3-27. Lake Health Index values for Lake Pansy from 2018 to 2025.

Lake Rochelle

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	2	2	3	1	3	2.5

Features & Statistics:

Surface area	559.9 acres
Mean depth	8.96 feet
Maximum depth	20 feet
Volume	6,060.2 acre-feet
Drainage basin area	1,667.7 acres
Annual TN Load	3,002.6 lbs
Annual TP Load	522.2 lbs
Limiting nutrient	Phosphorus

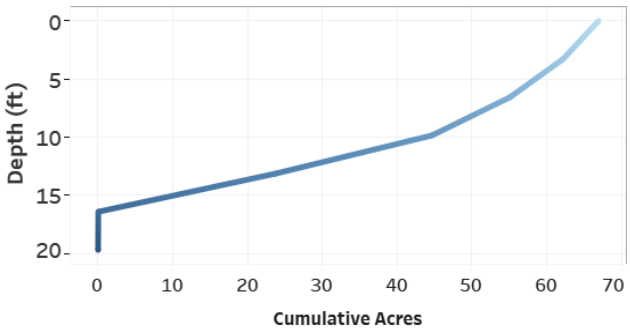


Figure 3-193. Hypsograph of Lake Rochelle depicting the depth profile and morphology of the lake bed.

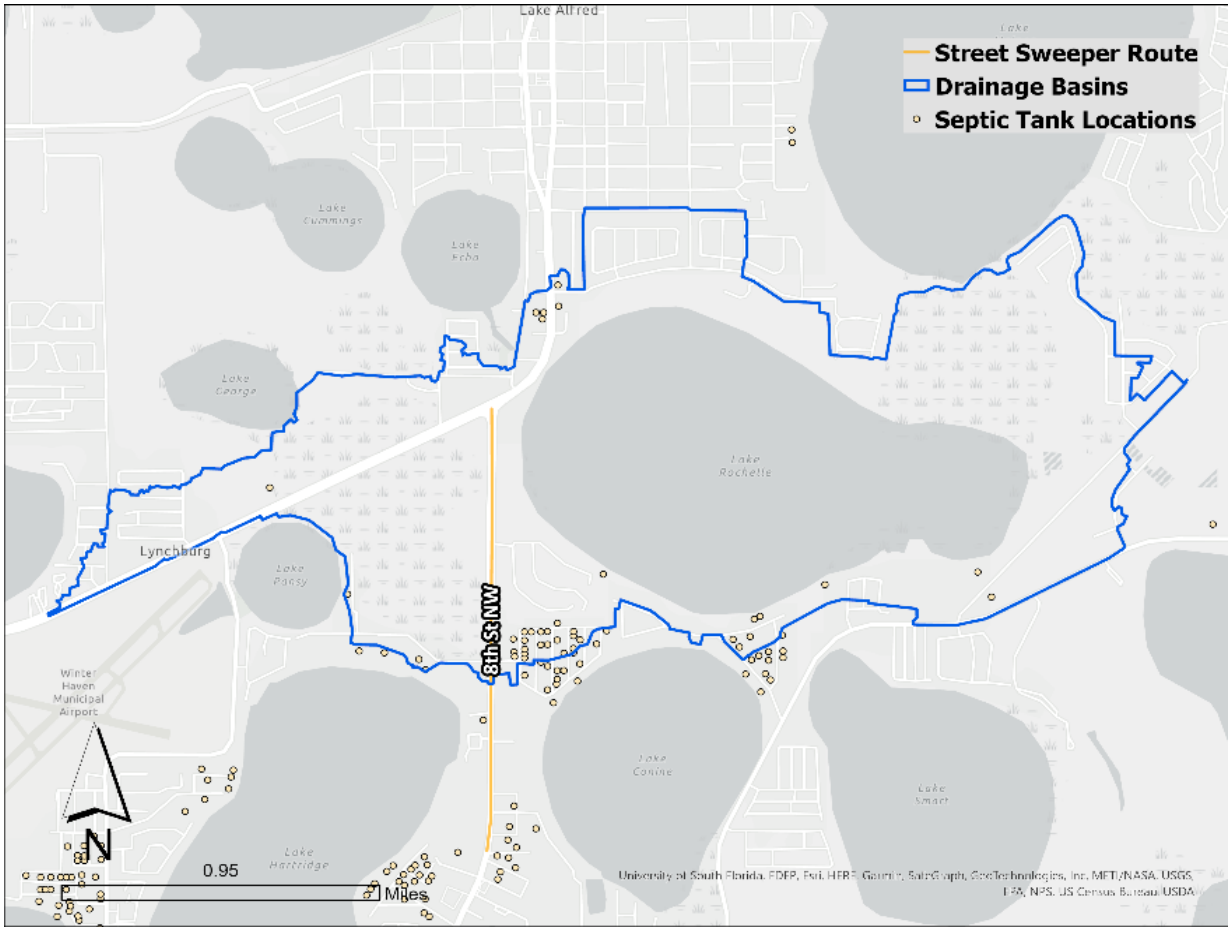


Figure 3-194. Map of Lake Rochelle's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Rochelle is one of Winter Haven's larger waterbodies with a surface area of 560 acres. Rochelle is slightly deeper than the regional average with a mean depth of nearly 9 feet and a maximum depth of 20 feet (Figure 3-193). Despite the depth, the slope of the lake bed is relatively gradual—allowing for a large littoral zone to support a robust vegetation community. Stormwater is conveyed to this waterbody from a 1,670 acre, relatively rural drainage basin (Figure 3-194). Wetland, residential, agricultural, and commercial land uses comprise the drainage basin, contributing 3,002 lbs of TN and 522 lbs of TP to the lake annually. On a per acre basis, these are some of the lowest pollutant loading rates in the study area. There are over 40 septic systems within the basin. These constitute a relatively low density based on the number of systems per acre. To mitigate stormwater pollutant loading, the City conducts 4.4 miles of street sweeping twice monthly along US Highway 17.

As part of the North Chain of Lakes, Lake Rochelle is connected to Lakes Conine and Haines via navigable canals. Excess water from the North Chain eventually drains via the SWFWMD-managed P-8 control structure at the south of Lake Hamilton and enters the Peace Creek. Over the period of record, surface levels in this section of the North Chain (Lakes Conine, Haines, Rochelle, and Smart) have fluctuated between 122 and 129.5 feet above sea level. The normal range fluctuates much less between 126.1 and 128.2 feet (Figure 3-195). During 2025, Lake Rochelle reached a peak of 128.5 feet in February and a low of 127.6 feet in December. The surface level generally declined throughout the year—likely due to the low annual rainfall as well as hydrologic management by the SWFWMD. While the North Chain surface level did not drop below its long-term median, 2025 marks the lowest this chain has reached since the 2017 dry season. Changes in Lake Rochelle's surface level are directly correlated with water clarity and indirectly correlated with Chl-a and TN (see appendix). This carries management implications as maintaining higher levels should result in improved water quality.

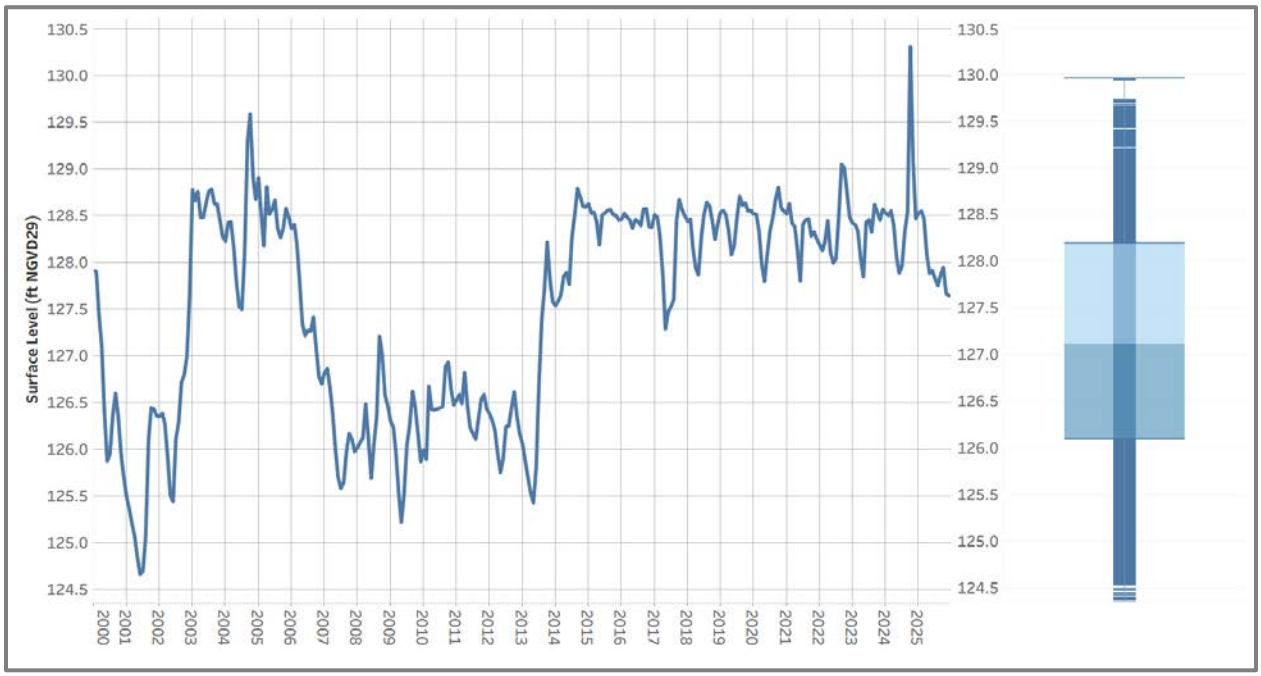


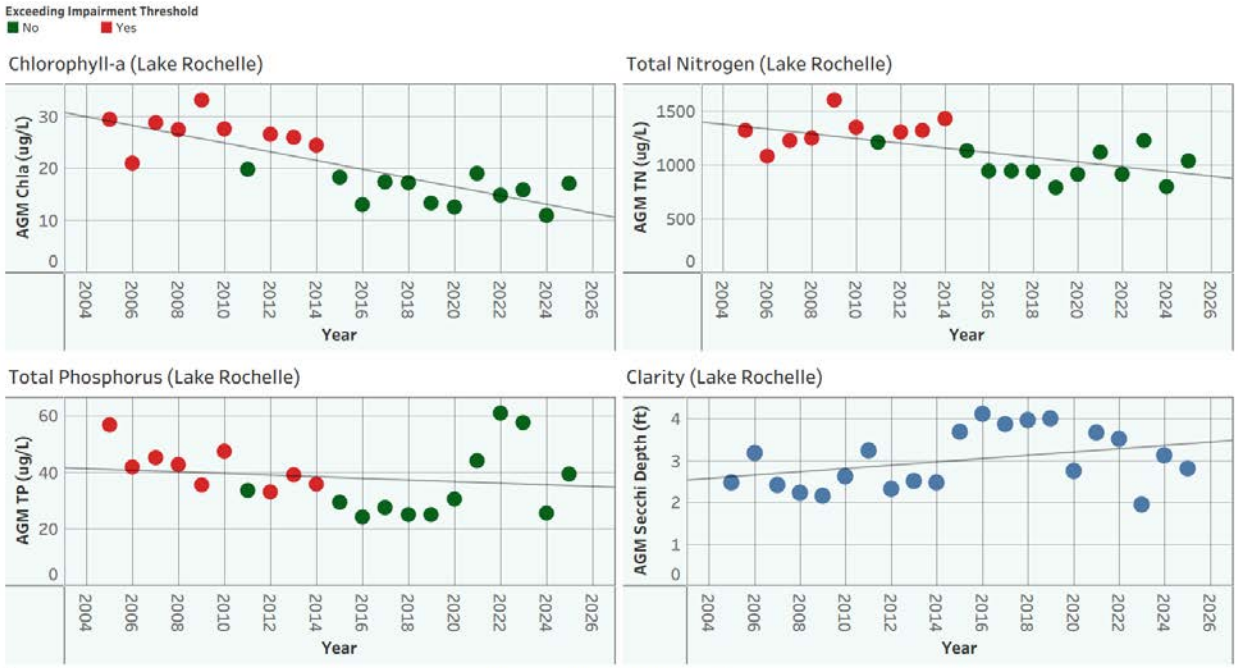
Figure 3-195. Hydrograph of Lake Rochelle depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria, Lake Rochelle is categorized as a clear, alkaline waterbody. While Lake Rochelle was previously impaired, a lack of NNC exceedances during the assessment period has resulted in its currently un-impaired status (Figure 3-196). This equates to an impairment criterion score of 3. In 2018, the FDEP established a total maximum daily load stipulating a 32% TN reduction to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During the most recent analysis, Ch-la and TN exhibited significant improving trends—equating to trend criteria scores of 3. Due to changes in the last few years both TP and water clarity have exhibited non-significant improving trends; for a trend score of 2. Ultimately, Lake Rochelle has significantly improved in the realm of water quality and the trends show either continued improvement or stability since it began meeting the NNC targets.



Lake Rochelle 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity No Trend
R Coeff.	-0.802	-0.628	-0.159	0.354
P-Value	0.000	0.002	0.490	0.115

Figure 3-196. Lake Rochelle AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Rochelle on 2/28/2025. The PAC during this survey was 33.8% and the total BV was 6.2% (Figure 3-197). This equates to an abundance criterion score of 3. Lake Rochelle has consistently maintained vegetation coverage above 30% until it dipped below this threshold in 2023. Fortunately, coverage has remained relatively high since then.

Invasive Species Management:

Based on data from the 2025 survey, Lake Rochelle boasts a healthy mix of both submerged and emergent vegetation—with eelgrass dominating the community at 21% (Figure 3-199). Hydrilla, and water hyacinth comprised the managed invasive species present at just over 7% of the community; equating to an invasive presence criterion score of 1. The invasive presence has been a constant issue since 2019 but has exhibited a gradual decline until 2024 where it rose somewhat from the 3% recorded in 2023. Continued management is necessary to keep these plants under control.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, all three of Lake Rochelle's diversity indices exceeded their long-term median values (Figure 3-198). This equates to a diversity criterion score of 3. Overall, Lake Rochelle exhibits good diversity compared with other waterbodies in the area. Compared to 2024, both the number of unique species and the evenness of their distribution increased—which also led to a rise in overall species diversity. It is likely invasive species management occurred between the 2024 and 2025 surveys, so these changes in diversity are likely due to a combination of exotic species reduction and natural community fluctuations.

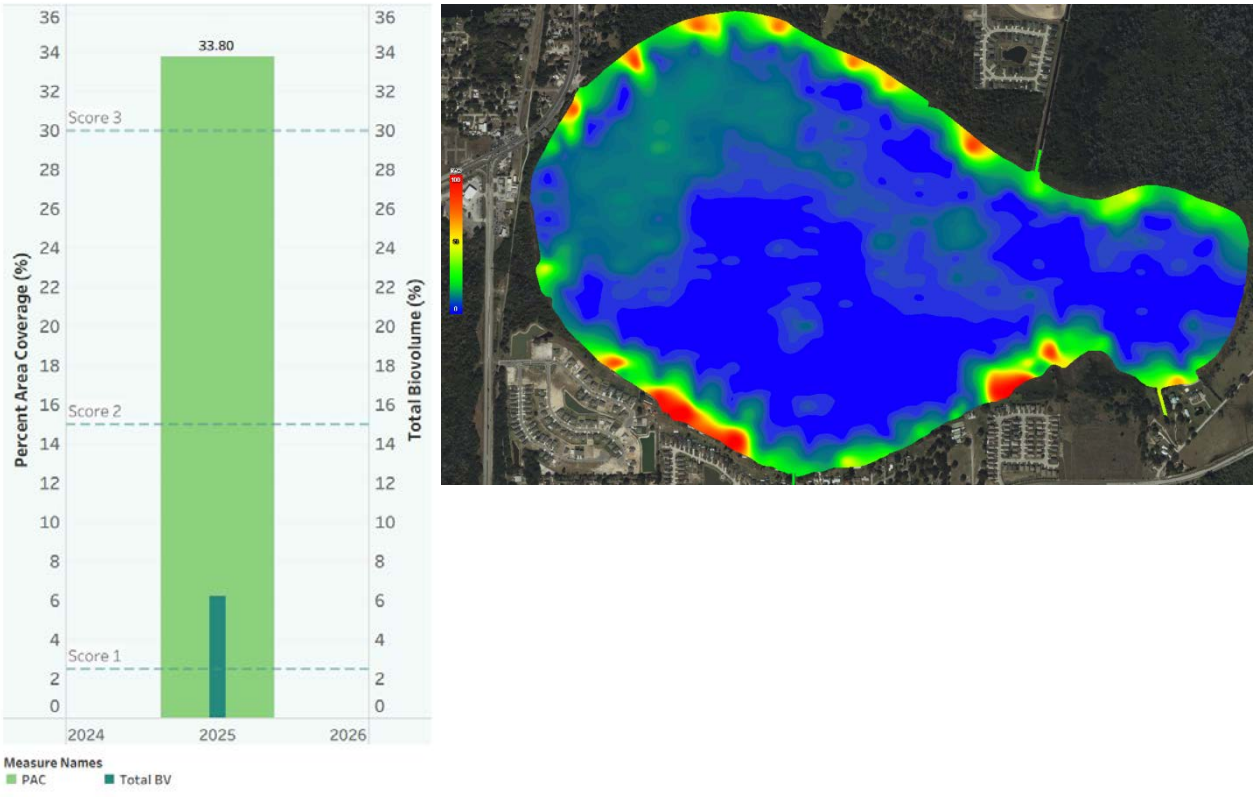


Figure 3-197. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Rochelle; biovolume values range from green (lowest) to red (highest).

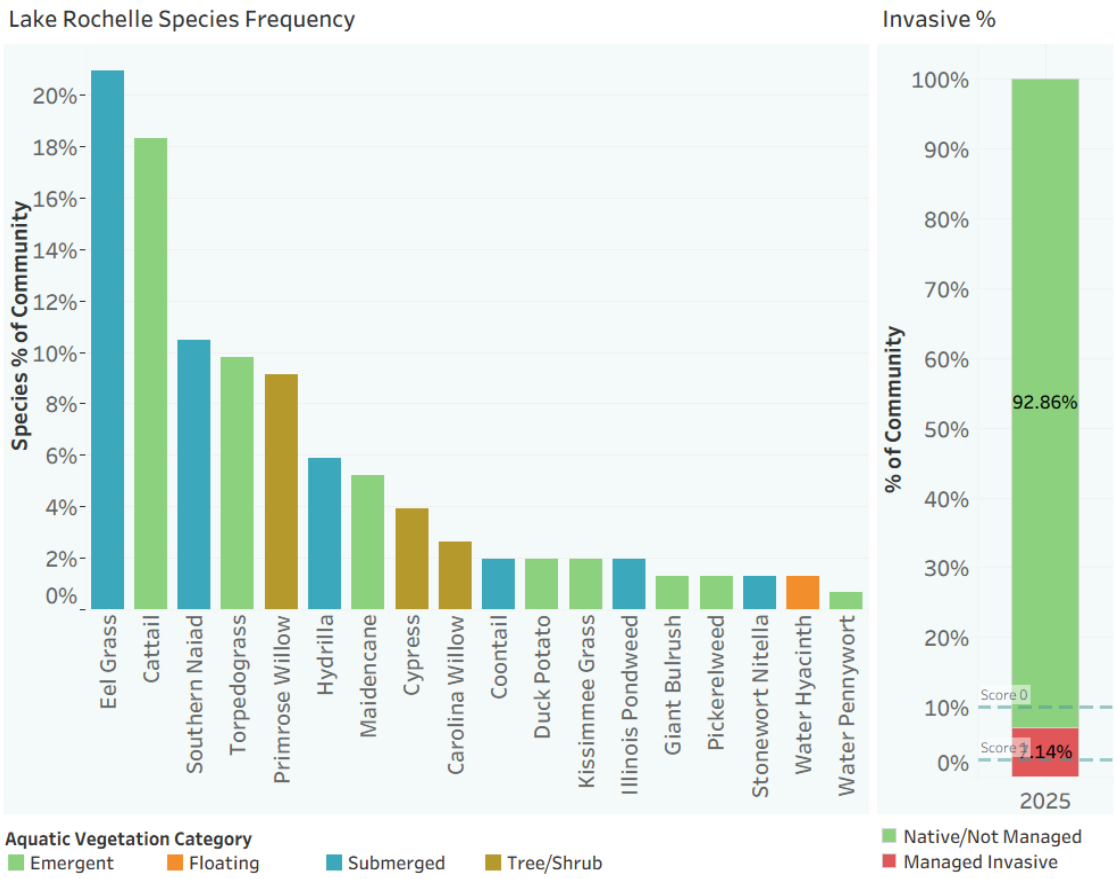


Figure 3-199. Chart depicting species frequency and invasive species percentage of Lake Rochelle during 2025.

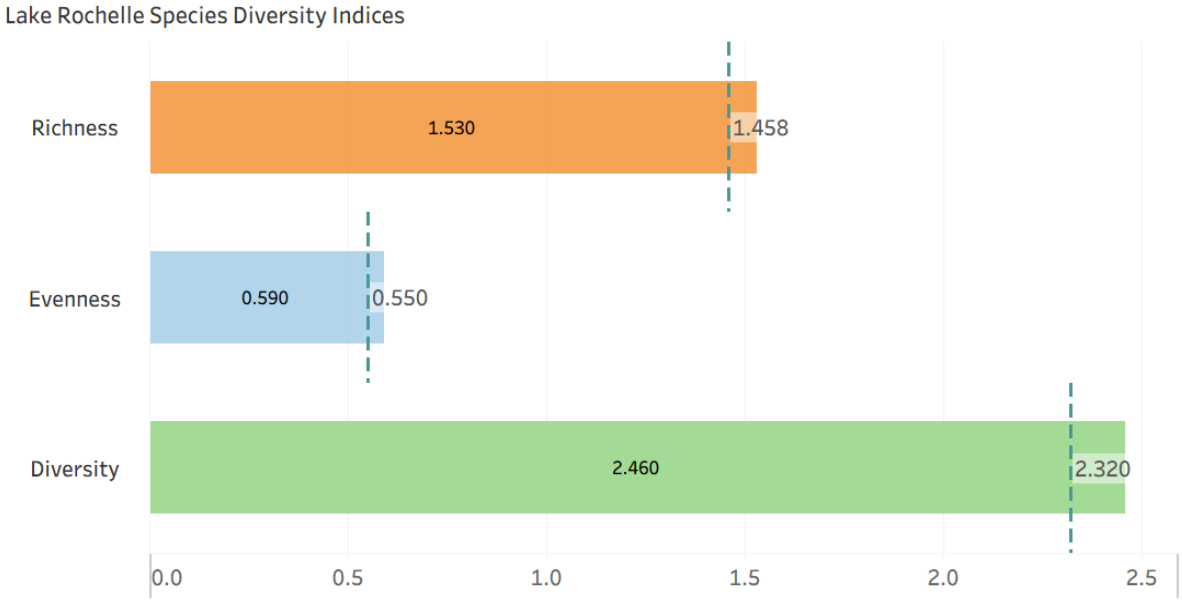


Figure 3-198. Chart depicting 2025 diversity indices for Lake Rochelle. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Rochelle's health index scores from 2018 to 2025 shows relative stability (Table 3-28). Over this span, Rochelle's water quality has improved considerably; both exhibiting improving trends and meeting NNC guidelines after 2020. Its vegetation abundance scores have remained high. Much of the lake health score variability has been the result of shifts in the invasive species and diversity criteria over the years. Overall, Lake Rochelle ranks lower on the priority list since its water quality is now meeting standards and continues to exhibit improvement. The main area for management action is controlling invasive plants.

Lake Health Impact/Challenges:

- Lake Rochelle currently exhibits good water quality and improving trends. However, stormwater pollutant loading is a potential concern and one of the primary factors at which to look if water quality begins trending in an unfavorable direction.
- Several of Lake Rochelle's water quality parameters are correlated with surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- The management of invasive species like hydrilla is one of the primary concerns. Large-scale herbicide treatments can lead to water quality declines; which is a possibility as hydrilla is still not in a controlled state.

Lake Management Strategy:

- In order to mitigate stormwater pollutant loading, the City conducts street sweeping along one of the few public roads in the basin.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Recent invasive species management efforts have included herbicide treatment and minimal stocking of triploid grass carp.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	3	2	3	3	3	1	3	**2.3**
2019	0	3	3	3	3	3	0	3	**2.3**
2020	0	3	3	3	3	3	0	1	**2.0**
2021	3	3	3	3	3	3	0	0	**2.3**
2022	3	3	3	3	3	3	0	2	**2.5**
2023	3	3	3	2	3	2	1	1	**2.3**
2024	3	3	3	2	3	3	1	2	**2.5**
2025	3	3	3	2	2	3	1	3	**2.5**

Table 3-28. Lake Health Index values for Lake Rochelle from 2018 to 2025.

Lake Roy

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	2	3	2	3	1	2	2.4

Features & Statistics:

Surface area	74.3 acres
Mean depth	10.76 feet
Maximum depth	26 feet
Volume	1,063.1 acre-feet
Drainage basin area	353.7 acres
Annual TN Load	1,448.3 lbs
Annual TP Load	241.53 lbs
Limiting nutrient	Phosphorus

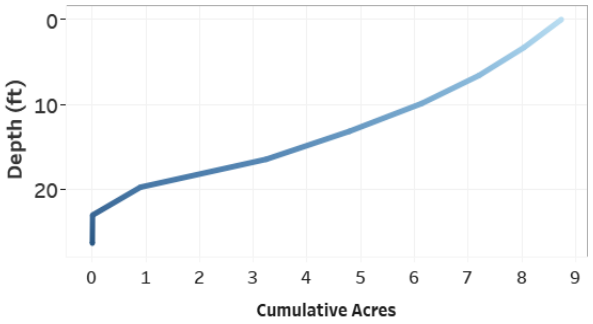


Figure 3-200. Hypsograph of Lake Roy depicting the depth profile and morphology of the lake bed.

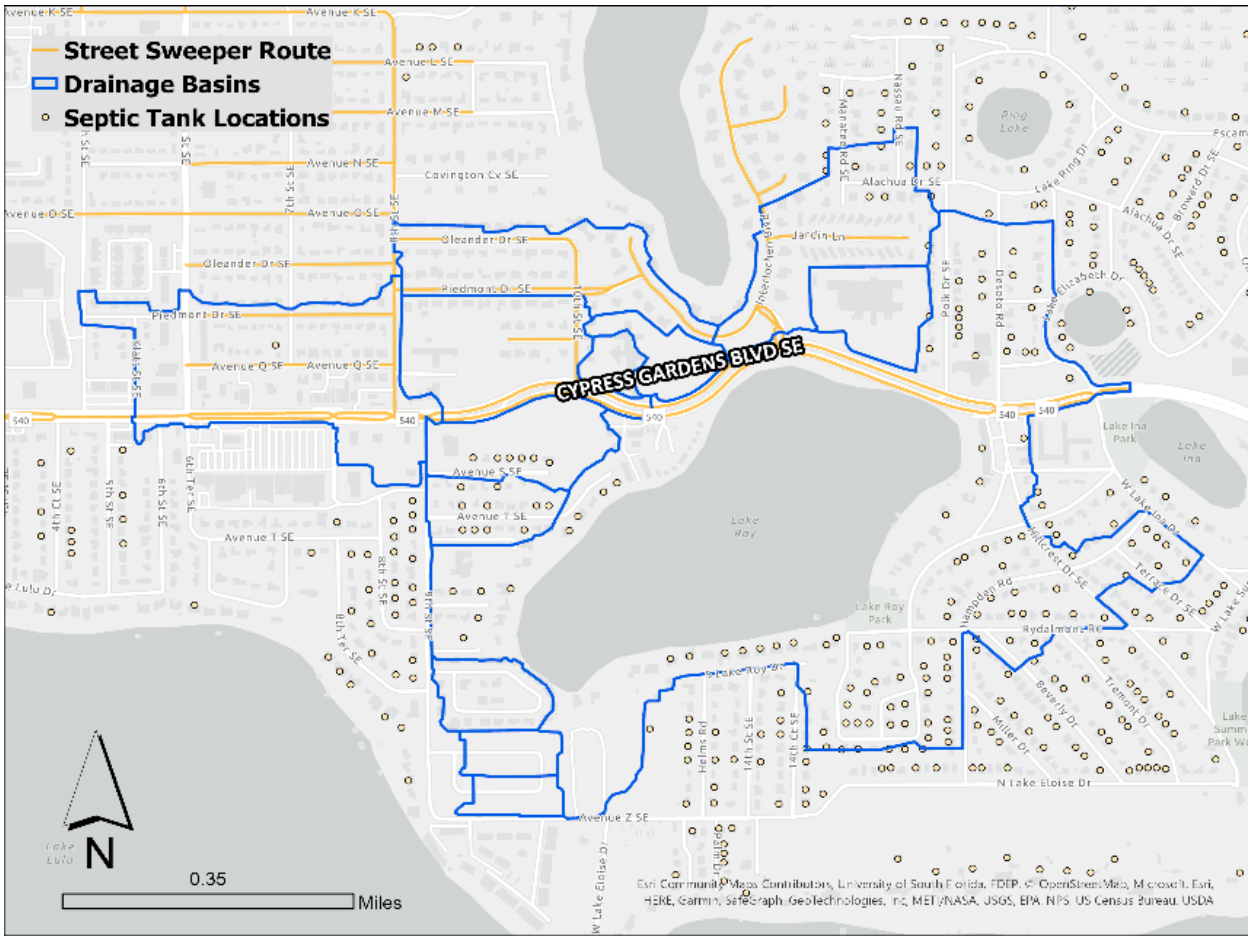


Figure 3-201. Map of Lake Roy's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Roy is a smaller, but deeper waterbody at 74 acres, an average depth of roughly 11 feet, and a maximum depth of over 25 feet (Figure 3-200). While Roy is deeper than many other lakes in the region, it possesses a gradual sloping lake bed which can support a large littoral zone and a robust aquatic plant community. Stormwater is conveyed to this waterbody from a 354 acre drainage basin comprised of 13 individual sub-basins (Figure 3-201). The basin is comprised mostly of residential land uses, but does include some commercial and transportation uses. This basin contributes 1,448 lbs of TN and 241 lbs of TP to the lake annually; the nitrogen load, in particular, is relatively high within the region on a per acre basis. There are 125 septic systems located within the basin—constituting a high density and greater potential for pollutant loading via groundwater leaching. To combat stormwater pollutant loading within the Winter Haven portion of the drainage area, the City conducts 11.8 miles of street sweeping on a monthly basis.

Lake Roy is located on the South Chain of Lakes, connecting to Lake Lulu via navigable canal. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-202). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Roy's surface level correlates with TN and water clarity (see appendix). This carries management implications as maintaining higher levels should result in water quality improvements.

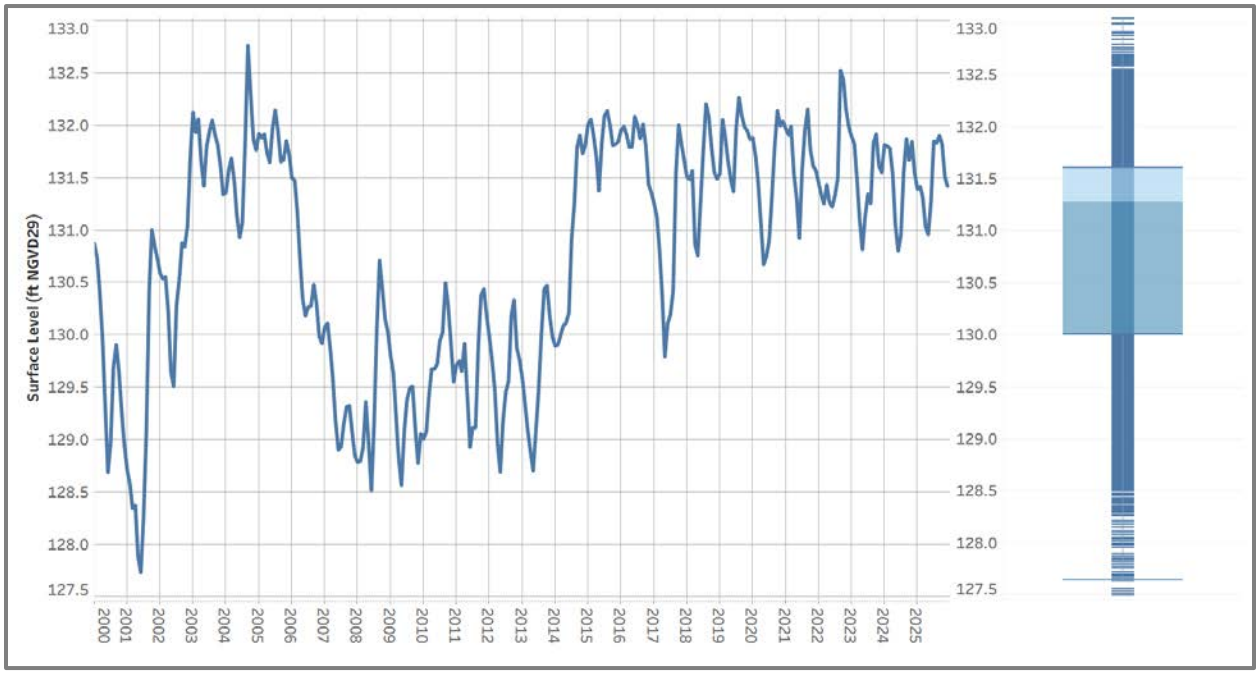


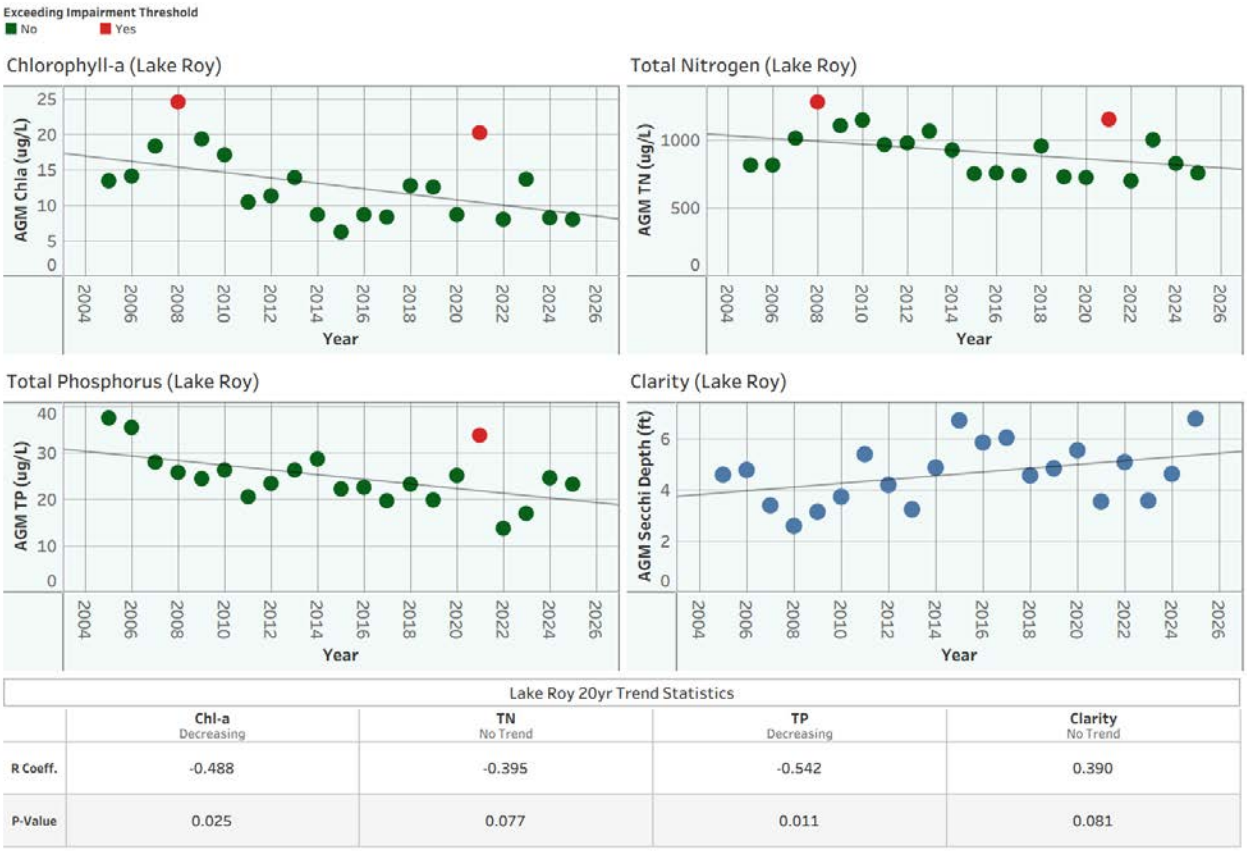
Figure 3-202. Hydrograph of Lake Roy depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Roy is categorized as a clear, alkaline waterbody. Aside from an outlier year during 2021, Lake Roy has exhibited only one NNC exceedance during the assessment period—in 2021 (Figure 3-203). As a result, Roy is considered un-impaired and earns an impairment criterion score of 3. Despite the high Chl-a and nutrient concentrations in 2021, Lake Roy has exhibited low Chl-a, TN, and TP concentrations in recent years.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, Chl-a and TP exhibited significant improving trends. This equates to a trend criteria score of 3 for these parameters. Secchi depth and TN exhibited non-significant improving trends; for criterion scores of 2. Generally, Lake Roy's water quality has remained relatively stable, indicating little cause for



Lake Roy 20yr Trend Statistics

	Chl-a Decreasing	TN No Trend	TP Decreasing	Clarity No Trend
R Coeff.	-0.488	-0.395	-0.542	0.390
P-Value	0.025	0.077	0.011	0.081

Figure 3-203. Lake Roy AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are trend lines and box & whisker plots showing relative variance.

concern.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Roy on 4/11/2025. The PAC during this survey was 46.3% and the total BV was 10.2% (Figure 3-204). PAC over the 30% threshold equates to an abundance criterion score of 3. In 2018, Lake Roy had a PAC of over 50%. However, in 2019, this abundance value dropped to 17%. This was likely due to large-scale

invasive species treatments between these two surveys. Fortunately, the abundance values have consistently increased since then—indicating an effective biological recovery.

Invasive Species Management:

Based on data from the 2025 survey, Lake Roy is very clearly dominated by submerged plants with native eelgrass and Illinois pondweed making up nearly 40% of the community (Figure 3-205). The remaining plants include a mix of other SAV and emergent species. While there were no managed invasives detected in 2024, a substantial resurgence in hydrilla led to an invasive percentage of almost 6%, resulting in an invasive score of 1. This demonstrates how quickly invasive species can take over a lake ecosystem and why monitoring efforts are so important.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. Based on the 2025 species data, Lake Roy's species richness and overall diversity index values exceeded their long-term medians (Figure 3-206). This equates to a diversity criterion score of 2. Both species richness and evenness increase from 2024, leading to the rise in overall diversity. Since hydrilla wasn't present in 2024, no invasive management efforts took place. Therefore this shift in the vegetation community can be attributed to natural fluctuations.



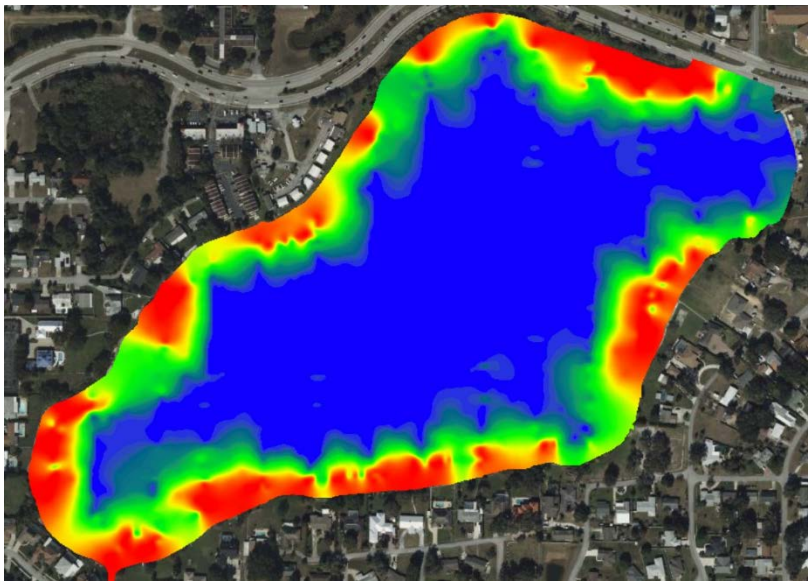


Figure 3-204. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Roy; biovolume values range from green (lowest) and red (highest).

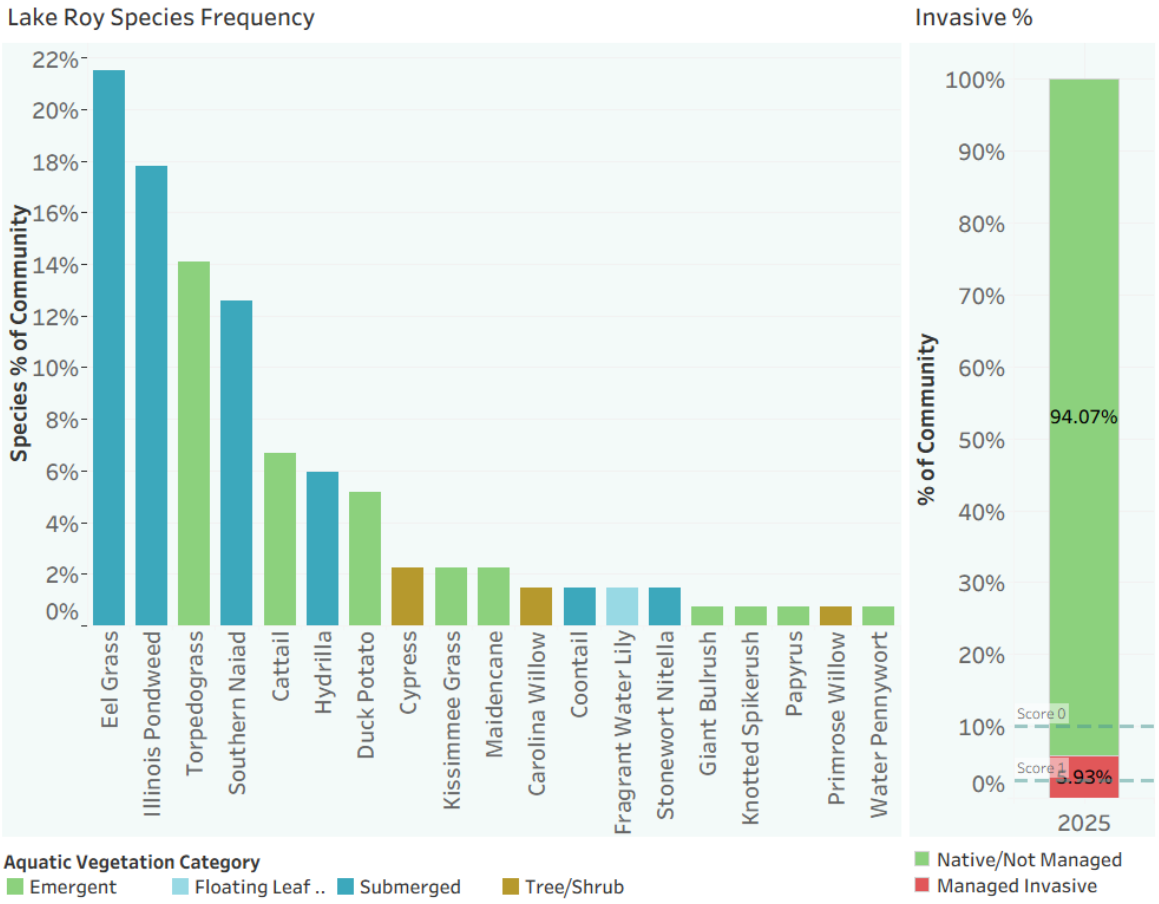


Figure 3-205. Chart depicting species frequency and invasive species percentage of Lake Roy during 2025.

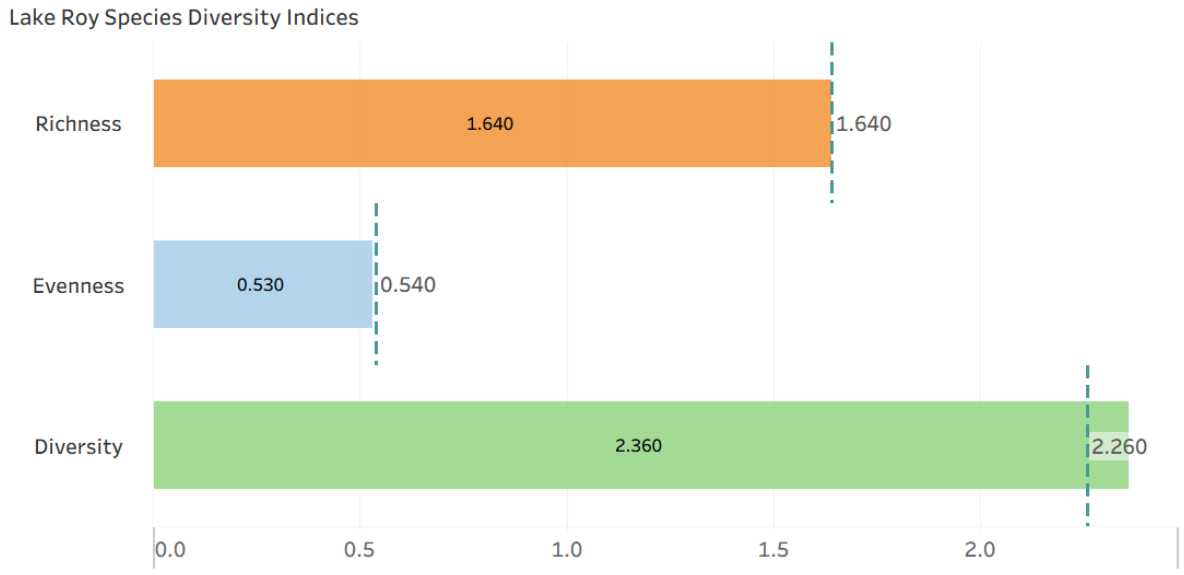


Figure 3-206. Chart depicting 2025 diversity indices for Lake Roy. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Roy's health index scores from 2018 to 2025 shows consistently high lake health (Table 3-29). Over this span, the water quality criteria scores have changed very little as it exhibits excellent water quality and generally improving trends. Vegetation abundance exhibited a decline in 2019 and 2020, but has since recovered. Invasive presence and its impact on species diversity continues to fluctuate and is the primary source of lake health changes at this point. Overall, Lake Roy is ranked low on the priority list due to these higher lake health scores.

Lake Health Impacts/Challenges:

- Lake Roy currently exhibits excellent water quality with no signs of deterioration. However, if this changes, the City would look to stormwater and the septic presence as potential primary drivers of water quality decline.
- The management of invasive species like hydrilla has been a concern in the past. While current populations appear to be controlled, it can take just a single growing season for these to take over large areas of a waterbody.
- Several of Lake Roy's water quality parameters are correlated with surface level; likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- The City currently conducts street sweeping and has implemented treatment swales in the northern portion of the drainage basin. Future stormwater mitigation efforts may be construction of green infrastructure in one of the northern sub-basins identified by the Stormwater Assessment and Improvement Plan.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response helps to prevent large-scale herbicide treatments and potential water quality impacts that follow.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	2	3	3	0	2	**2.4**
2019	3	3	3	3	3	2	1	2	**2.5**
2020	3	3	3	3	3	2	2	3	**2.8**
2021	3	3	3	2	3	3	1	2	**2.5**
2022	3	3	3	2	3	3	2	3	**2.8**
2023	3	3	2	3	2	3	2	2	**2.5**
2024	3	3	2	3	2	3	3	1	**2.5**
2025	3	3	2	3	2	3	1	2	**2.4**

Table 3-29. Lake Health Index values for Lake Roy from 2018 to 2025.

Lake Shipp

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	3	2	3	3	2	2	2.3

Features & Statistics:

Surface area	279.4 acres
Mean depth	7.25 feet
Maximum depth	14 feet
Volume	2,044.5 acre-feet
Drainage basin area	910.6 acres
Annual TN Load	3,614.3 lbs
Annual TP Load	654.7 lbs
Limiting nutrient	Phosphorus

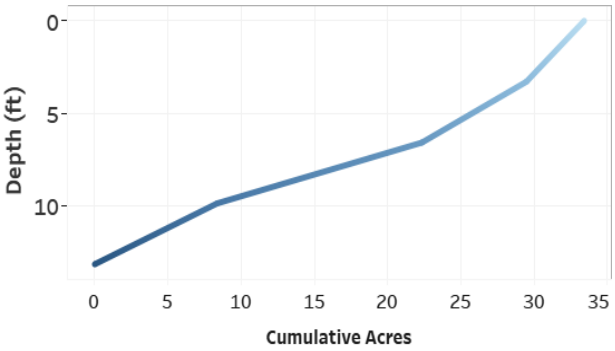


Figure 3-207. Hypsograph of Lake Shipp depicting the depth profile and morphology of the lake bed.

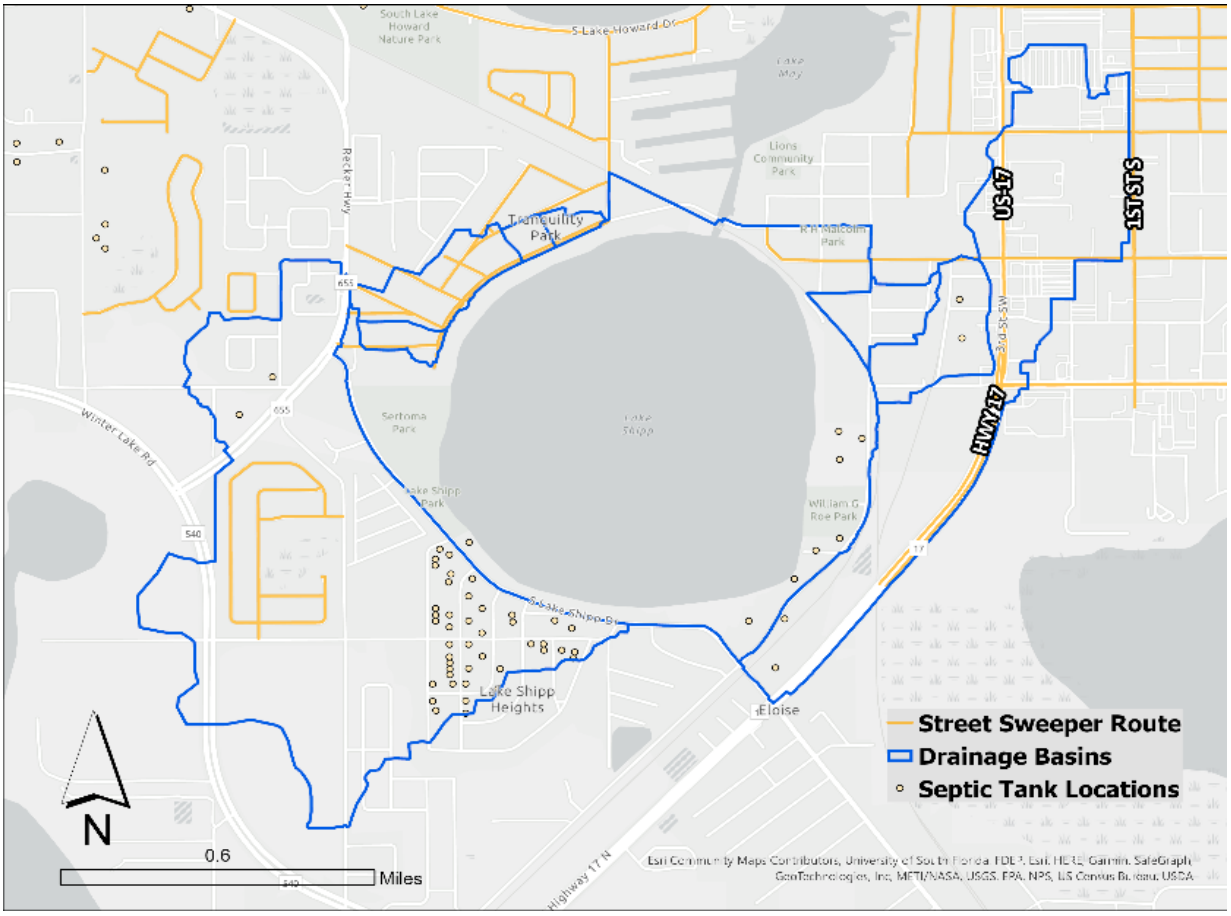


Figure 3-208. Map of Lake Shipp's drainage basin, City street sweeper routes, and nearby septic systems.

Hydrology:

Lake Shipp is a moderately-sized waterbody with a surface area of 280 acres. An average depth of 7.2 feet and a maximum depth of over 13 feet make Shipp a relatively shallow lake compared with other waterbodies in the region (Figure 3-207). The shallowness of the lake should allow it to support a wide littoral zone and robust aquatic vegetation community. Stormwater is conveyed to this waterbody from a 910 acre drainage basin comprised of 9 individual sub-basins (Figure 3-208). Ranked by area, the primary land uses in this basin are medium-density residential, commercial, high-density residential, industrial, and agricultural/open land. Based on stormwater pollutant load modeling, this drainage area contributes 3,614 lbs of TN and 655 lbs of TP to the lake annually; on a per acre basis, these loads are fairly high compared with other lakes in the study area. There are over 50 septic systems within the basin—constituting a moderate density with some potential for pollutant loading through groundwater leaching. To combat stormwater pollutant loading, the City conducts 12.4 miles of street sweeping in the basin on a monthly basis.

Lake Shipp is located centrally within the South Chain of Lakes with navigable connections to Lakes Lulu and May. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-209). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Shipp's surface level correlates with TN and water clarity (see appendix). This carries management implications as maintaining higher levels should result in improved water quality.

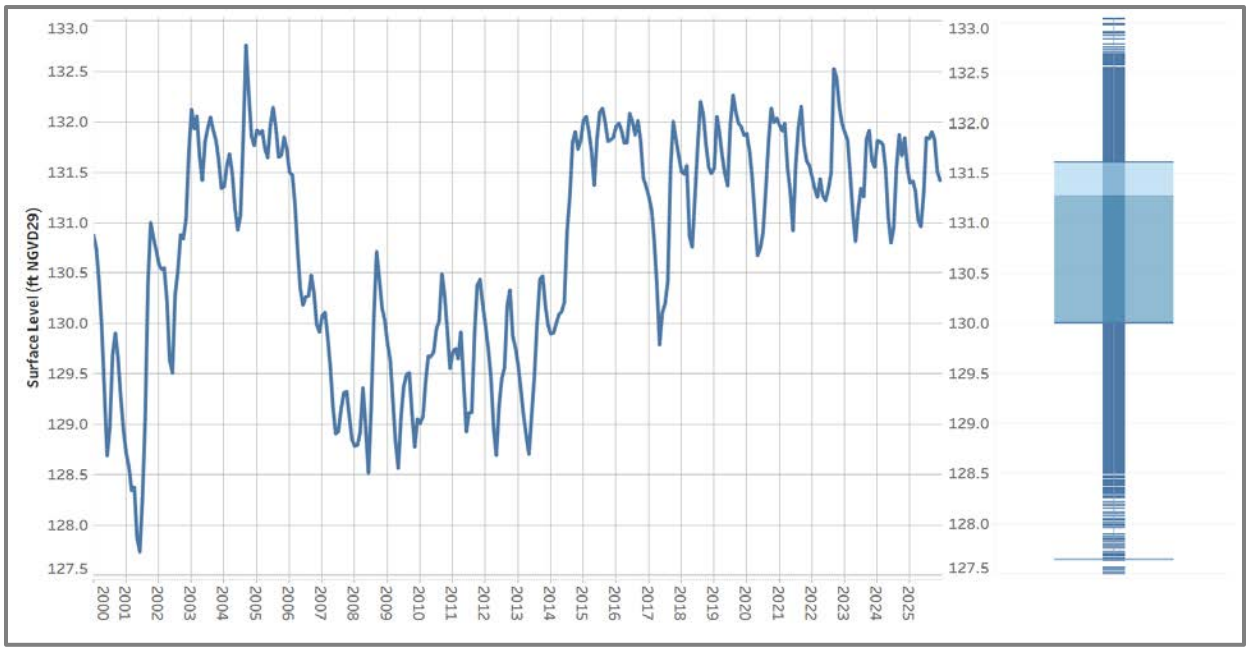


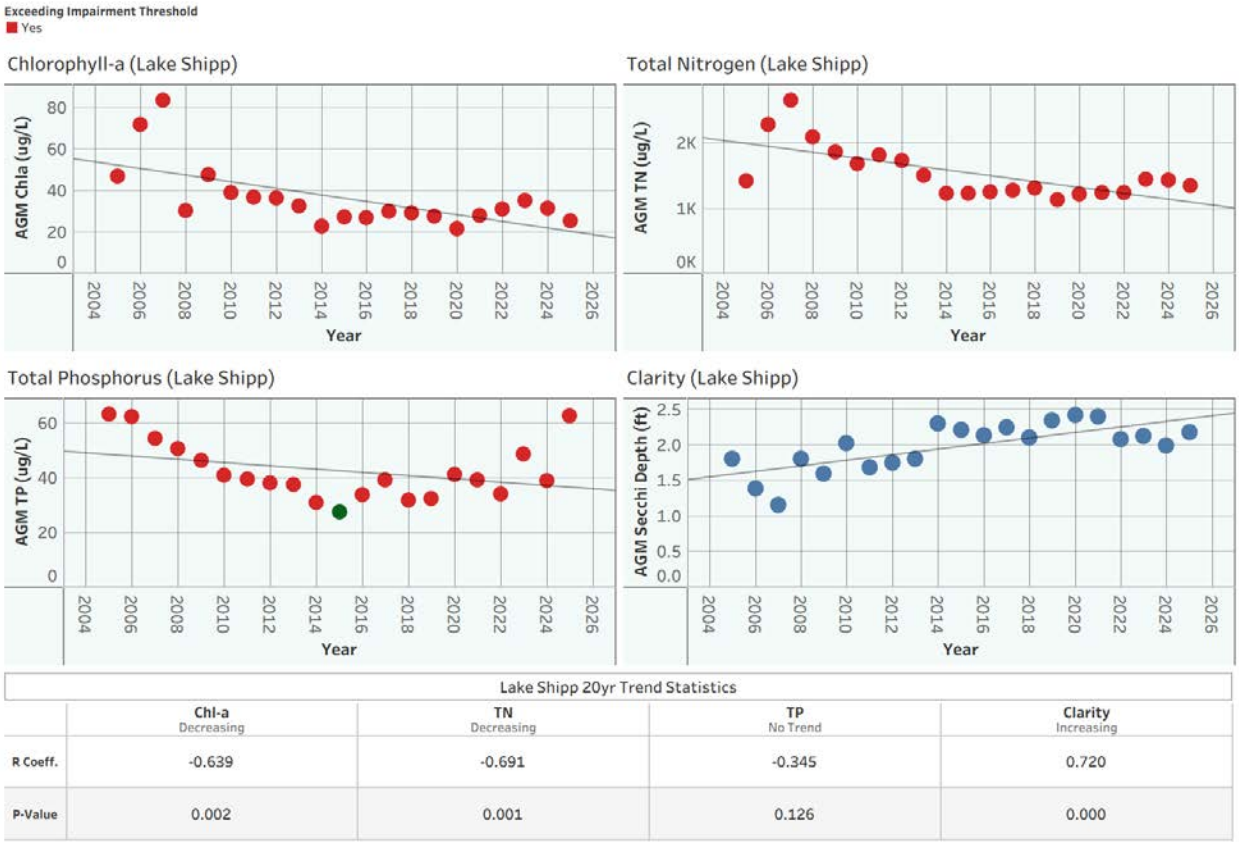
Figure 3-209. Hydrograph of Lake Shipp depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Shipp is categorized as a clear, alkaline waterbody. Due to consistent NNC exceedances during the assessment period, Lake Shipp is considered impaired for Chl-a, TN, and TP (Figure 3-210). This equates to an impairment criterion score of 0. In 2019, the FDEP established a total maximum daily load stipulating a 53% reduction in TN in order for Lake Shipp to meet NNC guidelines.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Each of Lake Shipp's water quality parameters except for TP exhibited significant improving trends during this period. This equates to trend criteria scores of 3 for Chl-a, TN, and Clarity. Recent elevated TP concentrations have reduced the significance of the TP trend, although it is still moving in an improving direction.



Lake Shipp 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity Increasing
R Coeff.	-0.639	-0.691	-0.345	0.720
P-Value	0.002	0.001	0.126	0.000

Figure 3-210. Lake Shipp AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Shipp on 9/12/2025. The PAC during this survey was 52.6% and the total BV was 15.3% (Figure 3-211). A PAC exceeding the 30% threshold equates to an abundance criterion score of 3. Since monitoring began, Lake Shipp has consistently exhibited PAC around in the 50% range. The robustness of this lake's littoral zone can be attributed to its gradual sloping bed and the abundance of vegetation likely contributes to

the improving water quality trends. The southern portion of Lake Shipp is much more gradually sloping than the north—supporting a much wider littoral zone.

Invasive Species Management:

Based on the 2025 survey data, Lake Shipp has a healthy mix of vegetation types. It is currently dominated by submerged species like eelgrass and southern naiad (Figure 3-213). Managed invasive species made up 1.5% of the community; comprised of hydrilla and water hyacinth; resulting in a criterion score of 2. This was a significant decrease from the previous year where invasives made up over 5% of the community. Hydrilla has previously been the major management concern for Lake Shipp. Its continued control requires consistent management action to prevent further expansion.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, Lake Shipp's species evenness and overall diversity indices exceeded their respective median values (Figure 3-212). This equates to a diversity criterion score of 2. Species richness decreased from the previous year to below-average levels—likely due to the absence of at least one invasive species. Lake Shipp boasts relatively high overall diversity which has held somewhat constant despite regular minor invasive treatment efforts.

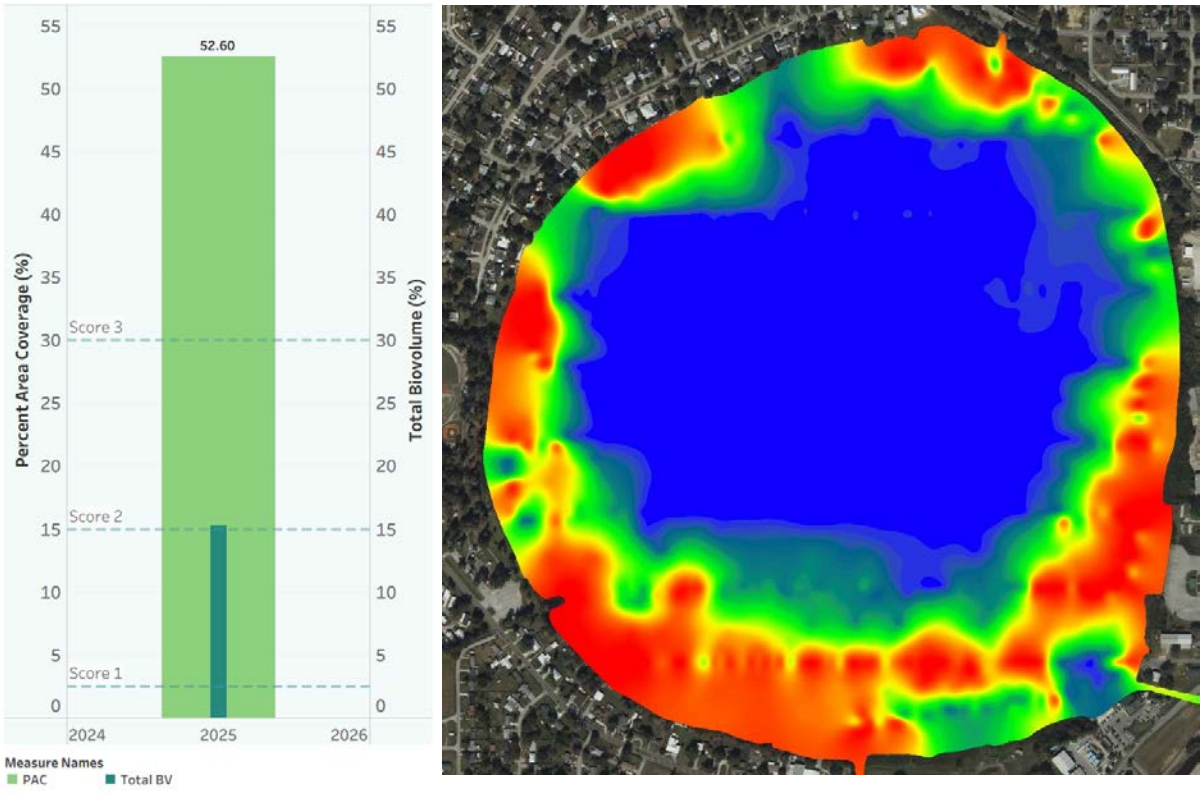


Figure 3-211. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Shipp; biovolume values range from green (lowest) to red (highest).

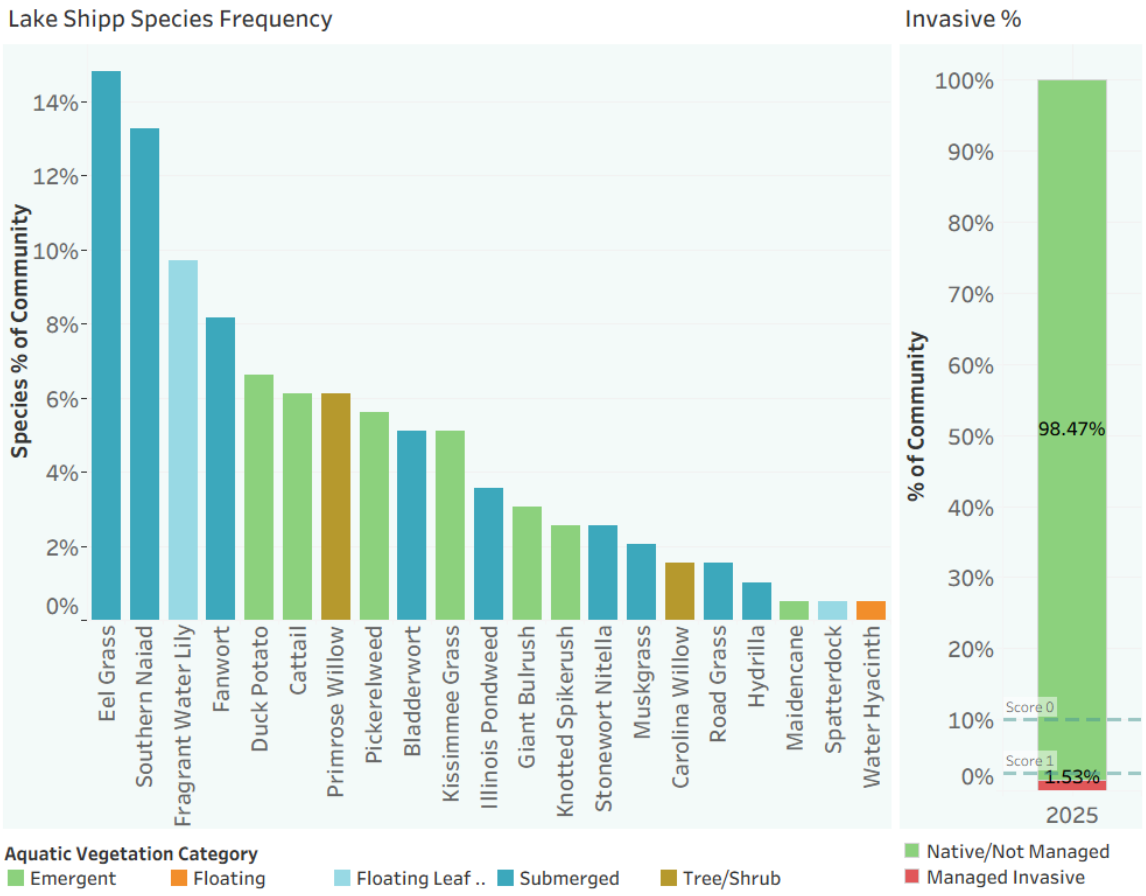


Figure 3-213. Chart depicting species frequency and invasive species percentage of Lake Shipp during 2025.

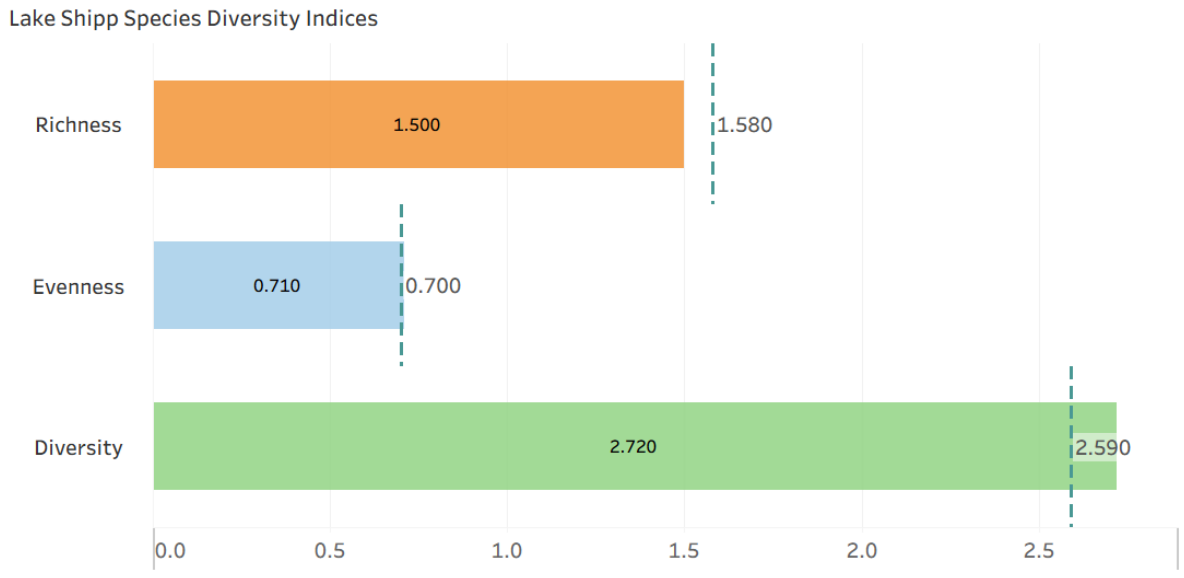


Figure 3-212. Chart depicting 2025 diversity indices for Lake Shipp. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Shipp's health index scores from 2018 to 2025 shows relative consistency (Table 3-30). Throughout this span, the lake has remained impaired, but with improving trends. The only major source of fluctuation has been in the invasive presence and diversity criteria—shifting due to expansion and treatment of exotic plant species. Overall, Lake Shipp ranks moderately low on the priority list. While it is impaired, the trend and biological scores indicate that management efforts have been having a positive impact.

Lake Health Impacts/Challenges:

- In addition to considerable stormwater pollutant loading, Lake Shipp historically received point-source inputs from multiple agricultural processing facilities. These legacy sediments may contribute to internal nutrient loading. Furthermore, the moderate density of septic systems may potentially contribute to additional loading.
- The management of invasive species like hydrilla has been a concern in the past. While current populations appear to be controlled, it can take just a single growing season for these to take over large areas of a waterbody.
- Several of Lake Shipp's water quality parameters are correlated with surface level—likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- To mitigate stormwater loading, the City has implemented street sweeping in the basin and has plans to construct green infrastructure along the northwest portion of the drainage basin as part of a streets improvement project.
- The City may explore sediment removal and/or septic system source analysis to determine if these alternative loading pathways are a significant contributor of nutrients.
- City staff will continue to monitor aquatic vegetation and share that informaiton with Polk County and the FWC. Now that hydrilla is in a controlled state, maintaining that control is a high priority to prevent future large scale herbicide treatments.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	3	3	3	3	3	1	1	**2.1**
2019	0	3	3	3	3	3	1	1	**2.1**
2020	0	3	3	3	3	3	1	1	**2.1**
2021	0	3	3	3	3	3	2	1	**2.3**
2022	0	3	3	3	3	3	2	2	**2.4**
2023	0	3	3	3	3	3	2	2	**2.4**
2024	0	3	3	3	3	3	1	2	**2.3**
2025	0	3	3	2	3	3	2	2	**2.3**

Table 3-30. Lake Health Index values for Lake Shipp from 2018 to 2025.

Lake Silver

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	2	2	3	2	2	3	2	2.4

Features & Statistics:

Surface area	54.3 acres
Mean depth	11.9 feet
Maximum depth	32 feet
Volume	1,040.1 acre-feet
Drainage basin area	164.2 acres
Annual TN Load	633.2 lbs
Annual TP Load	106.1 lbs
Limiting nutrient	Phosphorus

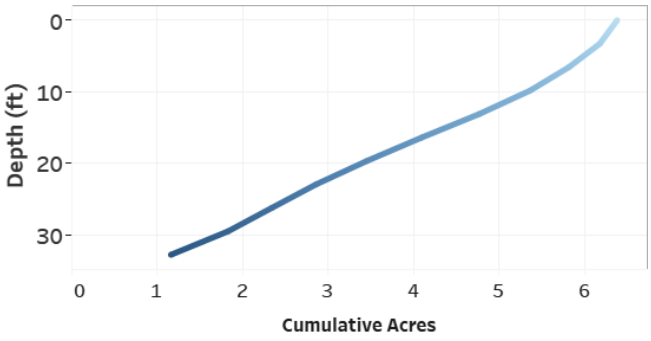


Figure 3-214. Hypsograph of Lake Silver depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Silver is a small, but deep waterbody with a surface area of 55 acres, an average depth of 12 feet, and a maximum depth of over 32 feet (Figure 3-214). Silver's depth likely results in increased interactions with the aquifer. Despite its depth, there are still areas near the shore where aquatic vegetation can grow. Stormwater is conveyed to this waterbody from an urbanized 164 acre drainage basin, comprised of 12 individual sub-basins (Figure 3-215). By far, the most dominant land use in this basin is commercial, followed by institutional, medium-density residential, recreational, and industrial. Based on stormwater pollutant load modeling, this drainage area contributes 633 lbs of TN and 106 lbs of TP to the lake annually; on a per acre basis, these loads rank relatively high compared with other drainage basins in the study area. To combat stormwater pollutant loading, the City conducts 20.15 miles of street sweeping—nearly all roads in this basin are swept monthly.

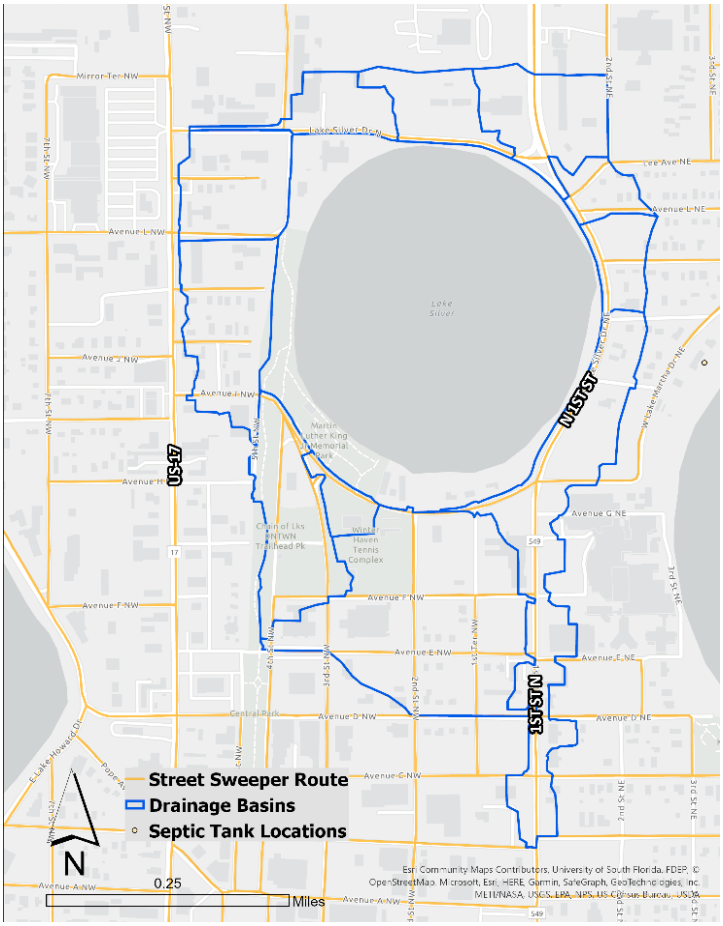


Figure 3-215. Map of Lake Silver's drainage basin, City street sweeper routes, and nearby septic systems.

Lake Silver is located in the center of downtown Winter Haven. Sitting at one of the highest elevations in the Peace Creek watershed, it discharges excess water downstream to Lake Martha via pipe. Over its period of record, Lake Silver's surface level has fluctuated between 139.9 and 147.1 feet above sea level. The normal level range fluctuates between 142.3 and 145.3 feet (Figure 3-216). During 2025, Lake Silver dropped to a dry season low of 144.7 feet in April, then rose to a peak of 146.5 feet in September; ending the year at an above-average level of 145.9 feet. It appears that Lake Silver did not experience much of an impact from the low rainfall totals in 2025. Changes in Lake Silver's surface level are not significantly correlated with any of its water quality metrics (see appendix).

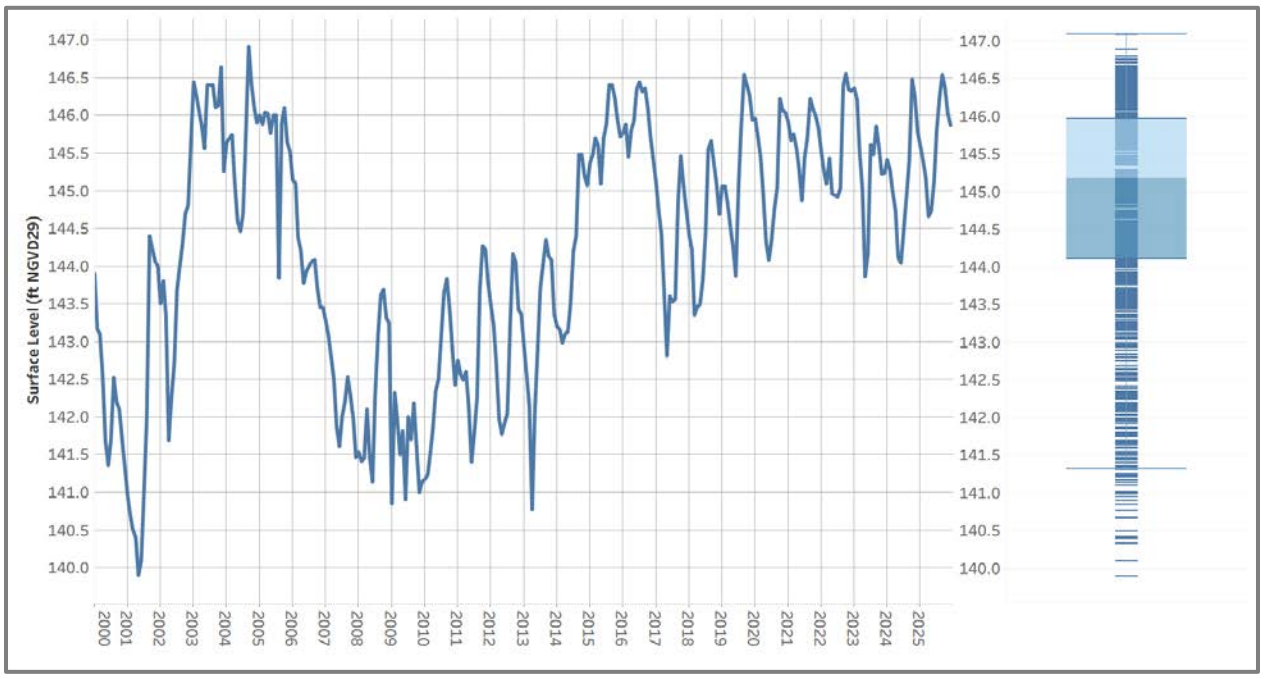


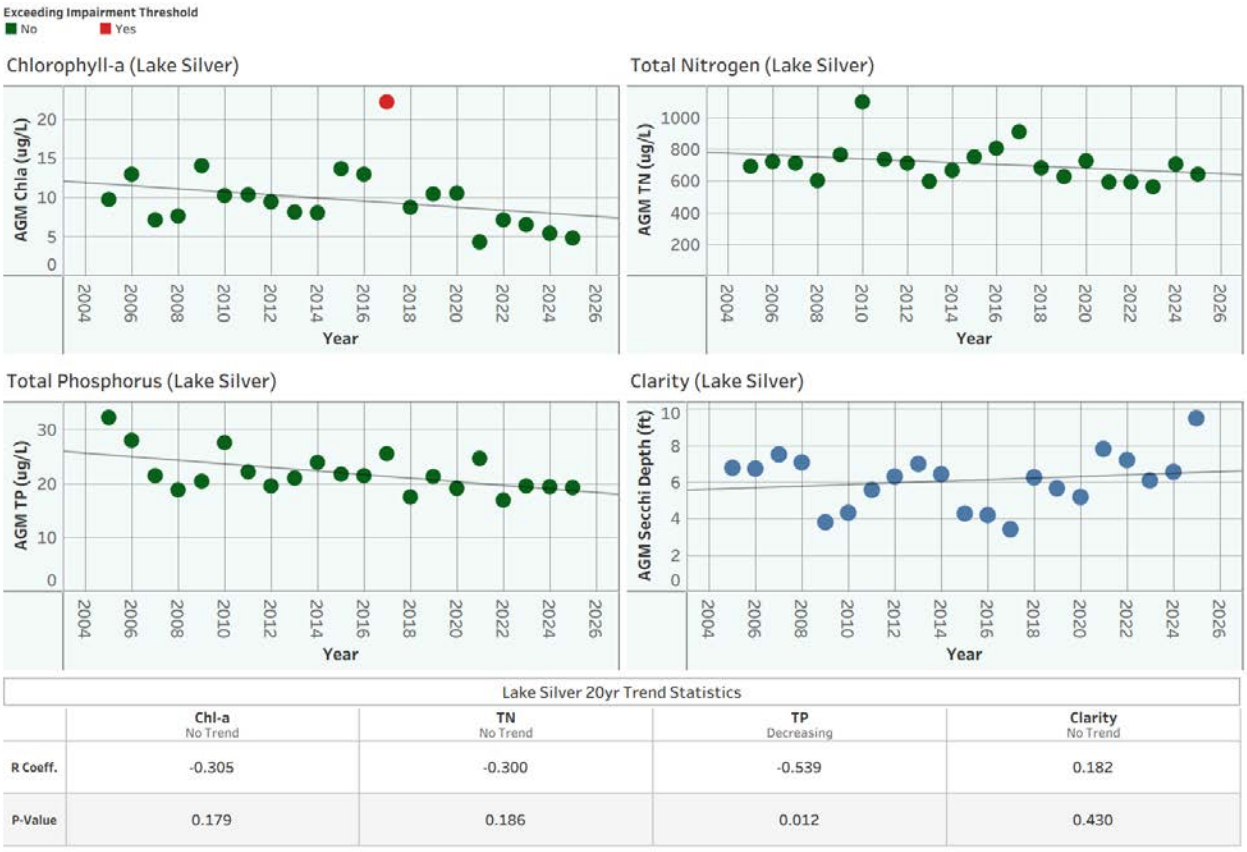
Figure 3-216. Hydrograph of Lake Silver depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria, Lake Silver is categorized as a clear, alkaline waterbody. Aside from an exceedance of the Chl-a threshold in 2017, Lake Silver has not exhibited any other NNC exceedances during the assessment period (Figure 3-217). Consequently, Lake Silver is not considered impaired and earns an impairment criterion score of 3. It should be noted that Silver's 2025 water clarity average was much higher than usual—indicating better-than-normal water quality.

Water Quality Trends

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, Chl-a, TN, and clarity exhibited non-significant trends in an improving direction; equating to trend scores of 2. Exhibiting a significant improving trend, TP earned a trend score of 3. Since 2018, each of Lake Silver's water quality parameters exhibited no significant short-term trends. This underscores the relative stability of these metrics and indicates that there is little concern regarding Lake Silver's future water quality.



Lake Silver 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP Decreasing	Clarity No Trend
R Coeff.	-0.305	-0.300	-0.539	0.182
P-Value	0.179	0.186	0.012	0.430

Figure 3-217. Lake Silver AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Silver on 7/3/2025. The PAC during this survey was 23.2% and the total BV was 1.4% (Figure 3-218). PAC values between 15% and 30% earn an abundance criterion score of 2. Since monitoring began, Lake Silver has displayed very low vegetation abundance, often lacking much submerged presence. However, the last two years saw record-setting PAC levels, bolstered by an increase in the submerged species eelgrass which should provide additional water quality and fish habitat enhancements.

Invasive Species Management:

Based on data from the 2025 survey, Lake Silver's vegetation community continues to demonstrate improvement. Prior to 2024, Lake Silver was dominated by emergent species. However, the native submerged eel grass has since expanded to become the most abundant species, but with emergent plants making up the vast majority of the community (Figure 3-219). The newfound presence of SAV is a positive change that should result in improved water quality and possibly better fish and wildlife habitat. As usual, Lake Silver lacked any managed invasive species during the survey; earning an invasive presence score of 3.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, Lake Silver's species richness and overall diversity indices exceeded their median values—equating to a diversity score of 2 (Figure 3-220). From the previous year, both species richness and overall diversity increased while species evenness

stayed relatively constant. With three plant species dwarfing the presence of all others in the lake, it comes as little surprise that evenness remains low. Ultimately, these changes are the result of natural community fluctuations.

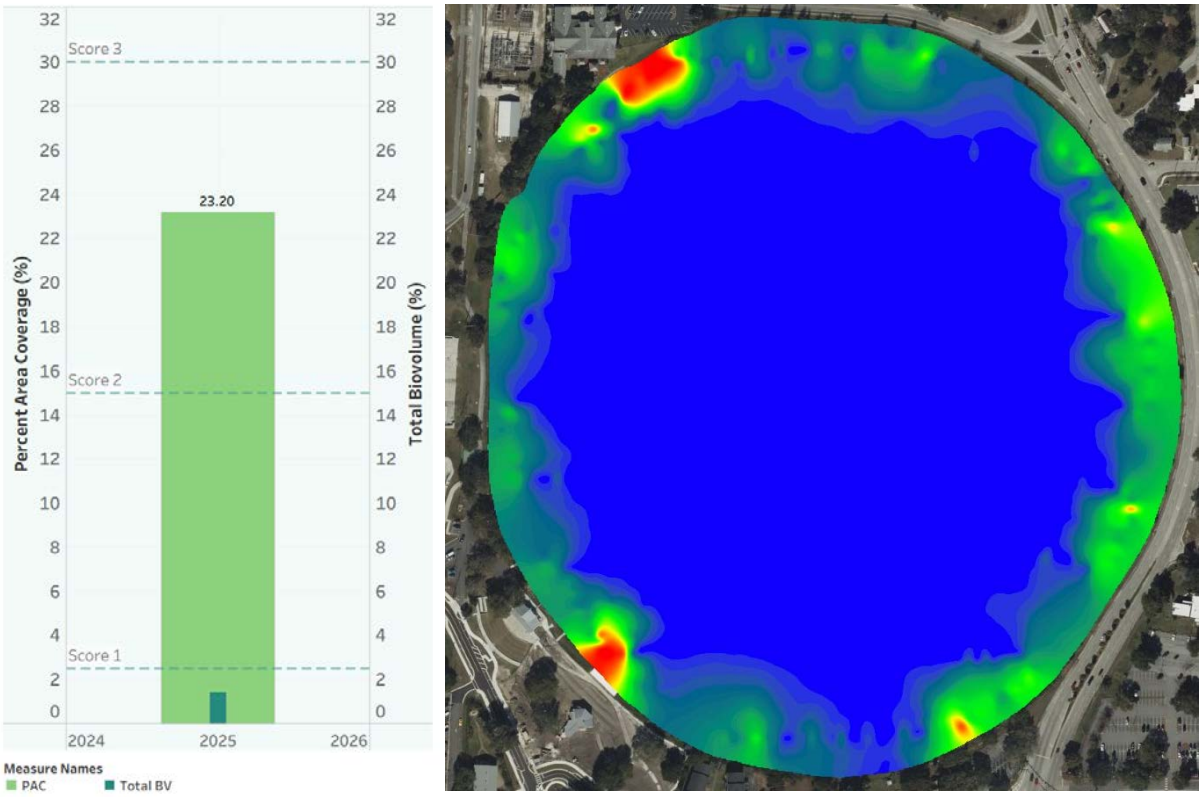


Figure 3-218. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Silver; biovolume values range from green (lowest) to red (highest).

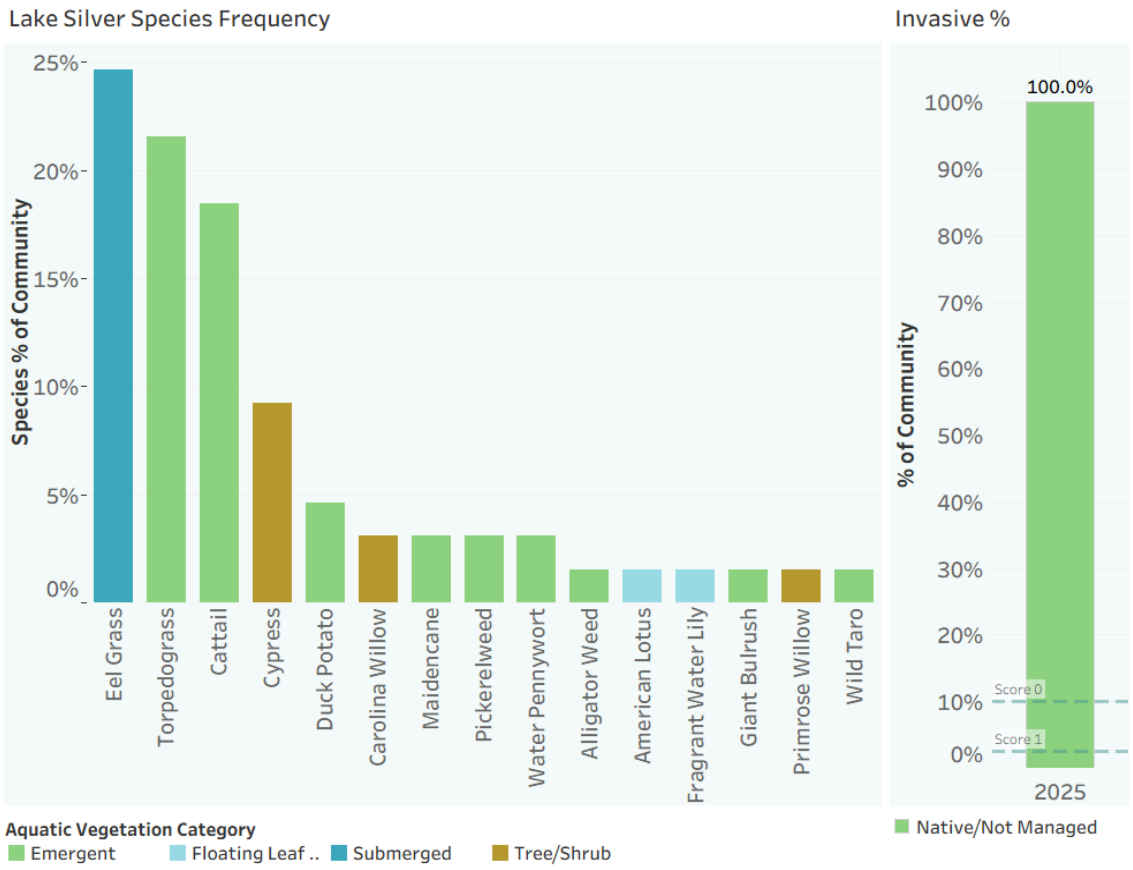


Figure 3-219. Chart depicting species frequency and invasive species percentage of Lake Silver during 2025.

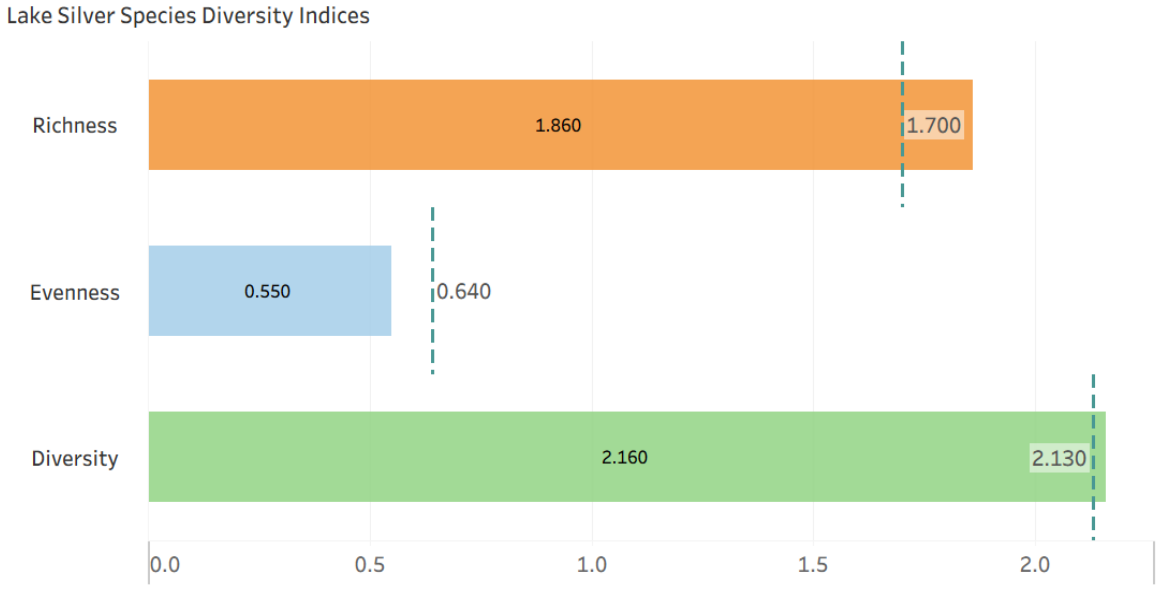


Figure 3-220. Chart depicting 2025 diversity indices for Lake Silver. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Silver's health index scores from 2018 to 2025 shows general improvement with values ranging from 1.6 in 2020 and 2022 to 2.4 in 2025 (Table 3-31). Over this span, the impairment has remained static, with some of the water quality trends improving slightly. While invasive species presence has been null, vegetation abundance has drastically improved with the reintroduction of eelgrass. Overall, Lake Silver ranks lower on the priority list. Its water quality is good, trends don't indicate deterioration, and it does not have issues with invasive plants. The recent shift in the vegetation community is a good sign that one of the primarily lacking areas is undergoing improvement.

Lake Health Impacts/Challenges:

- Lake Silver currently exhibits good water quality. However, stormwater pollutant loading is still a potential concern if trends begin to indicate a decline.
- While Lake Silver has no invasive species present, its lack of vegetation abundance has previously hindered its ability to buffer against changes in water quality in addition to negative impacts on fish and wildlife habitat.

Lake Management Strategy:

- To mitigate stormwater loading, the City conducts street sweeping over large areas of the drainage basin. Raingardens and other green infrastructure have been constructed along streets in the drainage basin south of the lake. However, there are more opportunities to construct additional green infrastructure within the drainage basin.
- While the lake now has a growing population of submerged aquatic vegetation, there is only one species of SAV present. Ideally, Lake Silver should have 3 or 4 SAV species in order to prevent decimation from pests, disease, or human disturbance. The City should continue to explore the possibility of planting other varieties of SAV to bolster the vegetation community. This would also help to improve the species diversity scores in the future.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	2	2	2	1	0	3	1	**1.8**
2019	3	2	2	2	1	1	3	3	**2.1**
2020	3	2	2	2	1	0	3	0	**1.6**
2021	3	2	2	2	1	0	3	3	**2.0**
2022	3	2	2	2	1	0	3	0	**1.6**
2023	3	2	2	2	2	1	3	2	**2.1**
2024	3	2	2	3	1	2	3	1	**2.1**
2025	3	2	2	3	2	2	3	2	**2.4**

Table 3-31. Lake Health Index values for Lake Silver from 2018 to 2025.

Lake Smart

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	2	2	2	3	1	3	2.0

Features & Statistics:

Surface area	281.2 acres
Mean depth	9.42 feet
Maximum depth	16 feet
Volume	2,903.8 acre-feet
Drainage basin area	642.6 acres
Annual TN Load	1,673.4 lbs
Annual TP Load	348.9 lbs
Limiting nutrient	Phosphorus

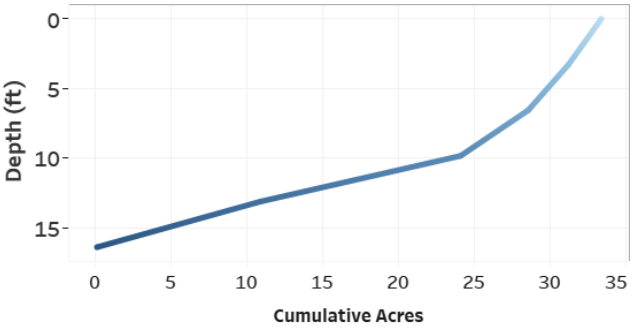


Figure 3-221. Hypsograph of Lake Smart depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Smart is moderately sized at 282 acres, but is actually one of the smaller lakes on the North Chain. Lake Smart is relatively deep with an average depth of 9.4 feet and a maximum depth of over 15 feet (Figure 3-221). Despite this depth, the lake supports a moderate littoral zone that should support a robust vegetation community. Stormwater is conveyed to this waterbody from a 643 acre drainage basin made up of residential, agricultural, and wetland land uses (Figure 3-222). Based on stormwater pollutant modelling, this drainage area contributes 1,673 lbs of TN and 349 lbs of TP to the lake annually; on a per acre basis, these loading rates are relatively average compared to other lakes in the study area. Due to a lack of drainage infrastructure discharging stormwater from City roadways, Winter Haven does not currently conduct street sweeping services in Lake Smart's drainage basin.

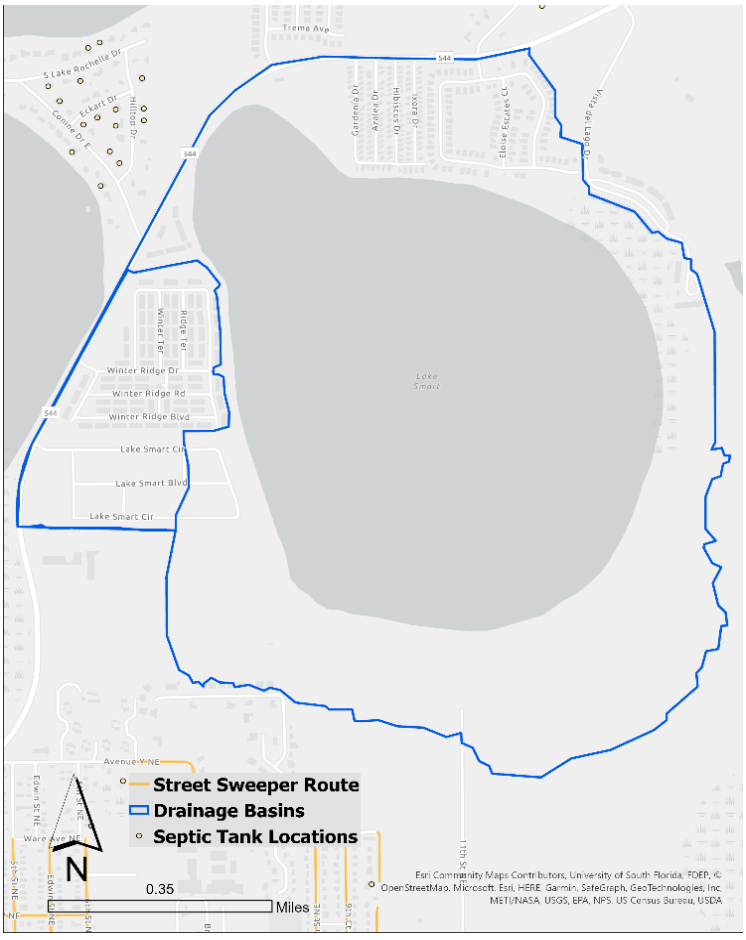


Figure 3-222. Map of Lake Smart's drainage basin and nearby septic systems.

As part of the North Chain of Lakes, Smart is connected to Lake Conine to the west via navigable canal and Lake Fannie to the east via a non-navigable ditch. Excess water from the North Chain eventually drains via the SWFWMD-

managed P-8 control structure at the south of Lake Hamilton and enters the Peace Creek. Over the period of record, surface levels in this section of the North Chain (Lakes Conine, Haines, Rochelle, and Smart) have fluctuated between 122 and 129.5 feet above sea level. The normal range fluctuates much less between 126.1 and 128.2 feet (Figure 3-223). During 2025, Lake Smart reached a peak of 128.5 feet in February and a low of 127.6 feet in December. The surface level generally declined throughout the year—likely due to the low annual rainfall as well as hydrologic management by the SWFWMD. While the North Chain surface level did not drop below its long-term median, 2025 marks the lowest this chain has reached since the 2017 dry season. Changes in Lake Smart's surface level are directly correlated with water clarity and indirectly correlated with Chl-a and TN (see appendix). This carries management implications as maintaining higher levels should result in water quality improvements.

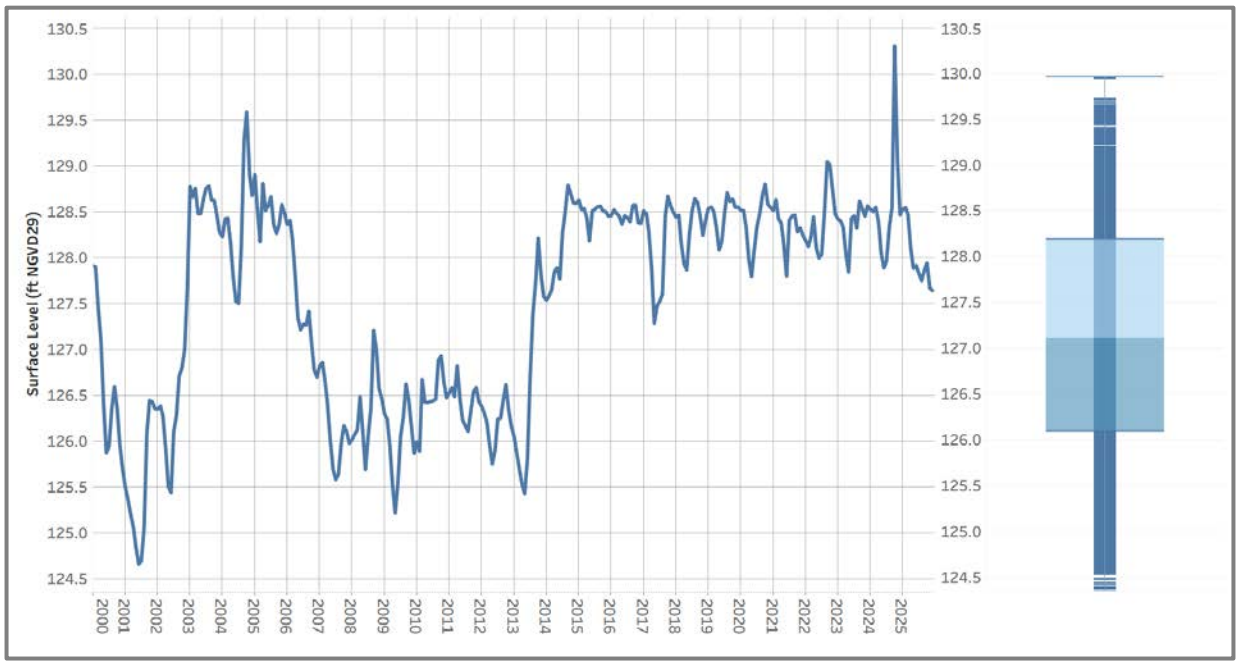


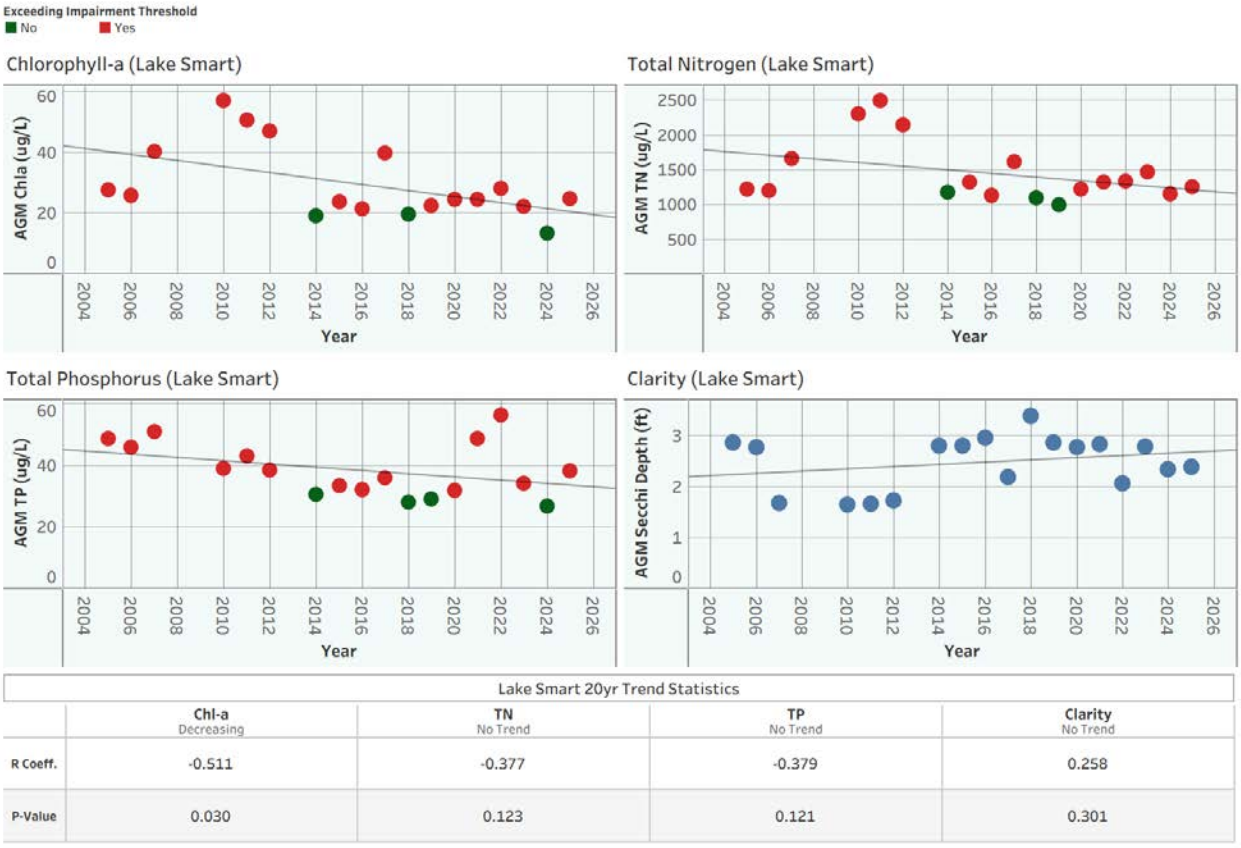
Figure 3-223. Hydrograph of Lake Smart depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Smart is categorized as a clear, alkaline waterbody. Due to numerous NNC exceedances during the assessment period, Lake Smart is considered impaired for Chl-a, TN, and TP (Figure 3-224). This equates to an impairment criterion score of 0. In 2024, an alternative restoration plan, submitted by Polk County, was accepted by the FDEP. This plan includes several projects aimed at improving water quality in the lake.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2004 to 2024. TN, TP, and water clarity exhibited non-significant improving trends—for criteria scores of 2. The trend for Chl-a was significant and improving, resulting in a trend score of 3. This indicates that Lake Smart's water quality is either stable or moving slowly in a positive direction.



Lake Smart 20yr Trend Statistics

	Chl-a Decreasing	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.511	-0.377	-0.379	0.258
P-Value	0.030	0.123	0.121	0.301

Figure 3-224. Lake Smart AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Smart on 5/29/2025. The PAC during this survey was 41.7% and the total BV was 4.8% (Figure 3-225). A PAC value above 30% equates to an abundance criterion score of 3. The 2025 PAC value represents a slight decrease in vegetation abundance from the previous year, albeit still in the top three abundance values since monitoring began.

Invasive Species Management:

Based on data from the 2025 survey, Lake Smart supports a healthy mix of vegetation types, with cattail and eel grass being the most dominant (Figure 3-226). The invasive hydrilla and water hyacinth made up over 8% of the community—resulting in an invasive presence criterion score of 1. Hydrilla has historically been the primary invasive concern for Lake Smart. Its population peaked at 12.9% in 2019 but has remained below 10% since. Management efforts are keeping it from expanding, but continued effort is required to bring it into a controlled state.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, all three of Lake Smart's diversity indices met or exceeded their respective median values (Figure 3-227). This equates to a diversity score of 3. This marks the third consecutive year where all diversity measures have been above-average in Lake Smart. It is likely that the increase in vegetation abundance over the years has coincided with a similar improvement in the biological diversity of the lake.

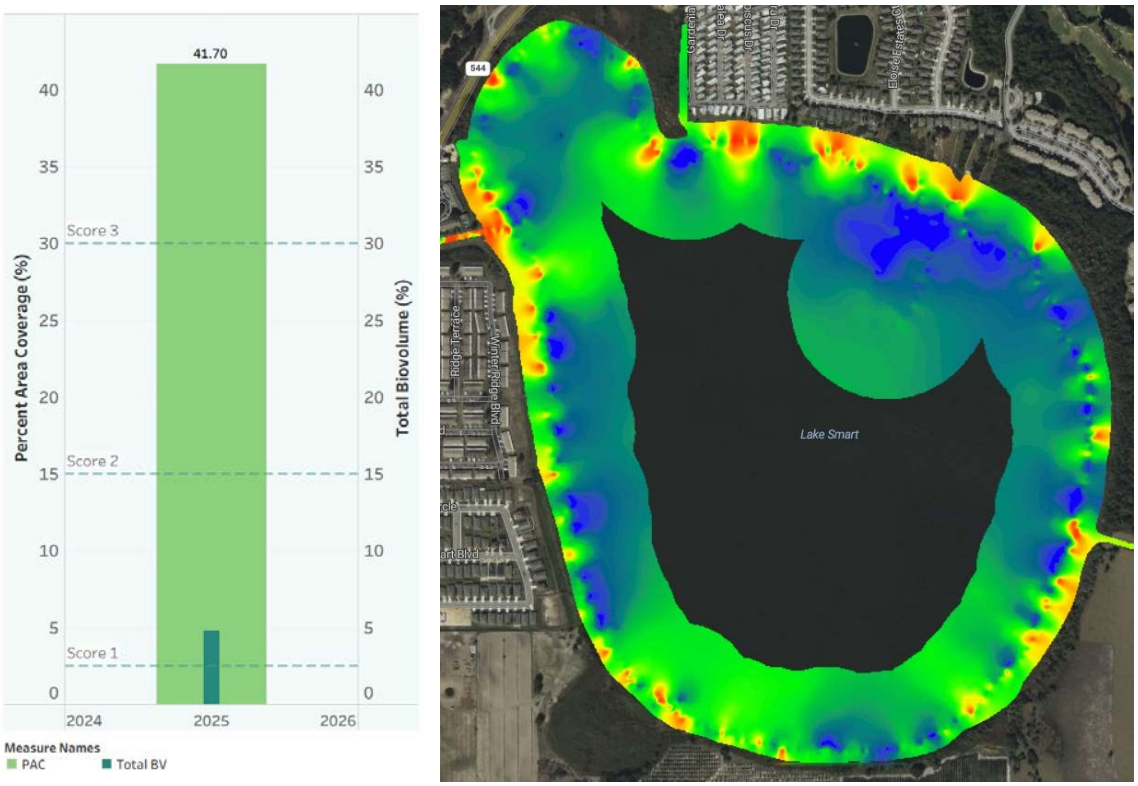


Figure 3-225. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Smart; biovolume values range from green (lowest) to red (highest).

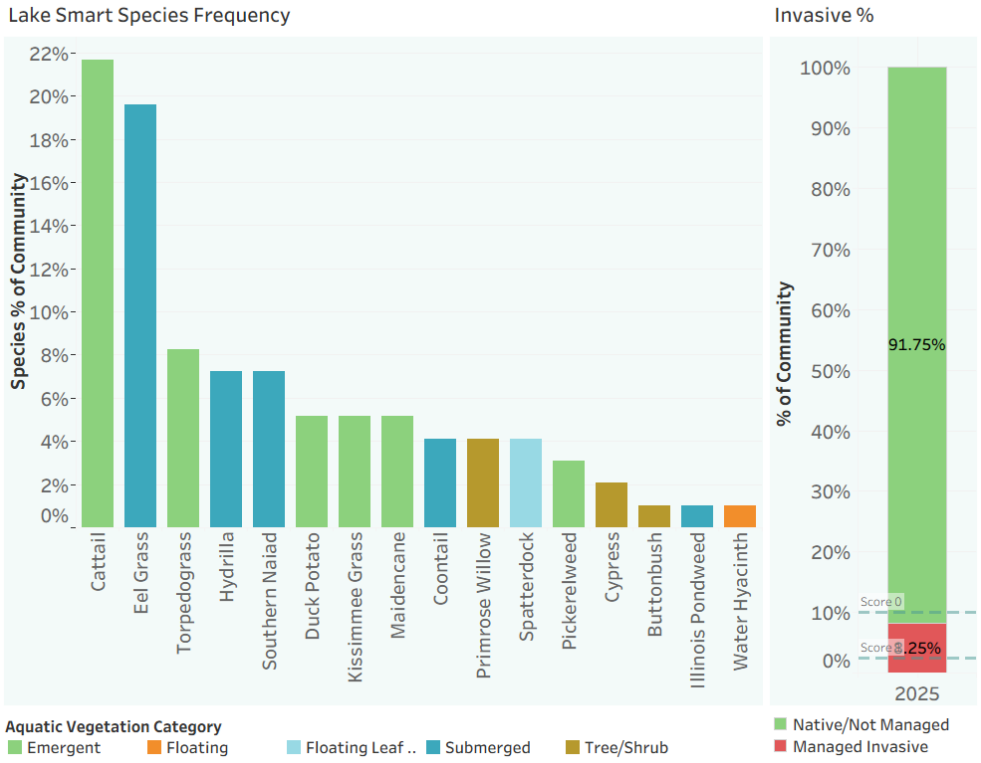


Figure 3-226. Chart depicting species frequency and invasive species percentage of Lake Smart during 2025.

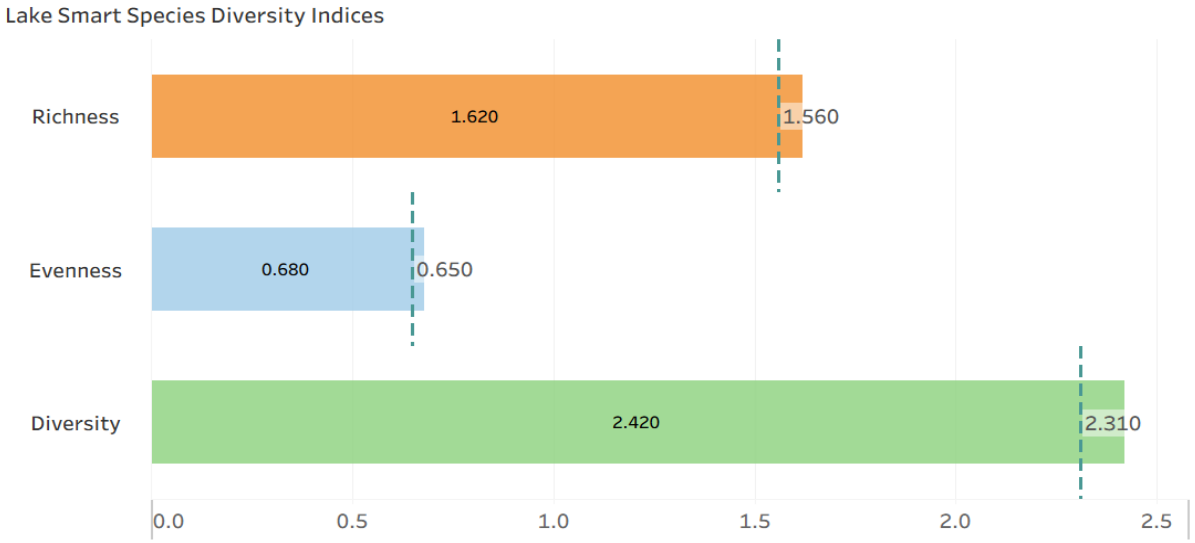


Figure 3-227. Chart depicting 2025 diversity indices for Lake Smart. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Smart's health index scores from 2018 to 2025 shows some improvement since monitoring began—with values ranging from 1.3 to 2.0 (Table 3-32). The impairment criterion score has not shifted during this period. However, the trend scores have varied somewhat with both the TP and Clarity trends shifting from significant to non-significant. Lake Smart's initial vegetation abundance was low, but has since improved as have its diversity scores. Invasive presence is the primary criterion exhibiting decline. Overall, Lake Smart ranks moderate-to-high on the ranking list. Management action is required to definitively improve water quality and control invasive plants.

Lake Health Impacts/Challenges:

- While stormwater loading may be a potential contributor to water quality impairment, much of Lake Smart's basin lacks direct stormwater inflows to the waterbody. The large presence of agriculture on the south side of the basin may be an area for runoff mitigation, but much of this land is currently being converted to residential land uses.
- The management of invasive species like hydrilla is a consistent concern. The hydrilla population, while low, can rapidly take over large areas of the lake without constant management.
- Several of Lake Smart's water quality parameters are correlated with surface level, likely due to increased flushing during wetter periods. The means that drought conditions could result in water quality declines.

Lake Management Strategy:

- Polk County submitted a pollutant reduction plan for Lake Smart in 2023 which was accepted by the FDEP in 2024. The plan involves sediment inactivation to help reduce phosphorus flux into the water column by the highly organic material in the lake bed.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best

management strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	2	1	2	2	1	2	0	**1.3**
2019	0	2	2	3	2	3	0	1	**1.6**
2020	0	2	2	3	2	2	2	3	**2.0**
2021	0	2	2	2	3	2	1	2	**1.8**
2022	0	2	2	2	3	3	1	2	**1.9**
2023	0	2	2	2	2	2	1	3	**1.8**
2024	0	2	2	2	2	3	1	3	**1.9**
2025	0	3	2	2	2	3	1	3	**2.0**

Table 3-32. Lake Health Index values for Lake Smart from 2018 to 2025.

Lake Spring

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	2	2	1	2	3	0	2	1.9

Features & Statistics:

Surface area	25.2 acres
Mean depth	9.02 feet
Maximum depth	23 feet
Volume	306.9 acre-feet
Drainage basin area	120.2 acres
Annual TN Load	520.7 lbs
Annual TP Load	90.8 lbs
Limiting nutrient	Co-limited (N & P)

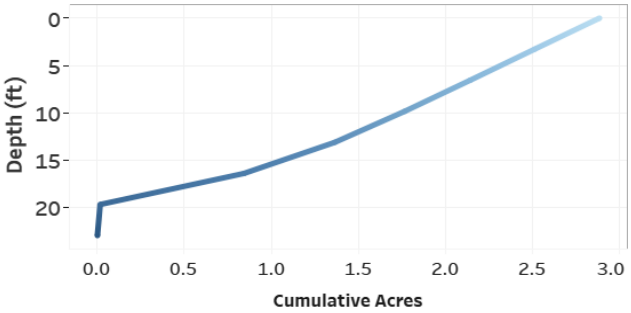


Figure 3-228. Hypsograph of Lake Spring depicting the depth profile and morphology of the lake bed.

Hydrology:

Lake Spring is the smallest lake on the South Chain at just 25 acres. While small, it is one of the South Chain's deeper lakes with an average depth of 9 feet and maximum depth of over 20 feet (Figure 3-228). Spring's morphology is indicative of a traditional sinkhole-formed lake. Despite its depth, Lake Spring's gradually sloping lake bed supports a wide littoral zone and robust vegetation community. Stormwater is conveyed to this waterbody from a 120 acre drainage basin, comprised of 7 individual sub-basins (Figure 3-229). The most dominant land use within this basin is commercial, followed by residential and institutional. Based on stormwater pollutant load modeling, this drainage area contributes 520 lbs of TN and 91 lbs of TP to the lake annually. These pollutant loads rank 6th highest (out of 37) on a per acre basis; mostly due to the high density of commercial land uses in the basin. To combat stormwater loading, the City conducts 7.4 miles of street sweeping in this basin on a monthly basis.

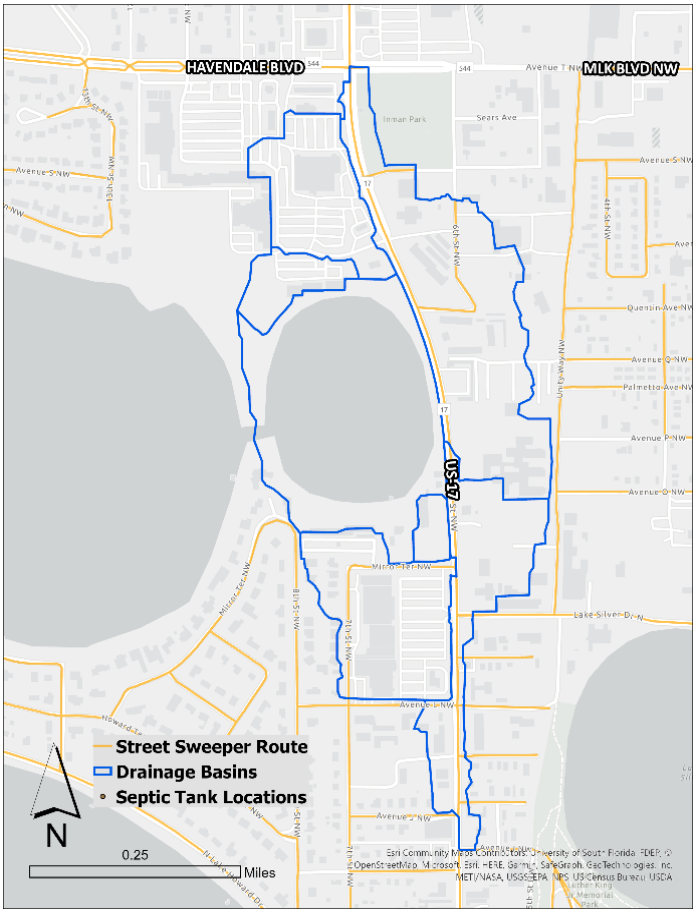


Figure 3-229. Map of Lake Spring's drainage basin and City street sweeper routes.

Lake Spring is located on the South Chain with a navigable connection to Lake Mirror to the west. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-230). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, Lake Spring's surface level is not correlated with its water quality parameters (see appendix).

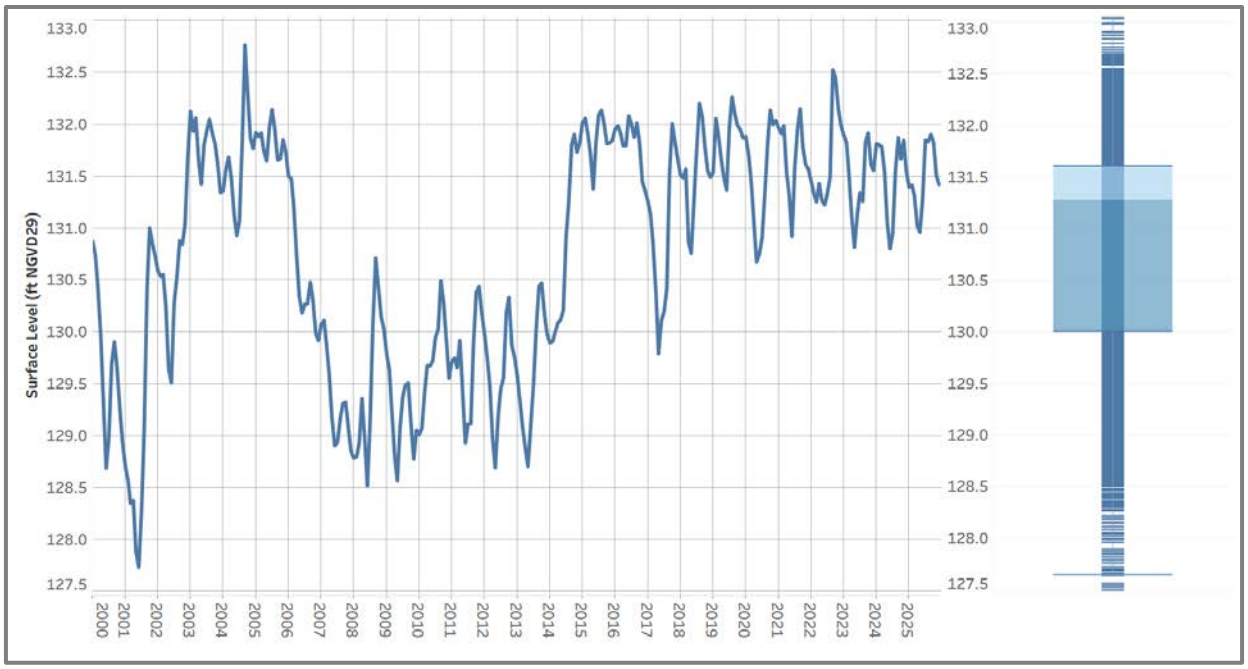


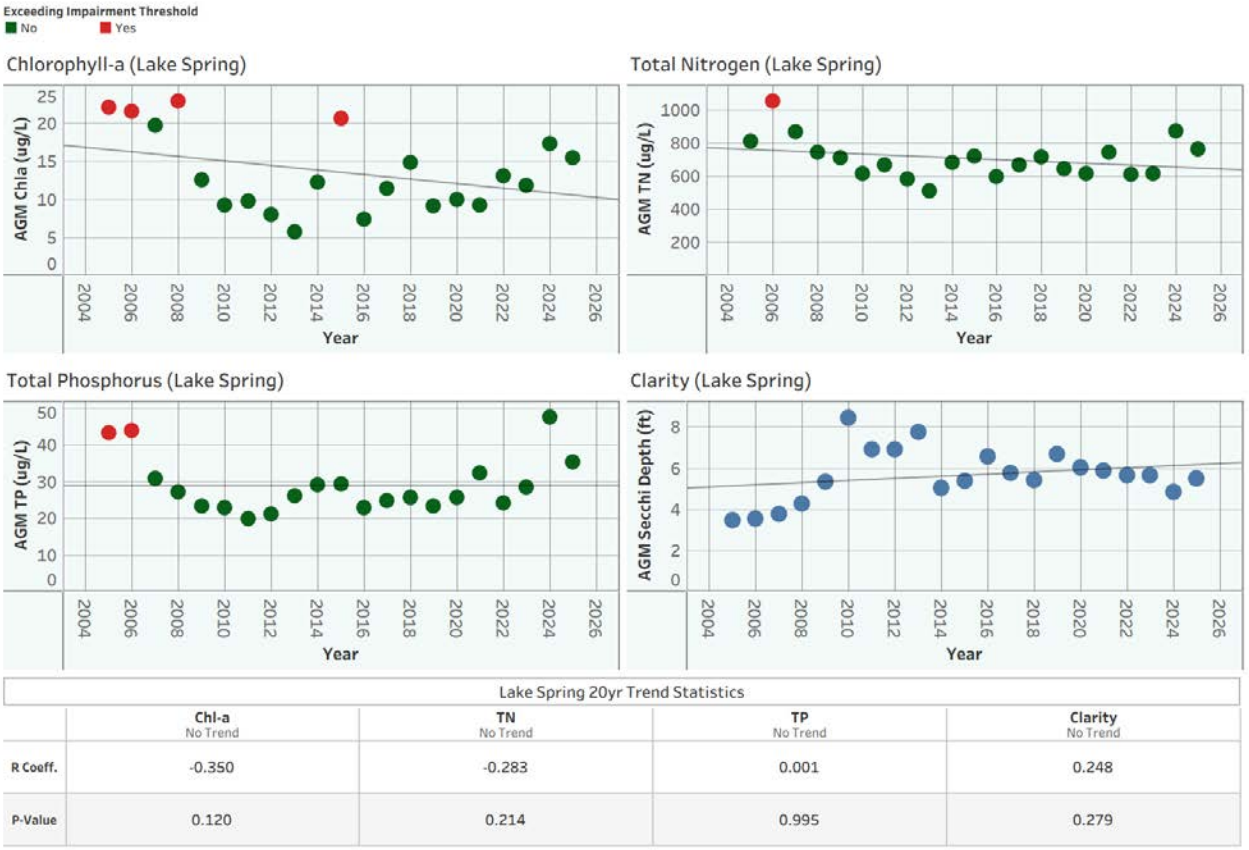
Figure 3-230. Hydrograph of Lake Spring depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Spring is categorized as a clear, alkaline waterbody. Despite an exceedance of Chl-a in 2015, Lake Spring has exhibited no other NNC exceedances during the assessment period (Figure 3-231). Due to this, Spring is considered un-impaired and earns an impairment criterion score of 3.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Trends for Chl-a, TN, and water clarity all exhibited non-significant improving trends, resulting in criteria scores of 2. The trend for TP was also non-significant, but just slightly oriented toward an increase in concentration—for a score of 1. Prior to 2024, all four of Spring's water quality parameters exhibited a significant improving trend. This recent shift indicates that these trends are tapering off and becoming static. For a lake that is currently meeting NNC standards, this does not mean there are water quality declines—just that water quality has stabilized.



Lake Spring 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP No Trend	Clarity No Trend
R Coeff.	-0.350	-0.283	0.001	0.248
P-Value	0.120	0.214	0.995	0.279

Figure 3-231. Lake Spring AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Spring on 1/17/2025. The PAC during this survey was 76.7% and the total BV was 12.6% (Figure 3-232). A PAC over the 30% threshold equates to a vegetation abundance criterion score of 3. Over the last six years, Lake Spring has maintained high vegetation abundance with coverage consistently above 50%. The PAC during 2025 was the second highest on record—just slightly below the 80% coverage exhibited in 2024.

Invasive Species Management:

Based on data from the 2025 survey, Lake Spring possesses a mix of vegetation types. The submerged plant, eelgrass, was the most dominant at nearly 18% (Figure 3-234). Invasive species, represented by hydrilla and burhead sedge, made up 16.1% of the community. This invasive percentage equates to an invasive criterion score of 0. This value is consistent with previous surveys as Lake Spring has historically had issues with hydrilla. Due to the small size of the lake, even a minor expansion in invasive abundance constitutes a large proportion of the lake's total area. For a species like hydrilla that can grow roughly a foot per day under the right conditions, it does not take long for it to exceed a managed state. Future management efforts may require more frequent vegetation monitoring in order to facilitate early detection and rapid invasive response.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, Lake Spring's species richness and overall diversity

indices exceeded their long-term median values—for a diversity criterion score of 2 (Figure 3-233). The increase in richness was due to the detection of five additional species that were not present in 2024. Moreover, the relative distribution of species was slightly less equitable in 2025. Ultimately, the large increase in richness outweighed the slight drop in evenness, for an improvement in overall diversity. These changes are likely due to a combination of natural community dynamics as well as the treatment of invasive species allowing habitat space for less common plants to take hold.

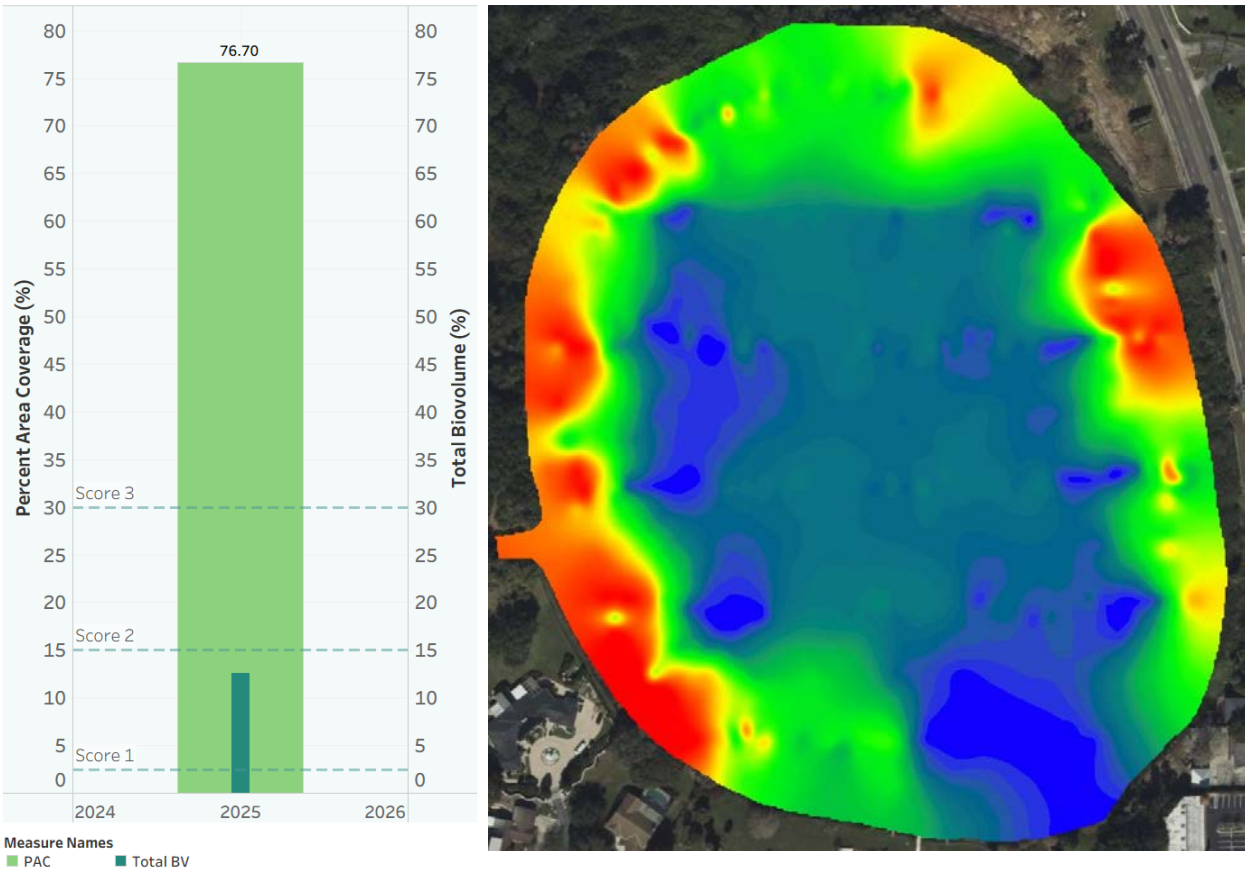


Figure 3-232. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Spring: biovolume values range from green (lowest) to red (highest).

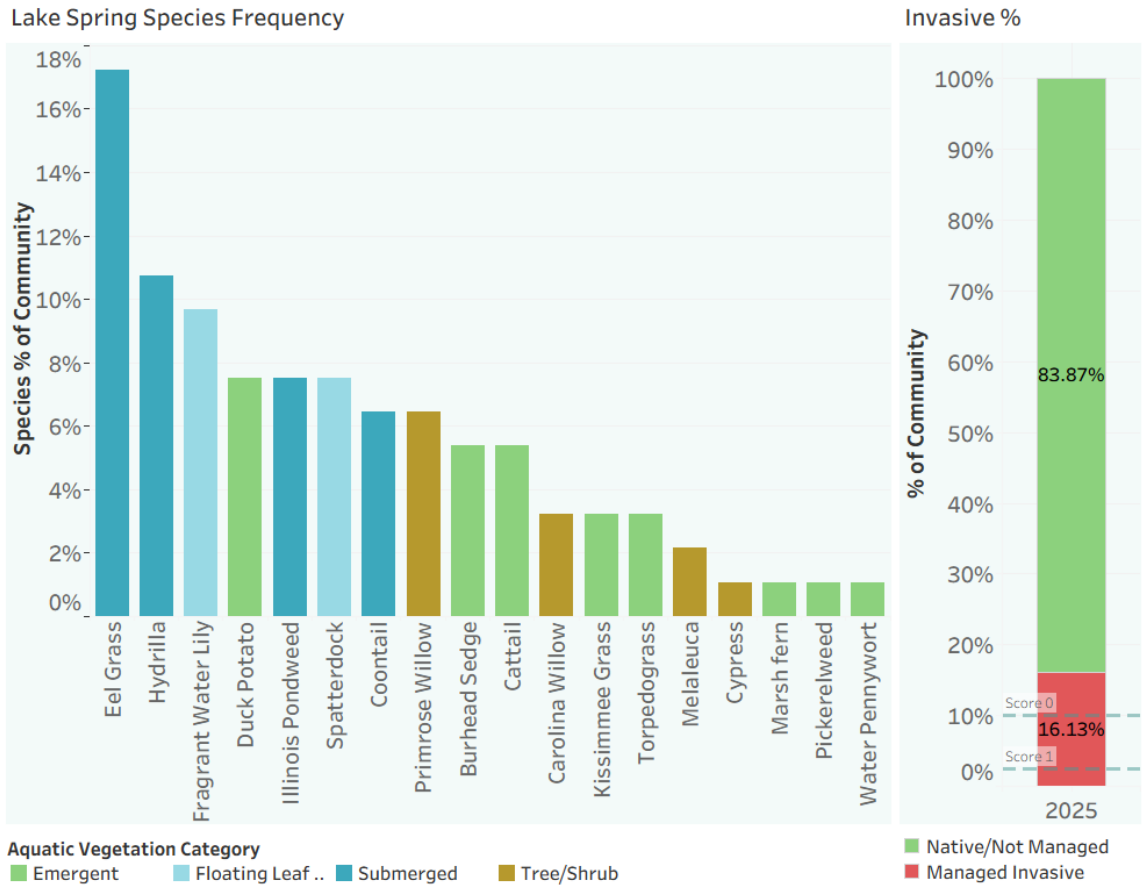


Figure 3-234. Chart depicting species frequency and invasive species percentage of Lake Spring during 2025.

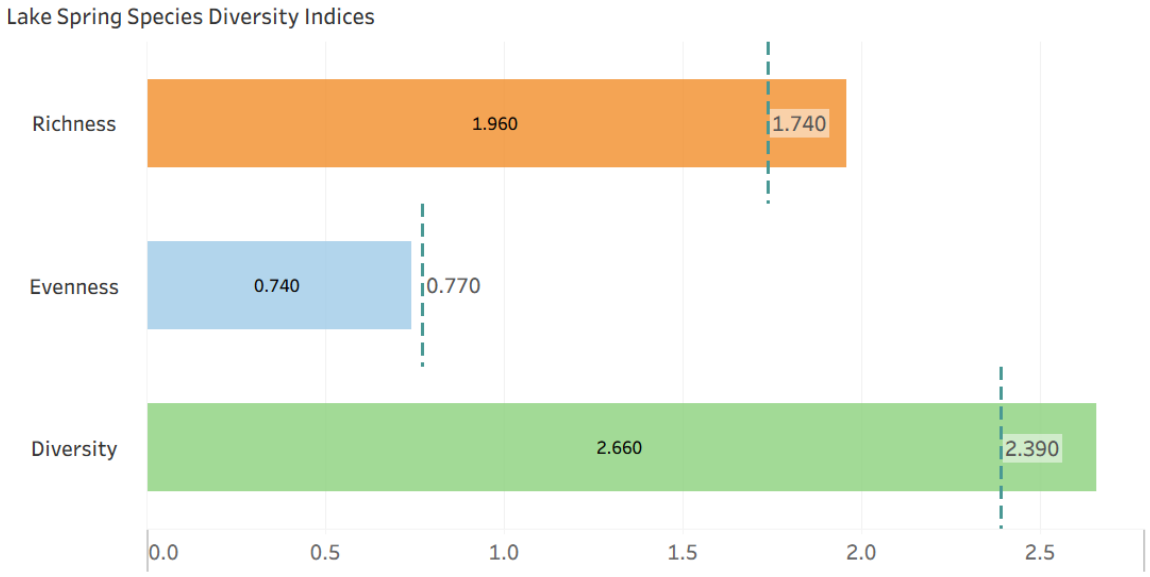


Figure 3-233. Chart depicting 2025 diversity indices for Lake Spring. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Spring's health index scores from 2018 to 2025 shows general consistency with a recent drop in lake health (Table 3-33). Not much has changed regarding each of the criterion scores aside from the recent shifts in the water quality trends. Again, this indicates more water quality stabilization rather than a decline. The one major issue that Lake Spring must contend with is the consistently high invasive species prescence. Overall, Lake Spring ranks low on the priority list due to it exhibiting good water quality, generally good trends, and excellent vegetation abundance.

Lake Health Impacts/Challenges:

- Lake Spring currently exhibits excellent water quality. However, stormwater pollutant loading is the leading vector for water quality issues if trends shift toward a deteriorating direction in the future.
- The management of invasive species is currently the primary management concern for Lake Spring. While hydrilla and burhead sedge abundance was lower in 2024, their proportions are still above the ideal range. These invasives can also quickly rebound and expand in the future; requiring additional management effort to control.

Lake Management Strategy:

- The City currently conducts street sweeping along the major roadways in the drainage basin to mitigate stormwater loading. Future stormwater management may aim to implement green infrastructure, if applicable locations can be identified.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	3	3	3	0	1	**2.4**
2019	3	3	3	3	3	3	0	2	**2.5**
2020	3	3	3	3	3	3	0	2	**2.5**
2021	3	3	3	3	3	3	0	1	**2.4**
2022	3	3	3	3	3	3	1	2	**2.6**
2023	3	3	3	3	3	3	0	1	**2.4**
2024	3	3	2	2	2	3	0	3	**2.3**
2025	3	2	2	1	2	3	0	2	**1.9**

Table 3-33. Lake Health Index values for Lake Spring from 2018 to 2025.

Lake Summit

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	1	3	3	1	3	2.5

Features & Statistics:

Surface area	67.4 acres
Mean depth	10.71 feet
Maximum depth	29 feet
Volume	900 acre-feet
Drainage basin area	166.5 acres
Annual TN Load	513.3 lbs
Annual TP Load	82.7 lbs
Limiting nutrient	Co-limited (N & P)

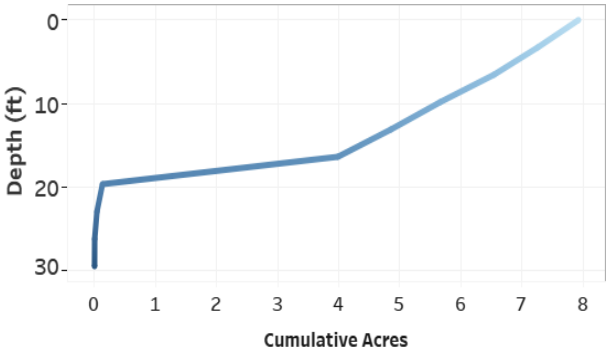


Figure 3-235. Hypsograph of Lake Summit depicting the depth profile and morphology of the lake bed.

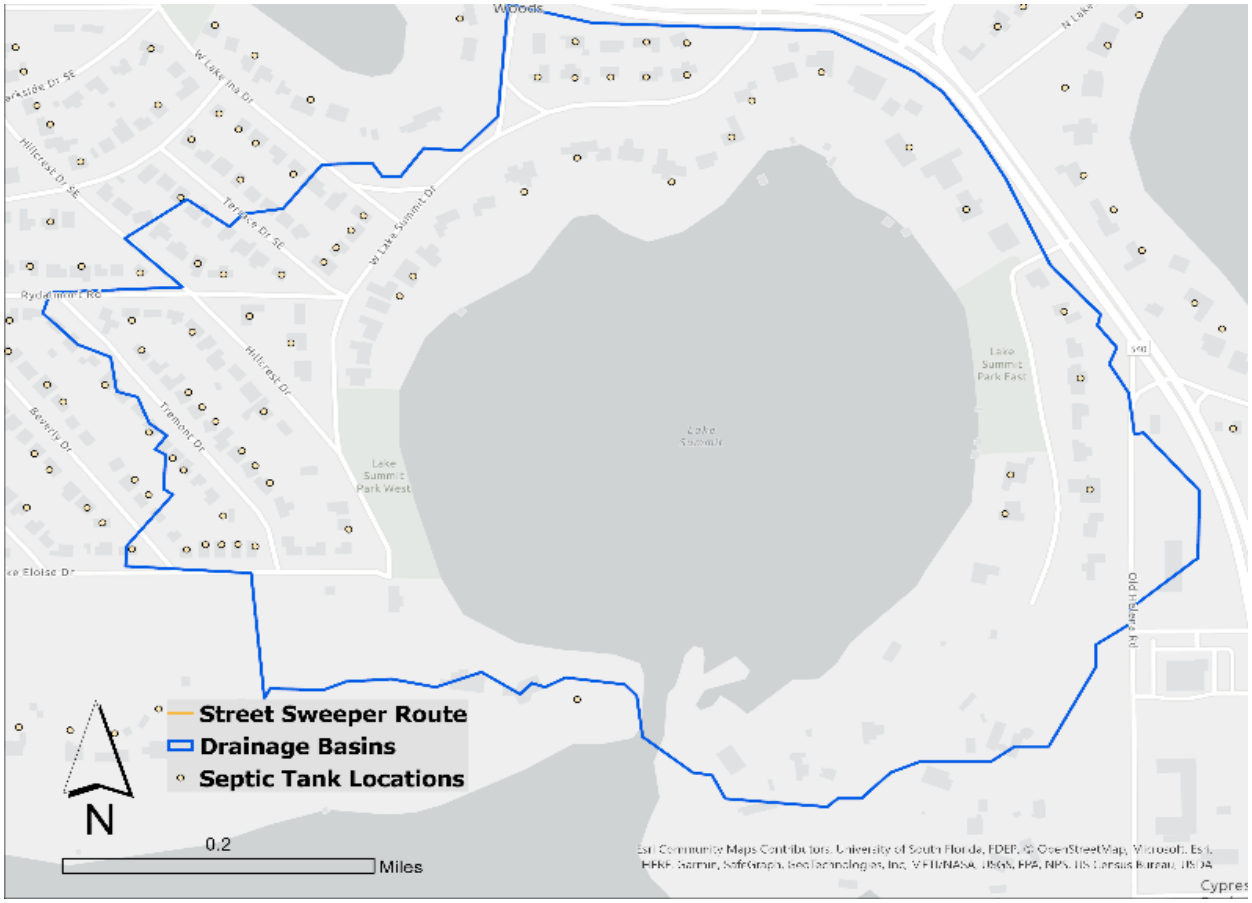


Figure 3-236. Map of Lake Summit's drainage basin and nearby septic systems.

Hydrology:

Lake Summit is a small, but deep waterbody at 67 acres, an average depth of 10.7 feet, and a maximum depth of almost 30 feet (Figure 3-235). Summit's average depth is almost two feet deeper than the regional mean. Coupled with the small size of the lake, the lake bed has a steeper slope. While this would normally significantly limit the littoral zone, Lake Summit has very high water clarity which allows its aquatic plants to grow in deeper water than many other lakes in the study area. Stormwater is conveyed to this waterbody from a 166 acre drainage basin (Figure 3-236). The basin is dominated by residential land uses, contributing 513 lbs of TN and 83 lbs of TP to the lake annually. On a per acre basis, these pollutant loading rates are fairly low compared with other drainage basins in the study area. There are 52 septic systems present in the basin. This constitutes a moderate density that may contribute some pollutant loading through groundwater leaching. Due to the drainage basin being mostly outside of Winter Haven limits, the City does not conduct any street sweeping that benefits this lake.

As part of the South Chain, Lake Summit is connected to Lake Eloise via navigable canal. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-237). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear regression analysis, changes in Lake Summit's surface level are correlated with Chl-a, TN, and water clarity (see appendix). This carries management implications as maintaining higher levels should result in water quality improvements.

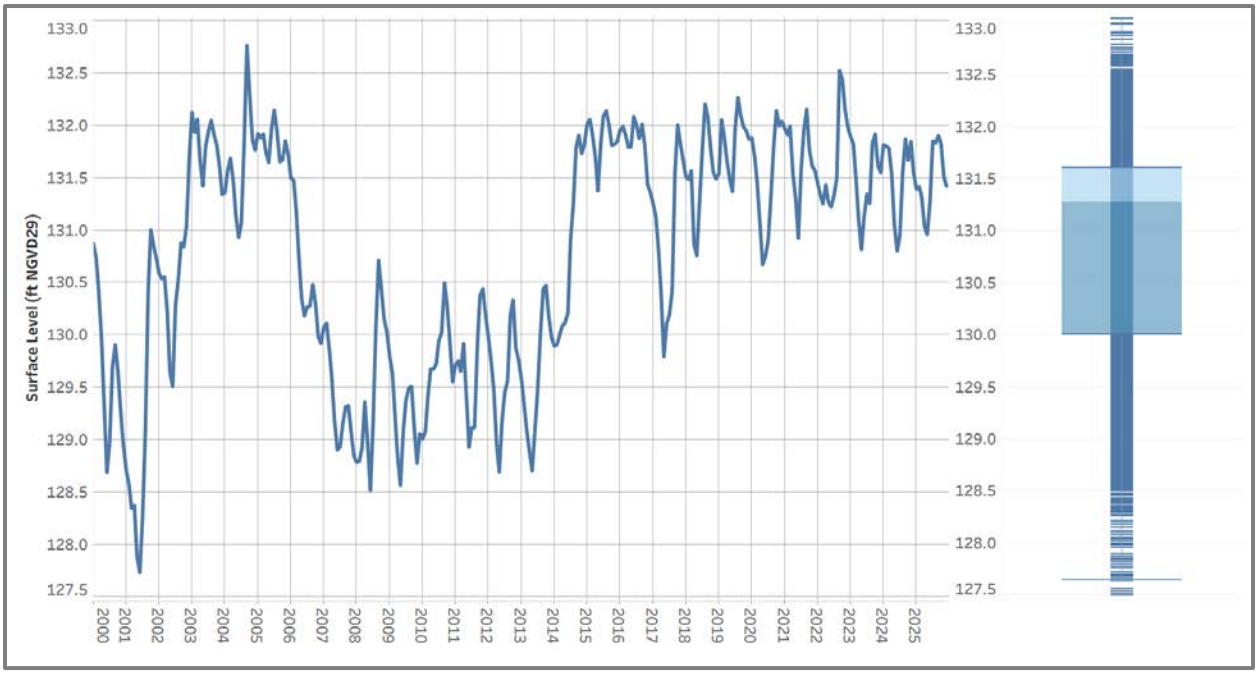


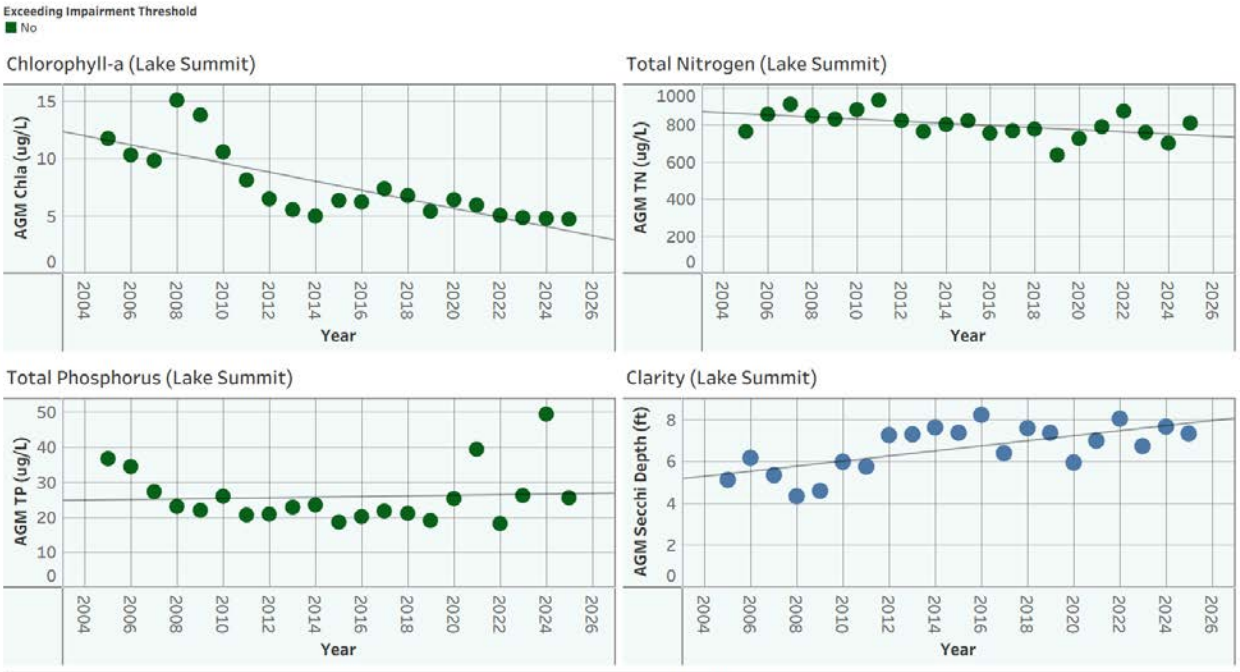
Figure 3-237. Hydrograph of Lake Summit depicting monthly surface level readings from 2000 to 2025. A box and whisker plot detail total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Summit is categorized as a clear, alkaline waterbody. Lake Summit has not exhibited any NNC exceedances during the assessment period (Figure 3-238). This equates to an impairment criterion score of 3. Lake Summit has consistently maintained excellent water quality throughout its period of record.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, Chl-a, TN, and water clarity exhibited significant improving trends; earning trend a criteria score of 3 for these parameters. TP exhibited non-significant deteriorating trend; for trend criterion score of 1. The recent shift in the TP trend isn't necessarily concerning; it just indicates that the previously improving water quality is beginning to stabilize.



Lake Summit 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP No Trend	Clarity Increasing
R Coeff.	-0.795	-0.506	0.069	0.666
P-Value	0.000	0.019	0.768	0.001

Figure 3-238. Lake Summit AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Summit on 3/7/2025. The PAC during this survey was 57.4% and the total BV was 8.5% (Figure 3-239). A PAC above the 30% threshold equates to a vegetation abundance criterion score of 3. Since 2018, Lake Summit has maintained consistently high abundance, with coverage between 48% and 63%. The excellent water clarity is likely the main factor for this robust vegetation community and vice versa—creating a positive feedback loop of great water quality and biological abundance.

Invasive Species Management:

Based on the 2025 data, Lake Summit is dominated by submerged aquatic vegetation as evidenced by eelgrass and Illinois pondweed making up over 40% of the community (Figure 3-241). Hydrilla was the only invasive species present in 2025, but with a relative proportion of 7.6%, the resulting invasive criterion score was 1. Hydrilla has historically been the primary invasive species requiring management in Lake Summit and management efforts have been challenging due to how small Summit is and the rapidity of hydrilla's growth. Perhaps more frequent monitoring and treatments can help to get this species into a managed state.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, all three of Lake Summit's diversity indices exceeded their long-term median values (Figure 3-240). This equates to a diversity criterion score of 3. All three diversity indices underwent a significant increase from the previous year—likely due to in-part to the reintroduction of less common submerged species as well as the resurgence in hydrilla. It is important that invasive management efforts attempt to minimize the impact on these less common plant species in order to preserve the diversity of the community while lessening the impact from plants like hydrilla. Ultimately, without management efforts, hydrilla would take over, resulting in an overall decline in species diversity.

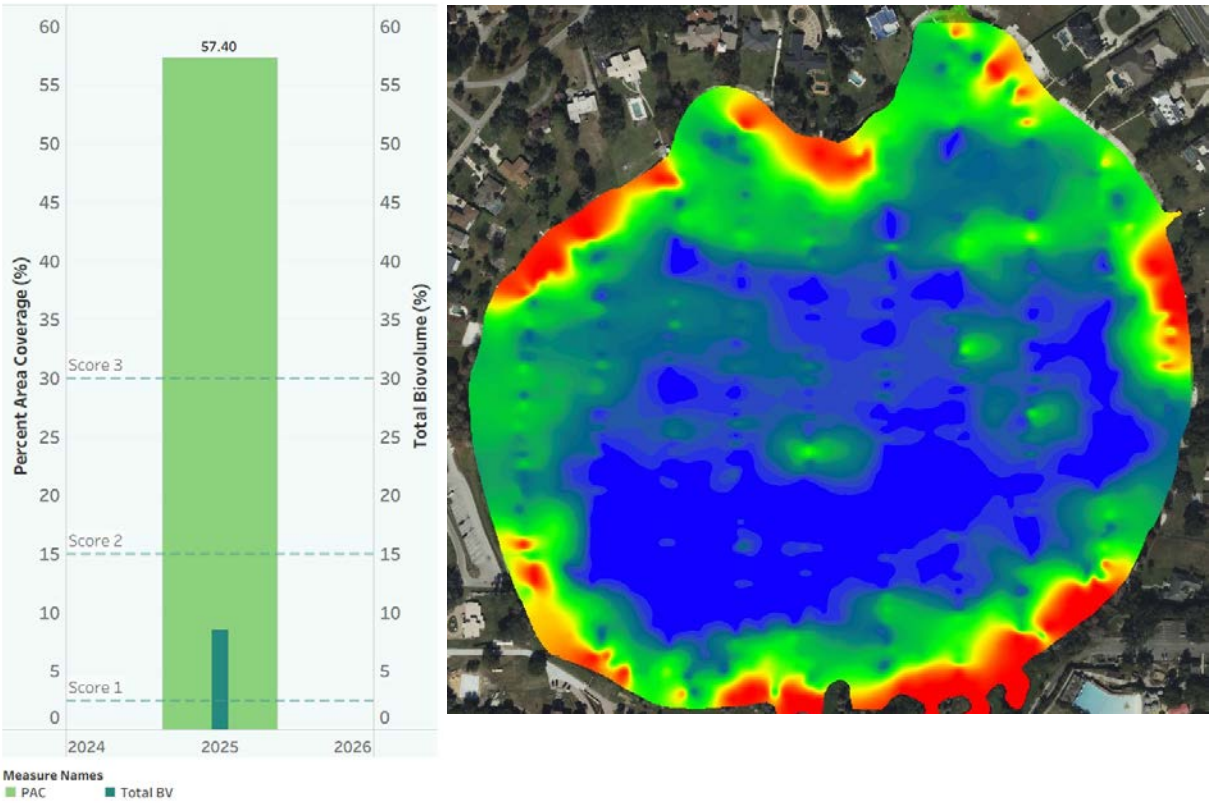


Figure 3-239. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Summit; biovolume values range from green (lowest) to red (highest).

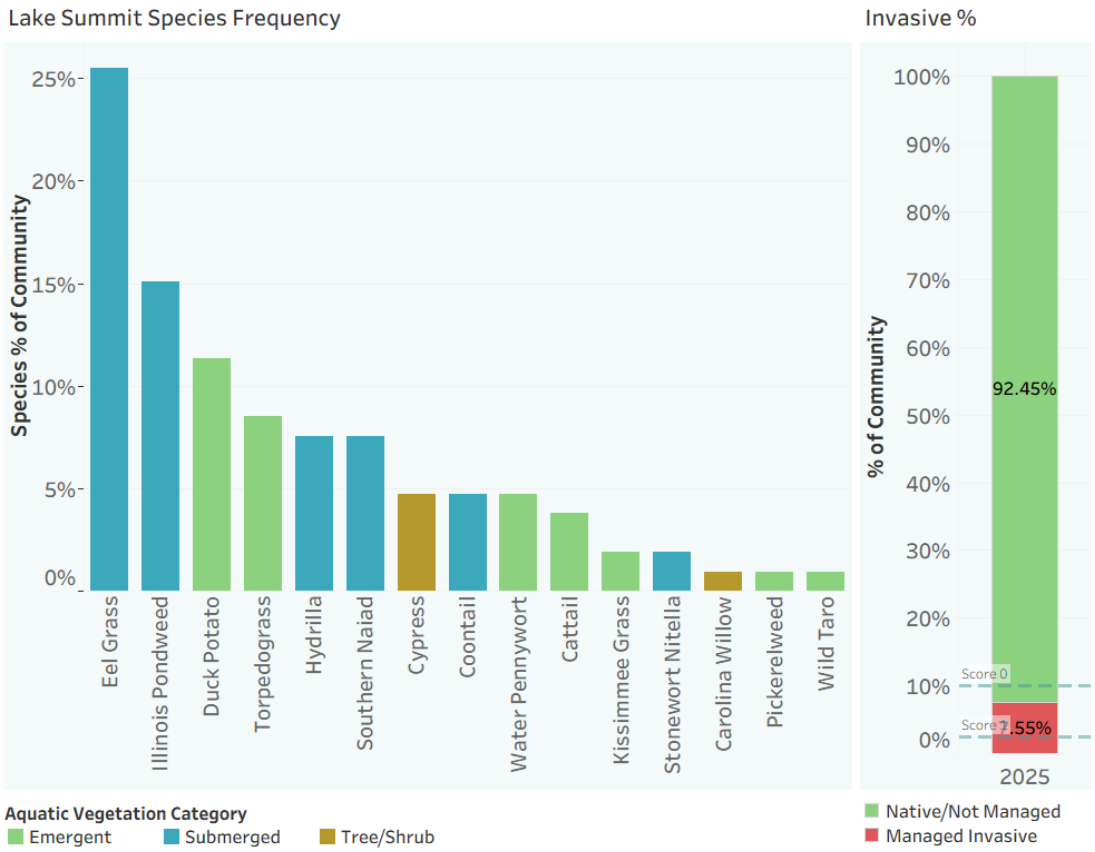


Figure 3-241. Chart depicting species frequency and invasive species percentage of Lake Summit during 2025.

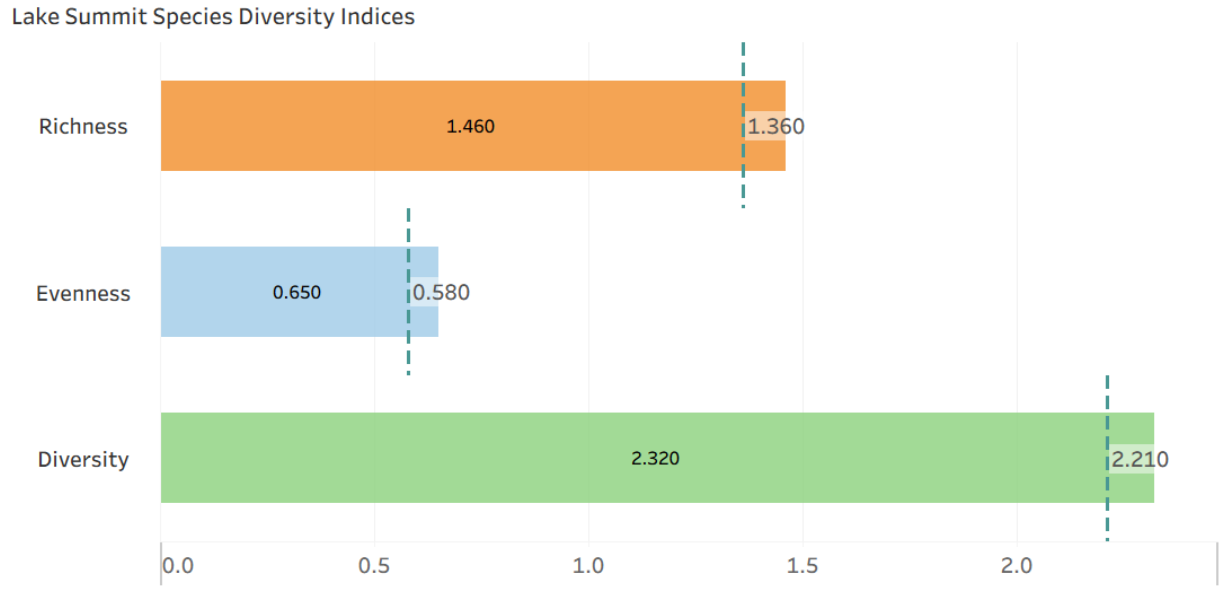


Figure 3-240. Chart depicting 2025 diversity indices for Lake Summit. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Summit's health index scores from 2018 to 2025 shows consistently good values ranging from 2.3 to 2.6 (Table 3-34). The impairment and vegetation abundance criteria have been consistently good. There have been some recent shifts in some of the trend scores, but the majority of lake health fluctuation has been due to invasive species presence and diversity criterion scores. These criteria likely change in response to natural factors as well as invasive species treatment efforts. Overall, Lake Summit ranks low on the City's management priority list due to its excellent water quality and improving trends.

Lake Health Impacts/Challenges:

- Lake Summit currently exhibits excellent water quality. However, stormwater and septic system pollutant sources remain a potential concern if trends ever begin to deteriorate.
- The management of invasive species like hydrilla is a consistent concern. It can only take a single growing season for even a small population to take over large areas of a waterbody.
- Several of Lake Summit's water quality parameters are correlated with surface level—likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.

Lake Management Strategy:

- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best strategy to prevent large-scale herbicide treatments and potential water quality issues that follow.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	3	3	3	1	1	**2.5**
2019	3	3	3	2	3	3	1	2	**2.5**
2020	3	3	3	2	3	3	1	1	**2.4**
2021	3	3	3	2	3	3	1	1	**2.4**
2022	3	3	3	2	3	3	1	3	**2.6**
2023	3	3	2	2	3	3	1	3	**2.5**
2024	3	3	2	1	3	3	2	1	**2.3**
2025	3	3	3	1	3	3	1	3	**2.5**

Table 3-34. Lake Health Index values for Lake Summit from 2018 to 2025.

Lake Winterset

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
3	3	3	3	3	3	1	2	2.6

Features & Statistics:

Surface area	555.5 acres
Mean depth	14.26 feet
Maximum depth	32 feet
Volume	10,133.6 acre-feet
Drainage basin area	1,074.5 acres
Annual TN Load	2,258.8 lbs
Annual TP Load	407.59 lbs
Limiting nutrient	Phosphorus

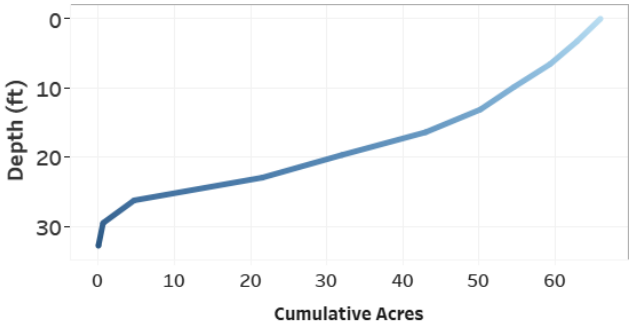


Figure 3-242. Hypsograph of Lake Winterset depicting the depth profile and morphology of the lake bed.

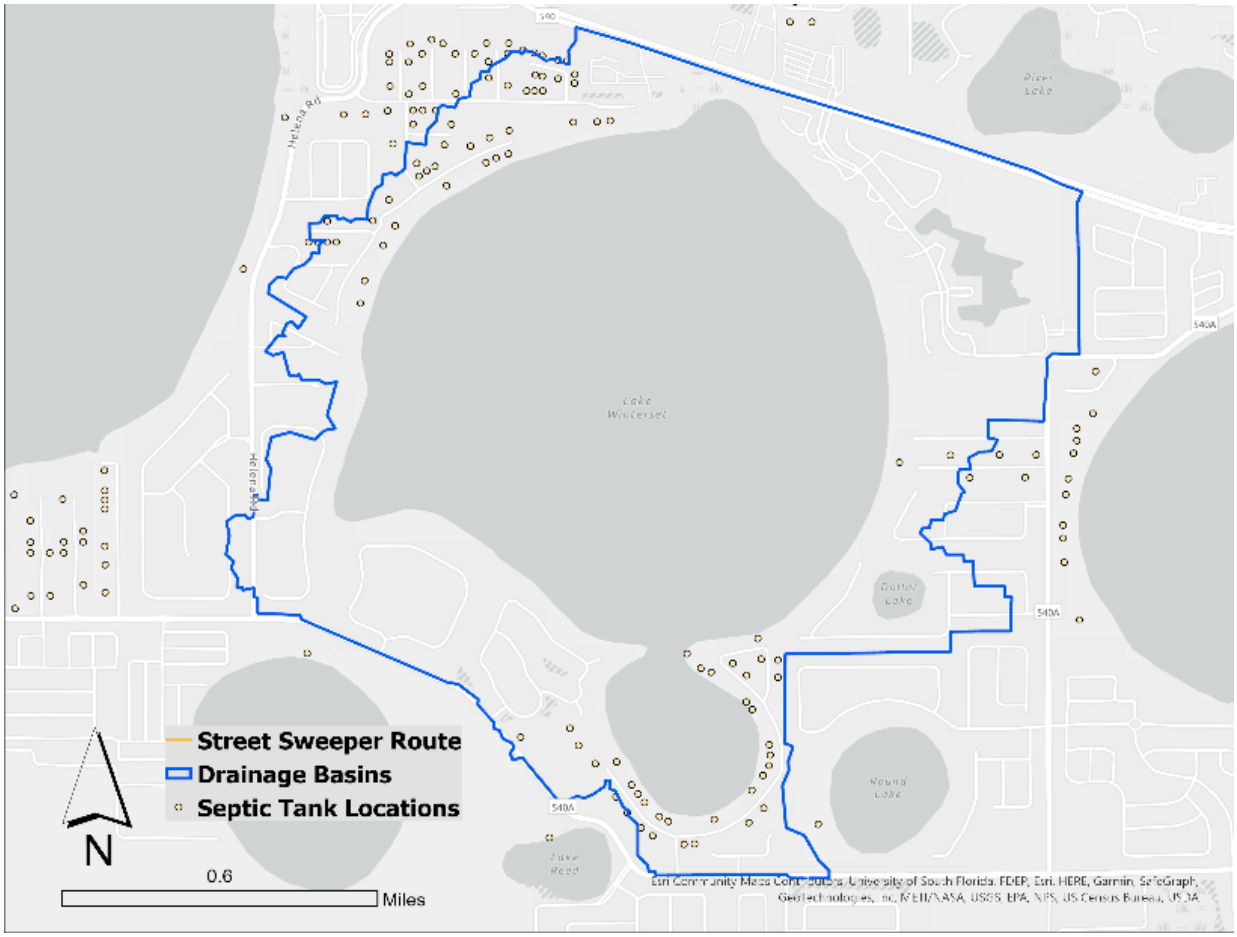


Figure 3-243. Map of Lake Winterset's drainage basin and nearby septic systems.

Hydrology:

Lake Winterset is one of the largest lakes on the South Chain at 555 acres. It is also one of the deepest lakes in the study area, with an average depth of over 14 feet, and a maximum depth of 32 feet (Figure 3-242). Due to this depth profile, Lake Winterset has a strong connection with the Floridan aquifer. While many believe this connection constitutes a spring vent, the magnitude of groundwater flow is not great enough to be officially labelled as a spring. Similar to Lake Summit, Winterset has a steeper sloping lake bed which would normally severely limit its littoral zone. However, like Summit, Lake Winterset's water clarity is high enough to allow aquatic vegetation to grow in deeper water. Stormwater is conveyed to this waterbody from a 1,074 acre drainage basin. The primary land uses in this basin are residential, commercial, wetlands, and agricultural. Based on stormwater pollutant load modelling, this drainage area contributes 2,259 lbs of TN and 408 lbs of TP to the lake annually. Since the relatively size of the drainage basin is small, the per acre pollutant loading rates are actually some of the lowest in the study area. There are 71 septic systems located within the basin (Figure 3-243). These constitute a moderate density with pollutant load potential via groundwater leaching. Located mostly outside Winter Haven limits, the City does not conduct any street sweeping services within Lake Winterset's drainage basin.

Lake Winterset is at the very southern end of the South Chain with a navigable connection to Lake Eloise. Due to these canal connections, surface levels fluctuate consistently across the South Chain of Lakes. Throughout the period of record, the South Chain's surface level has fluctuated between 127.5 and 133.7 feet above sea level. The normal range is much narrower—between 129.7 and 131.4 feet (Figure 3-244). That said, wetter and drier periods often result in more extreme peaks and troughs, respectively. During 2025, the South Chain reached a dry season low of 130.9 feet in May and a wet season peak of 131.9 feet in September. The South Chain ended the year slightly above the median level at 131.4 feet. Similar to the previous two years, the South Chain fluctuated near the top of the normal level range—indicating that the below-average rainfall had minimal effect on the individual lake surface levels. According to linear

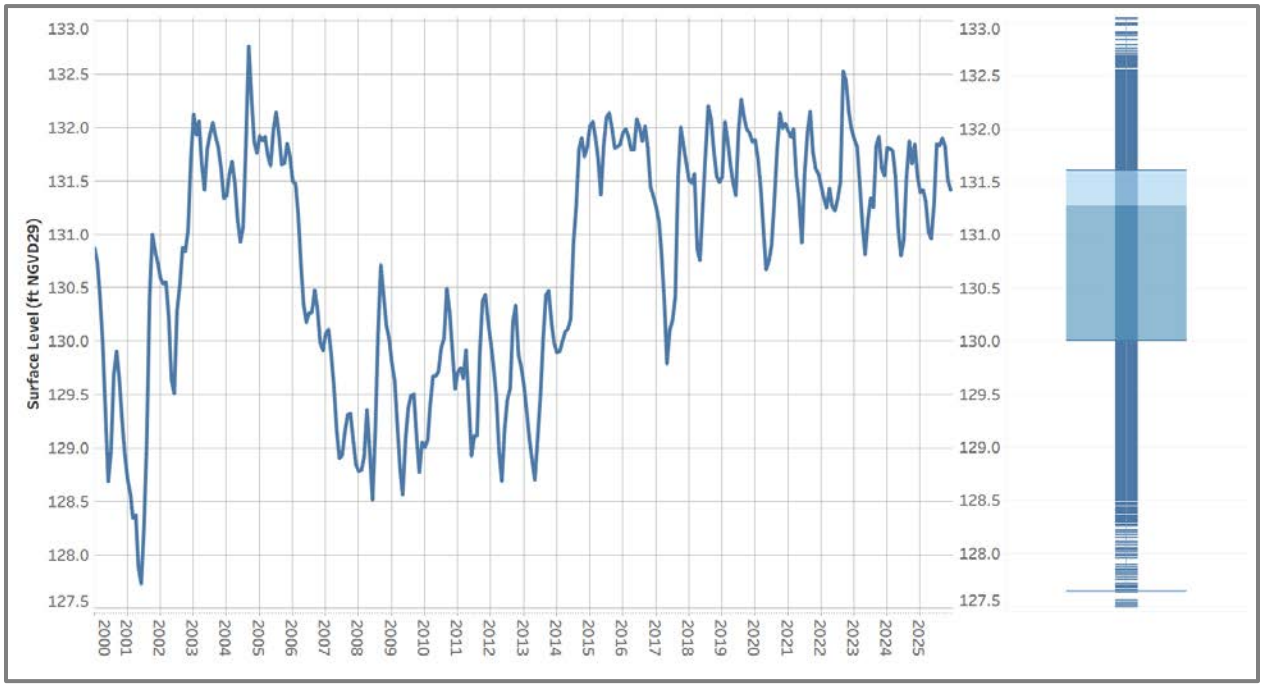


Figure 3-244. Hydrograph of Lake Winterset depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

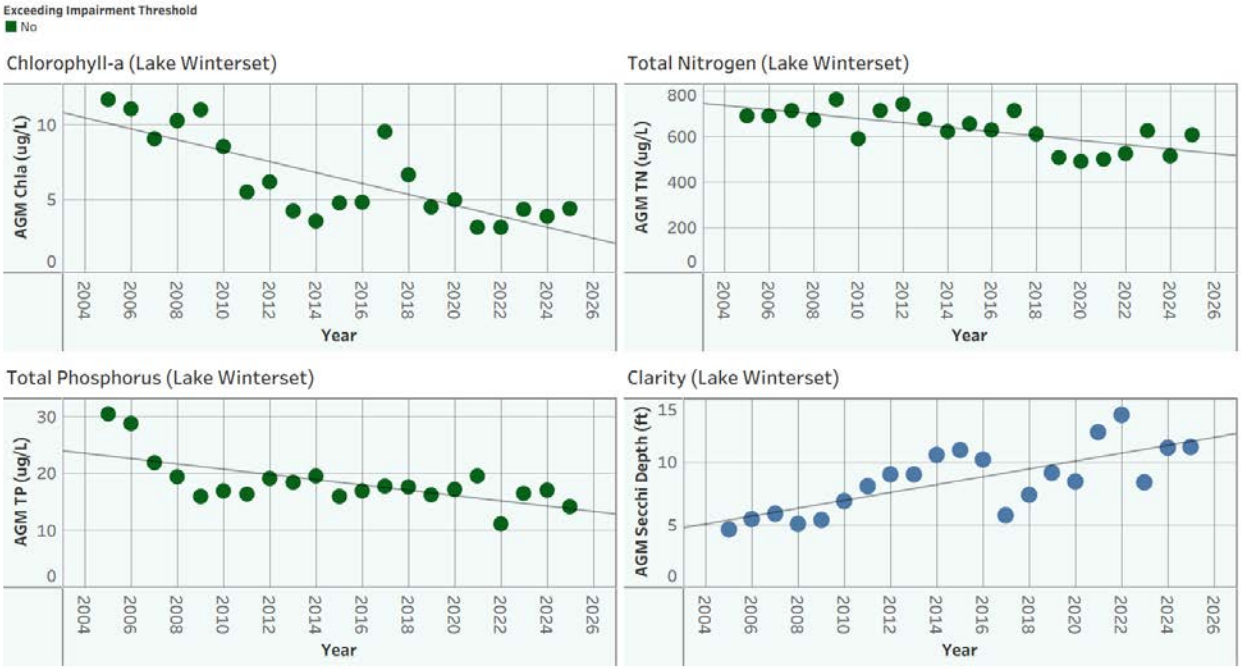
regression analysis, changes in Lake Winterset's surface level are correlated with TN concentrations—likely due to slight increases in flushing during rainy periods (see appendix).

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Lake Winterset is categorized as a clear, alkaline waterbody. Due to the presence of no NNC exceedances of Chl-a, TN, or TP during the assessment period, Lake Winterset is considered un-impaired (Figure 3-245).

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, all four of these parameters exhibited statistically significant improving trends. This equates to trend criteria scores of 3 for each of these. Lake Winterset likely has the best water quality in Winter Haven and will continue as long as the trends consistently maintain these improving directions.



Lake Winterset 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.783	-0.708	-0.664	0.744
P-Value	0.000	0.000	0.001	0.000

Figure 3-245. Lake Winterset AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Lake Winterset on 3/14/2025. The PAC during this survey was 48.5% and the total BV was 4.8% (Figure 3-246). A PAC value over the 30% threshold equates to a vegetation abundance criterion score of 3. Since 2018, Lake Winterset's vegetation coverage percentage has remained high. This robust vegetation community is likey the result of and a contributor to Winterset's excellent water clarity and improving water quality

trends. The excellent water clarity also allows for the growth of submerged vegetation into deeper areas of the lake.

Invasive Species Management:

Based on data from the 2025 survey, Lake Winterset is dominated by submerged species. Eelgrass and southern naiad made up over 30% of the vegetation community (Figure 3-247). Invasives like hydrilla made up 9.4% of the population. This equates to an invasive percentage score of 1. This invasive percentage was a slight increase from the previous year but is still far from the over 10% populations detected in 2021 and 2022. Continued monitoring and management efforts will be required to bring these invasive percentages down below a 2.5% threshold constituting a maintained status.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, Lake Winterset's species evenness and overall diversity indices exceeded their long-term median values (Figure 3-248). This equates to a diversity criterion score of 2. Species richness decreased from the previous year, but this allowed for a much more equitable distribution of plants. As a result, overall species diversity remained close to the same.

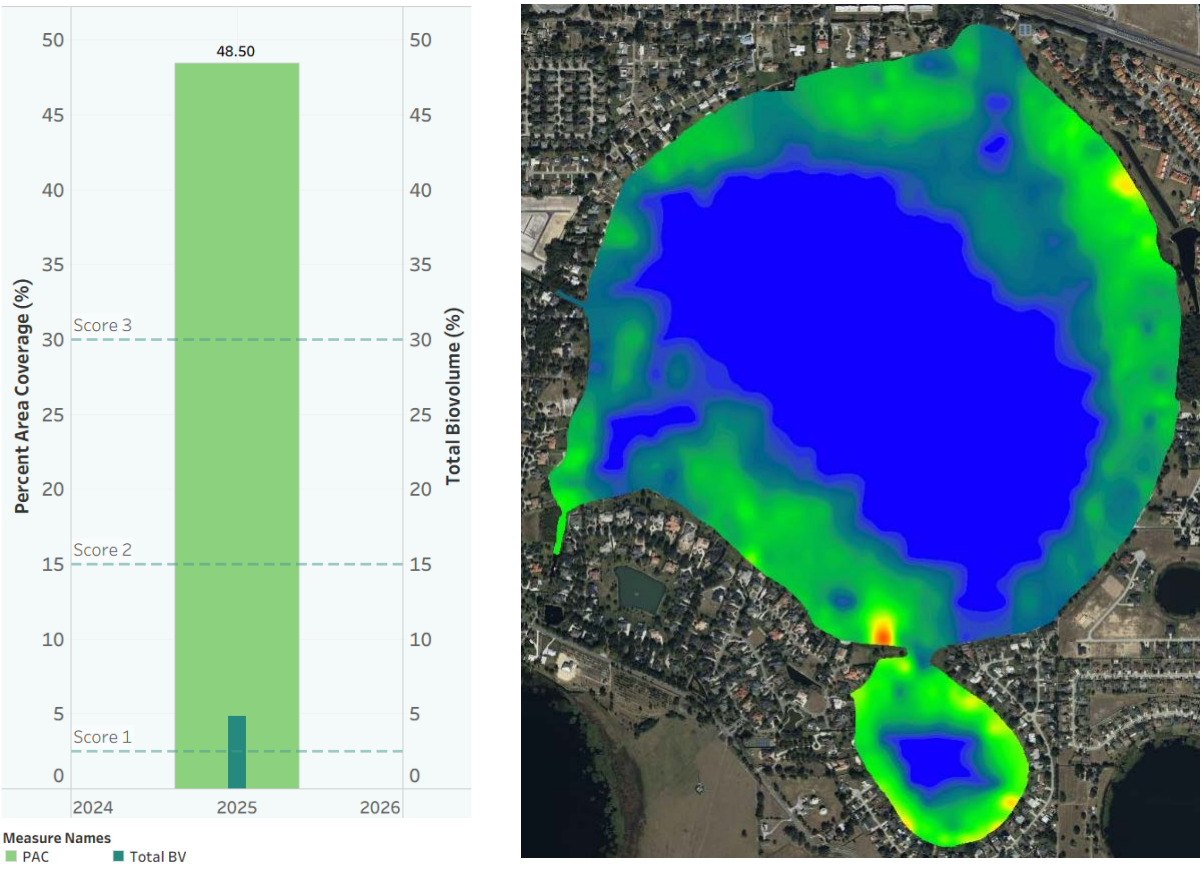


Figure 3-246. Graph depicting 2025 PAC/BV and biovolume heatmap of Lake Winterset; biovolume values range from green (lowest) to red (highest).

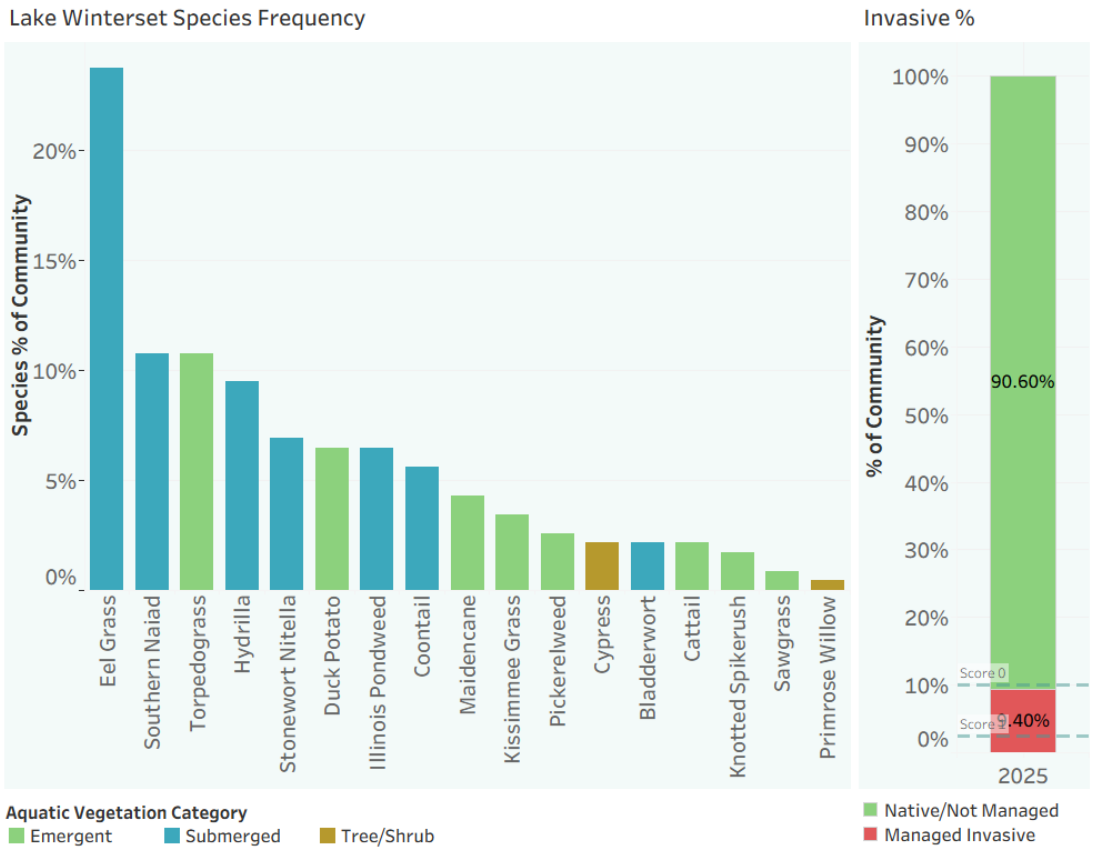


Figure 3-247. Chart depicting species frequency and invasive species presence of Lake Winterset during 2025.

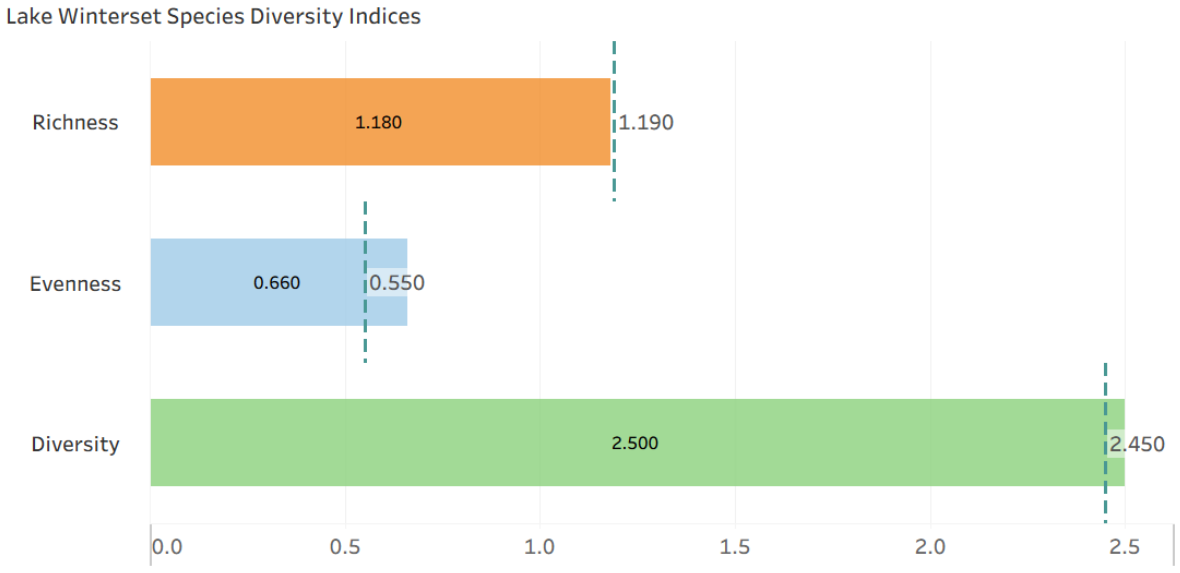


Figure 3-248. Chart depicting 2025 diversity indices for Lake Winterset. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Lake Winterset's health index scores from 2018 to 2025 shows consistently high values ranging from 2.4 to 2.8 (Table 3-35). The primary changes in score have been the result of invasive species presence and diversity criteria fluctuations. Management efforts to control invasive species, while necessary, likely impact species diversity in some way. Overall, Lake Winterset ranks low on the City's management priority list due to its excellent water quality and improving trends.

Lake Health Impacts/Challenges:

- Lake Winterset currently exhibits excellent water quality. However, stormwater and septic system loading are potential concerns if trends ever shift toward deterioration.
- The management of invasive species like hydrilla is a consistent concern. Based on the species data, the hydrilla population appears to be expanding in Lake Winterset. This may prompt the FWC to conduct more impactful treatment efforts in order to control it, which may result in some temporary declines in water quality.

Lake Management Strategy:

- If water quality becomes a future issue, City staff may explore source analysis to determine if septic leachate is a potential contributor of nutrient pollutant loading. Further management may involve septic-to-sewer conversions.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Bringing the hydrilla population down to a managed state should reduce the future need for large scale herbicide treatments and the potential water quality issues that follow.
- With the majority of the drainage basin comprised of residential housing, future management of stormwater may consist of public education and outreach. This aims to increase residents' knowledge of best stormwater practices and ways they can individually reduce their nutrient load.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	3	3	3	3	3	2	1	1	**2.4**
2019	3	3	3	3	3	3	1	3	**2.8**
2020	3	3	3	3	3	3	1	3	**2.8**
2021	3	3	3	3	3	3	0	3	**2.6**
2022	3	3	3	3	3	3	0	1	**2.4**
2023	3	3	3	3	3	3	1	2	**2.6**
2024	3	3	3	3	3	3	1	2	**2.6**
2025	3	3	3	3	3	3	1	2	**2.6**

Table 3-35. Lake Health Index values for Lake Winterset from 2018 to 2025.

Little Lake Hamilton

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	2	2	3	1	2	3	3	2.0

Features & Statistics:

Surface area	359.6 acres
Mean depth	8.46 feet
Maximum depth	22 feet
Volume	3,095.7 acre-feet
Drainage basin area	1,015.9 acres
Annual TN Load	1,472.7 lbs
Annual TP Load	198 lbs
Limiting nutrient	Phosphorus

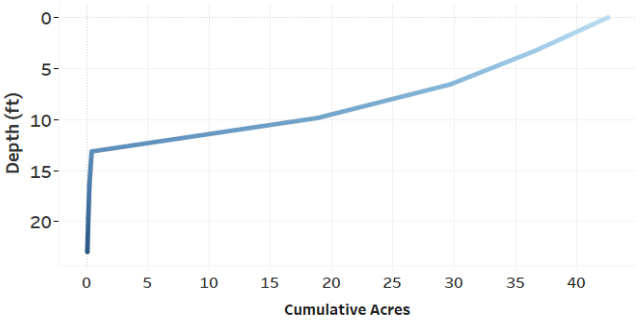


Figure 3-249. Hypsograph of Little Lake Hamilton depicting the depth profile and morphology of the lake bed.

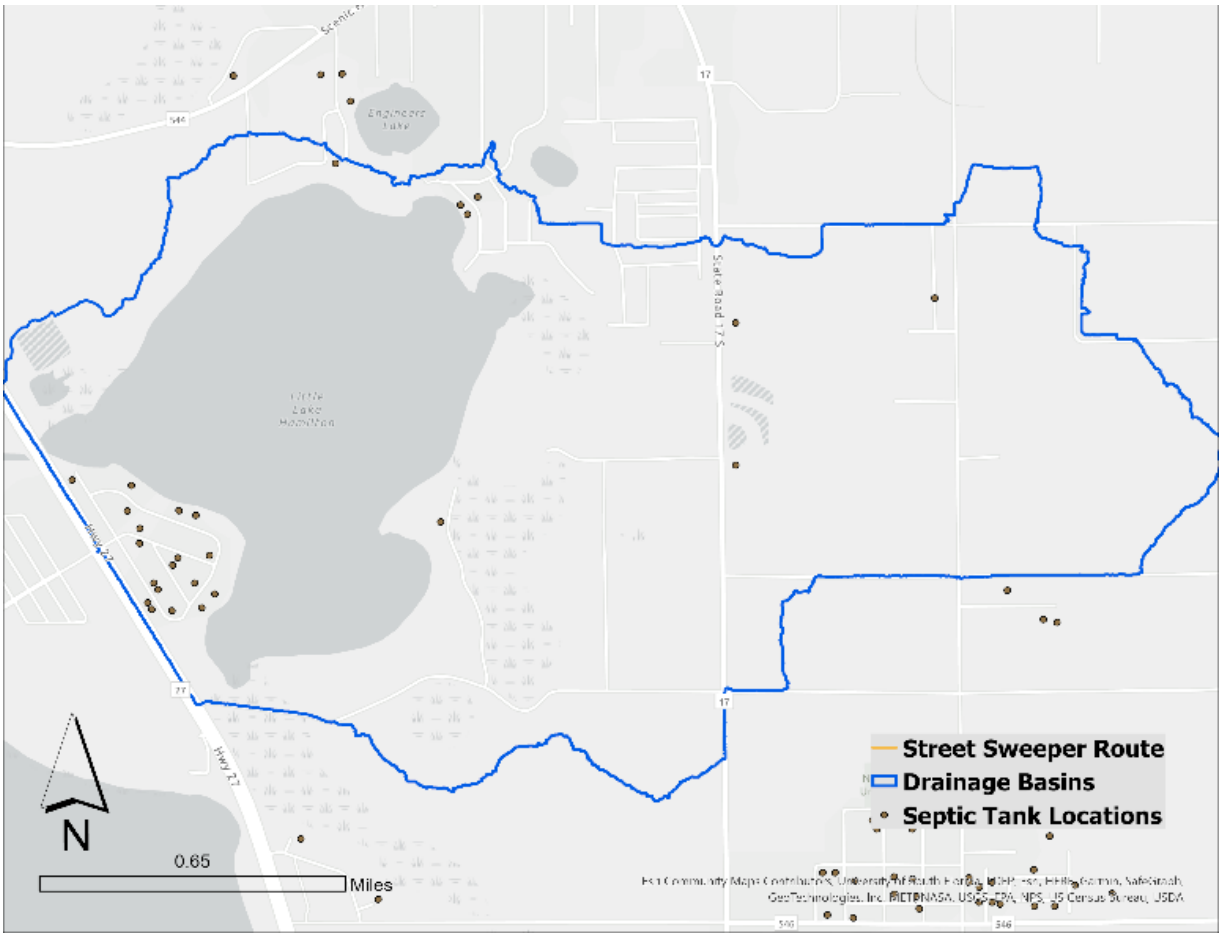


Figure 3-250. Map of Little Lake Hamilton's drainage basin and nearby septic systems.

Hydrology:

A moderately sized waterbody, Little Lake Hamilton has a surface area of 360 acres, an average depth of 8.5 feet, and a maximum depth of over 20 feet in a few deeper areas (Figure 3-249). With an average surface area and depth, Little Hamilton is able to support a moderate littoral zone and aquatic plant community. Stormwater is conveyed to this waterbody from a 1,016 acre drainage basin made up of agricultural, residential, and wetland land uses (Figure 3-250). Based on stormwater pollutant load modelling, this drainage area contributes 1,472 lbs of TN and 198 lbs of TP to the lake annually—some of the lowest pollutant loading rates in the region by area. There are 26 septic systems present in the basin. Since Little Hamilton is completely outside Winter Haven limits, the City does not conduct any street sweeping services in the basin.

Little Lake Hamilton is part of the North Chain with navigable connections to Lake Hamilton and Middle Lake Hamilton via canals. The North Chain discharges to the Peace Creek via the P-8 water control structure on the south side of Lake Hamilton. The three Hamilton lakes' surface levels all sit at the lowest elevation of all the waterbodies in the study area. Over its period of record, the Hamilton surface level has fluctuated between 117.5 and 123.6 feet above sea level. The normal range of fluctuation is between 119 and 121 feet (Figure 3-251). In 2017, the SWFWMD enacted new water level management protocols with the intent to restore seasonal level fluctuations within the lake's normal range. This is accomplished by releasing water downstream during the rainy season and storing water during the dry season. During 2025, Little Lake Hamilton dropped to a dry season low of 120.4 feet in April and reached a wet season peak of 121.3 feet in September. This group of lakes ended the year near the high end of the normal range at 120.9 feet. Since 2015, the SWFWMD has maintained Lake Hamilton's level consistently near this upper range. According to linear regression analysis, changes in Little Hamilton's surface level are strongly correlated with Chl-a, TN, TP, and water clarity (see appendix). This carries management implications as maintaining higher levels should result in water quality improvements.

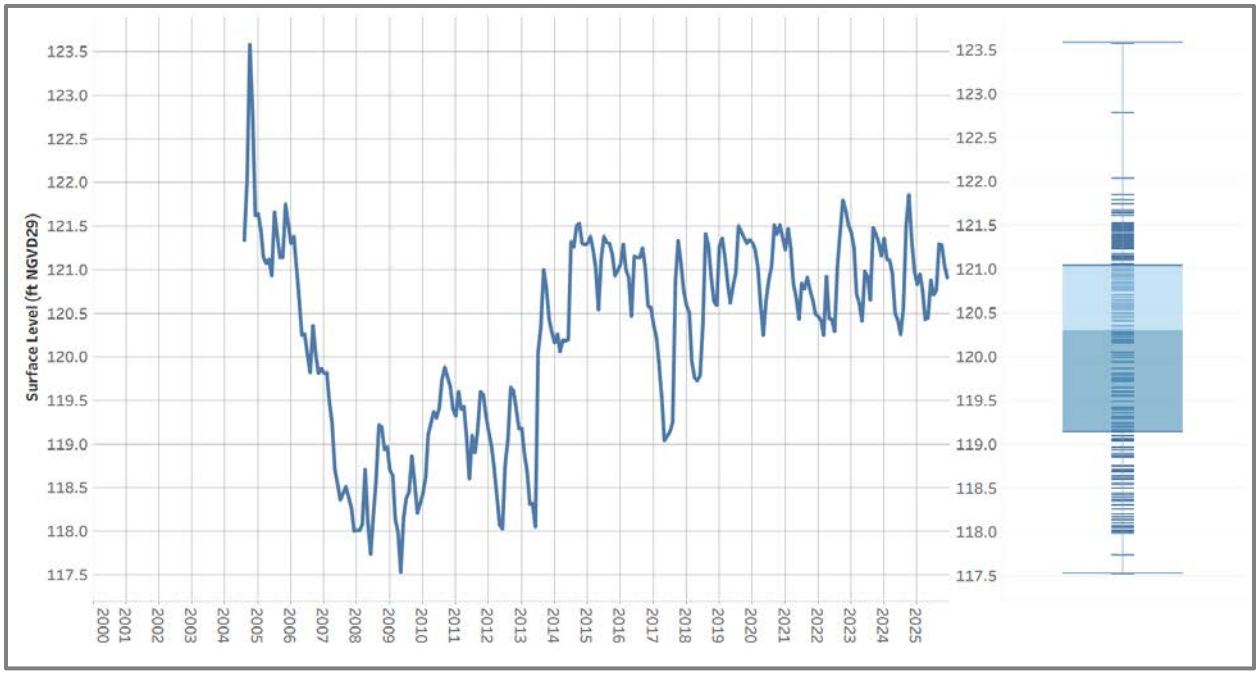


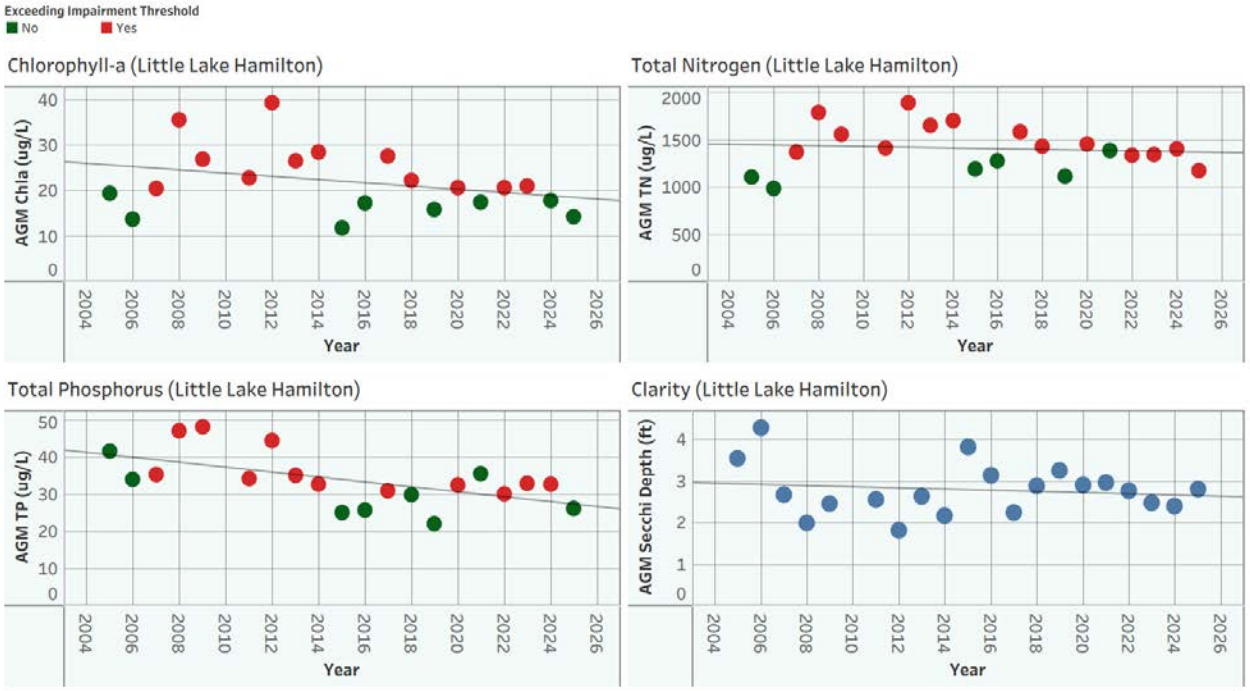
Figure 3-251. Hydrograph of Little Lake Hamilton depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Little Lake Hamilton is categorized as a clear, alkaline waterbody. Since impairment can be determined by more than one exceedance in any three year span during the assessment period, Little Hamilton is considered impaired for Chl-a, TN, and TP based on multiple consecutive exceedances in the last four years (Figure 3-252). This equates to an impairment criterion score of 0. In 2021, the FDEP adopted a Polk County proposed pollutant reduction plan for the Lake Hamilton Chain. This plan stipulates that existing or planned pollutant reduction strategies have been accepted in lieu of a total maximum daily load.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. During this period, TP exhibited a significant improving trend for a criterion score of 3. Trends for Chl-a and TN during this time were non-significant and in an improving direction, while water clarity was trending downward non-significantly—resulting in trend scores of 2 and 1, respectively. It should be noted that in the short term, most of these trends have been static. Only water clarity exhibited a significant downward trend from the years of 2019 to 2024.



Little Lake Hamilton 20yr Trend Statistics

	Chl-a No Trend	TN No Trend	TP Decreasing	Clarity No Trend
R Coeff.	-0.316	-0.103	-0.590	-0.146
P-Value	0.175	0.666	0.006	0.540

Figure 3-252. Little Lake Hamilton AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Little Lake Hamilton on 10/1/2025. The PAC during this survey was 24% and the total BV was 3.3% (Figure 3-253). This equates to an abundance criterion score of 2. Since 2018, Little Hamilton has exhibited moderate vegetation abundance with values less than 20%. PAC did increase in 2024 above the top-tier threshold. However, abundance has since dropped back down to levels in-line with historic levels. Maintaining a high vegetation abundance may help to drive positive water quality changes.

Invasive Species Management:

Based on the 2025 survey data, Little Lake Hamilton is dominated by emergent and floating-leaf plants. Cattail, spatterdock, and fragrant water lily made up nearly 50% of the community (Figure 3-255). Fortunately, there were no managed invasive species detected during the last four annual surveys. This absence equates to an invasive criterion score of 3. In previous years, hydrilla, burhead sedge, and elodea were invasives to be managed. This continued lack of invasive plants indicates successful management of exotics and a relatively healthy aquatic plant community.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to the 2025 species data, all of Little Hamilton's diversity indices exceeded their long-term median values (Figure 3-254). This equates to a diversity criterion score of 3. Much of this change was due to a substantial increase in species richness and many small and uncommon plant species were detected compared to the previous year. Despite a drop in the evenness of species distribution, the rise in species richness led to an overall increase in diversity. Due to the lack of invasive species in recent years, these changes can be attributed wholly to natural community dynamics.

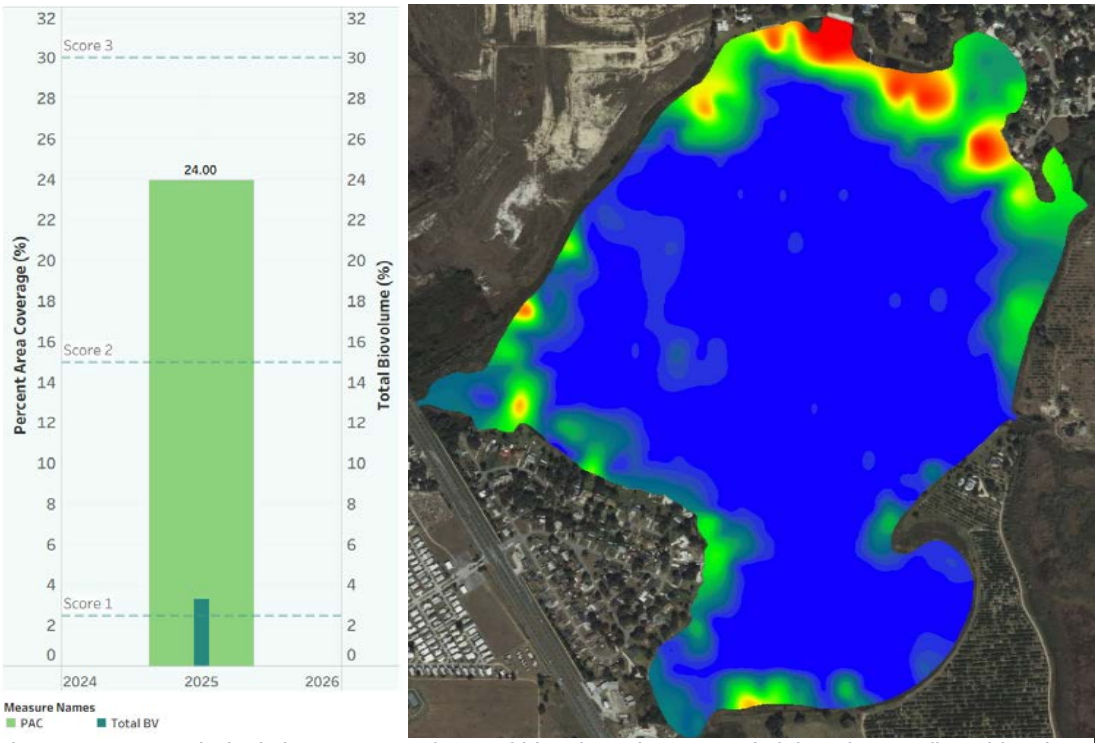


Figure 3-253. Graph depicting 2025 PAC/BV and biovolume heatmap of Little Lake Hamilton; biovolume values range from green (lowest) to red (highest).

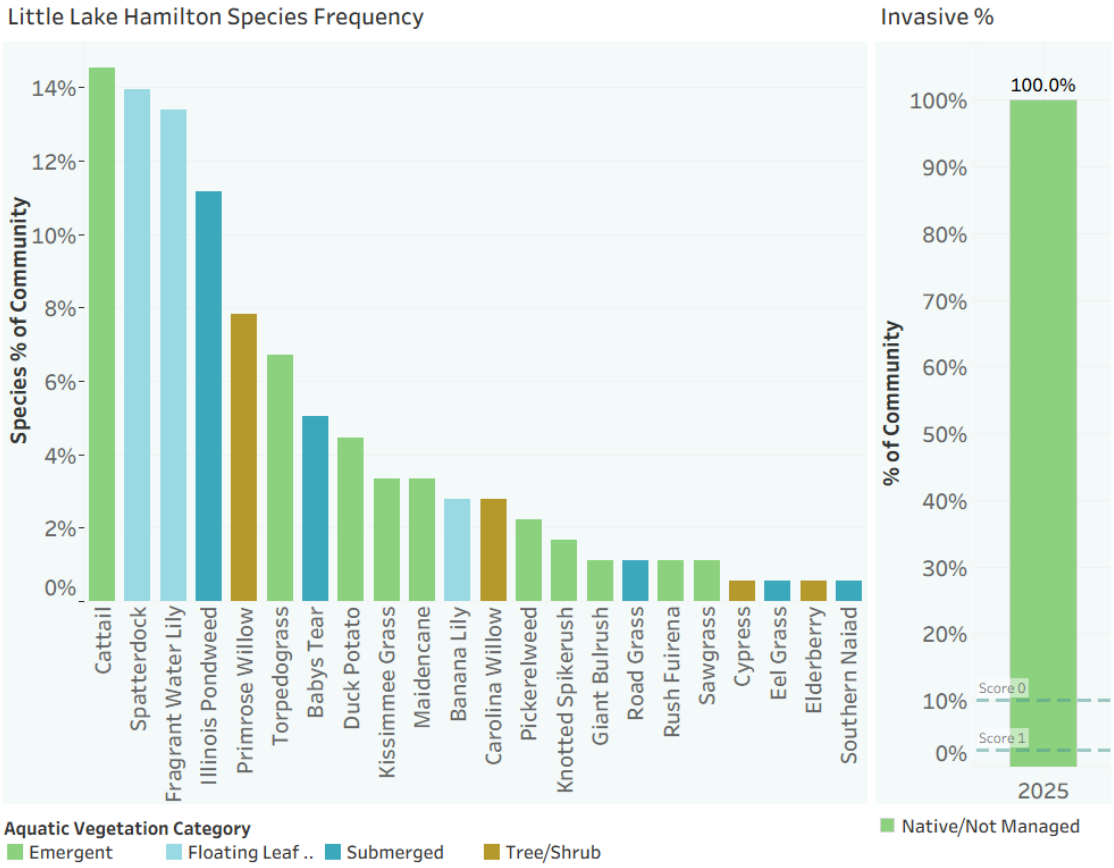


Figure 3-255. Chart depicting species frequency and invasive species percentage of Little Lake Hamilton during 2025.

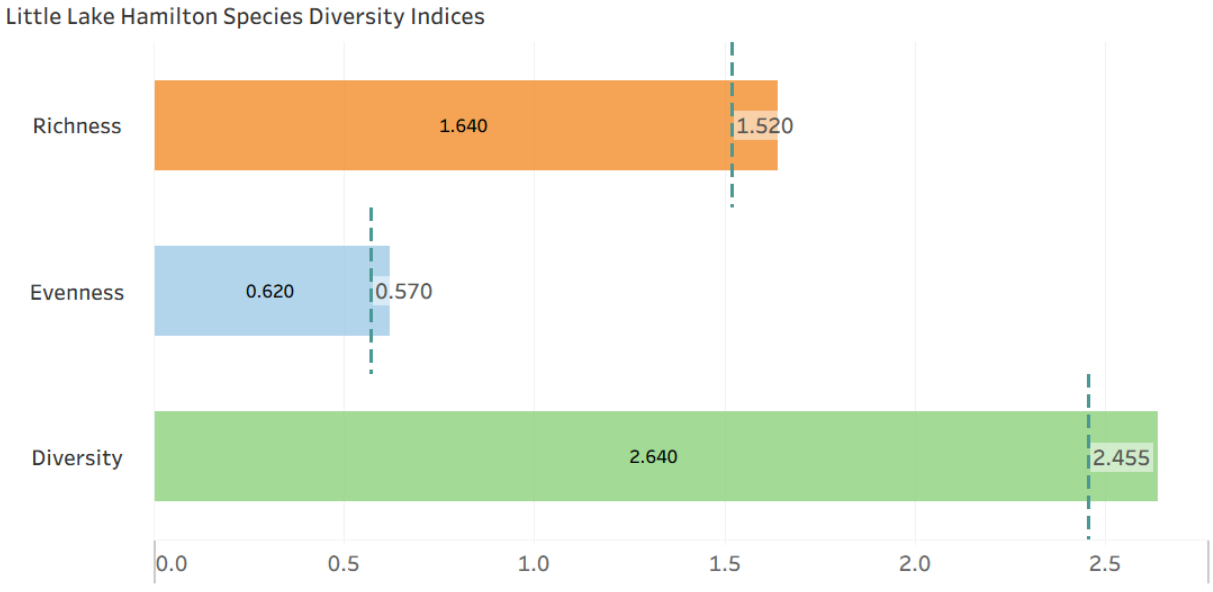


Figure 3-254. Chart depicting 2025 diversity indices for Little Lake Hamilton. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Little Lake Hamilton's health index scores from 2018 to 2025 shows slight improvement—with values ranging from 1.3 to 2.0 (Table 3-36). During this time frame, there has been very little change in the water quality impairment scores, although the trend scores appear to have improved somewhat. Invasive presence has remained stable in recent years. Therefore, vegetation abundance and species diversity have presented the greatest fluctuation in scores over the course of monitoring. Little Lake Hamilton has ranked high on the priority list due to its water quality impairments and there is little indication that water quality will begin to trend upwards. However, 2025 marks the best lake health score this waterbody has received in monitoring history—indicating at least marginal improvement.

Lake Health Impacts/Challenges:

- Stormwater and septic system pollutant loading remain the primary factors likely impacting water quality. Since Little Hamilton's drainage basin falls outside of Winter Haven's jurisdiction, the City is limited in its capacity to manage these potential pollution sources.
- Several of Little Lake Hamilton's water quality parameters are correlated with surface level—likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- The management of invasive species is a consistent concern. While invasive species were not detected in the last three years, it can take a single growing season for a previously undetected population to take over large areas of a waterbody.

Lake Management Strategy:

- The City plans to provide support to Polk County and other municipalities in the vicinity of Little Lake Hamilton as water quality management plans are developed and implemented.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and the potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	1	2	1	2	2	1	**1.3**
2019	0	1	1	2	1	2	3	0	**1.3**
2020	0	1	1	2	1	2	2	3	**1.5**
2021	1	1	1	2	1	1	1	3	**1.4**
2022	0	1	1	2	1	2	3	3	**1.6**
2023	0	1	1	2	1	2	3	2	**1.5**
2024	0	2	1	2	1	3	3	1	**1.6**
2025	0	2	2	3	1	2	3	3	**2.0**

Table 3-36. Lake Health Index values for Little Lake Hamilton from 2018 to 2025.

Middle Lake Hamilton

Impairment	Chl-a Trend	TN Trend	TP Trend	Clarity Trend	Plant Abundance	Invasive Presence	Diversity	Lake Health
0	3	3	3	3	2	0	3	2.1

Features & Statistics:

Surface area	102.6 acres
Mean depth	5.01 feet
Maximum depth	7 feet
Volume	425.7 acre-feet
Drainage basin area	1,539.9 acres
Annual TN Load	11,621.3 lbs
Annual TP Load	1,072 lbs
Limiting nutrient	Co-limited (N & P)

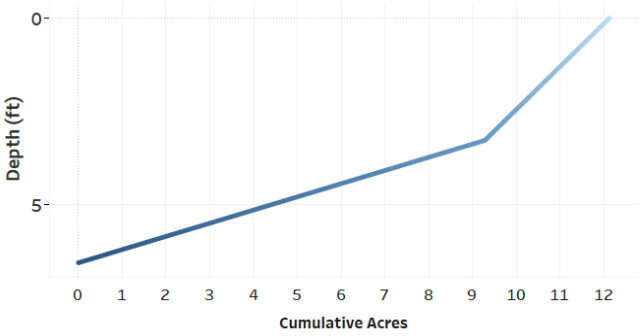


Figure 3-256. Hypsograph of Middle Lake Hamilton depicting the depth profile and morphology of the lake bed.

Hydrology:

Middle Lake Hamilton is the smallest lake in North Chain at just 103 acres. It also is one of the shallowest lakes in the study area with an average depth of 5 feet and a maximum depth of just 7 feet (Figure 3-256). This shallow depth makes the lake susceptible to sediment suspension via wind and wave action, and the high level of tannins in the water prevent much submerged vegetation from growing. Stormwater is conveyed to this waterbody from a comparatively enormous 1,540 acre drainage basin that extends far to the north (Figure 3-257). The basin is comprised of residential, commercial, agricultural, and wetland land uses which contribute 11,621 lbs of TN and 1,072 lbs of TP to the lake annually. Despite these massive pollutant loads, on a per acre basis, these only rank 8th highest out of the 37 lakes in the area. There are a little over 30 septic systems in the basin. However, the majority of these are very far from the actual waterbody and don't constitute a high enough density to be a major

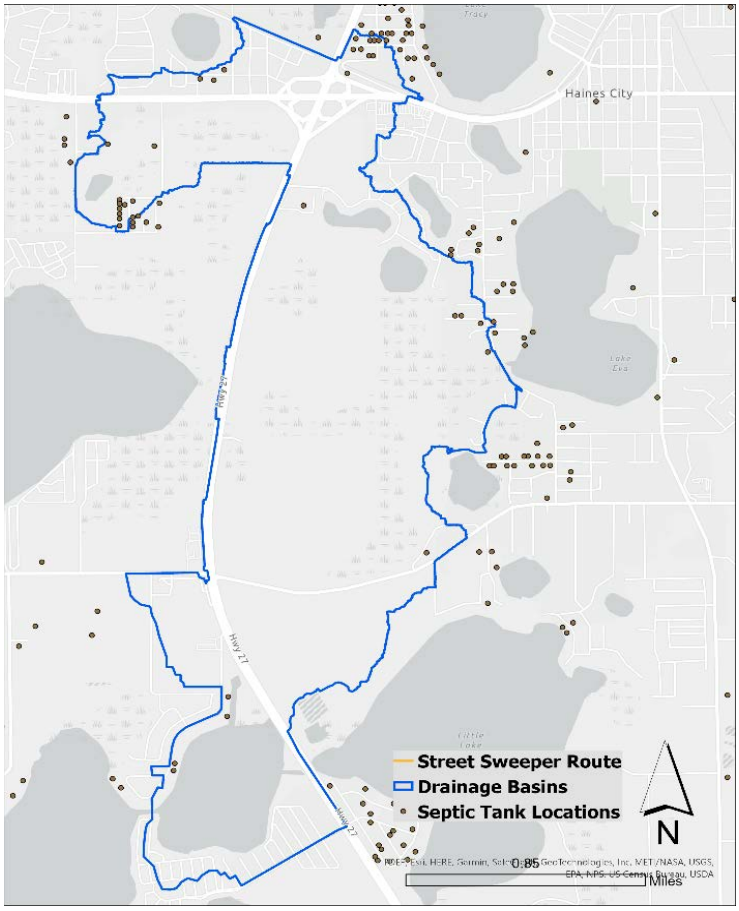


Figure 3-257. Map of Middle Lake Hamilton's drainage basin and nearby septic systems.

pollutant concern. With the majority of the basin outside of Winter Haven limits, the City does not conduct any street sweeping services in the vicinity.

Middle Lake Hamilton is part of the North Chain with navigable connections to Lake Hamilton and Little Lake Hamilton via canals. The North Chain discharges to the Peace Creek via the P-8 water control structure on the south side of Lake Hamilton. The three Hamilton lakes' surface levels all sit at the lowest elevation of all the waterbodies in the study area. Over its period of record, the Hamilton surface level has fluctuated between 117.5 and 123.6 feet above sea level. The normal range of fluctuation is between 119 and 121 feet (Figure 3-258). In 2017, the SWFWMD enacted new water level management protocols with the intent to restore seasonal level fluctuations within the lake's normal range. This is accomplished by releasing water downstream during the rainy season and storing water during the dry season. During 2025, Middle Lake Hamilton dropped to a dry season low of 120.4 feet in April and reached a wet season peak of 121.3 feet in September. This group of lakes ended the year near the high end of the normal range at 120.9 feet. Since 2015, the SWFWMD has maintained Lake Hamilton's level consistently near this upper range. According to linear regression analysis, changes in Middle Hamilton's surface level are strongly correlated with Chl-a, TN, TP, and water clarity (see appendix). This carries management implications as maintaining higher levels should result in water quality improvements.

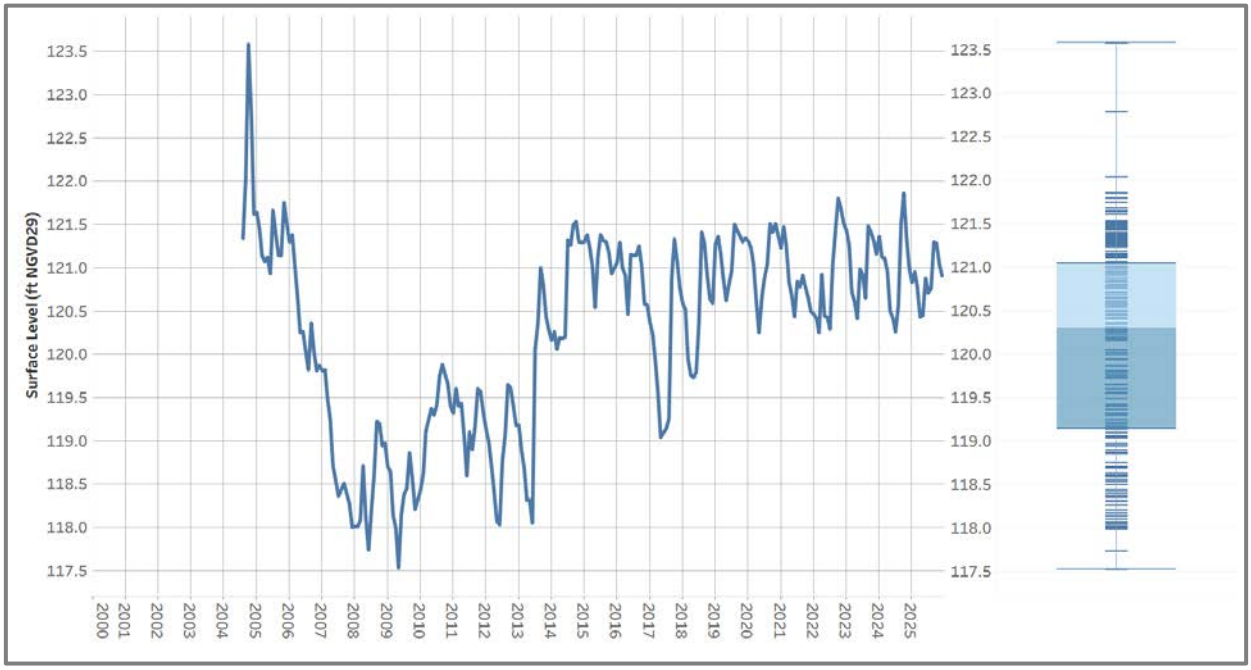


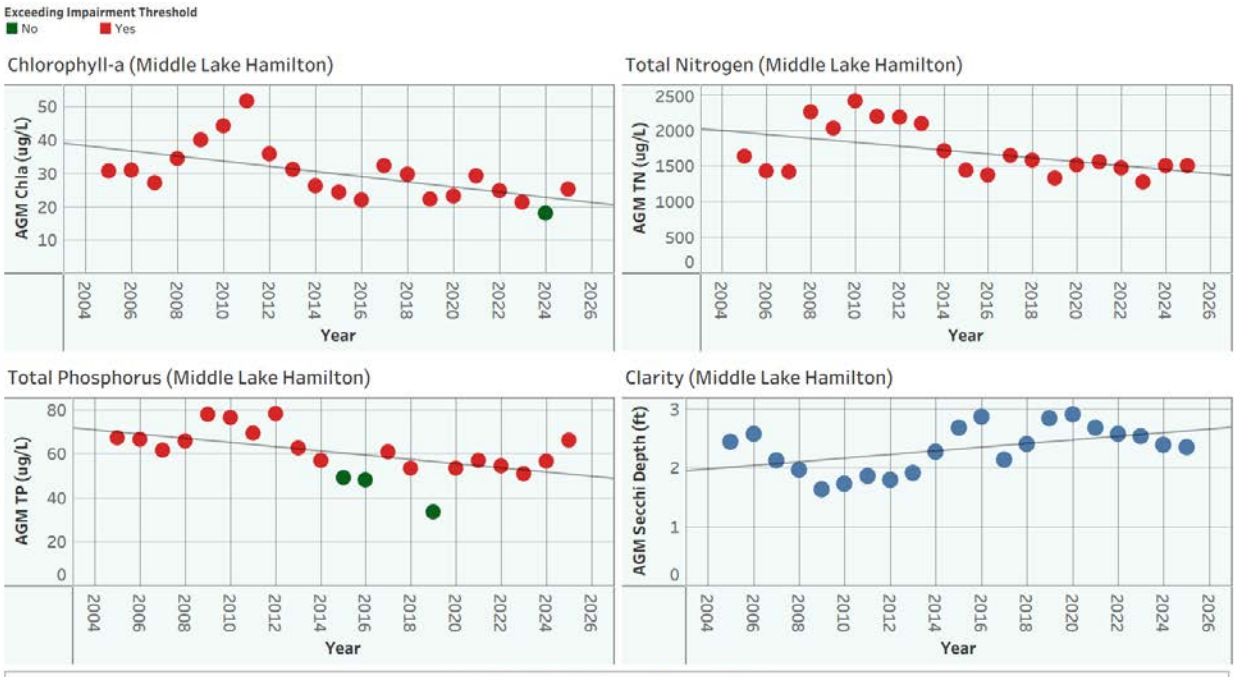
Figure 3-258. Hydrograph of Middle Lake Hamilton depicting monthly surface level readings from 2000 to 2025. A box and whisker plot details total range, median, and normal range of surface level during the period of record.

Water Quality Impairment:

To determine water quality impairment based on the Numeric Nutrient Criteria (NNC), Middle Lake Hamilton is categorized as a clear, alkaline waterbody. Due to numerous NNC exceedances during the assessment period, Middle Hamilton is considered impaired for Chl-a, TN, and TP (Figure 3-259). This equates to an impairment score of 0. Like with Lakes Hamilton and Little Hamilton, the FDEP has adoped a Polk County-developed pollutant reduction plan in lieu of a total maximum daily load.

Water Quality Trends:

Long-term trend evaluation was conducted using linear regression analysis of AGM Chl-a, TN, TP, and water clarity values from 2005 to 2025. During this period, all four water quality metrics exhibited significant improving trends—equating to trend criteria scores of 3. Despite its impairments, these water quality trends indicate recent improvement in water quality over the last 20 years. Water clarity has exhibited significant declining trends from 2019 to 2025—something to continue to examine.



Middle Lake Hamilton 20yr Trend Statistics

	Chl-a Decreasing	TN Decreasing	TP Decreasing	Clarity Increasing
R Coeff.	-0.586	-0.486	-0.546	0.492
P-Value	0.005	0.025	0.011	0.023

Figure 3-259. Middle Lake Hamilton AGM Chl-a, TN, TP, and Secchi depth values from 2005 to 2025. Data points colored in red depict NNC exceedances. Also detailed are 20 year trend statistics.

Aquatic Vegetation Abundance:

An aquatic vegetation survey was conducted for Middle Lake Hamilton on 10/10/2025. The PAC during this survey was 23.7% and the total BV was 4.4% (Figure 3-260). This PAC value equates to an abundance criterion score of 2. Middle Hamilton's vegetation abundance has previously been low, but rose significantly in 2023 and 2024. These record highs are indicative of an expanding vegetation community—most likely due to invasive species. The PAC value has since decreased back to pre-2022 levels; which most likely is due to invasive plant management efforts.

Invasive Species Management:

Based on data from the 2025 survey, Middle Hamilton's vegetation community has been relatively dominated by an equal mix of emergent and submerged species (Figure 3-262). The most dominant plant present was duck potato at just over 14%. This was followed by a mix of emergent, submerged, and floating plants. Invasive species like hydrilla and water hyacinth made up 11% of the community. While the invasive presence dropped by half from the previous year, it still

remains above the threshold earning it a 0 invasive criterion score. This demonstrates relative success in managing invasive plants, but these populations are still far from being controlled; requiring further effort.

Species Diversity:

This evaluation examines three diversity indices: species richness, species evenness, and overall diversity. According to 2025 species data, all three of Middle Hamilton's diversity indices exceeded their respective median values; earning a diversity criterion score of 3 (Figure 3-261). While species richness and overall diversity decreased slightly from the previous year, the relative equity in species distribution increased by a similar amount. It appears that these changes are likely due to the treatment of invasive plants. However, it is good to observe that despite the tremendous decline in vegetation abundance and the absence of a couple of uncommon plant species from the previous year, the diversity of the community remains relatively high.

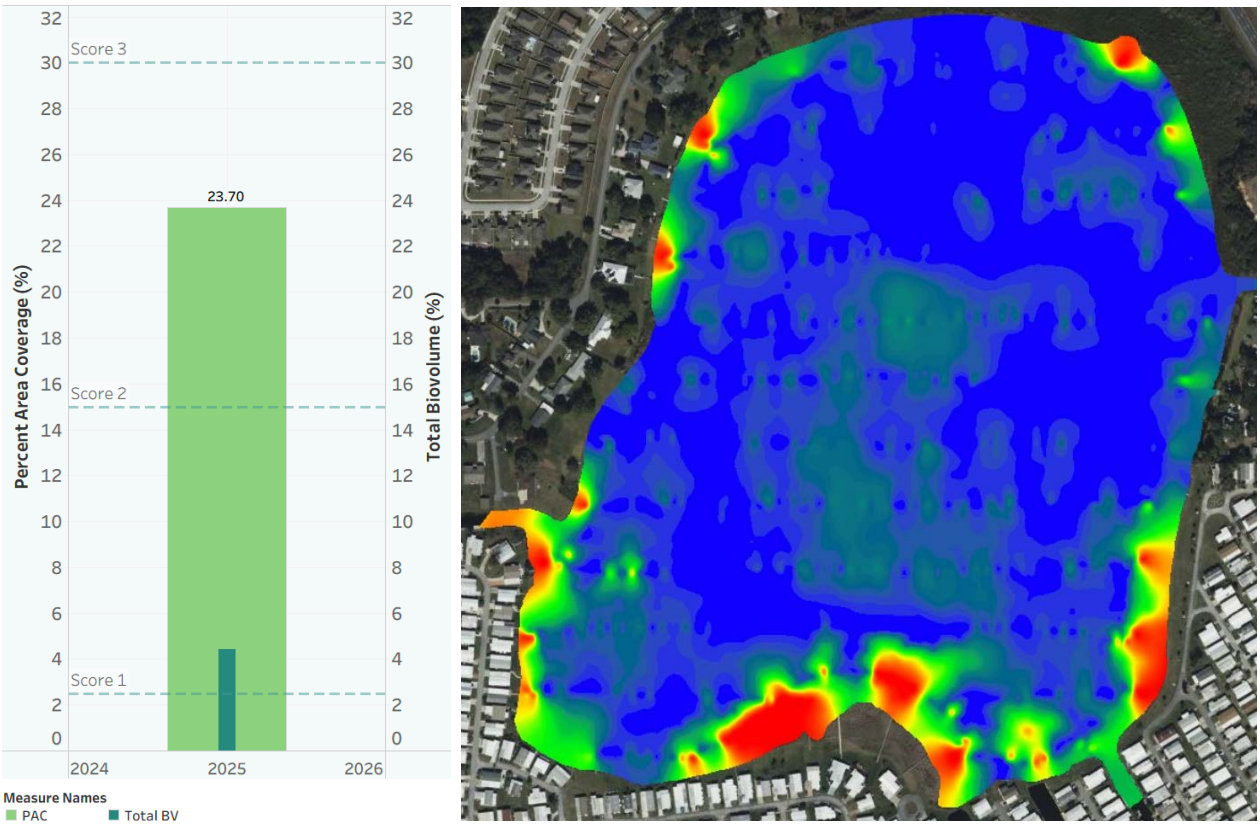


Figure 3-260. Graph depicting 2025 PAC/BV and biovolume heatmap of Middle Lake Hamilton; biovolume values range from green (lowest) to red (highest).

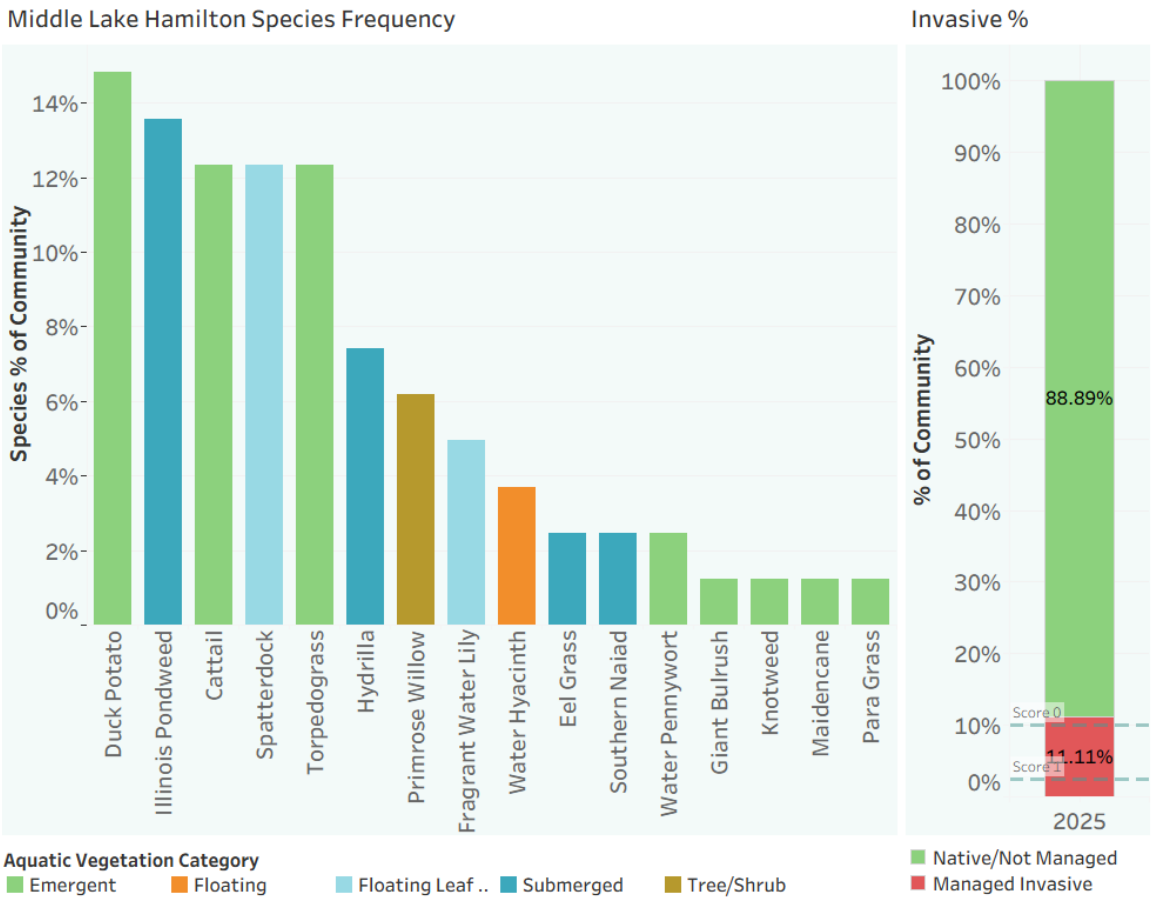


Figure 3-262. Chart depicting species frequency and invasive species percentage of Middle Lake Hamilton during 2025.

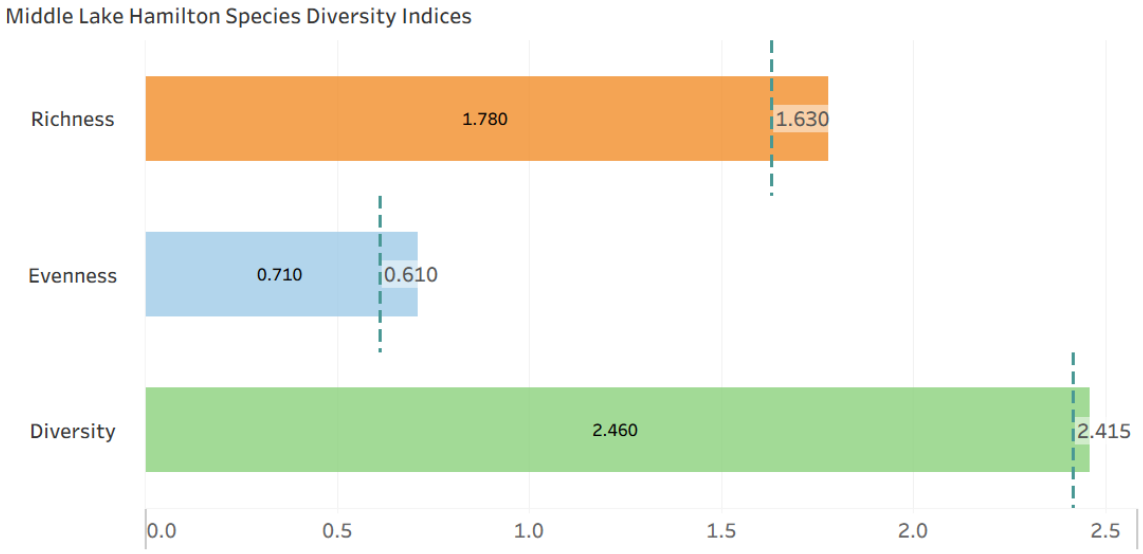


Figure 3-261. Chart depicting 2025 diversity indices for Middle Lake Hamilton. Dashed lines represent median values.

Lake Health Tracking:

A comparison of Middle Lake Hamilton's health index scores shows gradual improvement from values of 1.3 in 2018 to 2.1 in 2025 (Table 3-37). While impairment has not changed during this span, the water clarity trend scores have improved tremendously. Aquatic vegetation abundance has improved, but at the cost of the increase in invasive species. Surprisingly, the species diversity criterion has remained high since 2021. Overall, Middle Lake Hamilton is a moderate concern due to its water quality impairments coupled with invasive management issues.

Lake Health Impacts/Challenges:

- Stormwater pollutant loading remains the primary factor likely impacting water quality. Since the majority of Middle Hamilton's drainage basin falls outside of Winter Haven's jurisdiction, the City is limited in its capacity to manage these potential pollution sources.
- Several of Middle Hamilton's water quality parameters are correlated with surface level—likely due to increased flushing during wetter periods. This means that drought conditions could result in water quality declines.
- The management of invasive species is a consistent concern. The current infestation almost certainly requires large-scale treatment which can have negative impacts on water quality and species diversity.

Lake Management Strategy:

- The City will provide support to Polk County as water quality management plans are developed and implemented.
- Due to the surface level correlations with water quality, One Water projects that focus on surface water storage and aquifer recharge can help to mitigate declines in surface level during drier periods.
- City staff will continue to monitor aquatic vegetation and share that information with Polk County and the FWC. Early detection and rapid response to invasive species is the best management strategy to prevent large-scale herbicide treatments and the potential water quality issues that follow.

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	0	1	2	3	2	1	1	0	**1.3**
2019	0	1	2	3	2	2	1	1	**1.5**
2020	0	1	2	3	2	1	3	2	**1.8**
2021	0	1	2	3	3	1	1	3	**1.8**
2022	0	1	2	3	3	2	1	3	**1.9**
2023	0	1	2	3	3	3	0	3	**1.9**
2024	0	1	2	3	3	3	0	3	**1.9**
2025	0	3	3	3	3	2	0	3	**2.1**

Table 3-37. Lake Health Index values for Middle Lake Hamilton from 2018 to 2025.

Lake Management Summary

Using the Lake Health Index scores as a ranking system, the City is able to objectively prioritize management efforts for the study area lakes according to where the need is greatest. The following table displays the current priority ranking based on the 2025 Lake Health Index scores (Table 3-38).

Waterbody	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health Score
Lake Idyl	0	0	0	0	0	3	1	3	**0.9**
Lake Hamilton	0	0	0	3	0	2	1	3	**1.1**
Lake Martha	3	0	1	1	0	0	3	1	**1.1**
Lake Link	3	0	1	1	0	2	1	2	**1.3**
Lake Ned	3	0	0	1	0	3	1	2	**1.3**
Lake Elbert	3	0	0	1	0	1	3	3	**1.4**
Lake Mariana	0	1	1	2	0	3	2	2	**1.4**
Lake Cannon	1	2	2	1	1	3	1	1	**1.5**
Lake Haines	0	2	2	1	2	3	0	2	**1.5**
Lake Blue	0	2	1	2	0	3	3	2	**1.6**
Lake Hartridge	0	1	1	2	0	3	3	3	**1.6**
Lake Jessie	0	2	1	2	1	3	2	2	**1.6**
Lake Pansy	3	1	2	1	1	3	1	1	**1.6**
Lake Spring	3	2	2	1	2	3	0	2	**1.9**
Lake Eloise	0	3	2	3	2	2	3	1	**2.0**
Lake Mariam	3	1	2	1	1	3	2	3	**2.0**
Lake Mirror	1	2	3	2	2	3	1	2	**2.0**
Lake Otis	3	3	2	1	2	2	1	2	**2.0**
Lake Smart	0	3	2	2	2	3	1	3	**2.0**
Little Lake Hamilton	0	2	2	3	1	2	3	3	**2.0**
Lake Buckeye	3	1	2	1	2	3	2	3	**2.1**
Middle Lake Hamilton	0	3	3	3	3	2	0	3	**2.1**
Lake May	0	3	3	3	3	3	1	2	**2.3**
Lake Shipp	0	3	3	2	3	3	2	2	**2.3**
Lake Conine	3	3	3	2	3	2	0	3	**2.4**
Lake Fannie	3	3	3	2	3	3	0	2	**2.4**
Lake Lulu	0	3	3	3	3	3	2	2	**2.4**
Lake Roy	3	3	2	3	2	3	1	2	**2.4**
Lake Silver	3	2	2	3	2	2	3	2	**2.4**
Lake Idylwild	2	3	2	2	2	3	3	3	**2.5**
Lake Rochelle	3	3	3	2	2	3	1	3	**2.5**
Lake Summit	3	3	3	1	3	3	1	3	**2.5**
Lake Deer	3	3	3	3	3	3	1	2	**2.6**
Lake Howard	1	3	3	3	2	3	3	3	**2.6**
Lake Maude	3	3	3	2	2	3	2	3	**2.6**
Lake Winterset	3	3	3	3	3	3	1	2	**2.6**
Lake Daisy	3	3	3	3	3	2	3	3	**2.9**

Table 3-38. 2025 Lake Health Index scores ranking the Winter Haven study area lakes from highest to lowest priority.

It is noteworthy how many lakes demonstrated relatively good lake health scores in 2025. Lake Daisy exhibited the highest Lake Health Index score, followed closely by Lakes Winterset, Maude, Howard, and Deer. Each of these lakes demonstrate excellent biological health with robust, natural vegetation communities as well as great water quality and improving water quality trends.

The top priority waterbodies, on the other hand, possess similar qualities—water quality impairments and/or exhibiting multiple significantly deteriorating water quality trends. While the biological criteria also factor into these lake health scores, changes in vegetation abundance, invasive species presence, and species diversity are more variable and generally less impactful to overall lake health compared with water quality. Water quality issues are typically more challenging and costly to solve as well.

According to the 2025 Lake Health Index, the highest priority waterbodies include Lake Idyl (p. 150), Lake Hamilton (p. 131), Lake Martha (p. 192), Lake Link (p. 168), and Lake Ned (p. 216). The City and partnering agencies are engaged in various management strategies to improve the water quality in these lakes. These strategies can be reviewed in each lake's respective section (see the page numbers listed above). Specific management strategies are highlighted below:

Lake Idyl Water Quality Improvement Plan. The City submitted a restoration plan to the Florida Department of Environmental Protection (FDEP) aimed at addressing the pollutant sources to the lake. Projects associated with this plan include construction of stormwater improvements to reduce and treat runoff from the neighborhoods north of the lake and application of nutrient inactivation products to reduce internal pollutant loading from the lake sediments. Both of these projects will be dependent on funding availability. In 2025, the City was awarded a grant for the implementation of stormwater improvements in Lake Idyl's drainage basin and may also be receiving funding to implement a sediment inactivation project.

Lake Hamilton Water Quality Restoration Plan. Polk County Environmental Lands submitted a restoration plan to FDEP with projects that are designed to improve water quality in the three Hamilton waterbodies (i.e. Lake Hamilton, Middle Lake Hamilton, Little Lake Hamilton). The projects detailed in this plan include: stormwater enhancements at Lake Eva and Lake Henry, restoration projects designed to improve water quality from these lakes to downstream receivers, street sweeping within the Lake Hamilton drainage basins, groundwater seepage study to provide evidence as to the impacts from septic systems, and a City of Lake Hamilton septic to sewer conversion.

Lake Martha SAV Planting. A lack of submerged aquatic vegetation in Lake Martha has resulted in diminished fish and wildlife habitat and capacity to buffer against stormwater pollutant loads. In 2024, the City partnered with the Florida Fish and Wildlife Commission (FWC) to transplant Illinois pondweed from Lake Hartridge into Lake Martha. This native species was planted along the Lake Martha boatramp and Kiwanis Park shorelines. Unfortunately, the remnant grass carp originally stocked in 2011 to combat hydrilla ended up destroying the new plantings. City staff are exploring alternative options to increase SAV presence in the currently denuded lake; possibly replanting with carp-exclusion cages.

Lake Ned Vegetation Management. While Lake Ned's water quality is currently meeting standards, long-term trends indicate it is undergoing water quality deterioration. That said, within the last three years, the majority of its water quality metrics have exhibited improvement. This has

coincided with the restoration of submerged vegetation within the lake. Continued efforts to promote native SAV within Lake Ned appears to be the best strategy to drive water quality improvement. Therefore, the City will continue to monitor the biological health of the lake and advocate for habitat restoration projects, such as planting efforts, in the short-term.

Comparing the Lake Health Index scores over time provides insights into how successful these management strategies have been. Taking the mean of Lake Health criteria values from 2018 to 2025 shows that Winter Haven's lakes have improved in most areas (Table 3-39). The following are some highlights of this comparison:

Year	Impairment	Chla Trend	TN Trend	TP Trend	Clarity Trend	Vegetation Abundance	Invasive Presence	Diversity	Lake Health
2018	1.3	1.8	1.9	2.2	2.1	2.2	1.3	1.3	**1.8**
2019	1.5	1.9	2.0	2.2	2.1	2.3	1.1	2.0	**1.9**
2020	1.5	1.9	2.1	2.2	2.1	2.4	1.3	1.5	**1.9**
2021	1.7	1.9	2.1	2.0	2.1	2.3	1.3	1.7	**1.9**
2022	1.7	1.9	2.1	2.0	2.2	2.5	1.5	1.9	**2.0**
2023	1.8	1.9	2.0	2.2	1.9	2.5	1.5	2.1	**2.0**
2024	1.8	2.0	2.0	2.1	1.7	2.6	1.7	2.0	**2.0**
2025	1.7	2.0	2.0	1.9	1.6	2.6	1.5	2.3	**2.0**

Table 3-39. Mean Lake Health Index scores for all Winter Haven area lakes from 2018 to 2025.

The impairment criterion is based on the annual average concentrations of chlorophyll-a, total nitrogen, and total phosphorus compared to State and Federal regulatory thresholds. Since 2018, several lakes have started meeting the Numeric Nutrient Criteria (NNC), resulting in gradual improvements to the impairment criterion scores: Lakes Conine, Deer, Fannie, Idylwild, Otis, and Rochelle are the waterbodies that have started to meet the NNC for one or more parameters. However, recent NNC exceedances in Lakes Cannon, Hartridge, and Mirror have since dropped the impairment criterion score slightly from 2024 to 2025.

The chlorophyll-a (Chla) trends have exhibited slight improvement, with 2025 tying with 2024 as having the best average trend scores on record. Chlorophyll-a trend scores improved for Lakes Hartridge, Mariam, Otis, Middle Hamilton, and Smart but decreased for Buckeye, Haines, Link, and Mirror from 2024 to 2025.

The average total nitrogen (TN) trend scores have remained static, fluctuating between an annual average of 1.9 to 2.1. The average TN trend score remained the same from 2024 to 2025 due to slight increases in the scores for Lakes Hartridge, Summit, Little Hamilton, and Middle Hamilton but slight declines in the scores for Lakes Blue, Haines and Link.

The total phosphorus (TP) trends have undergone marginal variation with annual average scores vascillating between 1.9 and 2.2. The average TP trend score decreased slightly from 2024 to 2025 due to slight decreases in the scores for Lakes Blue, Buckeye, Cannon, Hartridge, Idylwild, Mariana, Shipp, and Spring. Only Little Lake Hamilton experienced an increase in its TP trend score during this time.

The water clarity trends have undergone considerable declines in recent years with large decreases in annual average trend scores. The latest decrease was due to a decline in Secchi depth trend scores for Lakes Blue, Cannon, Idylwild, Link, and Rochelle, but with the following lakes exhibiting an increase: Fannie and Ned.

The vegetation abundance criterion scores have undergone a steady increase from 2018 to 2025, with the latest annual average abundance scores tying with 2024 as the highest on record. During the most recent report year, Lakes Fannie, Haines, Howard, Mariana, and Pansy increased in aquatic vegetation abundance. Whereas, Lakes Daisy, Elbert, Martha, Otis, Middle Hamilton, and Little Hamilton experienced declines in overall abundance.

The nature of invasive plants allows them to quickly spread, taking over vegetation communities within the lakes. As a result, this criterion has the capacity to shift considerably from year to year. The annual average scores for this criterion have generally improved over time, but there was a decrease in average scores observed from 2024 to 2025. During this time, Lakes Conine, Haines, Idylwild, Link, Mariana, Mirror, Ned, Otis, Pansy and Summit exhibited increased invasive plant presence. That said, Lakes Buckeye, Daisy, Eloise, Howard, Idyl, Idylwild, Jessie, and Lulu all experienced an improvement in this metric.

Due to the ability for aquatic vegetation communities to shift based on both natural ecological dynamics and human-mediated management efforts, the species diversity criterion has the capacity to undergo the most fluctuation out of all the lake health metrics. This is evidenced by the fluctuation in annual average diversity scores from 1.3 to 2.1. Indeed, diversity scores increased significantly from 2024 to 2025. The following waterbodies exhibited improvement in their scores: Lakes Daisy, Deer, Elbert, Idyl, Jessie, Link, Mariam, Mariana, Martha, Ned, Rochelle, Roy, Silver, Summit, and Little Hamilton. Whereas, Lakes Cannon, Fannie, Lulu, Mirror, Otis, Pansy, and Spring experienced slight decreases in diversity.

Overall, the annual average Lake Health Index (LHI) scores experienced an increase from 2018 to 2022 where they have remained steady at 2.0. It is worth noting that the outcomes of lake management efforts are often incremental which is why the average LHI values have not exhibited substantial changes during this time frame. Additionaly, some management strategies can have unintended consequences on other aspects of lake health, for example the short-term water quality and species diversity impacts from invasive plant treatment efforts. Moreover, the maintenance of relatively high scores is also an achievement worth celebrating.

While these scores show general improvement, many individual waterbodies still aren’t meeting the high standards set forth by both the State of Florida and the City of Winter Haven. There is still much to accomplish to meet these goals. It will take the combined efforts of the City, partner organizations, local stakeholders, and Winter Haven residents in order to make these improvements a reality. Please reach out to the Winter Haven Natural Resources Division if you would like more information about a specific lake or management strategy.

#4 | Appendix



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4.2 Data Sources:

Water Quality Data

Collected from: https://polk.wateratlas.usf.edu/datadownload/; Surface Water Quality

Parameters:

- Akalinity, Total (hydroxide+carbonate+bicarbonate)
- Chlorophyll-a, corrected for pheophytin
- Nitrogen, Total
- Phosphorus as P, Total
- Secchi disk depth
- True Color, Total

Data Sources:

- POLKCO_NRD_WQ
- WIN_21FLPOLK
- WIN_21FLCEN
- LAKEWATCH_V
- SWFWMD_LAKES_WQ
- STORET_21FLTPA
- LEGACYSTORET_21FLA
- USGS_NWIS

Hydrologic Data

Southwest Florida Water Management District Environmental Data Portal: https://www.swfwmd.state.fl.us/resources/data-maps/environmental-data-portal

- Rainfall
- Lake (surface elevation)
- Well (Upper Floridan Aquifer elevation)

University of Florida IFAS Extension; Florida Automtated Weather Network: https://fawn.ifas.ufl.edu/data/

- Rainfall
- Evapotranspiration

City of Winter Haven Lake Level Sensors: http://hydrometcloud.com/hydrometcloud/index.jsp

- Lake (surface elevation)

Biological Data

Aquatic vegetation abundance collected using SONAR devices (e.g. Lowrance, Garmin, etc.).

SONAR data is processed using BIOBASE:
https://www.biobasemaps.com/Solutions/AquaticPlants

Species data is collected using the Florida Fish and Wildlife Commission (FWC) point-intercept sampling methodology.

- Collected by City of Winter Haven staff, Polk County staff, and FWC staff.

4.3 Supplemental Data

Annual Geometric Mean Data

Table 4-1. Annual geometric mean corrected chlorophyll-a concentrations from 2005-2025 for all study area lakes.

Waterbody	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	53.8	66.8	122.4	75.7	120.5	58.8	70.7	34.4	57.7	52.3	58.1	65.9	70.9	59.8	72.6	61.1	49.0	60.0	51.3	82.6	102.9
Lake Buckeye	24.2	12.1	13.6	10.6	10.2	7.4	6.0	7.1	4.9	7.1	5.3	5.4	4.9	6.5	9.5	3.4	3.6	9.3	18.1	20.7	19.0
Lake Cannon	27.8	18.5	22.9	23.7	32.2	28.0	28.7	23.1	31.7	27.3	16.5	19.0	19.0	21.5	25.0	22.6	18.9	35.0	18.3	25.7	25.5
Lake Conine	39.6	36.8	45.9	34.0	36.1	36.2	44.1	34.5	30.1	23.3	22.7	19.0	22.3	17.5	17.6	15.7	24.0	15.1	25.6	17.9	36.7
Lake Daisy	4.8	9.0	8.5	5.7	5.7	4.8	3.7	4.9	4.8	4.4	3.8	3.4	4.5	4.5	3.9	3.0	3.0	3.0	2.6	3.3	2.8
Lake Deer	16.4	17.3	21.6	31.6	27.9	18.8	11.5	28.4	22.2	10.3	12.4	8.1	11.3	4.9	8.7	7.2	10.8	4.2	10.1	4.1	8.9
Lake Elbert	6.2	5.2	3.7	3.1	3.7	3.6	4.9	5.0	4.0	4.4	5.5	3.7	6.2	5.6	8.2	10.6	8.2	13.0	8.0	10.4	12.3
Lake Eloise	43.7	34.1	25.5	30.5	27.1	31.0	39.0	25.6	36.0	33.5	32.0	37.0	22.8	25.9	21.4	23.8	33.2	16.9	28.3	27.6	30.4
Lake Fannie	13.4	14.7	14.3	16.9	22.6	22.0	25.6	19.1	17.1	13.7	10.5	11.3	11.5	12.0	11.6	8.1	13.6	12.4	11.3	7.6	11.7
Lake Haines	34.9	44.8	28.3	29.8	25.8	23.7	21.3	35.2	28.7	18.7	16.8	26.0	23.8	34.4	23.7	23.1	23.0	18.5	25.5	18.0	33.4
Lake Hamilton	13.6	7.7	6.8	16.0	28.9	26.5	22.8	29.0	29.2	22.5	21.3	24.9	45.8	40.5	32.8	34.7	37.1	48.2	31.4	38.2	22.6
Lake Hartridge	7.7	13.3	14.9	14.4	22.9	22.8	28.5	27.5	31.0	30.5	28.1	26.7	25.9	24.6	22.3	25.2	21.1	26.1	20.1	23.9	21.0
Lake Howard	31.0	37.4	64.0	41.9	33.3	24.7	30.0	29.6	26.9	25.0	25.4	27.6	24.7	21.7	20.0	23.7	25.5	33.4	23.0	22.6	19.9
Lake Idyl	9.2	7.0	4.4	1.9	25.1	4.4	5.5	4.8		4.7	9.7	9.6	57.5	33.6	31.7	29.7	38.9	17.4	17.1	24.3	54.0
Lake Idylwild	20.1	25.0	21.3	29.3	37.3	33.2	23.3	21.0	26.8	22.5	16.8	13.9	24.8	21.3	18.3	16.6	15.8	21.6	14.8	24.2	24.0
Lake Jessie	28.1	27.8	24.0	25.4	30.9	31.9	25.0	24.0	26.8	26.8	18.3	15.4	33.0	24.3	23.0	25.2	23.3	27.0	20.8	29.7	26.6
Lake Link						5.2	10.0	15.5	15.3	14.5	13.8	11.1	13.9	17.3	14.2	9.8	14.9	13.0	15.6	19.9	16.9
Lake Lulu	39.0	38.6	35.0	34.8	30.9	29.6	25.2	22.3	23.1	17.2	21.2	25.4	25.7	30.2	22.3	20.8	21.3	19.8	23.1	26.9	21.0
Lake Mariam	5.4	5.4	8.0	6.0	4.7	4.0	4.1	4.8	4.7	6.3	6.3	10.9	7.1	8.2	6.8	6.3	7.4	13.1	5.6	5.7	6.4
Lake Mariana	26.9	23.4	28.9	32.5	34.2	25.5	42.1	32.4	35.0	37.1	29.1	21.3	38.2	31.5	35.1	26.3	35.6	35.6	28.8	41.5	25.5
Lake Martha	3.6	3.0	3.4	7.1	5.6	7.1	7.1	6.3	6.3	7.3	12.2	12.7	17.7	17.2	8.8	8.2	10.7	9.3	6.7	9.3	8.1
Lake Maude	12.8	4.7	4.9	16.3	15.9	12.3	8.7	12.6	8.2	5.3	8.3	6.5	8.2	4.1	4.0	3.4	3.9	8.1	10.9	4.6	5.0
Lake May	36.1	47.6	65.6	51.3	46.3	32.6	35.3	37.3	33.0	24.4	18.5	29.1	30.6	23.5	21.7	19.9	21.3	35.6	26.6	30.8	26.2
Lake Mirror	29.6	23.6	22.9	26.4	21.0	19.5	13.5	10.5	15.8	8.2	8.1	12.4	16.7	21.7	14.0	14.7	9.2	13.4	24.0	22.7	23.2
Lake Ned	8.0	5.4	4.9	6.2	7.9	10.0	3.6	10.7	13.9	13.9	13.2	15.2	14.3	14.8	13.7	13.5	10.8	11.9	16.3	13.1	8.9
Lake Otis						21.9	18.3	23.2	20.4	16.3	17.3	13.9	13.5	18.3	17.7	15.1	19.3	13.3	15.2	15.2	16.6
Lake Pansy	10.9	11.7	15.9	12.1	11.2	11.4	8.7	15.4	23.3	16.5	16.4	15.6	15.3	13.0	13.7	10.7	12.7	13.1	21.0	10.9	17.0
Lake Rochelle	29.3	20.9	28.8	27.4	33.1	27.6	19.7	26.6	26.0	24.5	18.2	13.0	17.4	17.2	13.3	12.6	19.0	14.9	15.8	10.9	17.1
Lake Roy	13.5	14.2	18.4	24.6	19.4	17.1	10.4	11.4	13.9	8.6	6.2	8.7	8.3	12.8	12.5	8.7	20.3	8.0	13.7	8.3	8.0
Lake Shipp	46.9	71.7	83.2	30.0	47.5	38.8	36.4	36.2	32.5	22.7	27.2	26.6	29.6	28.9	27.4	21.5	27.7	30.9	35.2	31.2	25.1
Lake Silver	9.8	12.9	7.1	7.6	14.0	10.2	10.4	9.4	8.1	8.0	13.6	12.9	22.2	8.7	10.4	10.5	4.3	7.2	6.5	5.4	4.8
Lake Smart	27.5	25.7	40.1			56.9	50.5	46.9		19.0	23.7	21.3	39.8	19.5	22.4	24.5	24.3	28.0	22.1	13.5	24.6
Lake Spring	22.1	21.6	19.7	22.9	12.6	9.2	9.7	8.0	5.7	12.3	20.7	7.4	11.4	14.8	9.1	9.9	9.2	13.1	11.8	17.3	15.4
Lake Summit	11.7	10.3	9.8	15.1	13.8	10.6	8.1	6.4	5.5	5.0	6.3	6.2	7.3	6.7	5.4	6.4	5.9	5.0	4.8	4.8	4.7
Lake Winterset	11.7	11.1	9.1	10.3	11.0	8.5	5.5	6.2	4.2	3.5	4.7	4.8	9.5	6.6	4.5	4.9	3.0	3.1	4.3	3.8	4.3
Little Lake Hamilton	19.4	13.6	20.4	35.4	26.8		22.6	39.2	26.4	28.3	11.6	17.3	27.5	22.2	15.8	20.6	17.3	20.5	20.9	17.8	14.3
Middle Lake Hamilton	30.6	31.0	27.2	34.4	40.1	44.3	51.7	35.9	31.1	26.3	24.3	22.0	32.2	29.8	22.2	23.1	29.2	24.7	21.3	18.0	25.3

Table 4-2. Annual geometric mean total nitrogen concentrations from 2005-2025 for all study area lakes.

Waterbody	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	1836.2	2239.6	3561.0	2633.2	3691.4	2508.2	3155.2	2308.2	2633.9	2280.7	2203.4	2515.2	2587.2	2387.2	2332.2	2528.3	3127.2	3242.9	1764.8	3033.4	3708.3
Lake Buckeye	944.3	818.3	834.9	870.2	830.4	864.2	773.2	671.7	716.7	744.2	657.7	592.0	618.9	653.9	784.9	571.5	663.2	757.2	1046.8	966.0	925.3
Lake Cannon	1061.8	856.1	1137.4	1046.9	1306.1	1206.3	1328.2	1162.7	1355.1	1289.6	931.8	1059.8	922.6	985.7	1143.9	995.0	1046.3	1304.0	848.1	1120.8	1121.3
Lake Conine	1460.6	1278.6	1464.4	1378.7	1475.8	1455.7	1647.9	1359.1	1364.1	1193.2	1140.2	1056.7	1054.4	970.0	859.7	997.9	1211.1	938.7	1356.4	1043.6	1337.8
Lake Daisy	598.9	585.8	533.0	531.8	558.7	569.5	532.3	509.5	479.6	459.4	459.6	439.8	524.3	506.4	463.0	435.3	425.2	376.1	377.8	449.4	451.5
Lake Deer	955.2	932.4	1235.3	1425.5	1511.5	1519.0	1129.2	1629.6	1515.7	1079.4	990.6	782.3	850.8	716.1	846.5	821.9	1035.5	774.9	1052.8	763.0	888.3
Lake Elbert	520.7	504.1	424.7	353.7	415.4	409.9	560.0	506.3	397.0	454.2	477.1	476.7	501.3	542.3	616.9	669.2	665.9	777.9	544.2	594.1	590.3
Lake Eloise	1480.1	1270.1	1166.6	1134.4	1167.2	1344.5	1648.2	1313.7	1559.7	1574.9	1336.2	1519.4	1012.7	1078.5	883.8	1094.3	1436.5	948.5	1100.2	1275.0	1357.8
Lake Fannie	997.5	863.4	913.5	1326.9	1401.4	1288.3	1727.9	1453.5	1389.2	1114.5	970.3	898.2	870.0	873.5	750.3	899.2	842.5	869.8	841.1	795.5	935.6
Lake Haines	1464.2	1458.5	1263.5	1363.9	1398.7	1379.8	1292.2	1506.4	1497.0	1267.2	1258.0	1204.3	1069.2	1232.2	979.9	1192.9	1289.4	1126.9	1483.9	1287.1	1477.2
Lake Hamilton	1113.9	1286.9	1194.5	1244.7	1511.3	1451.0	1426.4	1503.2	1715.9	1524.7	1432.8	1620.9	2329.0	2016.4	1672.6	1994.1	1741.0	2332.5	1689.8	1946.2	1978.0
Lake Hartridge	608.9	808.0	860.8	991.8	1246.7	1217.5	1415.4	1463.1	1638.1	1659.3	1355.7	1425.4	1251.6	1308.5	1204.6	1297.6	1318.5	1252.3	1172.1	1258.8	1164.4
Lake Howard	1266.3	1521.1	2288.3	1758.0	1652.8	1381.3	1628.9	1597.2	1461.6	1378.6	1267.8	1439.4	1196.6	1134.1	1150.9	1077.2	1336.7	1283.1	1054.2	1438.5	1522.0
Lake Idyl	649.8	630.0	544.4	530.0	1000.0	557.8	546.8	529.6		619.3	825.2	850.2	1797.4	1446.9	1000.4	1266.9	1254.0	971.5	1079.4	1143.8	1331.7
Lake Idylwild	891.5	937.7	988.8	1203.7	1540.9	1328.4	1288.4	1260.8	1299.4	1243.2	955.9	973.4	1125.5	1022.2	969.6	971.4	998.2	1069.6	927.6	1101.5	1187.5
Lake Jessie	980.0	914.4	916.8	1063.3	1140.5	1197.3	1208.6	1163.6	1134.2	1174.0	927.9	902.1	1153.5	1067.4	1117.5	1021.3	1043.5	1091.1	929.6	1087.8	1142.8
Lake Link					764.9	1036.5	1043.3	816.5	855.2	829.0	688.3	734.2	862.4	732.8	701.6	1060.7	769.6	834.4	1030.1	962.4
Lake Lulu	1226.5	1373.9	1587.7	1643.1	1454.7	1495.6	1482.5	1327.1	1164.7	1037.9	1084.7	1219.6	1204.9	1296.0	1047.5	1132.2	1228.9	1051.3	1051.3	1230.4	1095.3
Lake Mariam	947.5	1036.9	1147.3	1070.5	1042.3	897.1	915.7	878.2	836.4	867.3	891.0	996.5	1078.0	1092.6	939.9	893.2	945.7	1012.2	877.8	993.7	1091.2
Lake Mariana	1075.1	1030.1	1250.7	1476.0	1648.0	1421.1	1726.8	1456.3	1635.1	1789.2	1441.2	1190.6	1746.0	786.9	1415.4	1509.6	1759.3	1589.7	1110.7	1659.1	1275.8
Lake Martha	500.1	433.3	479.2	601.1	613.0	664.4	720.1	597.1	539.6	660.5	732.7	716.3	717.2	811.3	630.7	558.9	656.4	545.7	505.5	550.0	589.2
Lake Maude	870.4	559.2	663.1	822.7	984.9	898.3	859.1	836.4	718.1	607.2	694.8	658.5	691.5	559.3	524.9	488.4	512.1	760.5	787.1	611.9	610.4
Lake May	1326.4	1640.6	2298.1	1904.8	1756.5	1609.6	1731.9	1688.7	1490.8	1322.8	1163.8	1409.7	1268.1	1190.9	1182.1	1188.7	1291.3	1224.8	1053.5	1269.9	1173.7
Lake Mirror	1161.1	1091.6	1246.5	1234.8	1138.2	1077.6	991.4	900.0	1038.8	756.2	696.5	836.7	897.9	984.4	926.0	856.2	784.3	810.6	1067.1	914.9	988.9
Lake Ned	659.4	632.4	627.3	609.6	661.6	767.8	656.7	808.9	766.2	691.3	639.9	678.0	708.5	691.2	657.5	842.0	820.6	814.4	965.0	977.6	833.7
Lake Otis						970.0	1095.3	985.8	921.0	788.0	819.8	681.1	673.0	769.7	634.2	753.1	953.5	750.9	727.3	806.5	847.9
Lake Pansy	720.3	810.7	1025.4	920.9	855.6	835.3	813.2	1007.9	1233.7	885.8	796.2	788.9	835.8	726.1	753.4	703.4	761.4	739.2	876.3	726.9	895.3
Lake Rochelle	1322.9	1084.7	1228.4	1249.6	1603.5	1346.9	1208.9	1306.6	1319.5	1426.7	1134.0	946.5	942.1	934.6	792.8	914.3	1114.2	916.4	1228.1	798.4	1040.0
Lake Roy	812.8	814.9	1009.2	1277.0	1103.3	1142.8	964.3	977.3	1062.2	925.4	754.1	759.1	742.0	950.8	729.9	720.5	1148.5	697.8	1000.3	823.7	755.3
Lake Shipp	1415.8	2277.6	2647.7	2082.6	1859.5	1681.1	1808.3	1722.2	1495.5	1228.1	1217.1	1249.6	1274.7	1307.9	1130.9	1210.5	1234.0	1235.8	1433.9	1424.0	1337.9
Lake Silver	689.4	718.6	713.0	603.7	763.1	1098.1	735.7	712.1	595.9	666.8	749.4	805.7	910.1	681.4	624.2	726.7	591.3	591.2	560.3	708.1	643.0
Lake Smart	1221.8	1194.7	1654.9		2300.0	2490.1	2141.4		1173.0	1316.8	1122.0	1606.6	1093.4	989.2	1217.0	1320.7	1327.8	1460.9	1152.0	1252.8
Lake Spring	809.7	1052.9	867.8	741.2	707.8	613.3	665.3	580.0	510.6	680.5	721.0	593.7	666.1	712.8	643.3	615.5	742.7	611.5	613.2	872.6	761.2
Lake Summit	764.0	856.8	912.2	849.1	830.5	882.4	931.1	819.9	762.4	800.2	821.6	755.6	767.2	773.4	635.1	726.6	789.1	870.2	758.2	701.2	807.9
Lake Winterset	688.9	686.6	713.8	669.4	760.4	589.7	713.0	739.0	674.7	618.6	654.0	625.2	712.5	609.9	506.2	490.0	499.6	523.1	621.6	511.3	605.2
Little Lake Hamilton	1108.0	986.7	1365.8	1786.2	1559.7		1416.7	1891.5	1650.0	1701.6	1191.7	1274.2	1580.4	1433.1	1111.8	1455.5	1384.8	1332.1	1345.0	1405.2	1173.9
Middle Lake Hamilton	1630.4	1426.8	1412.3	2260.0	2030.0	2408.9	2196.3	2183.4	2096.8	1711.7	1442.3	1379.1	1648.2	1582.0	1325.9	1520.2	1563.9	1467.0	1273.3	1507.2	1503.7

Table 4-3. Annual geometric mean total phosphorus concentrations from 2005-2025 for all study area lakes.

Waterbody	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	74.2	83.2	91.2	71.2	89.3	60.6	62.4	55.4	65.7	53.1	54.1	55.8	61.0	49.4	51.9	67.0	56.8	74.6	50.5	73.0	75.7
Lake Buckeye	42.5	33.3	26.5	24.8	21.6	26.1	20.5	20.9	25.9	26.5	17.8	18.2	21.7	19.2	22.3	18.2	27.1	24.0	40.6	27.7	51.1
Lake Cannon	46.0	39.2	34.8	30.4	27.3	33.8	31.0	29.9	30.6	29.0	25.7	30.0	27.6	24.9	26.7	30.0	31.6	39.3	29.3	44.2	42.8
Lake Conine	63.2	56.6	66.5	50.9	47.7	52.7	61.5	47.2	47.1	37.4	36.9	37.6	39.1	30.4	33.4	43.7	56.5	66.7	62.7	36.1	61.7
Lake Daisy	39.4	38.1	31.2	28.3	30.0	27.2	23.7	26.9	29.2	25.9	22.4	20.4	23.7	22.1	23.7	23.9	25.7	15.4	16.7	20.7	21.4
Lake Deer	55.4	42.5	33.7	27.9	30.8	34.7	26.5	36.2	40.5	32.0	20.4	19.2	19.4	17.5	25.3	25.1	36.3	18.7	28.8	29.6	31.9
Lake Elbert	28.4	27.0	18.8	16.3	15.2	15.2	20.7	18.4	18.5	21.7	16.4	17.3	16.2	15.5	18.4	21.7	26.7	19.2	17.7	24.0	22.1
Lake Eloise	72.5	54.0	38.6	32.8	33.2	30.8	31.7	31.3	32.6	31.9	29.9	38.2	30.7	29.3	27.6	33.5	40.5	23.3	28.2	39.0	35.7
Lake Fannie	27.7	37.0	37.9	55.1	62.0	58.4	65.9	53.8	50.4	38.2	28.8	28.1	26.1	23.3	28.3	33.7	33.3	59.2	33.2	30.0	36.0
Lake Haines	84.7	58.9	45.9	38.4	38.2	42.3	36.7	39.0	38.4	37.4	36.8	46.6	50.9	42.6	41.8	58.1	84.5	80.3	118.3	51.9	73.1
Lake Hamilton	76.8	117.1	95.2	64.5	76.6	59.8	53.7	66.0	58.2	43.3	41.1	38.2	50.1	40.9	26.5	44.6	39.5	50.1	42.8	47.5	41.8
Lake Hartridge	33.2	35.8	25.9	27.3	30.6	32.3	30.9	30.1	29.4	29.4	28.6	29.8	26.3	23.5	23.0	27.4	30.1	18.1	21.0	35.4	30.9
Lake Howard	48.8	43.8	39.4	38.5	33.3	28.0	28.1	26.4	28.6	25.5	22.2	25.7	29.3	22.6	22.6	29.9	29.4	28.1	28.4	28.9	30.9
Lake Idyl	34.7	23.0	17.9	16.7	41.3	25.1	21.4	20.0		26.5	41.6	58.8	96.8	61.0	46.2	59.9	74.1	62.3	52.6	85.1	81.0
Lake Idylwild	46.4	44.8	40.2	37.3	35.5	35.2	27.7	29.2	30.4	28.7	25.8	31.6	28.9	27.5	27.0	31.7	36.7	30.6	25.5	42.1	38.9
Lake Jessie	53.1	48.4	40.5	46.9	38.2	41.7	35.1	36.0	32.4	30.0	31.0	39.7	34.0	34.4	44.7	46.6	33.7	38.0	49.2	45.7
Lake Link						27.5	37.5	33.7	29.2	30.7	27.7	23.9	25.0	23.9	27.4	26.9	38.4	27.7	32.3	30.3	33.5
Lake Lulu	61.6	58.0	50.5	49.1	44.2	41.6	37.3	33.7	35.1	31.0	30.9	38.0	38.3	34.6	31.7	38.9	45.0	35.0	35.9	34.9	38.4
Lake Mariam	66.7	61.1	75.0	74.8	63.2	58.5	45.7	42.3	43.6	35.9	42.0	44.1	75.4	66.8	62.8	64.1	74.4	61.0	72.6	91.7	81.4
Lake Mariana	51.7	41.6	31.1	34.8	28.6	32.1	31.1	33.0	32.7	31.4	26.2	27.9	30.9	31.9	28.1	34.6	30.4	31.4	31.6	34.7	32.8
Lake Martha	27.3	21.6	16.9	19.3	17.2	23.7	20.3	23.5	27.1	25.2	22.1	24.5	32.7	34.0	24.0	23.9	30.9	16.2	18.6	17.9	22.4
Lake Maude	42.1	25.5	22.3	38.3	35.4	38.2	32.3	29.5	27.1	25.4	22.6	20.4	20.8	16.7	22.6	16.2	22.4	48.9	32.2	23.9	21.2
Lake May	74.2	77.0	87.0	73.7	74.6	58.2	57.7	53.7	53.9	44.0	34.3	45.7	51.1	42.4	33.0	48.9	57.8	48.0	50.7	51.8	57.3
Lake Mirror	45.2	38.5	31.2	29.1	25.5	27.9	24.7	31.0	28.2	23.4	20.9	25.2	24.3	24.3	22.2	30.1	29.5	24.4	38.1	38.7	33.1
Lake Ned	24.5	31.1	24.9	20.9	24.0	27.3	22.2	32.1	43.3	29.0	27.9	31.3	31.6	26.4	27.1	29.7	36.4	30.8	34.1	23.6	27.1
Lake Otis						33.0	30.5	34.8	28.5	27.8	25.6	26.3	25.4	26.4	23.3	30.6	41.2	26.7	27.2	31.2	30.5
Lake Pansy	30.3	33.9	30.5	24.2	24.8	23.5	21.8	27.6	37.1	32.0	30.6	29.6	28.9	20.5	29.2	31.9	33.6	30.6	35.7	24.1	35.5
Lake Rochelle	56.9	42.0	45.3	42.8	35.5	47.4	33.6	33.0	39.2	35.7	29.6	24.2	27.4	25.1	25.0	30.6	44.2	60.9	57.7	25.7	39.5
Lake Roy	37.5	35.5	28.0	25.8	24.4	26.2	20.4	23.3	26.3	28.6	22.2	22.6	19.7	23.2	19.9	25.0	33.7	13.7	16.9	24.6	23.2
Lake Shipp	63.1	62.3	54.2	50.5	46.2	40.9	39.3	37.9	37.4	30.7	27.5	33.7	39.0	31.6	32.2	41.2	39.2	34.0	48.4	38.8	62.5
Lake Silver	32.2	27.9	21.4	18.8	20.4	27.6	22.2	19.5	21.0	23.9	21.7	21.3	25.5	17.5	21.2	19.1	24.6	16.8	19.5	19.4	19.2
Lake Smart	48.6	45.9	51.0			39.0	42.9	38.5		30.6	33.2	32.1	35.9	28.1	29.0	31.9	48.5	56.2	34.1	26.7	38.3
Lake Spring	43.3	44.0	30.8	27.2	23.2	22.8	19.9	21.0	26.1	29.1	29.3	22.9	24.8	25.6	23.3	25.7	32.3	24.1	28.5	47.6	35.4
Lake Summit	36.7	34.4	27.2	23.0	22.0	26.0	20.6	20.8	22.9	23.4	18.7	20.1	21.8	21.1	19.0	25.3	39.3	18.1	26.0	49.4	25.4
Lake Winterset	30.4	28.8	21.9	19.4	16.0	16.9	16.4	19.1	18.5	19.5	15.9	16.9	17.7	17.6	16.2	17.2	19.5	11.1	16.5	17.0	14.2
Little Lake Hamilton	41.4	33.9	35.2	46.9	48.0		34.1	44.4	35.0	32.6	24.9	25.7	30.9	29.8	22.0	32.4	35.3	30.0	32.8	32.5	26.1
Middle Lake Hamilton	67.4	66.5	61.4	66.0	78.0	76.6	69.5	78.2	62.8	56.8	49.0	48.2	60.7	53.5	33.6	53.4	57.1	54.4	51.0	56.6	66.1

Table 4-4. Annual geometric mean Secchi depth from 2005-2025 for all study area lakes.

Waterbody	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	1.81	1.66	1.00	1.26	0.98	1.50	1.13	1.86	1.18	1.43	1.42	1.30	1.18	1.22	1.29	1.31	1.01	0.97	1.20	0.92	0.81
Lake Buckeye	3.31	5.26	3.97	4.65	5.25	5.81	6.89	9.29	9.11	6.59	8.27	7.06	7.26	8.86	7.00	10.93	8.72	6.26	3.26	3.46	3.31
Lake Cannon	2.64	3.49	3.07	2.70	2.29	2.60	2.51	2.65	2.13	2.23	3.89	3.14	3.45	3.14	2.36	3.24	3.00	2.22	2.91	2.52	2.16
Lake Conine	2.47	2.56	2.02	2.31	2.08	2.40	2.27	2.46	2.51	2.67	3.47	3.70	3.24	3.96	3.67	3.52	3.11	3.63	3.04	3.06	2.12
Lake Daisy	5.80	6.00	5.45	4.50	5.03	7.06	6.46	5.80	5.16	6.47	6.63	6.59	5.00	5.69	5.56	6.40	8.26	10.06	7.60	6.11	6.76
Lake Deer	4.56	4.96	2.83	2.37	2.35	2.71	4.48	2.28	2.37	4.11	4.07	5.39	4.83	8.18	6.28	6.03	4.50	7.26	4.68	7.14	4.46
Lake Elbert	7.54	9.62	12.05	12.61	11.76	13.73	9.69	9.28	11.09	8.65	8.84	10.70	8.03	8.63	6.53	5.96	6.24	5.09	5.64	4.74	4.65
Lake Eloise	2.16	2.31	2.21	2.40	2.85	2.40	2.16	2.53	2.01	2.06	2.34	2.13	2.88	2.61	3.11	2.86	2.09	3.15	2.71	2.12	2.23
Lake Fannie	3.43	3.11	2.51	1.38	1.38	1.64	1.31	1.68	2.07	2.29	3.40	3.51	3.62	3.75	3.59	4.16	2.57	3.22	2.73	2.94	3.13
Lake Haines	2.10	2.46	2.29	2.31	2.43	2.78	3.05	2.19	2.32	2.72	2.92	3.01	3.32	2.94	3.07	2.90	2.95	2.60	2.07	2.33	2.12
Lake Hamilton	3.21	1.78	2.30	2.30	1.70	1.74	2.11	1.75	1.83	2.16	2.18	2.14	1.54	1.74	2.05	1.91	1.63	1.38	1.67	1.58	1.90
Lake Hartridge	4.86	3.85	3.72	3.61	2.97	2.74	2.35	2.25	1.91	1.86	2.36	2.16	2.52	2.34	2.47	2.26	2.55	1.98	2.30	2.32	2.32
Lake Howard	2.12	1.96	1.23	1.64	1.78	2.66	2.14	1.87	1.92	1.95	2.25	1.93	2.47	2.66	2.39	2.13	2.09	1.82	2.55	1.89	2.02
Lake Idyl	6.89	6.76	6.50	9.34	4.40	3.94	8.80	7.85		7.24	5.00	5.96	2.27	2.68	3.51	2.62	2.65	4.35	3.51	4.53	2.63
Lake Idylwild	3.07	2.92	2.60	2.36	2.03	2.32	2.53	2.47	2.16	2.48	3.60	3.70	2.77	2.93	3.23	3.47	3.25	2.78	3.37	2.62	2.37
Lake Jessie	2.76	2.65	2.65	2.58	2.36	2.39	2.59	2.42	2.50	2.47	3.45	3.29	2.35	2.76	2.44	2.68	2.55	2.32	2.62	2.49	2.12
Lake Link						7.55	5.08	3.52	3.80	4.73	4.92	5.17	3.70	3.68	4.51	4.61	3.37	3.80	3.67	3.03	3.19
Lake Lulu	2.19	1.80	1.68	1.75	1.90	2.07	2.15	2.34	2.31	2.98	2.92	2.42	2.19	2.35	2.55	2.65	2.39	2.59	2.52	1.87	2.65
Lake Mariam	1.88	1.82	0.98	2.18	2.08	2.25	2.90	2.84	2.94	2.91	2.00	2.16	0.99	1.72	1.51	2.28	1.67	2.24	1.41	1.82	1.95
Lake Mariana	2.53	2.63	2.47	2.18	1.95	2.53	1.95	2.24	1.83	1.72	2.11	2.84	1.65	2.03	1.82	2.03	1.67	1.77	2.30	1.79	1.93
Lake Martha	10.12	13.06	11.40	7.24	7.85	6.29	5.09	5.30	5.96	6.59	5.32	4.67	4.55	4.87	5.80	6.19	5.35	5.40	5.90	5.25	4.34
Lake Maude	5.04	9.48	8.49	5.46	3.03	3.85	4.08	4.72	6.12	7.40	6.44	6.58	6.99	10.45	10.98	10.36	10.33	6.42	3.73	7.43	6.79
Lake May	2.03	1.64	1.18	1.42	1.39	2.04	1.79	1.79	1.91	2.43	2.92	2.05	2.19	2.53	2.24	2.57	2.25	2.11	1.87	2.09	2.07
Lake Mirror	2.64	3.12	2.74	2.47	2.97	3.49	4.10	4.92	3.33	5.25	6.43	4.24	3.67	3.48	3.58	4.11	4.30	4.13	2.60	2.89	2.53
Lake Ned	5.70	7.75	7.29	6.63	5.61	6.33	7.69	4.10	3.95	4.17	3.97	3.59	3.79	3.85	4.00	3.71	3.57	3.40	2.66	3.57	5.42
Lake Otis						3.94	3.38	2.62	3.03	4.07	4.00	5.17	4.41	3.85	4.28	3.69	3.30	4.37	4.09	3.78	3.27
Lake Pansy	5.09	3.87	2.77	3.29	3.43	4.45	4.61	3.51	2.61	3.85	4.00	3.79	3.27	4.33	3.83	4.22	3.81	3.68	3.25	3.84	3.20
Lake Rochelle	2.47	3.17	2.42	2.23	2.15	2.62	3.23	2.32	2.51	2.47	3.69	4.12	3.88	3.96	4.00	2.74	3.66	3.52	1.94	3.13	2.81
Lake Roy	4.60	4.77	3.39	2.58	3.15	3.72	5.39	4.17	3.24	4.86	6.72	5.84	6.02	4.55	4.84	5.54	3.55	5.08	3.59	4.62	6.78
Lake Shipp	1.80	1.39	1.15	1.80	1.59	2.02	1.68	1.74	1.80	2.29	2.20	2.12	2.24	2.10	2.34	2.42	2.39	2.07	2.11	1.99	2.17
Lake Silver	6.80	6.74	7.53	7.09	3.82	4.33	5.56	6.31	7.01	6.44	4.26	4.20	3.40	6.27	5.66	5.17	7.82	7.20	6.09	6.57	9.51
Lake Smart	2.86	2.76	1.67		1.64	1.66	1.73		2.79	2.80	2.95	2.17	3.38	2.86	2.76	2.83	2.06	2.78	2.34	2.39
Lake Spring	3.44	3.53	3.75	4.24	5.31	8.45	6.90	6.89	7.76	5.04	5.39	6.56	5.77	5.40	6.67	6.02	5.87	5.62	5.64	4.82	5.47
Lake Summit	5.10	6.15	5.32	4.31	4.59	5.98	5.75	7.22	7.27	7.61	7.34	8.22	6.38	7.56	7.35	5.93	6.96	8.02	6.70	7.66	7.31
Lake Winterset	4.59	5.43	5.88	5.03	5.35	6.88	8.05	8.97	8.98	10.57	10.92	10.19	5.72	7.34	9.09	8.44	12.39	13.75	8.39	11.13	11.17
Little Lake Hamilton	3.53	4.29	2.66	1.99	2.46		2.55	1.80	2.62	2.16	3.81	3.12	2.23	2.88	3.25	2.91	2.96	2.77	2.48	2.40	2.80
Middle Lake Hamilton	2.44	2.57	2.12	1.97	1.64	1.73	1.86	1.80	1.92	2.27	2.68	2.86	2.14	2.40	2.83	2.91	2.67	2.58	2.53	2.39	2.34

Linear Regression Statistics

Table 4-5. Trendline statistics for linear regressions of chl-a, TN, TP, and Secchi depth from 2005-2025. Stats include regression correlation coefficient (R) and probability value.

Waterbody	Chla R	Chla p	TN R	TN p	TP R	TP p	Secchi R	Secchi p
Lake Blue	-0.123	0.597	0.137	0.552	-0.389	0.081	-0.554	0.009
Lake Buckeye	0.004	0.985	-0.048	0.837	0.112	0.629	0.113	0.626
Lake Cannon	-0.119	0.606	-0.132	0.569	0.000	0.999	-0.102	0.660
Lake Conine	-0.698	0.000	-0.608	0.003	-0.199	0.386	0.560	0.008
Lake Daisy	-0.782	0.000	-0.855	0.000	-0.833	0.000	0.510	0.018
Lake Deer	-0.732	0.000	-0.556	0.009	-0.512	0.018	0.599	0.004
Lake Elbert	0.789	0.000	0.682	0.001	-0.009	0.968	-0.793	0.000
Lake Eloise	-0.452	0.040	-0.283	0.214	-0.471	0.031	0.266	0.244
Lake Fannie	-0.600	0.004	-0.514	0.017	-0.348	0.123	0.455	0.038
Lake Haines	-0.431	0.051	-0.323	0.154	0.413	0.063	0.164	0.476
Lake Hamilton	0.711	0.000	0.797	0.000	-0.758	0.000	-0.554	0.009
Lake Hartridge	0.411	0.064	0.396	0.075	-0.389	0.082	-0.691	0.001
Lake Howard	-0.616	0.003	-0.537	0.012	-0.607	0.004	0.322	0.155
Lake Idyl	0.638	0.002	0.693	0.001	0.792	0.000	-0.685	0.001
Lake Idylwild	-0.437	0.048	-0.219	0.341	-0.360	0.109	0.319	0.159
Lake Jessie	-0.186	0.419	0.090	0.697	-0.138	0.551	-0.167	0.469
Lake Link	0.562	0.024	0.066	0.808	0.041	0.880	-0.651	0.006
Lake Lulu	-0.718	0.000	-0.685	0.001	-0.637	0.002	0.537	0.012
Lake Mariam	0.380	0.089	-0.068	0.770	0.330	0.145	-0.161	0.486
Lake Mariana	0.198	0.390	0.141	0.542	-0.408	0.067	-0.523	0.015
Lake Martha	0.511	0.018	0.183	0.426	0.078	0.737	-0.709	0.000
Lake Maude	-0.498	0.022	-0.493	0.023	-0.328	0.147	0.300	0.187
Lake May	-0.675	0.001	-0.743	0.000	-0.652	0.001	0.521	0.015
Lake Mirror	-0.266	0.243	-0.581	0.006	-0.123	0.596	0.093	0.690
Lake Ned	0.643	0.002	0.736	0.000	0.263	0.250	-0.739	0.000
Lake Otis	-0.590	0.016	-0.496	0.050	-0.026	0.924	0.150	0.579
Lake Pansy	0.234	0.307	-0.298	0.190	0.230	0.315	-0.148	0.521
Lake Rochelle	-0.802	0.000	-0.628	0.002	-0.159	0.490	0.354	0.115
Lake Roy	-0.488	0.025	-0.395	0.077	-0.542	0.011	0.390	0.081
Lake Shipp	-0.639	0.002	-0.691	0.001	-0.345	0.126	0.720	0.000
Lake Silver	-0.305	0.179	-0.300	0.186	-0.539	0.012	0.182	0.430
Lake Smart	-0.511	0.030	-0.377	0.123	-0.379	0.121	0.258	0.301
Lake Spring	-0.350	0.120	-0.283	0.214	0.001	0.995	0.248	0.279
Lake Summit	-0.795	0.000	-0.506	0.019	0.069	0.768	0.666	0.001
Lake Winterset	-0.783	0.000	-0.708	0.000	-0.664	0.001	0.744	0.000
Little Lake Hamilton	-0.316	0.175	-0.103	0.666	-0.590	0.006	-0.146	0.540
Middle Lake Hamilton	-0.586	0.005	-0.486	0.025	-0.546	0.011	0.492	0.023

Table 4-6. Trend statistics for linear regressions of lake surface levels against chl-a, TN, TP, and Secchi depth from 2000 - 2021. Stats include regression direction (+/-), R-squared value, and p-value.

Waterbody	Chl-a			Secchi			TN			TP		
	Dir.	R2	p-value	Dir.	R2	p-value	Dir.	R2	p-value	Dir.	R2	p-value
Lake Blue	-	0.006	0.740	+	0.002	0.830	-	0.081	0.200	+	0.010	0.660
Lake Buckeye	-	0.020	0.540	+	0.171	0.056	-	0.041	0.370	+	0.010	0.676
Lake Cannon	-	0.610	0.002	+	0.386	0.023	-	0.550	0.004	-	0.151	0.189
Lake Conine	-	0.350	0.004	+	0.533	0.000	-	0.314	0.007	-	0.102	0.146
Lake Daisy	-	0.053	0.315	+	0.054	0.310	-	0.009	0.684	+	0.011	0.653
Lake Deer	-	0.124	0.107	+	0.107	0.138	-	0.060	0.270	+	0.041	0.368
Lake Elbert	+	0.315	0.007	-	0.466	0.000	+	0.289	0.010	+	0.193	0.041
Lake Eloise	-	0.024	0.612	+	0.006	0.800	-	0.073	0.371	-	0.013	0.710
Lake Fannie	-	0.588	0.000	+	0.809	0.000	-	0.724	0.000	-	0.868	0.000
Lake Haines	-	0.003	0.794	+	0.263	0.015	-	0.244	0.020	+	0.233	0.023
Lake Hamilton	-	0.007	0.734	+	0.094	0.215	+	0.002	0.853	-	0.012	0.661
Lake Hartridge	-	0.039	0.517	-	0.044	0.491	-	0.040	0.512	-	0.346	0.035
Lake Howard	-	0.235	0.022	+	0.191	0.042	-	0.449	0.001	-	0.024	0.489
Lake Idyl	-	0.080	0.227	+	0.053	0.331	-	0.049	0.350	-	0.003	0.819
Lake Idylwild	-	0.681	0.001	+	0.855	0.000	-	0.915	0.000	-	0.097	0.301
Lake Jessie	-	0.379	0.025	+	0.353	0.032	-	0.553	0.004	-	0.015	0.695
Lake Link	-	0.172	0.110	+	0.097	0.240	-	0.524	0.002	-	0.415	0.007
Lake Lulu	-	0.138	0.212	+	0.413	0.018	-	0.453	0.012	-	0.074	0.370
Lake Mariam	+	0.001	0.906	+	0.016	0.575	-	0.114	0.124	-	0.044	0.352
Lake Mariana	-	0.034	0.548	-	0.002	0.873	-	0.137	0.213	-	0.004	0.833
Lake Martha	+	0.219	0.032	-	0.031	0.431	+	0.046	0.340	+	0.172	0.061
Lake Maude	-	0.091	0.172	+	0.157	0.068	-	0.248	0.018	-	0.112	0.128
Lake May	-	0.762	0.000	+	0.622	0.001	-	0.794	0.000	-	0.616	0.002
Lake Mirror	-	0.135	0.217	+	0.157	0.180	-	0.544	0.004	-	0.113	0.262
Lake Ned	+	0.202	0.036	+	0.013	0.615	-	0.171	0.056	+	0.040	0.374
Lake Otis	-	0.341	0.018	+	0.398	0.009	-	0.570	0.001	-	0.129	0.172
Lake Pansy	+	0.017	0.569	+	0.274	0.012	-	0.144	0.081	+	0.011	0.636
Lake Rochelle	-	0.334	0.005	+	0.328	0.005	-	0.232	0.023	-	0.096	0.161
Lake Roy	-	0.157	0.180	+	0.359	0.030	-	0.414	0.018	-	0.001	0.941
Lake Shipp	-	0.207	0.034	+	0.318	0.006	-	0.521	0.000	-	0.111	0.130
Lake Silver	+	0.067	0.256	-	0.046	0.350	-	0.000	0.955	+	0.000	0.977
Lake Smart	-	0.866	0.000	+	0.800	0.000	-	0.869	0.000	-	0.216	0.150
Lake Summit	-	0.361	0.030	+	0.331	0.040	-	0.378	0.025	+	0.015	0.692
Lake Winterset	-	0.255	0.078	+	0.272	0.068	-	0.440	0.014	-	0.001	0.943
Little Lake Hamilton	-	0.537	0.001	+	0.519	0.001	-	0.448	0.003	-	0.522	0.001
Middle Lake Hamilton	-	0.541	0.001	+	0.661	0.000	-	0.540	0.001	-	0.486	0.001
Spring Lake	+	0.118	0.251	-	0.176	0.153	+	0.110	0.268	+	0.233	0.095

Table 4-7. Stormwater pollutant loading rates for all study area lakes.

Waterbody	Drainage Basin Area (Acres)	Total TN Load	Total TP Load	TN Load/Acre	TP Load/Acre
Lake Blue	183.72	871.51	154.23	4.74	0.84
Lake Buckeye	305.78	867.10	154.76	2.84	0.51
Lake Cannon	1039.11	3863.09	637.80	3.72	0.61
Lake Conine	796.43	2836.20	474.36	3.56	0.60
Lake Daisy	356.67	1717.66	382.25	4.82	1.07
Lake Deer	377.43	1451.11	261.19	3.84	0.69
Lake Elbert	605.00	2365.80	385.07	3.91	0.64
Lake Eloise	1981.43	3875.24	665.40	1.96	0.34
Lake Fannie	2208.68	4133.27	717.67	1.87	0.32
Lake Haines	2317.85	5701.02	1055.90	2.46	0.46
Lake Hamilton	4177.60	6701.70	1167.79	1.60	0.28
Lake Hartridge	920.07	2658.28	458.94	2.89	0.50
Lake Henry	2409.92	6902.81	1379.68	2.86	0.57
Lake Howard	1869.01	6321.28	1097.50	3.38	0.59
Lake Idyl	230.98	934.96	154.55	4.05	0.67
Lake Idylwild	225.44	669.14	121.61	2.97	0.54
Lake Jessie	973.41	3871.23	652.31	3.98	0.67
Lake Link	63.11	197.24	31.74	3.13	0.50
Lake Lulu	1006.48	2791.48	483.02	2.77	0.48
Lake Mariam	622.11	1609.45	274.81	2.59	0.44
Lake Mariana	1935.67	6530.83	1160.57	3.37	0.60
Lake Martha	307.50	1217.07	199.11	3.96	0.65
Lake Maude	385.75	1900.55	320.03	4.93	0.83
Lake May	353.57	1732.69	292.88	4.90	0.83
Lake Mirror	277.95	749.60	120.88	2.70	0.43
Lake Ned	256.97	1002.90	202.66	3.90	0.79
Lake Otis	586.90	2291.05	372.60	3.90	0.63
Lake Pansy	243.82	880.73	111.22	3.61	0.46
Lake Rochelle	1669.70	3002.65	522.22	1.80	0.31
Lake Roy	353.73	1448.34	241.53	4.09	0.68
Lake Shipp	910.64	3614.35	654.69	3.97	0.72
Lake Silver	164.17	633.20	106.11	3.86	0.65
Lake Smart	642.59	1673.37	348.90	2.60	0.54
Lake Spring	120.18	520.71	90.81	4.33	0.76
Lake Summit	166.52	513.32	82.73	3.08	0.50
Lake Winterset	1074.54	2258.84	407.59	2.10	0.38
Little Lake Hamilton	1015.97	1472.72	198.04	1.45	0.19
Middle Lake Hamilton	1539.88	11621.29	1072.03	7.55	0.70

Table 4-8. Count and density of known OSTD systems within each lake drainage basin.

Waterbody	OSTD Count	Density (OSTD/acre)
Lake Blue	0	0.00
Lake Buckeye	42	0.18
Lake Cannon	338	0.49
Lake Conine	40	0.07
Lake Daisy	33	0.15
Lake Deer	48	0.18
Lake Elbert	2	0.00
Lake Eloise	186	0.23
Lake Fannie	33	0.02
Lake Haines	15	0.01
Lake Hamilton	62	0.03
Lake Hartridge	65	0.14
Lake Howard	30	0.02
Lake Idyl	6	0.03
Lake Idylwild	33	0.25
Lake Jessie	111	0.14
Lake Link	15	0.23
Lake Lulu	42	0.06
Lake Mariam	132	0.32
Lake Mariana	0	0.00
Lake Martha	1	0.00
Lake Maude	0	0.00
Lake May	1	0.00
Lake Mirror	0	0.00
Lake Otis	66	0.15
Lake Pansy	0	0.00
Lake Rochelle	38	0.03
Lake Roy	125	0.44
Lake Shipp	57	0.09
Lake Silver	0	0.00
Lake Smart	0	0.00
Lake Summit	52	0.52
Lake Winterset	71	0.14
Little Lake Hamilton	0	0.00
Middle Lake Hamilton	4	0.02
Ned Lake	53	0.29
Spring Lake	0	0.00

Table 4-9. List of aquatic plant species detected in Winter Haven area lakes.

Common Name	Scientific Name	Common Name	Scientific Name
Alligator Weed	Alternanthera philoxeroides	Red Maple	Acer rubrum
American Lotus	Nelumbo lutea	Redtop Panicum	Panicum rigidulum
Bald Cypress Pond Cypress	Taxodium spp.	Road Grass	Eleocharis baldwinii
Banana Lily	Nymphoides aquatica	Rosy Camphorweed	Pluchea rosea
Bladderwort	Utricularia spp.	Rush Fuirena	Fuirena scirpoidea
Brazilian Pepper	Schinus terebinthifolius	Sacred Lotus	Nelumbo nucifera
Bulrushes	Scirpus spp.	Sawgrass	Cladium jamaicense
Burhead Sedge	Oxycaryum cubense	Soft Rush	Juncus effusus
Buttonbush	Cephalanthus occidentalis	Southern naiad	Najas guadalupensis
Carolina Willow	Salix caroliniana	Spatterdock	Nuphar advena
Cattail	Typha spp.	Stonewort Nitella	Nitella spp.
Climbing Hempweed	Mikania scandens	Swamp Bay	Persea palustris
Coontail	Ceratophyllum demersum	Sweetbay Magnolia	Magnolia virginiana
Duck Potato	Sagittaria lancifolia	Torpedograss	Panicum repens
Duckweed	Lemna spp.	Water Hyacinth	Eichhornia crassipes
Eel Grass	Vallisneria americana	Water Lettuce	Pistia stratiotes
Egyptian Paspalidium	Paspalidium geminatum	Water Pennywort	Hydrocotyle spp.
Elodea Waterweed	Egeria densa	Water Spangles	Salvinia minima
Filamentous Algae	Lyngbya species	Wild Taro	Colocasia esculenta
Fire Flag	Thalia geniculata		
Fragrant Water Lily	Nymphaea odorata		
Hairy Maiden Fern	Thelypteris hispidula		
Hydrilla	Hydrilla verticillata		
Illinois Pondweed	Potamogeton illinoensis		
Knotted Spikerush	Eleocharis interstincta		
Knotweed	Polygonum spp.		
Maidencane	Panicum hemitomon		
Melaleuca	Melaleuca quinquenervia		
Muskgrass	Chara spp.		
Papyrus	Cyperus papyrus		
Para grass	Urochloa mutica		
Parrot Feather	Myriophyllum aquaticum		
Pickerelweed	Pontederia cordata		
Primrose Willow	Ludwigia spp.		

Table 4-10. Percent area coverage values from 2018 – 2025 for all study area lakes.

Waterbody	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	19.5	6.5		17.6	46.9	78.9	78	75.2
Lake Buckeye	98	99.7	99.1	98.9	98.8	20.1	55.2	64.2
Lake Cannon	32.4	34.9	33.6	37.1	31.8	30.5	34.1	35
Lake Conine	29	38.8	36.5	24.2	25.7	23.1	28.1	28.9
Lake Daisy	3.4	14.3	9	21.7	31.1		32.3	26.7
Lake Deer	83.6	91	57.6	80.3	71.9	86.6	90.6	94.3
Lake Elbert	59.7	58.9	54.9	48.4	46.4	23.3	18.2	7.1
Lake Eloise	12.2	17.1	36.7	29	17.6	17	18.2	16.9
Lake Fannie	26.9	26.2	13.3	21.4	26.6	21	23.1	36.3
Lake Haines	24.1	26	34.7	10.4	7.5	31	12.1	38.5
Lake Hamilton	7.7	8.8	9.5	9.6	10.2	13.5	15.8	17.9
Lake Hartridge	35.6	39.7	63.1	36.4	37.9	42.4	43.1	46
Lake Howard	28.35	29	30	39.2	27.1	27.6	26.4	34.1
Lake Idyl	52.9	3.6	35.2	52.9	53	50.5	87.6	51
Lake Idylwild	49.1	52.5	54	66.7	58.9	60.4	87	73.8
Lake Jessie	35.7	51.6	36.1	34.7	43.5		86.3	91
Lake Link	53.5		47.7	26.5	24.6	34.9	25.8	23.2
Lake Lulu	37.5	40	38.2	38.9	45.7	46.3	46.2	37.5
Lake Mariam	5.8	20	13.5	45.7	34.9	96.9	85.8	67.8
Lake Mariana	22.4	26.1	27.3	24.5	27.8	31.4	27.7	30
Lake Martha	0.7	3.1	4.1	4.3	7.8	7.3	4.8	0.5
Lake Maude	96.2	99.1	99.1	96.3	71.6	79.3	43.4	64.3
Lake May	56	69.7	71	78	63.2	76.7	97.1	56.1
Lake Mirror	42.9	43.6	39.9	41.7	49.3	48.4	62.1	52.8
Lake Ned	7	13.6	4.8	10.1	16	27.5	42.4	45.9
Lake Otis	21.2	23.3	27.7	11.4	19.6	31.9	30.9	29.8
Lake Pansy	20.4	45	24.1	31	15.1	20.6	20.7	52.1
Lake Rochelle	34.3	33.9	34.1	31.5	43.8	27	45.9	33.8
Lake Roy	53.5	17	29.9	32.9	34.8	43.3	43	46.3
Lake Shipp	49.3	52.3	56.4	50.7	51.8	50.6	52.5	52.6
Lake Silver	1	7.3	2.4	1.7	2.3	5	18.8	23.2
Lake Smart	13.1	30.6	16.6	28.9	61.9	28.5	80.4	41.7
Lake Spring	56.7	57.8	60.4	53.9	56.3	56.9	56.1	76.7
Lake Summit	59.5	48.4	61.2	54.8	63	54.3	55.7	57.4
Lake Winterset	28.1	36.3	37.5	44.7	56	44.7	42.3	48.5
Little Lake Hamilton	18.2	17.4	15.9	14.9	21.3	18.6	35	24
Middle Lake Hamilton	12.3	19	12.2	8.6	21.8	61.2	52.9	23.7

Table 4-11. Invasive species percentage values from 2018 to 2025 for all study area lakes.

Waterbody	2018	2019	2020	2021	2022	2023	2024	2025
Lake Blue	0	0	0	0	0	0	0.00	0.00
Lake Buckeye	14.18	11.32	13.14	6.8	2.98	2.22	6.61	2.50
Lake Cannon	1.89	1.47	3.1	7.04	1.17	6.98	5.31	3.19
Lake Conine	13.29	25.24	16.87	10.84	6.02	6.1	3.95	19.74
Lake Daisy	0	0	0.94	0.65	0.66	5.1	0.72	0.00
Lake Deer	8.13	26.33	15.33	28.39	19.05	17.78	2.74	4.76
Lake Elbert	9.31	11.83	15.48	20.22	38.32	1.75	0.00	0.00
Lake Eloise	1.26	2.3	1.61	1.03	1.13	0.42	0.92	0.00
Lake Fannie	16.41	17.79	11.81	14.37	16.97	13.86	11.06	19.00
Lake Haines	24.07	28.99	25.76	4.29	5.19	4.76	0.00	19.71
Lake Hamilton	1.39	0.74	3.73	3.6	0	5.83	5.74	2.52
Lake Hartridge	0	1.81	0.43	0	0.97	0	0.00	0.00
Lake Howard	0.96	0	0	0	0	0.52	0.42	0.00
Lake Idyl	4.35	16.67	13.33	24	6.06	15.38	26.09	4.88
Lake Idylwild	1.76	3.76	3.14	5.94	3.65	7.37	3.19	0.00
Lake Jessie	1.27	6.33	4.65	11.84	2.55	5.14	11.11	0.94
Lake Link	10.71	0	0	5.66	5.45	2	0.00	4.35
Lake Lulu	4.07	1.55	0	1.63	3.55	3.12	2.59	0.51
Lake Mariam	30.65	23.6	3.03	0	2	11.32	6.82	2.50
Lake Mariana	1.63	0	0	0.57	0	0	0.00	1.06
Lake Martha	0	2.33	0	0	0	0	0.00	0.00
Lake Maude	2.86	4.38	2.23	5.69	1.63	2.88	2.46	2.36
Lake May	7.37	11.32	11.32	13.83	18.33	17.24	5.23	3.42
Lake Mirror	0.65	3.36	3.68	1.23	7.14	2.99	1.90	2.70
Lake Ned	5.81	5.48	0	0	1.27	0	1.08	3.28
Lake Otis	3.96	11.16	0	1.18	2.29	2.53	0.00	3.92
Lake Pansy	13.16	12.5	16	21.28	6.06	1.64	0.00	6.85
Lake Rochelle	8	22.5	20.11	15.48	14.71	7.37	7.30	7.10
Lake Roy	17.69	4.76	1.08	7.81	1.55	4.62	0.00	5.93
Lake Shipp	3.68	6.25	6.63	1.8	2.33	1.67	5.29	1.53
Lake Silver	0	0	0	0	0	0	0.00	0.00
Lake Smart	1.33	12.9	2.25	3.16	3.39	4.44	6.67	8.25
Lake Spring	17.81	18.64	17.65	11.86	5.8	22.5	13.51	16.13
Lake Summit	4.4	3.45	4.21	2.86	4.96	3.7	1.12	7.55
Lake Winterset	3.09	7.93	6.49	13.82	17.55	7.89	6.37	9.40
Little Lake Hamilton	1.27	0	1.86	3.43	0	0	0.00	0.00
Middle Lake Hamilton	3.85	3.29	0	2.61	6.34	25	21.74	11.11

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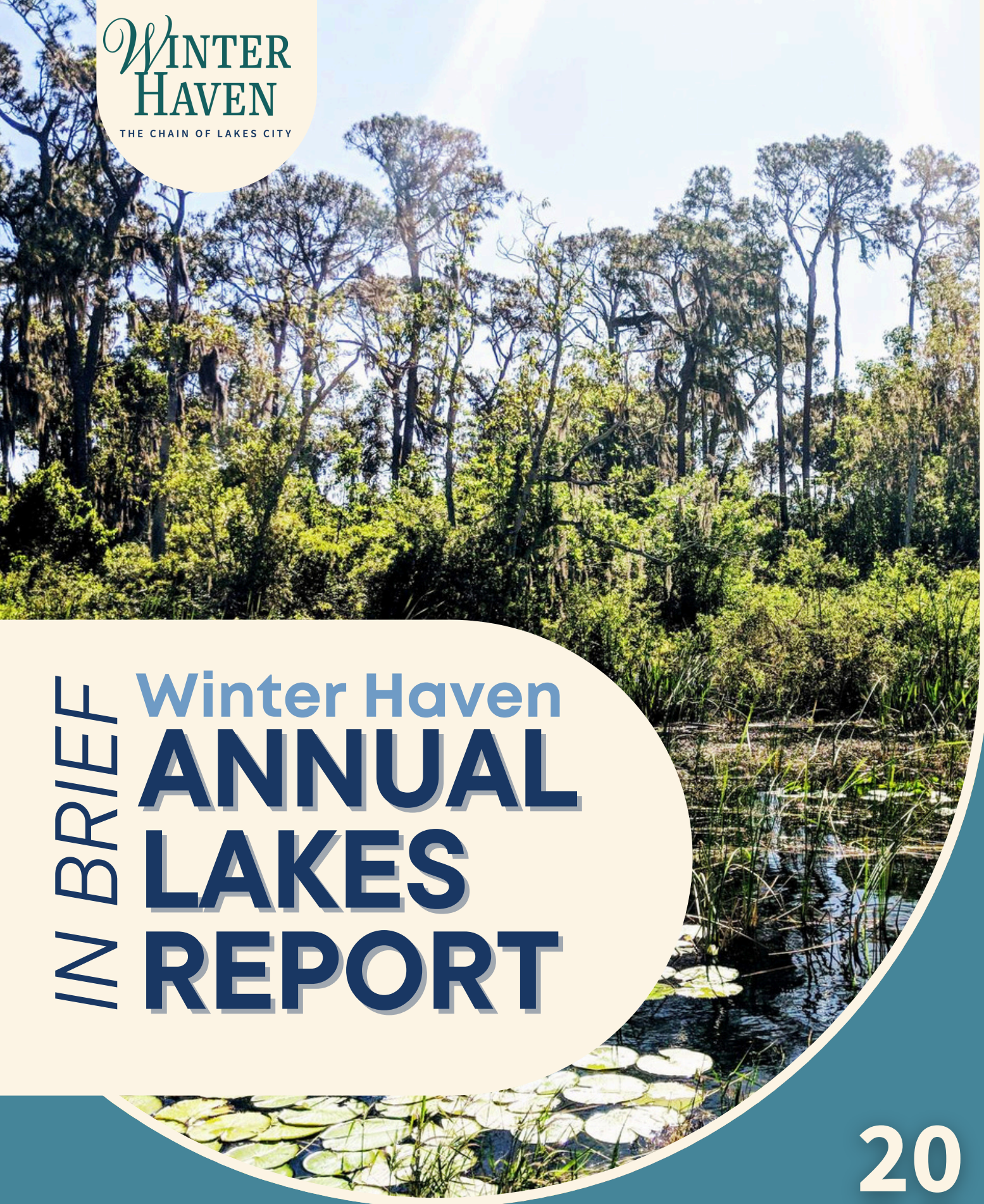
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WINTER HAVEN
THE CHAIN OF LAKES CITY



IN BRIEF

Winter Haven ANNUAL LAKES REPORT

2025

PUBLISHED JULY 2026





DUSTIN EVERITT
Natural Resources
Division Manager

Manager's Note:

Most people don't think about everything that goes into keeping a lake healthy.
They see the fish they catch, the sunset over the water, the trail they walk, or the birds along the shoreline. What they don't see are the water samples collected month after month, invasive plants removed before they spread, stormwater projects designed years in advance, and the countless decisions made every day to protect these lakes. That's why the work matters.

Healthy lakes don't happen by chance. They are the result of thoughtful planning, sound science, and years of dedicated work. Some of that work is visible—restored shorelines, cleaner water, new trails, and improved public access. Much of it happens quietly behind the scenes.

Just as important, none of it happens alone. The health of our lakes reflects the efforts of City staff, partner agencies, volunteers, our Lakes Advisory Committee, and residents who care deeply about these waters. Every project and every shared investment builds on the work that came before it.

This report provides a snapshot of where our lakes stand today, the progress we've made, and the work that continues every day to protect and better understand these remarkable resources. Thank you for taking the time to learn about one of Winter Haven's greatest assets. On behalf of the Natural Resources Division, thank you for your continued support and trust. We are proud to serve a community that cares so deeply about its lakes.

Dustin W. Everitt

Office: 863-291-5881 | **Email:** deveritt@mywinterhaven.com

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High-level, notable stats from this year's report

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Summary of water quality metrics and background on our lakes' watershed

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Presentation of 2025 Lake Health Index and highlights from the data

pg. 7 **2025 PROJECT UPDATES**
Brief updates on ongoing projects and project spotlight for 2025





SCAN FOR INTERACTIVE WEB VERSION

SCAN FOR FULL REPORT DOCUMENT

NOTE ON THE REPORT:

The **Annual Lakes Report** is an effort of the City of Winter Haven's **Natural Resources Division** to provide a comprehensive yet accessible overview of the **status of our lakes' health** and provide transparency on **management updates.** This effort is guided and supported by the citizen-led **Lakes Advisory Committee** and connects to the **Goal 4.3** of the City's Strategic Plan FY 25 - FY 29.

This **"Report in Brief"** is intended to give a high level overview of the Annual Lakes Report - a comprehensive document as well as an online presentation is available at the QR codes to the left.

Have specific questions on your lake?

Use the QR codes to check out the Full Report or Online presentation & get updated information on vegetation, water quality, and management strategies!



REPORT AT A GLANCE

BY THE NUMBERS:

37 **lakes included in this report.** Criteria for inclusion were: Has public access via ramp or canal, are within or adjacent to City limits, lie in the Peace River Watershed, and have at least 20 years of water quality and hydrologic data.

51% **of our lakes meet or exceed State water quality standards**. **This is up 14%** from 2018, when the Report was first published.

40% **or 15 of 37 impaired lakes** are showing significant improvement in at least two water quality metrics.

45 in. **of rainfall received in 2025.** This is below our annual average of **52 inches.** However, lake levels remain high overall. Higher lake levels can help improve water quality.

17 lakes had either no invasive plants present or had invasive populations managed at **low levels (< 2.5%)** in 2025. **15 lakes** also had increased plant diversity in 2025

3,600 **people reached** through educational programs.

& 30 individual outreach **programs hosted in 2025.**

LAKE TRIVIA ?

Was Winter Haven almost called Lakeland?

No. Winter Haven has more lakes than Lakeland, which maybe a more suitable name for us - but it is actually just an urban legend story that there was a post office mix-up leading to a switch.



ABOUT OUR LAKES

Winter Haven's lakes are its most emblematic natural resources - being known as the **"Chain of Lakes City"** due to the chain of 18 lakes connected by navigable canals - made up of the South & North Chain.

Outside of the Chain - there are also several other lakes across the City that are not navigably connected - but which have smaller hydrologic connections through ditches, pipes, and in some cases wetlands that make them a part of our watershed. A full list of the lakes included in this report is provided below.

While the South Chain of Lakes share a common water level - **each of our lakes has a unique character determined by a variety of factors** - namely by their morphology - or shape and depth, stormwater inputs, and biological community (flora and fauna).



Above: The earliest canals were hand dug, but in 1917, the same dredge used on the Panama Canal arrived to complete the canal system.

LAKE TRIVIA

True or False: The City alters lake levels?

False - The City doesn't control lake levels. The Water Management District sets guide levels for most lakes, but rainfall also has a major impact because most overflow structures depend on gravity to slowly release excess water and have limited ability to regulate lake levels.

Southern Chain:

- Cannon
- Hartridge
- Howard
- Eloise
- Idylwild
- Jessie
- Lulu
- May
- Mirror
- Roy
- Shipp
- Spring
- Summit
- Winterset

Northern Chain:

- Conine
- Fannie
- Haines
- Hamilton
- Little Hamilton
- Middle Hamilton
- Rochelle
- Smart

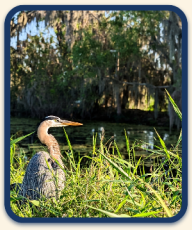
Other Lakes:

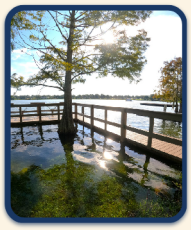
- Blue
- Buckeye
- Daisy
- Deer
- Elbert
- Idyl
- Link
- Mariam
- Mariana
- Martha
- Maude
- Ned
- Otis
- Pansy
- Silver

SIGNIFICANCE OF OUR LAKES

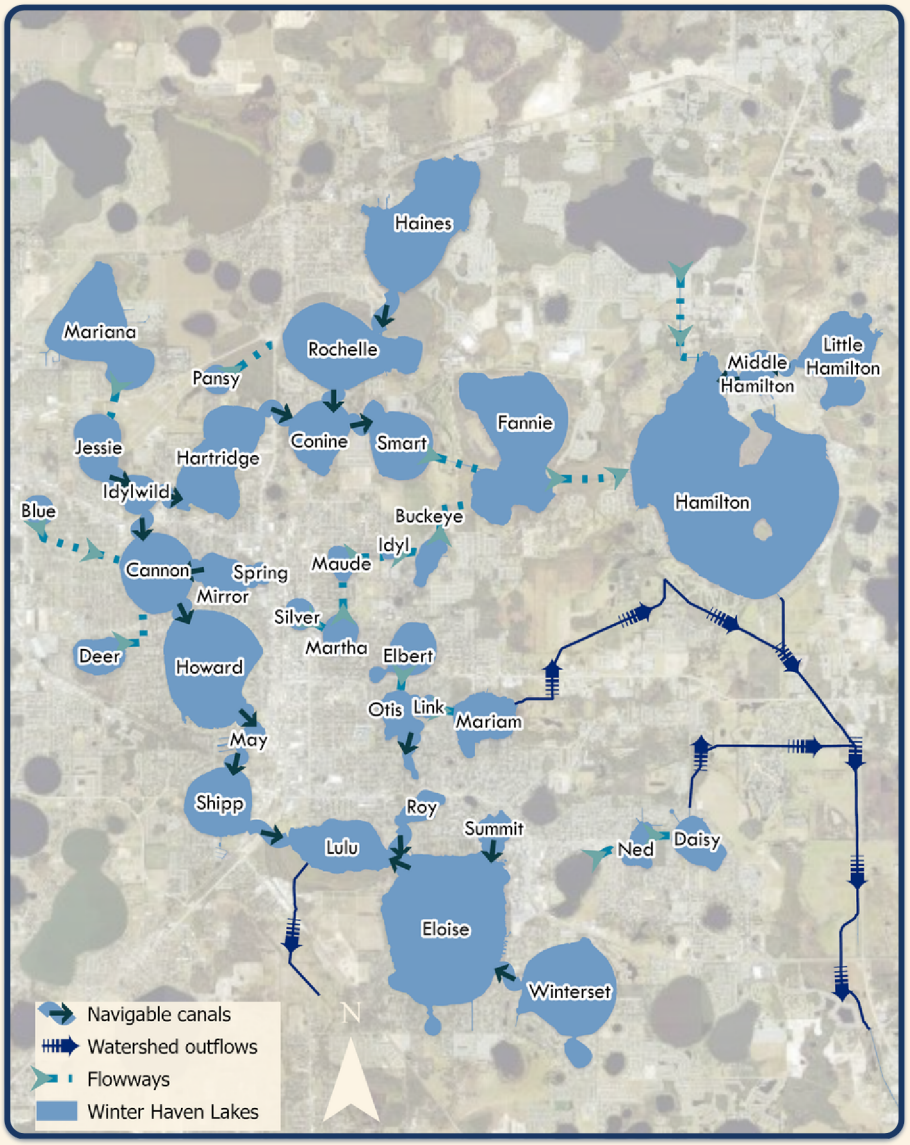
Winter Haven is home to one of the highest concentrations of natural lakes in Florida. These lakes are at the heart of our lifestyle, economy, and ecology, serving as places for fishing, boating, and seaplane training while also providing wildlife habitat sustaining our water supply.

In addition, **Winter Haven sits at the headwaters for the Peace River Watershed** - carrying water supply and water quality implications all the way through the watershed into Charlotte Harbor.









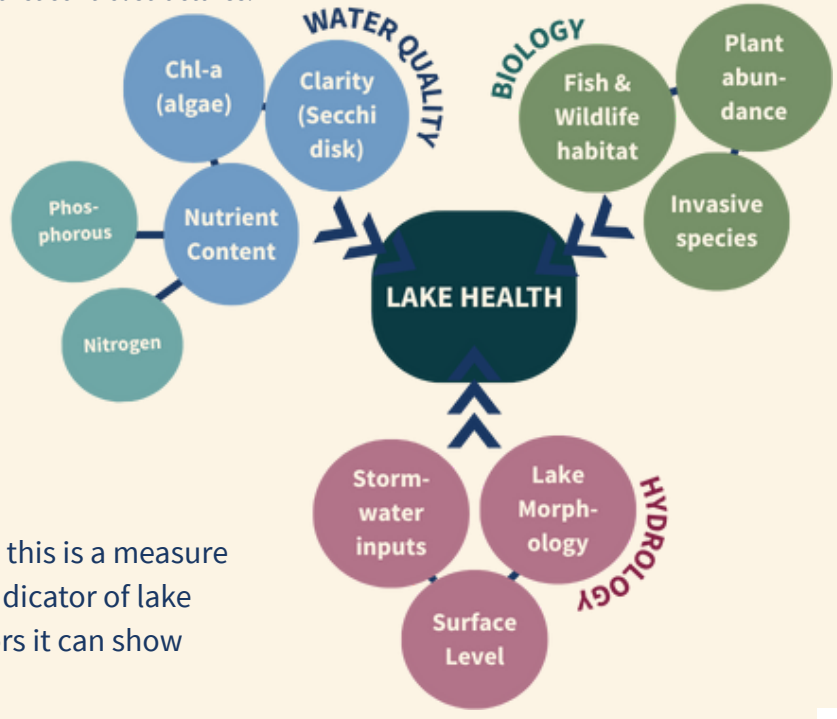
Above: Map of Winter Haven lakes' flow-ways, navigable canals, and watershed outflows. While Smart, Fannie and Hamilton on the North Chain are connected by canals - they are not navigable due to Southwest Florida Water Management District control structures.

WHAT MAKES A HEALTHY LAKE?

This report looks at Lake Health through three major lenses - water quality, biology (vegetation and fish and wildlife abundance), and hydrologic factors.

Water Quality:

- **Chlorophyll-a (Chl-a)** measures algae abundance in the water. While some algae is normal, there is a threshold where too much algae is problematic for a lake.
- **Nutrients:** In our lakes, the primary nutrients of concern are **phosphorus (TP) and nitrogen (TN)** - again while some levels are normal, above a certain level lakes can produce too much algae and become unhealthy.
- **Water Clarity:** Measured as **"Secchi"** depth - this is a measure of how clear the water is. While not a direct indicator of lake health, in conjunction with the other indicators it can show good water quality.



Biology:

- **Plant population health:** Measured by diversity, lake coverage, and plant volume. Underwater plants improve water quality and provide essential fish habitat. Shoreline plants prevent erosion and support wildlife.
- **Invasive species:** Non-native plants harm ecosystems and outcompete natives and can cause harm to fish populations and unbalance an ecosystem. Controlling invasives helps protect lake health and biodiversity.
- **Fish & wildlife habitat:** While not yet explicitly quantified in this report - thriving fish and wildlife — like river otters — signal a healthy lake. These animals rely on robust food chains and clean water to survive.



Top left: *City staff do routine plant sampling to measure the quantity of plants on our lakes.* ***Top right:*** *American lotus is a beautiful floating plant on our lakes - great at providing a buffer for erosion and habitat for fish and birds.* ***Bottom left:*** *Coontail is a native underwater plant often mistaken for hydrilla.* ***Bottom right:*** *As avid fish eaters, river otter populations are an indicator that a lake is doing well.*

Hydrology:

- **Lake Morphology:** A lake's size, depth, and shape affect water quality. Deeper lakes often connect to cleaner groundwater, while shallow, flat lakes can stir up more sediment, reducing clarity.
- **Stormwater Inputs:** All Winter Haven lakes rely entirely on rainfall for their water, which can carry pollutants from lawns, roads, and businesses. Both the amount and cleanliness of this runoff impact lake health.
- **Surface Level:** Higher lake levels from steady rainfall are often linked to better water quality, as deeper water dilutes pollutants and reduces sediment disturbance.

LAKE TRIVIA

What's the deepest lake in Winter Haven?

While depth varies with rainfall - **Lake Silver** is typically the deepest lake in the area, followed closely by Winterset. Both lakes can be up to 35 feet deep - resulting in **groundwater interaction that contributes to their clear water**

Regulatory Status:

As Waters of the State, Winter Haven's lakes are subject to state-level water quality standards established by the Florida Department of Environmental Protection (FDEP). These standards are based on the designated use of each waterbody. Winter Haven's lakes are classified as **Class III Waterbodies**, which means they are intended for **recreation, and the promotion and maintenance of a healthy, well-balanced population of fish and wildlife**.

To support this designated use, our lakes must meet **Numeric Nutrient Criteria (NNC)** for **chlorophyll, total phosphorus, and total nitrogen**. If a lake exceeds these nutrient criteria more than once within a three-year period, it is considered **impaired**.

Once a lake is classified as impaired, FDEP develops pollutant reduction targets for entities contributing surface water or groundwater to that lake. These targets are called **Total Maximum Daily Loads (TMDLs)**, which represent the maximum amount of a given pollutant that can enter the lake each day while still supporting its intended use.



LAKE HEALTH 2025

This report summarizes the status of our lakes using the **Lake Health Index.** The index combines current water quality and biological conditions with recent trends to summarize the status of each lake as a management tool. Scores range from 0 to 3, with higher scores reflecting healthier conditions and/or improving trends.

The score is a **relative metric, not an absolute marker of lake health, built to emphasize change over time**. This makes the index a useful measure for tracking individual lakes and **prioritizing management** for those in decline, and is not intended to compare lakes. Details on how the score is calculated are shown below.

LAKE HEALTH INDEX SCORING BREAKDOWN:

Water Quality

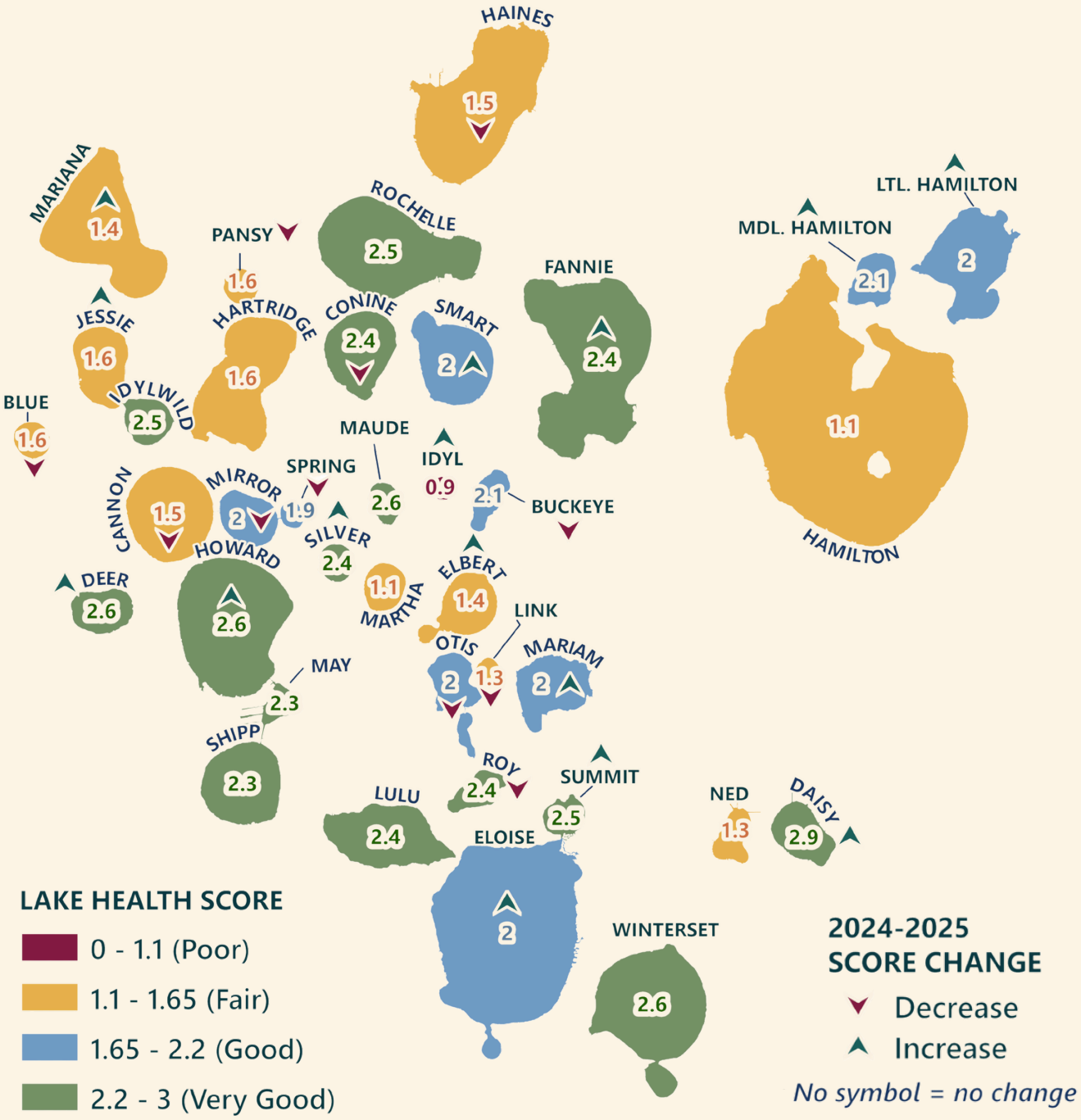
- **Impairment Score:** 0-3 points.
  - + 1 point for each **unimpaired** metric- Chlorophyll-a, Total phosphorus (TP) & Total Nitrogen (TN)
- **Water Quality Trend Scores:** 0-3 points for each parameter (Chl-a, TP, TN, and Clarity (Secchi).
  - 3 pts: Significantly improving trend
  - 2 pts: Improving trend
  - 1 pt: Deteriorating trend
  - 0 pt: Significantly deteriorating trend

Each category score is then averaged to get the overall **Lake Health Index score**

Biology

- **Plant Coverage Score:** 0-3 points
  - 3 pts: Plant coverage (PAC) at or above 30%
  - 2 pts: Plant coverage at or above 15%
  - 1 pt: Plant coverage at or above 2.5%
  - 0 pts: Plant coverage below 2.5%
- **Invasive Plant Score:** 0-3 points
  - 3 pts: 0% invasive plant population
  - 2 pts: Invasive pop. below 2.5%
  - 1 pt: Invasive pop. at or above 2.5%
  - 0 pts: Invasive pop at or above 10%
- **Plant Diversity Score:** 0-3 points
  - Each increasing diversity index gets plus 1 point. 0 given for decreasing index.

2025 OVERALL LAKE HEALTH INDEX SCORES



PROGRESS SNAPSHOT

- **Mariam is the Most Improved** lake in 2025, jumping from a 1.5 to 2 - owed to improving Chl-a trends, invasive decline, and increased vegetation diversity
- **Over 90% of impaired lakes are improving** in at least one metric (Chl-a, TP, TN)
- 48% of lakes have **maintained good (above 2) scores since 2022**. This indicates an overall stability in trends and holistic health.

NEXT STEPS

- **Lakes Idyl, Hamilton, Martha, and Ned** are the highest priority lakes - each with unique challenges. See full report for a detailed breakdown of the management strategies for all these lakes
- **Stormwater runoff management** is key for improving many of these lakes water quality issues. The City kicked off its stormwater improvement project for Lake Idyl in 2025.



2025 PROJECT UPDATES

ONGOING PROJECTS OVERVIEW:

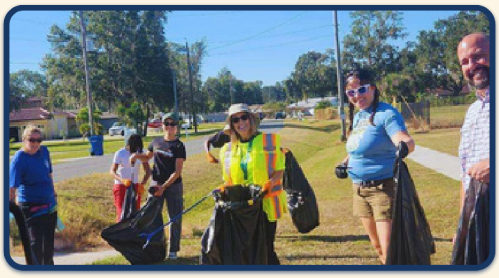
Environmental Monitoring: The City regularly tracks lake health by scanning for **plant species** and **density** with **sonar and field surveys**. We also collect **water level** and **quality data** for analysis.

Green Stormwater Infrastructure: The City has **four Nature Parks** that help clean stormwater and provide wildlife habitat and recreation. Also, **60 raingardens** soak up runoff, reduce flooding, and beautify the city. In 2025, the team **refurbished and replanted** a downtown rain garden and **installed fish feeders** in South Lake Howard Nature Park.

NPDES Reporting: Each year, the City submits a comprehensive report to the State as part of its National Pollutant Discharge Elimination System (NPDES) permit requirements under the **Clean Water Act**. This report provides an overview of all the stormwater maintenance, education and **litter and debris removal** the City does each year. In 2025, the **City removed 11 tons of litter** through clean-up efforts.

Public Outreach & Education: In 2025, staff hosted **30 outreach events** aimed at increasing community engagement and environmental awareness. These events included informational booths at festivals, neighborhood workshops, classroom lessons, and our free guided kayak ecotours. Of note this year, is the City's stormwater booth (featuring a storm pipe & litter collection activity) at the annual Community Fest & Hands on Haven , reaching about 1,450 people at just those two events.







Top to bottom: Newly planted Downtown Winter Haven raingarden; 2025 Chain Reaction Lakes Cleanup; Storm litter activity at the Annual Community Fest event.

Stormwater Assessment & Improvement Program: The City has developed a full inventory of its stormwater infrastructure and constantly monitors the condition of these assets. Priority areas have been highlighted, and proposed improvements have been developed. **In 2025, a Lake Idyl priority area project was kicked-off to address stormwater issues North of the lake.**

Street Sweeping: The City owns and operates a street sweeper machine along most City roads. The downtown areas get swept weekly, and residential areas are swept monthly. **This not only keeps streets clean, but also keeps litter and plant debris from going into the stormwater system and into our lakes .**

Vegetation & Habitat Management: City staff actively maintains aquatic vegetation at our nature parks, boat ramps and City-owned shorelines. Work focuses on the **removal of exotic species** that harm the ecosystem, and **replanting native plants to improve fisheries and wildlife habitat.** In 2025, a large removal of Brazilian peppertree and other invasives was undertaken at Lake Maude Nature Park - clearing views of the lake and improving the marsh habitat there.







Top to bottom: Stormwater pipe inspection; Street Sweeper in operation; Restored shoreline at Lake Maude Nature Park.

PROJECT SPOTLIGHT

LAKE ELBERT TRAIL: STORMWATER IMPROVEMENT





In collaboration, Parks Recreation & Culture and Public Works completed the Lake Elbert Trail project in 2025. The project completes a continuous **2.4-mile multi-use trail that now encircles the entire lake.**

A component of this project were several **new raingardens and stormwater improvements** that now clean runoff coming from Lake Elbert Drive and Polk State College before it enters the lake. According to modeling, these improvements are estimated to remove **9 pounds of phosphorus and 70 pounds of nitrogen** from the lake annually.

This project is a great example of collaborating across departments to ensure City projects provide multiple benefits to citizens' quality of life via recreation, water quality, and environmental health.



Produced By:

CITY OF WINTER HAVEN
NATURAL RESOURCES DIVISION

WINTER HAVEN

THE CHAIN OF LAKES CITY

We'd Love to Hear from You!

naturalresources@mywinterhaven.com

863-291-5881

Check out more resources on our site!

https://www.mywinterhaven.com/195/Natural-Resources

DATE: June 2, 2026

TO: Honorable Mayor and City Commissioners

FROM: T. Michael Stavres, City Manager

SUBJECT: Commissioners Compensation

BACKGROUND

At the request of Commissioner Chad Davis, and as affirmed by the City Commission during its May 26, 2026 regular meeting, this agenda item has been placed before the City Commission for discussion regarding the compensation rates established for members of the City Commission.

This item is presented for discussion and Commission direction.

FINANCIAL IMPACT

Should the City Commission desire to modify commissioner compensation, such action may require future ordinance consideration in accordance with applicable legal requirements.

STRATEGIC PLAN ALIGNMENT

This is not specifically defined as a goal or strategy within the Strategic Plan.

ATTACHMENT

- Summary of compensation rates

Commissioner Salary Comparisons

Municipality	2024 BEBR Population	FY26 Budget	Commissioner Annual Salary	Mayor Annual Salary	Millage
Lake Hamilton	1,702	40,912,000	1,200	1,500	7.99
Frostproof	3,032	7,452,000	7,800	9,000	6.553
Polk City	3,049	21,624,000	3,000	6,000	5.25
Mulberry	4,483	15,507,000	6,745	8,469	6.39
Eagle Lake	4,902	11,252,000	1,992	1,992	7.6516
Ft. Meade	5,219	41,627,000	7,800	8,400	9.45
Dundee	6,275	15,196,000	4,800	6,000	9.8679
Lake Alfred	8,037	47,588,000	7,500	9,000	6.75
Davenport	13,630	85,500,400	6,504	8,520	7.25
Lake Wales	17,558	123,600,000	14,532	26,268	7.0462
Auburndale	20,186	61,570,000	6,957	8,444	4.2515
Bartow	20,502	135,935,000	14,409	14,409	6.108
Haines City	39,514	151,585,000	22,000	26,000	7.5895
Winter Haven	57,923	250,200,000	17,525	20,917	6.59
Lakeland	123,760	815,100,000	34,124	51,185	5.4323

Non-Polk County Juristictions

Municipality	2024 BEBR Population	FY26 Budget	Commissioner Annual Salary	Mayor Annual Salary	Millage
Plant City	42,141	148,534,000	9,742	9,742	5.7157
Deland	43,185	133,221,000	15,002	20,020	6.0358
Altamonte Springs	47,313	47,391,000	6,000	8,000	3.1
Clermont	48,988	142,563,000	8,525	10,075	4.88
Ocoee	51,186	137,181,000	3,996	4,500	4.95
St. Cloud	65,974	214,800,000	26,390	31,668	5.1128

DATE: July 1, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Frederick J. Murphy, Jr. City Attorney

SUBJECT: Ratification of retention of outside Legal Litigation Counsel for matters relating to Blue Line Aviation, LLC

BACKGROUND

On June 17, 2026, the City issued formal notice to Blue Line Aviation, LLC regarding Blue Line Aviation, LLC's defaults under the September 15, 2023, Land Lease Agreement, as amended, and the resulting automatic termination of the said Agreement pursuant to its terms. The notice also addressed the pending automatic expiration of the Temporary Land Lease Agreement between the parties.

Given the complexity of the matters associated therewith and the potential for litigation and other legal proceedings arising therefrom, the City Manager executed a Letter of Representation retaining outside legal litigation counsel with Campbell Trohn Tamayo & Aranda to represent the City's interests in these matters.

The engagement of outside legal litigation counsel was determined to be in the best interests of the City to ensure timely legal representation and protection of the City's interests in connection with this matter. The Letter of Representation has been executed by the City Manager and is presented to the City Commission for ratification and confirmation.

FINANCIAL IMPACT

Outside legal litigation services will be billed in accordance with the hourly rates and terms set forth in the attached Letter of Representation. Total costs will depend upon the scope and duration of legal services required and any related proceedings that may arise from this matter.

STRATEGIC PLAN ALIGNMENT

- This is a matter of routine operations and not defined in a specific goal within the Strategic Plan, however, it generally aligns with the Responsible Government Pillar.

RECOMMENDATION

The City Manager and the City Attorney request that the City Commission ratify and confirm the retaining of the law firm of Campbell Trohn Tamayo & Aranda and the City Manager's execution of that Letter of Representation for outside legal litigation counsel for the City in matters relating to Blue Line Aviation, LLC and authorize the City Manager, the City Attorney, and/or their designees, to undertake any actions necessary and related thereto.

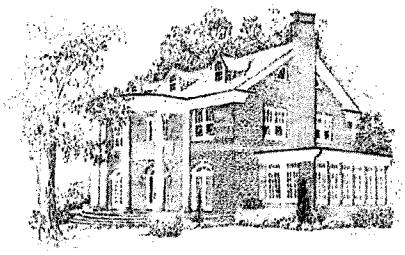
ATTACHMENT

- Letter of Representation between the City of Winter Haven and Campbell Trohn Tamayo & Aranda

LAW OFFICES
CAMPBELL TROHN TAMAYO & ARANDA

ROBERT J. ARANDA
HANK B. CAMPBELL
WILLIAM S. CHAMBERS, IV^
THOMAS L. DUDASH~
JENNIFER HIGLEY SPATH
CALEB A. SUSZKO
JOHN MARC TAMAYO*
JONATHAN B. TROHN*

^BOARD CERTIFIED IN CONSTRUCTION LAW
*BOARD CERTIFIED IN CIVIL TRIAL LAW
~ADMITTED IN FLORIDA AND MISSOURI



1701 SOUTH FLORIDA AVENUE
LAKELAND FL 33803-2262

PO BOX 2369
LAKELAND FL 33806-2369

Phone: 863-686-0043
Fax: 863-616-1445
Website: www.cttalaw.com

June 17, 2026

Sent via first-class mail and email: mstavres@mywinterhaven.com
T. Michael Stavres, City Manager
City of Winter Haven, Florida
451 Third Street, N. W.
Winter Haven, FL 33881

Re: City of Winter Haven v. Blue Line Aviation

Dear Mr. Stavres:

This letter outlines the terms under which the Campbell Trohn Tamayo & Aranda law firm is willing to represent the City of Winter Haven in accordance with the above-captioned matter.

I will be primarily responsible for the services provided to you by our firm. However, I will be assisted by other firm lawyers, legal assistants and law clerks to the extent appropriate and you will be charged for the work performed by them. We use law clerks and legal assistants whenever appropriate so that we can provide legal services more economically.

Our fee for all legal work will be based on the then-current hourly billing rates of the lawyers performing the services. The hourly billing rates for lawyers currently range from $250.00 to $750.00, and the hourly billing rates for services you require are $600.00 for myself and $325.00 for associate attorneys. However, I am willing to represent you at a reduced fee of $400.00 for myself and $250.00 for Caleb A. Suszko. We periodically adjust the billing rates of our lawyers to reflect the augmentation of their ability, experience and reputation and to account for economic factors, such as increases in our costs in delivering legal services. Should we anticipate any increases we will give 30 days' advanced notice of any proposed increase.

You will be responsible for all costs incurred by our firm in connection with your representation. Chargeable costs include, but are not limited to, expenses or disbursements for taxes, travel, copying, faxing, courier and messenger services, long distance telephone tolls, computerized research, paralegal services, investigative services, accounting services, fees paid to experts, court reporters, and other third parties, filing, recording, certification and registration fees and postage, sheriff's charges for service of summonses and subpoenas, mediation fees, witness fees, and expert witness fees. We reserve the right to require an advance cost deposit when substantial costs can be predicted and to bill you immediately for any major costs.

We will send you a monthly statement, at the address set forth above, for any services rendered and costs incurred during the preceding month. Payment of each statement is due in full when you receive it and becomes delinquent if not paid within twenty-five (25) days after its date. If the statement becomes delinquent, we will charge 1½% interest per month (18% per year) on all delinquent amounts. Our firm reserves the right to discontinue or terminate our services should a delinquency persist. Failure to make the payments will ultimately result in our firm's withdrawal from representation.

If collection action becomes necessary, you are obligated to pay all costs of collection of the delinquent statement (including legal fees incurred and for trial, appellate, bankruptcy and judgment-execution proceedings), plus interest on the unpaid balance of the delinquent statement, from the date when it became delinquent until it is paid, at a rate of 1½% per month. This interest rate of 1½% per month will also apply to any judgments obtained for unpaid fees and costs.

We customarily collect in advance a retainer fee from our clients with whom we do not have an established relationship; however, we are waiving this requirement in your case

We appreciate the opportunity to represent you and look forward to a mutually beneficial relationship. Please acknowledge your acceptance of these terms of engagement by signing and dating this letter where indicated below and returning it to me.

Sincerely yours,

CAMPBELL TROHN TAMAYO & ARANDA

John Marc Tamayo

JMT/lr

Copied via email:
John Murphy, Esq.
Drew Crawford, Esq.

I hereby accept and agree to the terms of the foregoing letter of representation this 17TH day of June, 2026.

T. Michael Stavres, City Manager on behalf of the City of Winter Haven

WINTER HAVEN
THE CHAIN OF LAKES CITY

DATE: June 26, 2026

TO: Honorable Mayor and City Commissioners

VIA: T. Michael Stavres, City Manager
M.J. Carnevale, Deputy City Manager

FROM: Amanda-Jo Nicholson, Assistant to the City Manager

SUBJECT: Designation of voting delegate for Florida League of Cities (FLC) 2026 Annual Conference

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BACKGROUND

The Florida League of Cities Annual Conference will be held in Hollywood, Florida, from August 13-15, 2026. This conference provides valuable educational opportunities to help municipal officials serve their citizenry more effectively.

As part of this conference each member municipality sending delegates are asked to designate one of their officials to vote at the Annual Business Session, which will be held on Saturday, August 15. Election of League leadership and adoption of resolutions are undertaken during the business meeting.

FINANCIAL IMPACT

There is no financial impact for this item.

STRATEGIC PLAN ALIGNMENT

- **Pillar:** Responsible Government
- **Goal:** 6.2 – Engage and participate in legislative matters (State & Federal) and advocate for Home Rule and local priorities.
- **Strategy:** 6.2.1 – Strategically engage in local, State and national professional organizations and coalitions.

RECOMMENDATION

Staff request the City Commission authorize one member to vote during the Annual Business Session at the 2026 Florida League of Cities Conference.

ATTACHMENT

- 2026 Florida League of Cities Annual Conference Voting Delegate Information

FLC
FLORIDA LEAGUE OF CITIES

To: Key Official

From: Eryn Alcorn, Florida League of Cities

Date: June 18, 2026

Subject: 2026 Annual Conference Voting Delegate Information

The Florida League of Cities Annual Conference will be held at the Diplomat Beach Resort in Hollywood, Florida, from August 13-15, 2026. This conference will provide valuable educational opportunities to help Florida's municipal officials serve their citizenry more effectively.

We ask that each member municipality sending delegates to the Annual Conference **designate one elected official to serve as its Voting Delegate** and cast the municipality's votes at the Annual Business Meeting which will be held on **Saturday, August 15, 2026**. The Voting Delegate designated by each municipality will vote on all official business matters brought before the League membership and requiring a vote during the Business Meeting. Matters such as the election of League leadership, adoption of resolutions and any other official business matters affecting the League may be voted on during the Business Meeting.

In accordance with the League's by-laws, the number of votes allocated to each municipality is determined based upon population. The League will use the latest Florida Estimates of Population as published by the University of Florida, Bureau of Economic and Business Research.

Annual Conference registration materials were sent to each municipality via the League's e-newsletter and are available online at *flcities.com*.

If you have any questions about voting delegates, please email *ealcorn@flcities.com*. **Voting delegate forms must be received by the League no later than July 31, 2026.**

Attachments: Form Designating Voting Delegate

2026 Annual Conference
Florida League of Cities, Inc.
August 13-15, 2026
Hollywood, Florida

It is important that each member municipality sending delegates to the Annual Conference of the Florida League of Cities designate one of its elected officials to cast the municipality's votes at the Annual Business Meeting. League By-Laws require each municipality to select one person to serve as the municipality's Voting Delegate.

Municipalities do not need to adopt a resolution to designate a voting delegate. Instead, please fill out this form and return it to the League office so that your voting delegate may be properly identified. **Voting delegate forms must be received by the League no later than July 31, 2026.**

Designation of Voting Delegate

Name of Voting Delegate: _____

Title: _____

Delegate Email: _____

Municipality of: _____

AUTHORIZED BY:

_____
Name

_____
Title

Return this form to:
Eryn Alcorn
Florida League of Cities, Inc.
Post Office Box 1757
Tallahassee, FL 32302-1757
Email: *ealcorn@flcities.com*