Final

Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River Basin Management Action Plan

Division of Environmental Assessment and Restoration Water Quality Restoration Program
Florida Department of Environmental Protection

with participation from the
Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River Stakeholders

June 2025

2600 Blair Stone Rd.
Tallahassee, FL 32399
floridadep.gov

Exhibit 1

Acknowledgments

The Florida Department of Environmental Protection adopted the *Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River Basin Management Action Plan (BMAP)* by Secretarial Order as part of its statewide watershed management approach to restore and protect Florida's water quality. The plan was developed in coordination with stakeholders identified below, including participation from affected local, regional and state governmental entities, non-governmental organizations and entities, and private citizens.

Florida Department of Environmental Protection
Alexis A. Lambert, Secretary

Table ES-1. Silver and Rainbow stakeholders

Type of Organization/Entity	Name
Responsible Entities	Agriculture Alachua County Lake County Levy County Marion County Putnam County Sumter County City of Belleview City of Dunnellon City of Fruitland Park City of Hawthorne City of Leesburg City of Micanopy City of Ocala City of Wildwood City of Williston Town of Bronson Town of Lady Lake Town of McIntosh Town of Reddick The Villages Private Wastewater Treatment Facilities Private Golf Courses
Responsible Agencies	Florida Department of Agriculture and Consumer Services (FDACS) Florida Department of Environmental Protection (DEP) County Health Departments Florida Department of Transportation (FDOT) Southwest Florida Water Management District (SWFWMD) St. Johns River Water Management District (SJRWMD)

Type of Organization/Entity	Name
Other Interested Stakeholders	Florida Farm Bureau Florida Department of Economic Opportunity Florida Native Plant Society Florida Onsite Wastewater Association (FOWA) Howard T. Odum Florida Springs Institute Marion County Farm Bureau Oklawaha Valley Audubon One Rake at a Time Rainbow River Conservation Coalition Residents/Homeowners Sciences Extension Septic Contractors Sierra Club University of Florida Institution of Food and Agriculture Weyerhaeuser

See **Appendix A** for links to resources referenced in this document. For additional information, contact:

Florida Department of Environmental Protection/ Water Quality Restoration Program
2600 Blair Stone Road, Mail Station 3565
Tallahassee, FL 32399-2400
Email: BMAPProgram@FloridaDEP.gov

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ac	Acre
AC	Spatial Autocorrelation
AWT	Advanced Waste Treatment
ATU	Aerobic Treatment Unit
BAF	Biochemical Attenuation Factor
BEBR	Bureau of Economic and Business Research
BMAP	Basin Management Action Plan
BMPs	Best Management Practices
CASTNET	Clean Air Status and Trends Network
cfs	Cubic Feet Per Second
CMAQ	Community Multiscale Air Quality
CRF	Controlled Release Fertilizer
CRISPS	Collaborative Research Initiative on Sustainability and Protection of Springs
DEP	Florida Department of Environmental Protection
DMR	Discharge Monthly Report
DO	Dissolved Oxygen
DWTS	Distributed Wastewater Treatment System
ENR	Enhanced Nutrient Reducing
F.A.C.	Florida Administrative Code
F.A.R.	Florida Administrative Register
FAS	Floridan Aquifer System
FDACS	Florida Department of Agriculture and Consumer Services
FDOH	Florida Department of Health
FF	Farm Fertilizer
FGS	Florida Geological Survey
FLUCCS	Florida Land Use Cover and Forms Classification System
FLWMI	Florida Water Management Inventory
FNAI	Florida Natural Areas Inventory
FOWA	Florida Onsite Wastewater Association
F.S.	Florida Statutes
FSAID	Florida Statewide Agricultural Irrigation Demand
FSU	Florida State University
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
gpd	Gallons Per Day
IA	Implementation Assistance
IV	Implementation Verification
in/yr	Inch Per Year
lbs	Pounds
lbs-N/yr	Pounds of Nitrogen Per Year
LID	Low Impact Development

LVS	Linear Vegetation Survey
LW	Livestock Waste
MCAVA	Marion County Aquifer Vulnerability Assessment
MFLs	Minimum Flows and Levels
mgd	Million Gallons Per Day
mg/L	Milligrams Per Liter
N	Nitrogen
N/A	Not Applicable
NADP	National Atmospheric Deposition Program
NELAC	National Laboratory Environmental Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NHD	National Hydrography Database
NNC	Numeric Nutrient Criteria
NOI	Notice of Intent
NPDES	National Pollutant Discharge and Elimination System
NSF	NSF International (formerly National Sanitation Foundation)
NSILT	Nitrogen Source Inventory Loading Tool
NTN	National Trends Network
OAWP	Office of Agricultural Water Policy (FDACS)
OFS	Outstanding Florida Spring
OSTDS	Onsite Sewage Treatment and Disposal System
PBTS	Performance-based Treatment System
PFA	Priority Focus Area
PSA	Public Service Announcement
PWS	Public Water Systems
QA/QC	Quality Assurance/Quality Control
RIB	Rapid Infiltration Basin
RPS	Rapid Periphyton Survey
RRLA	Rapid Rate Land Application
SAV	Submerged Aquatic Vegetation
SBIO	DEP Statewide Biological Database
SCI	Stream Condition Index
SJRWMD	St. Johns River Water Management District
SOP	Standard Operating Procedure
SRLA	Slow Rate Land Application
STF	Sports Turf Fertilizer
STORET	Florida Storage and Retrieval Database
SWFWMD	Southwest Florida Water Management District
SWIM	Surface Water Improvement and Management
TDEP	Total Atmospheric Deposition Model
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus

TSS	Total Suspended Solids
UF	University of Florida
UFA	Upper Floridan aquifer
UF–IFAS	University of Florida-Institute of Food and Agricultural Sciences
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UTF	Urban Turfgrass Fertilizer
WAFR	Wastewater Facility Regulation (Database)
WBID	Waterbody Identification (Number)
WIN	Florida Watershed Information Network Database
WMD	Water Management District
WMP	Watershed Management Plan
WWTF	Wastewater Treatment Facility
Year	yr

Executive Summary

The Florida Springs and Aquifer Protection Act (Chapter 373, Part VIII, Florida Statutes [F.S.]), along with the Watershed Restoration Act (section 403.067, F.S.), provide for the protection and restoration of Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, six additional named springs, and their associated spring runs. The DEP has assessed water quality in each OFS and has determined that 26 of the 30 OFS are impaired for the nitrate form of nitrogen. Silver Springs and the Rainbow Springs Group are impaired first magnitude OFS.

The Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP area includes Silver Springs, Silver Springs Group, the Silver River, Rainbow Springs Group, Rainbow Springs Group Run, and the Rainbow River, along with the groundwater contributing area for the springs (**Figure ES-1**). These waterbodies are collectively referred to as Silver and Rainbow in this document. The BMAP area is located largely within Marion County, with portions extending into Alachua, Levy, Putnam, Sumter, and Lake Counties, and encompasses all or portions of several municipalities including the City of Ocala, City of Belleview, City of Dunnellon, City of Hawthorne, Town of McIntosh, City of Fruitland Park, Town of Lady Lake, City of Wildwood, City of Williston, and the Villages Community Development Districts (CDDs).

Silver and Rainbow Springs Priority Focus Areas (PFAs)

Each spring area has a delineated PFA. These PFAs represent the areas in the basin where the aquifer is most vulnerable to inputs and where there are the most connections between groundwater and Silver Springs and the Rainbow Springs Group. The PFA areas are based on Marion County's identified Primary Protection Zones and supported by local ordinance. Consistency in the enactment of policy was a factor in DEP's consideration when basing PFA boundaries on the existing county ordinance at the time of development.

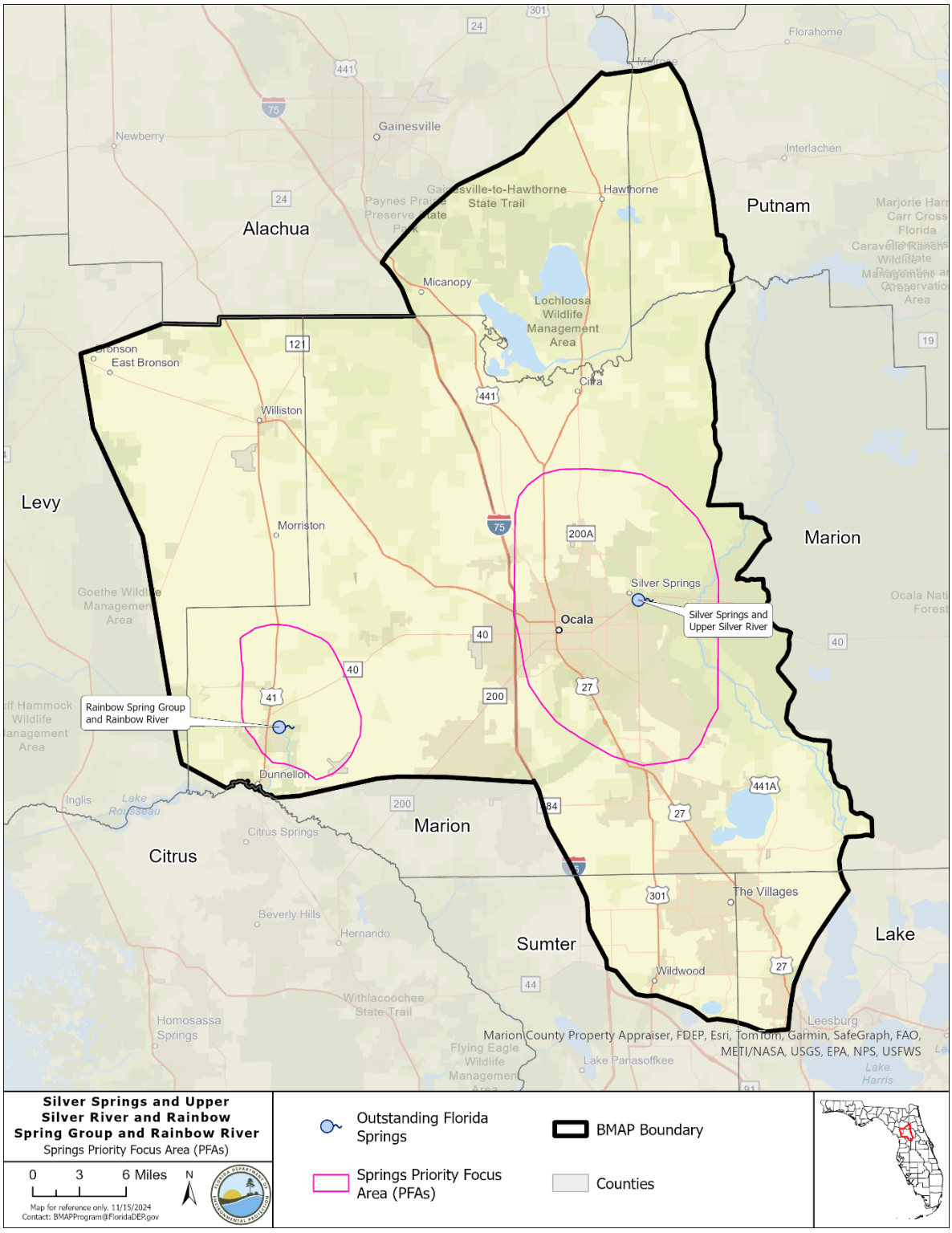

Figure ES-1. Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP and PFA boundaries

Nitrogen Source Identification, Required Reductions, and Options to Achieve Reductions

At least 30 named springs comprising Silver Springs and Silver Springs Group are the main source of water to the Upper Silver River, which along with the springs was identified as impaired because of a biological imbalance caused by excessive concentrations of nitrate in the water. In 2012, total maximum daily loads (TMDLs) for nitrate were developed as water quality restoration targets for Silver Springs and the Upper Silver River. The TMDLs established a long- term monthly average nitrate target of 0.35 milligrams per liter (mg/L).

The springs associated with Rainbow Springs Group and the next segment of the Rainbow River, called Rainbow Springs Group Run, are the primary source of water for the Rainbow River. They were identified as impaired because of a biological imbalance caused by excessive concentrations of nitrate in the water. In 2013, TMDLs for nitrate were developed as water quality restoration targets for the Rainbow Springs Group and Rainbow Springs Group Run; they established a long-term monthly average nitrate target of 0.35 mg/L.

DEP developed the Nitrogen Source Inventory Loading Tool (NSILT) to provide information on the major categories of nitrogen sources in the groundwater and spring contributing areas for the springs. Among other sources, urban turfgrass fertilizer (UTF) represents 20% of the nitrogen loading to groundwater, onsite sewage treatment and disposal systems (OSTDS or septic systems) 32%, and agriculture 32% of the total loading to groundwater based on the DEP analysis conducted using the NSILT.

To achieve the TMDL targets at the spring vents, the total load reduction required is 3,142,039 pounds of nitrogen per year (lbs-N/yr). The following milestones are being established to measure progress towards achieving the total necessary load reduction of 3,142,039 lbs/yr:

- 2028 - Reduction of 942,612 lbs-N/yr (30%).
- 2033 - Additional reduction of 1,571,020 lbs-N/yr (50%).
- 2038 - Additional reduction of 628,408 lbs-N/yr (20%).

Springs systems are complex, particularly because of the karst geology where conduits or fractures can impact the relative conveyance of water to the spring vents. In some areas, water can take decades to travel to the spring vent, but in others it can reach the spring vent in a matter of weeks or months. Due to the delayed impact projects may have on water quality at the spring vent, DEP will continue to monitor groundwater stations throughout the BMAP and the springs to better understand the benefits from the policies, implemented projects and management strategies within the springshed. The BMAP is designed to achieve 80% of the load reductions to the spring vents by 2033 and 100% by 2038. DEP will evaluate progress towards these milestones and will report to the Governor and Florida Legislature annually. Assessment of progress toward these milestones must be conducted every five years and revisions to the BMAP must be made as appropriate. BMAPs use an adaptive management approach that allows

for incremental load reductions through the implementation of projects and management strategies; however, the restoration target, the TMDL, remains the same. If needed, policies and management strategies will be adjusted to ensure the target spring vent concentrations are achieved. This may include requiring additional management strategies and any such change would be incorporated into a future updated BMAP through a formal adoption process.

Cost estimates were provided by stakeholders for approximately 50% of the projects and management actions listed in the BMAP. For the projects where cost estimates were provided, the total estimated cost exceeds $877 million. Of the total estimated cost, approximately $334 million has been expended to date on completed projects. While stakeholders are required to implement additional projects listed in the BMAP, accurate cost estimates have not been developed for every project. The total cost estimate for all projects referenced in the BMAP is unknown until more cost information is provided. By the next 5-year BMAP milestone, stakeholders are projected to achieve additional reductions in annual nutrient loadings to the Silver and Rainbow Basin, including 35,469 pounds of TN, based on estimates of the planned and underway projects listed to date.

For the list of water quality improvement projects and management strategies, see **Appendix B**. Included are owner-implemented best management practices (BMPs) for farm fertilizer (FF), livestock waste (LW) and STF; wastewater treatment facility (WWTF) upgrades; projects to reduce UTF application; and OSTDS remediation projects.

Successful BMAP implementation requires commitment, dedicated funding and ongoing assessment. Stakeholders have expressed their intention to carry out the plan, monitor its effects, and continue to coordinate within and across jurisdictions to achieve nutrient reduction goals. As the BMAP and TMDLs must be achieved by 2038, DEP, water management districts (WMDs), FDOH, and FDACS will also implement state-level management strategies using relevant state and federal funding.

Restoration Approaches

Reduction in the nitrogen loading to the aquifer is needed to achieve the load reduction requirements at the spring vents. To ensure that load reductions are achieved at the spring vents, the restoration actions described below are being implemented. These actions are designed to reduce nutrient loading to the aquifer, which will reduce the load at the vents and ultimately achieve the TMDL targets. Monitoring at the spring vents during implementation will continue to assess progress.

- **New OSTDS** – Florida law (sections 373.811 and 403.067, F.S) prohibits new OSTDS on lots of one acre or less within the BMAP boundary, unless the systems are enhanced nutrient-reducing OSTDS systems or other wastewater treatment systems that achieve at least 65% nitrogen reduction. The OSTDS remediation plan pursuant to section 373.807, F.S. was updated in this BMAP iteration to prohibit the installation of new OSTDS on any lot size within the BMAP boundary unless the systems are enhanced nutrient-reducing OSTDS systems or other wastewater treatment systems that achieve at least

65% nitrogen reduction.

- **Existing OSTDS** –For the BMAP remediation plan required under subsection 373.807(3), F.S. (detailed in **Appendix E**), any existing OSTDS within the BMAP boundary that requires a permit to modify or replace an existing system pursuant to Chapter 62-6, F.A.C., must connect to sewer if available, or if not available, upgrade or replace the OSTDS to meet enhanced nutrient reducing OSTDS requirements that achieve at least 65% nitrogen reduction, unless sewer connections will be available based on a BMAP-listed project. All OSTDS subject to this policy must include enhanced nitrogen treatment by 2038. Local governments may expand the geographic extent of this requirement by incorporating it into their local ordinances and local government specific remediation plans required under section 403.067, F.S., however, local governments are responsible for implementing their ordinances. In the 2020 Clean Waterways Act, local governments were required to submit OSTDS remediation plans in accordance with section 403.067, F.S., if applicable, to DEP by Aug. 1, 2024, to address existing OSTDS and the potential for future OSTDS.

- **WWTFs** – The required treatment of wastewater effluent to advanced waste standards applies to all surface water disposal and certain reuse disposal determined necessary by the department within the BMAP area. In the 2020 Clean Waterways Act, local governments were required to submit WWTF plans in accordance with section 403.067, F.S., if applicable, to DEP by Aug. 1, 2024, to address wastewater loads and the potential for future additional loads, including those created from sewering OSTDS. Subparagraph 403.067(7)(a)9., F.S., was amended in 2024 to clarify that private domestic wastewater facilities must provide this information to local governments effective July 1, 2024. Information related to private facilities will need to be included in future local government WWTF plans if not captured in the initial plans.

- **Local governments with OSTDS or WWTF** are expected to meet their overall reduction milestones and to keep their project lists current, including any efforts to address OSTDS loading and any necessary wastewater facility improvements. Private wastewater facilities are also expected to meet their assigned reductions and keep their project lists current. The projects identified in these plans have been included in the BMAP project list under **Appendix B** and are adopted as part of the BMAP requirements.

- **UTF** – UTF consists of fertilizers applied to turfgrass typically found in residential and urban areas (including residential lawns and public green spaces). Fertilizers are applied either by the homeowner or a lawn service company on residential properties. On nonresidential properties, fertilizers may be applied by contractors or maintenance staff. UTF sources are assigned to the applicable responsible entity. Strategies to address UTF include education, enforcement of local government ordinances related to appropriate use of fertilizer, and stormwater projects.

- **STF –** STF sources include golf courses and other sporting facilities. Reductions from most sports facilities, including publicly owned golf courses and school district sites, are assigned to the applicable local government. Private sporting facilities are assigned to the owner. Sporting facilities are required to follow the 2025 Sports Turf BMP Manual to protect water resources. Reductions from private golf courses are assigned to the golf course owners. All golf courses within the BMAP are required to follow the 2021 DEP Golf Course BMP Manual and submit for approval a final nutrient management plan (NMP) to DEP within two years of BMAP adoption, and to follow their plan.

- **FF Enrollment** – All FF sources are required to implement BMPs or perform monitoring to demonstrate compliance with the TMDL. A 15% reduction to groundwater is estimated for owner-implemented BMPs. Additional reduction credits could be attained through better documentation of nutrient reductions achieved through BMP implementation or implementation of additional agricultural cost-share BMPs, projects or practices, such as precision irrigation, soil moisture probes, controlled release fertilizer and cover crops.

- **LW Enrollment** – All LW sources are required to implement BMPs or perform monitoring to demonstrate compliance with the TMDL. A 10% reduction to groundwater is estimated for owner-implemented BMPs. Additional credits may be attained through documentation of nutrient reductions achieved through BMP implementation, NMP updates and implementation, and additional projects.

- **Additional Agriculture** - Cooperative agricultural regional water quality improvement elements are being developed to reduce agricultural nutrient loading in combination with owner-implemented BMPs, cost-share BMPs, state-sponsored regional projects and other measures. The BMAP outlines a collaborative framework for identifying, prioritizing and implementing regional projects that address nutrient loading from agricultural operations. Partner agencies will work in annual cycles with agricultural landowners to provide technical support, regulatory guidance and funding opportunities to further implementation and the success of regional water quality improvement initiatives.

Section 1. Background

1.1 Legislation

Chapter 373, Part VIII, Florida Statutes (F.S.), the Florida Springs and Aquifer Protection Act, along with the Watershed Restoration Act (section 403.067, F.S.), provide for the protection and restoration of Outstanding Florida Springs (OFS), which comprise 24 first magnitude springs, six additional named springs, and their associated spring runs. DEP has assessed water quality in each OFS and determined that 26 of the 30 OFS are impaired for the nitrate form of nitrogen. Silver Springs and the Rainbow Springs Group are impaired first magnitude OFS. Development of the BMAP to meet the requirements of the Florida Springs and Aquifer Protection Act for the Silver and Rainbow Basin was initiated in 2016. Since adoption, additional statutory requirements in Chapter 373, F.S., and section 403.067, F.S., have been enacted and continue to enhance the protection and restoration of water quality throughout Florida. For specific requirements, please refer to the source management sections below.

1.2 Water Quality Standards and TMDLs

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet water quality criteria. Upper Silver River, Silver Springs Group, Silver Springs, Rainbow Springs Group, and Rainbow Springs Group Run are Class III waterbodies with a designated use of recreation, propagation, and the maintenance of a healthy, well-balanced population of fish and wildlife. They are also designated as Outstanding Florida Waters (OFWs). These waters are impaired by nitrate nitrogen, which in excess has been demonstrated to adversely affect flora or fauna through the growth of algae. Excessive algal growth results in ecological imbalances in springs and rivers and can produce human health problems, foul beaches, inhibit navigation, and reduce the aesthetic value of the resources.

DEP adopted nutrient TMDLs for Upper Silver River, Silver Springs Group, and Silver Springs in November 2012 (Chapter 62-304, Florida Administrative Code [F.A.C.]), and for the Rainbow Springs Group and Rainbow Springs Group Run in 2013 (**Table 1**). The TMDLs established the target of a long-term monthly average of 0.35 milligrams per liter (mg/L) of nitrate to be protective of the aquatic flora and fauna (Hicks and Holland 2012, Holland and Hicks 2013). The period of record for water quality data evaluated for the TMDLs were January 1, 2000, through December 30, 2011, for Silver Springs waterbodies, and January 1, 2000, through December 30, 2010, for Rainbow Springs waterbodies.

Table 1. Restoration targets for Silver and Rainbow TMDLs

Waterbody or Spring Name	Waterbody Identification (WBID) Number	Parameter	TMDL (mg/L)
Silver Springs	2772A	Nitrate as monthly average	0.35
Silver Springs Group	2772C	Nitrate as monthly average	0.35

Waterbody or Spring Name	Waterbody Identification (WBID) Number	Parameter	TMDL (mg/L)
Upper Silver River	2772E	Nitrate as monthly average	0.35
Rainbow Springs Group	1320A	Nitrate as monthly average	0.35
Rainbow Springs Group Run	1320B	Nitrate as monthly average	0.35

It should be noted that since the development of the BMAP, the TMDL WBIDs may have been modified. The most updated version of WBID boundaries can be found on the DEP Watershed Assessment Section webpage.

1.3 BMAP Requirements

Subsection 403.067(7), F.S., provides DEP with the statutory authority to develop and implement BMAPs. A BMAP is a comprehensive set of strategies to achieve the required pollutant load reductions. It requires any entity with a specific pollution load reduction to submit to DEP projects or strategies to meet 5-year pollution reduction milestones. In addition to this authority, the Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.) describes additional requirements and prohibitions for the 30 OFS.

1.4 BMAP Area

The Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP area (**Figure 1**) comprises approximately 1,668 square miles. The Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP area includes Silver Springs, Silver Springs Group, the Silver River, Rainbow Springs Group, Rainbow Springs Group Run, and the Rainbow River, along with the groundwater contributing area for the springs. These waterbodies are collectively referred to as Silver and Rainbow in this document.

The BMAP area is located mostly in Marion County, with portions extending into Alachua, Levy, Putnam, Sumter, and Lake counties, and encompasses all or portions of several municipalities and special districts including the City of Ocala, City of Belleview, City of Dunnellon, City of Hawthorne, Town of McIntosh, City of Fruitland Park, Town of Lady Lake, City of Wildwood, City of Williston, and the Villages Community Development Districts. The Ocala National Forest is located along the eastern border of the BMAP area.

Silver Springs is a group of springs, with as many as 30 named springs and numerous other unnamed groundwater discharges. WBID 2772A is the head spring, also referred to as Mammoth Springs, and the largest of the group. Water discharged from this spring appears to originate from two distinct locations: Mammoth East and Mammoth West. WBID 2772C consists of a short section of the Silver River called Silver Springs Group, ending a short distance downstream from the confluence with Half Mile Creek, containing numerous other springs contributing flow to the Silver River. Half Mile Creek is the only significant surface tributary to the impaired segments of the Silver River. WBID 2772E is a 1.7-mile section of the

Upper Silver River starting below the confluence of the Silver River with Half Mile Creek. Silver Springs and the Silver River are located in Silver Springs State Park.

Rainbow Springs Group (WBID 1320A) encompasses 11 named springs within the Head Springs area, defined as the first 1.5 miles of the Rainbow River (SWFWMD 2011). It is located in Rainbow River State Park. Rainbow Springs Group Run (WBID 1320B), the next segment of the Rainbow River, includes additional named springs and inputs from Indian Creek and its springs. Most of the land surrounding Rainbow Springs Run is in private ownership and developed with residential housing.

The northern portion of the BMAP area overlaps with the Orange Creek Basin. Water quality issues in the large lakes, Orange Creek, and connecting streams are addressed by the Orange Creek BMAP. Lake Weir is also located within the Silver and Rainbow BMAP area. Though Lake Weir is not directly addressed by the Silver and Rainbow BMAP it will benefit from the policies of this BMAP.

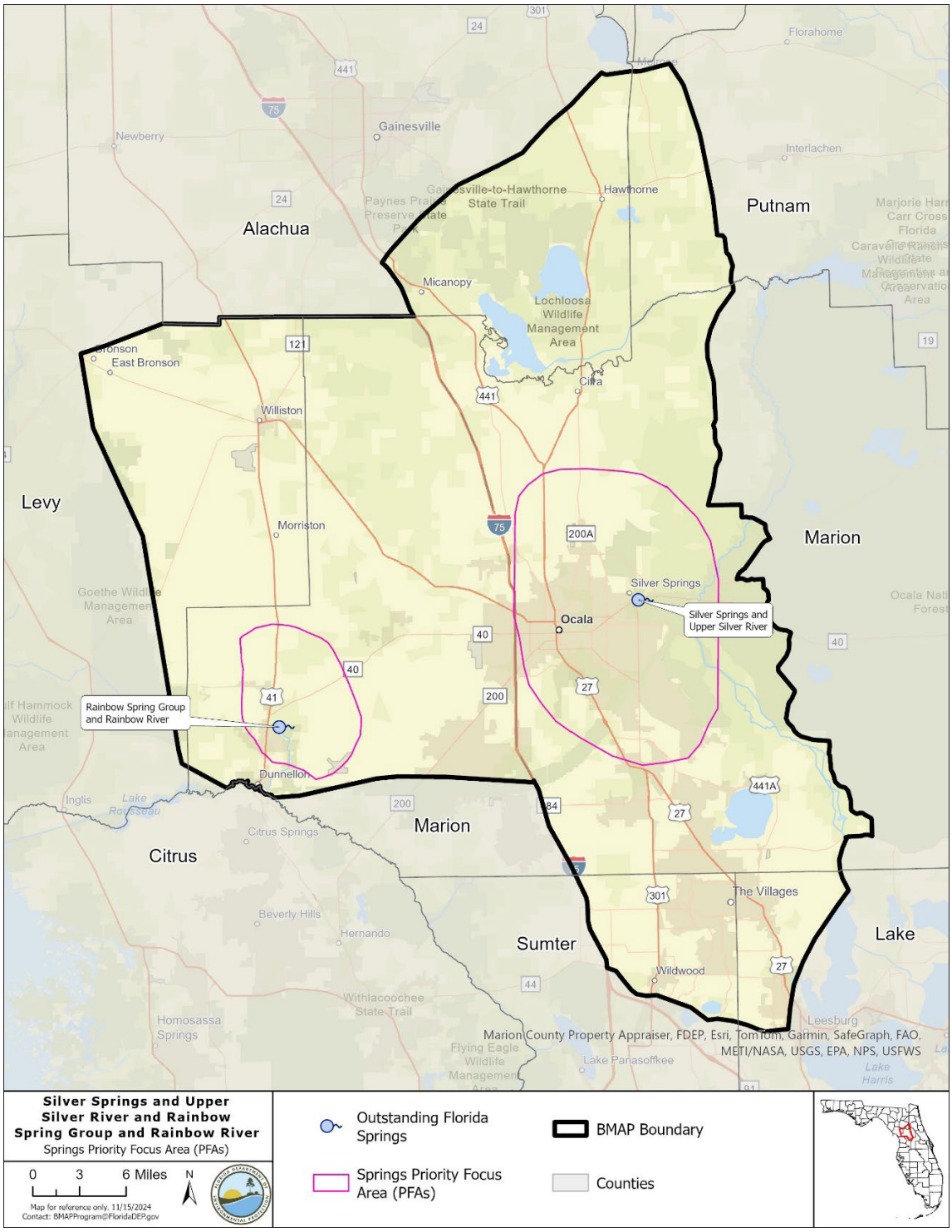

Figure 1. Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP and PFA boundaries

1.4.1 Hydrogeology

Groundwater flow in the BMAP area originates from the karstic UFA. A surficial aquifer may overlie portions of the UFA, and in some places a confining unit may be present. The UFA is recharged from rainfall collected across the karst terrain.

Geology and hydrogeology influence the characteristics of Silver Springs and help explain many of the observed groundwater quality issues. Around Silver Springs and moving westward, the Ocala Group, the geological formation containing the limestone rocks of the UFA, is close to the land surface and typically under unconfined or water table aquifer conditions. The proximity of the UFA to the land surface continues west across the Rainbow Springs Group and Rainbow River area.

Overburden is thicker to the east of Silver Springs moving towards the Ocklawaha River. As a result, the Floridan Aquifer lies deeper under the land surface. East of Silver Springs, the Ocala Group may be overlain by the Hawthorn Group, a phosphate-rich clay layer, which can act as an intermediate confining unit and may contain an intermediate aquifer. The UFA typically is confined where the Hawthorn Group is present. As a confining layer, the Hawthorn Group may slow the downward movement of water to the UFA.

Several conclusions were drawn from modeling results and dye tracer tests completed for Silver Springs (Boniol 2013, McGurk 2012). The movement of groundwater to the springs is a mix of conduit flow and matrix flow. However, comparing modeled results with dye tracer results, it was concluded that most of the groundwater movement in the two-year capture zone (closest to the spring) is probably by conduit flow. Conduit flow moves groundwater more quickly toward the spring than matrix flow; thus, distance from the spring is not a completely reliable indicator of the potential effect of a nitrate source on the spring's nitrate concentration.

Both Alachua and Marion Counties have prepared detailed aquifer vulnerability maps using local information (Marion County Aquifer Vulnerability Assessment [MCAVA] and Alachua County Aquifer Vulnerability Assessment). In Alachua County, the portion of the Silver Springs and Upper Silver River area, including Orange Lake, is classified as moderately vulnerable, while east of Orange Lake is classified as low vulnerability. In Marion County, the Silver Springs and Upper Silver River area west of Silver Springs and the western half of Lake Weir are a mix of the two highest vulnerability classes: most vulnerable and more vulnerable. East of Silver Springs is classified as less vulnerable to the south and vulnerable to the north of the springs. The Florida Aquifer Vulnerability Assessment (Arthur et al. 2005) is less detailed than MCAVA, but classifies the parts of Sumter County and Lake County in the BMAP area as more vulnerable.

The Rainbow Springs Group and Rainbow River area is classified by Marion County's MCAVA as either most vulnerable or more vulnerable. The most vulnerable area is in southwestern Marion County. The Florida Aquifer Vulnerability Assessment (Arthur et al. 2005) classifies the part of Levy County in the BMAP area as more vulnerable.

1.4.2 BMAP Boundary Delineation

The established BMAP boundary reflects both the approximate extent of the 1,000-year groundwater capture areas as modeled by SJRWMD and SWFWMD and potentiometric springshed delineations, but they are referenced to roads wherever possible to provide a readily

recognizable boundary tied to a permanent feature on the land surface. Springshed delineations are estimated based on the UFA's potentiometric surface, which can vary significantly from year to year because of climatic conditions such as rainfall and seasonality, and the density of measuring wells. For these reasons, the BMAP area does not coincide with any particular year's potentiometric surface, although variations in potentiometric surface were considered in its development.

The groundwater divide between Silver Springs and Rainbow Springs Group is not well defined **(Figure 2)**. Different authors have defined the extent of the Silver Springs Springshed west of I-75 (Phelps 2004) or farther north to include Lake Santa Fe or farther south almost to Lake Harris (Boniol 2013). A part of the contributing area for the Rainbow Springs Group Springshed delineated by SWFWMD extends across the Silver Springs contributing area into Alachua County (SWFWMD 2015, Jones 1996).

For this BMAP iteration, the two springsheds were combined into one BMAP boundary based on the following considerations:

- The two spring systems have a zone of interaction that influences the movement and direction of groundwater flow. There is no clear delineation between the two systems' groundwater contributing areas.
- Management policies implemented to address pollutant sources are largely the same for both spring systems. Two plans are not needed to implement most of these policies.
- Marion County has the largest land area within both BMAP areas: 60% of Silver Springs and 65% of Rainbow Springs. Alachua County and the City of Ocala spans both springshed areas. One BMAP provides for greater consistency in local jurisdiction planning and policy making.

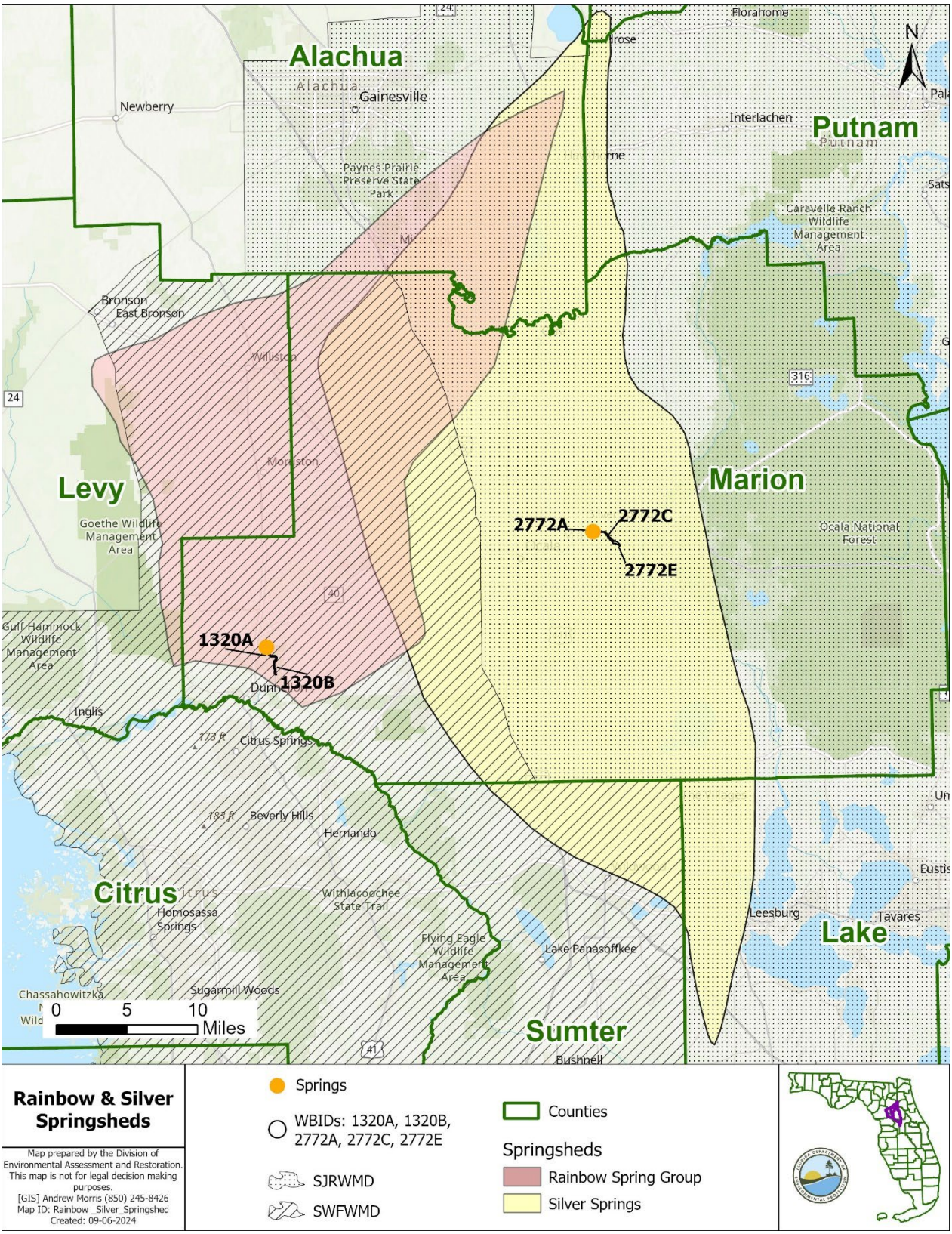

Figure 2. Silver Springs and Rainbow Springs Group springsheds

1.5 Priority Focus Area (PFA)

In compliance with the Florida Springs and Aquifer Protection Act, the 2018 BMAP delineated PFAs for the Silver Springs and Upper Silver River area and Rainbow Springs Group and Rainbow River area, defined as the areas of a basin where the Floridan aquifer is generally most vulnerable to pollutant inputs and where there is a known connectivity between groundwater pathways and an OFS. The PFAs provide a guide for focusing restoration strategies where science suggests these efforts will most benefit the springs.

The PFAs are incorporated by reference into this BMAP. The PFAs delineated for Silver Springs and Rainbow Spring Group are based on Marion County's identified Primary Protection Zones and supported by local ordinance. Consistency in the enactment of policy was a factor in DEP's consideration of basing PFA boundaries on existing county ordinance. Marion County's Spring Protection Resolution (05-R-106) was passed in 2005, and the county's Comprehensive Plan, Future Land Use Element, Objective 7.4, establishes the Springs Protection Overlay and identifies the extent of the primary and secondary zones, as well as design and development standards. Subsequent updates to the county Land Development Code incorporated these development standards. **Appendix D** includes additional documentation.

1.5.1 Description

The PFAs delineate the estimated modeled 10-year travel time to each spring system. Dye trace studies performed in the Silver Springs and Upper Silver River area confirm the movement of water to Silver Springs and Silver River in reasonably short times. The vulnerability of both PFAs is largely supported through the MCAVA.

The geographic information system (GIS) files associated with the PFA boundaries are available to the public on the DEP Map Direct webpage.

1.5.2 Additional Requirements

In accordance with section 373.811, F.S., the following activities are prohibited in the BMAP boundary:

- New domestic wastewater disposal facilities, including rapid infiltration basins (RIBs), with permitted capacities of 100,000 gpd or more, except for those facilities that meet an advanced waste treatment (AWT) standard of no more than 3 mg/L TN on an annual permitted basis.

- New OSTDS (or septic systems) on lots one acre or less inside the BMAP where central sewer is available. If central sewer is unavailable, then the owner must install a DEP-approved enhanced nutrient-reducing OSTDS that achieves at least 65% nitrogen reduction, or other wastewater system that achieves at least 65% reduction.

- New facilities for the disposal of hazardous waste.

- The land application of Class A or Class B domestic wastewater biosolids not in accordance with a DEP-approved NMP establishing the rate at which all biosolids, soil amendments, and sources of nutrients at the land application site can be applied to the land for crop production, while minimizing the amount of pollutants and nutrients discharged to groundwater or waters of the state.

- New agricultural operations that do not implement BMPs, measures necessary to achieve pollution reduction levels established by DEP, or groundwater monitoring plans approved by a WMD or DEP.

1.5.3 Biosolids and Septage Application Practices

The aquifer contributing to the springs is highly vulnerable to nitrogen sources and where soils have a high to moderate tendency to leach applied nitrogen. DEP previously documented elevated nitrate concentrations in groundwater beneath septage application zones in contributing areas to springs. Within BMAP areas for OFS, section 373.811, F.S. prohibits the land application of Class A or Class B domestic wastewater biosolids not in accordance with a department approved NMP establishing the rate at which all biosolids, soil amendments, and sources of nutrients at the land application site can be applied to the land for crop production while minimizing the amount of pollutants and nutrients discharges to groundwater or waters of the state. Further, there are additional requirements for biosolid and septage application practices under Chapter 62-640 F.A.C.

1.6 Other Scientific and Historical Information

In preparing this BMAP, DEP collected and evaluated credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and springs systems. Some of the information collected is specific to the Silver and Rainbow Basin, while other references provide information on related knowledge for restoring springs, such as nitrogen-reducing technologies, the treatment performance of OSTDS, and runoff following fertilizer applications.

1.7 Stakeholder Involvement

Stakeholder involvement is critical to develop, gain support for, and secure commitments in a BMAP. In the context of the BMAP, there are different organizations named in the plan.

- **R*esponsible entities*** are those organizations who are assigned load reductions and must comply with the BMAP provisions; these organizations are sometimes referred to as "***Lead Entities***."
- ***Responsible agencies*** may be accountable for reducing loads from their own activities or have an important public sector role in BMAP implementation such as regulatory oversight, monitoring, research, or other related duties.
- ***Interested stakeholders*** are those organizations that have engaged with BMAP development and implementation with the intention to influence the implementation process and outcomes.
- ***Stakeholders*** is a more general term often used in the BMAP context to include all three of the previously mentioned organizations—responsible entities, responsible agencies, and interested stakeholders.

The BMAP process engages responsible entities, responsible agencies, and interested stakeholders and promotes coordination and collaboration to address the pollutant load reductions necessary to achieve the TMDLs. DEP invited stakeholders to participate in the BMAP development process and encouraged public participation and consensus to the greatest practicable extent. **Table ES-1** identifies the stakeholders who participated in the development of this BMAP.

During the development and update of the Silver and Rainbow BMAP, DEP held a series of meetings involving stakeholders and the public. The purpose of these meetings was to consult with stakeholders to gather information, evaluate the best available science, define management strategies and milestones, update the NSILT, develop entity required reductions, and update monitoring requirements. Public meetings were held virtually in January 2024 and May 2024. An in-person meeting was held on October 30, 2024, in Ocala, Florida. All meetings were open to the public and noticed in the *Florida Administrative Register* (F.A.R.). Additionally, a final public meeting was held on April 11, 2025, that was noticed in the F.A.R. and in local newspapers.

In addition to public meetings, DEP held over 20 one-on-one meetings with the responsible stakeholders for this BMAP. Throughout the process, DEP made themselves available to answer stakeholder questions.

Upon BMAP adoption, DEP intends to facilitate annual meetings with stakeholders to review progress towards meeting entity required reductions identified for the milestones that are needed to achieve the TMDL.

1.8 Description of BMPs Adopted by Rule

Table 2 identifies the FDACS adopted agricultural BMPs and BMP manuals relevant to this BMAP, along with environmental resource permitting requirements for certain land use activities.

Table 2. BMPs and BMP manuals adopted by rule as of July 2025

Agency	F.A.C. Chapter	Chapter Title
FDACS Office of Agricultural Water Policy (OAWP)	5M-1	Office of Agricultural Water Policy
FDACS OAWP	5M-6	Florida Nursery Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-8	Florida Vegetable and Agronomic Crop (VAC) Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-9	Florida Sod Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-11	Florida Cattle Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-12	Conservation Plans for Specified Agricultural Operations
FDACS OAWP	5M-13	Florida Specialty Fruit and Nut Crop Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-14	Florida Equine Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-16	Florida Citrus Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-17	Florida Dairy Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-18	Florida Agriculture Wildlife Best Management Practices
FDACS OAWP	5M-19	Florida Poultry Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS OAWP	5M-21	Florida Small Farms and Specialty Livestock Operations, 2024 Edition: Water Quality and Water Quantity Best Management Practices
FDACS Division of Agricultural Environmental Services	5E-1	Fertilizer
FDACS Division of Aquaculture	5L-3	Aquaculture Best Management Practices, 2023 Edition
FDACS Florida Forest Service	5I-6	Best Management Practices for Silviculture, 2008 Edition
FDACS Florida Forest Service	5I-8	Florida Forestry Wildlife Best Management Practices for State Imperiled Species
DEP	62-330	Environmental Resource Permitting

Additionally in 2024, the Florida Legislature ratified changes to the Statewide Stormwater Rule related to the minimum treatment requirements for Environmental Resource Permits for urban stormwater. The treatment requirements for nitrogen and phosphorus were increased to reduce the nutrient loading of future urban development and other structural changes to assist with water quality restoration in impaired waters.

Section 2: Implementation to Achieve TMDLs

2.1 Allocation of Pollutant Loads

2.1.1 Nutrients in the Springs and Spring Systems

DEP developed the NSILT to provide information on the estimated nitrogen loading from major sources to groundwater in the spring contributing area for the OFS (**Table 3**). The NSILT was updated in 2023 with more current data and some methodology improvements and revised in 2024 based on stakeholder feedback. The NSILT is a GIS- and spreadsheet-based tool that provides spatial estimates of the relative contribution of nitrogen from major nitrogen sources to groundwater and accounts for the transport pathways and processes affecting the various forms of nitrogen as they move from the land surface through the soil and geologic strata to groundwater.

The first major factor to be considered in estimating the loading to groundwater in the NSILT is the attenuation of nitrogen as it moves from its source through the environment, before it reaches the Upper Floridan aquifer (UFA). Biological and chemical processes that occur as part of the nitrogen cycle, as well as hydrogeological processes, control the movement of nitrogen from the land surface to groundwater. Many of these processes attenuate (impede or remove) the amount of nitrogen transported to groundwater. An understanding of how water moves through the subsurface and the processes that transform the different forms of nitrogen is essential for estimating nitrogen loading to groundwater from various sources.

A second major factor to consider in estimating the loading to groundwater is the geologic features in the springshed and the related "recharge rate." Water movement between the shallow groundwater (surficial aquifer, where present) and the deeper aquifer (UFA) is slowed by a low permeability layer of clay, silt and fine sand that retards the vertical movement of infiltrating water from the surface. The UFA is in limestone that can be prone to dissolving and, over geologic time, develop numerous karst features (sinkholes, caves and conduits). These features allow water to move directly and relatively rapidly from the land surface into the aquifer, and in some areas, the groundwater in the aquifer then moves rapidly to the springs.

Potential recharge rates from the surface to the UFA are affected by variations in geologic materials and the presence of karst features. DEP estimated three recharge rate categories, which were applied to the NSILT.

Silver Springs and Upper Silver River area:

- Low recharge (Less than 4 inches per year [in/yr]).
- Medium recharge (4 to 12 in/yr).
- High recharge (greater than 12 in/yr).

Rainbow Springs Group and Rainbow River area:

- Low recharge (Less than 4 in/yr).
- Medium recharge (4 to 10 in/yr).
- High recharge (greater than 10 in/yr).

In addition to the low-, medium-, and high-recharge categories for Silver Springs, there are areas located near Lochloosa Lake and Marshall Swamp where water is discharged from the UFA. Discharge areas were not included in the NSILT. There are no low recharge or discharge areas in the Rainbow Springs Group and Rainbow River area.

In the NSILT, DEP applied different attenuation factors to different types of sources to estimate the various biological, chemical and hydrogeological effects. Attenuation is the process where the nitrogen source is removed or stored by chemical and biological processes before it reaches the groundwater. In the NSILT estimates, the attenuation rates ranged from 90% (for atmospheric deposition) to 25% (for wastewater disposal in a RIB). This means that, for these examples, only 10% of nitrogen from atmospheric deposition is expected to reach the aquifer, while 75% of nitrogen from a RIB is expected to reach groundwater, because the remainder is attenuated by various chemical and biological processes.

Phosphorus is naturally abundant in the geologic material underlying much of Florida and is often present in high concentrations in surface water and groundwater. Monitoring and evaluation of phosphorus and other chemical and biological influences on the springs continues as the nitrate-nitrite TMDLs are implemented.

Table 3. Estimated total nitrogen load to groundwater by source in the Silver and Rainbow BMAP area

Nitrogen Source	Total Nitrogen Load to Groundwater in Pounds of Total Nitrogen Per Year (lbs/yr)	% Contribution
OSTDS	1,265,209	32%
UTF	778,537	20%
Atmospheric Deposition	336,807	9%
STF	164,784	4%
LW	921,420	23%
FF	348,742	9%
Biosolids	41,561	1%
WWTFs	81,898	2%
Total	**3,938,958**	**100%**

2.1.2 Assumptions and Considerations

The NSILT estimates are based on the following assumptions and considerations:

- **NSILT Nitrogen Inputs** – The methods used to estimate nitrogen inputs for each pollutant source were based on a detailed synthesis of information, including direct water quality measurements, census data, surveys following University of Florida-Institute of Food and Agricultural Sciences (UF-IFAS) trainings, WWTF permits, published scientific studies and reports, and information obtained in meetings with agricultural producers, WMDs and FDACS. For some pollutant source categories, nitrogen inputs were obtained using assumptions and extrapolations and, as a result, these inputs may be further refined if more detailed information becomes available. More details on the NSILT methodology and assumptions are in the NSILT Technical Support Document in **Appendix F**.

- **OSTDS Inventory and Load Contribution** – A per capita contribution to an OSTDS of 10 lbs-N/year was used to calculate the loading from OSTDS. The average household contribution was estimated based on 2020 U.S. Census Bureau Data on the average number of people per household by county (2.48 for Alachua County, 2.56 for Lake County, 2.39 for Levy County, 2.4 for Marion County, 2.43 for Putnam County, and 2.04 for Sumter County).

  The total number of OSTDS in the basin is estimated based on the Florida Water Management Inventory (FLWMI) data. OSTDS loading calculations in future BMAPs may be adjusted based on improved information on the number, location and type (conventional and enhanced nutrient-reducing) of existing septic systems, and will include updates on additional OSTDS installed in the area since the previous BMAP adoption.

  Note that all values listed in this report are rounded, while the actual calculations were completed using whole numbers.

Other assumptions and considerations for BMAP implementation include the following:

- **Unquantified Project Benefits** – Nitrogen reductions for some of the projects and activities listed in this BMAP cannot currently be quantified. However, these projects are included because of their assumed positive impact to reduce pollutant loads, and estimated loading reductions may be determined at a later date.

- **Atmospheric Deposition** – Atmospheric sources of nitrogen are local, national and international. Local sources include the petroleum-fueled combustion engines of cars and trucks as well as fertilizers used for agricultural and residential uses. Other local or regional sources may include power plants and industrial facilities. Atmospheric sources have generally low nitrogen concentrations compared with other sources and are further reduced through additional biological and chemical processes before they reach groundwater. Himes and Dawson (2017) indicates that emissions of nitrogen have been generally decreasing in Florida with an up to 55% decrease in emissions estimated by 2028, possibly related to power plant fuel source changes and air treatment upgrades as well as the increased use of

electric vehicles, decreasing mobile sources (Himes and Dawson, 2017) and increased use of solar energy. This gradual decrease in atmospheric emission of nitrogen will likely assist with creating the necessary reductions for this source. However, atmospheric deposition is a nitrogen source and is, therefore, estimated as a loading factor to the springs. As other sources are addressed and decreased, the relative percentage contribution of atmospheric sources is expected to increase. For this BMAP, atmospheric deposition sources and trends will be re-evaluated periodically. The regulatory programs that limit atmospheric sources are primarily national or international, which limits how this BMAP can regulate these sources.

- **PFA** – The PFAs provide a guide for focusing strategies where science suggests efforts will best benefit the springs. The PFA boundaries may be adjusted in the future if additional relevant information becomes available.

- **Project Collection Period –** The BMAP project collection period is limited to projects after a certain date, based on the data used to calculate the reductions needed. Reductions from older projects are accounted for in the updated baseline loading. The timing eligibility for projects is dependent on the data used to estimate the NSILT loads, which also depend on the source type. The following project cutoff dates apply in this BMAP document, which are based on the data used in the most recent NSILT update.

    - Urban and agricultural stormwater projects: Projects completed in the BMAP, on or after January 1, 2003.

    - WWTF Improvements: Projects completed on or after January 1, 2022, or later. Prior projects were included in the NSILT estimates.

    - OSTDS Enhancements/50% Treatment or OSTDS Connection to Sewer: Projects completed on or after January 1 of the years listed below, based on the county in which the project is located and the FLWMI data year used in the 2023 NSILT update.

        - Alachua County: 2023
        - Lake County: 2022.
        - Levy County: 2022.
        - Marion Couty: 2022.
        - Putnam County: 2022.
        - Sumter County: 2023.

- **WWTFs** – Allocations for WWTFs were determined by applying effluent limits to each WWTF. This approach allows WWTFs to assume additional flows as OSTDS are phased out

and still meet their allocation. It also acknowledges those facilities that already meet a high level of treatment. With this concentration-based approach, the total percent reduction assigned to the WWTFs will be different than the percentage applied to other sources.

- **Legacy Sources** – Land uses, activities or management practices not currently active in the basin may still be affecting the nitrate concentration of the springs. The movement of water from the land surface through the soil column to the UFA and through the UFA to the spring system varies both spatially and temporally and is influenced by local soil and aquifer conditions. As a result, there may be a time lag between when nitrogen input to the UFA occurs and, ultimately, when that nitrogen arrives at the impaired springs. The timing of this delay is not fully known.

- **Milestones –** Assessment of progress toward the milestones must be conducted every five years and revisions to the plan must be made as appropriate. BMAPs use an adaptive management approach that allows for incremental load reductions through the implementation of projects and management strategies; however, the restoration target, or TMDL, remains the same.

- **Implementation Schedule** – Nutrient load reduction in BMAP implementation is intended to occur over 20 years. To meet the TMDLs within this timeframe, this plan defines nitrogen reduction milestones for 2028 (30%), 2033 (+50%) and 2038 (+20%) implementation (see **Section 2.1.5** for further details). Further, the total reductions and the project credits may be adjusted under the adaptive management approach used for the BMAP. This approach requires regular follow-up to ensure management strategies are carried out and their incremental effects are assessed. The process acknowledges that there is some uncertainty associated with the outcomes of proposed management strategies and the estimated response in nitrogen concentration at the springs. As more information is gathered and progress towards each milestone is reviewed, additional management strategies may be developed or existing strategies refined to better address the sources of nitrogen loading to achieve the TMDLs.

- **Changes in Spring Flows** – The role of this BMAP is specifically to address the implementation of projects that reduce nitrogen load to groundwater, while the minimum flows and levels (MFLs) established for specific springs address water flows and levels. To maximize efforts between the two programs, it is recommended that when practicable, springs protection projects provide both water quality and quantity benefits.

2.1.3 Loading by Source

Based on the updated NSILT results, **Figure 3** depicts the estimated percentage of nitrogen loading to groundwater by source in the Silver and Rainbow BMAP area. For example, UTF represents 20% of the total nitrogen loading to groundwater, OSTDS loads are 32%, and STF loads are 4%. Stormwater loading to groundwater is incorporated into the various source categories.

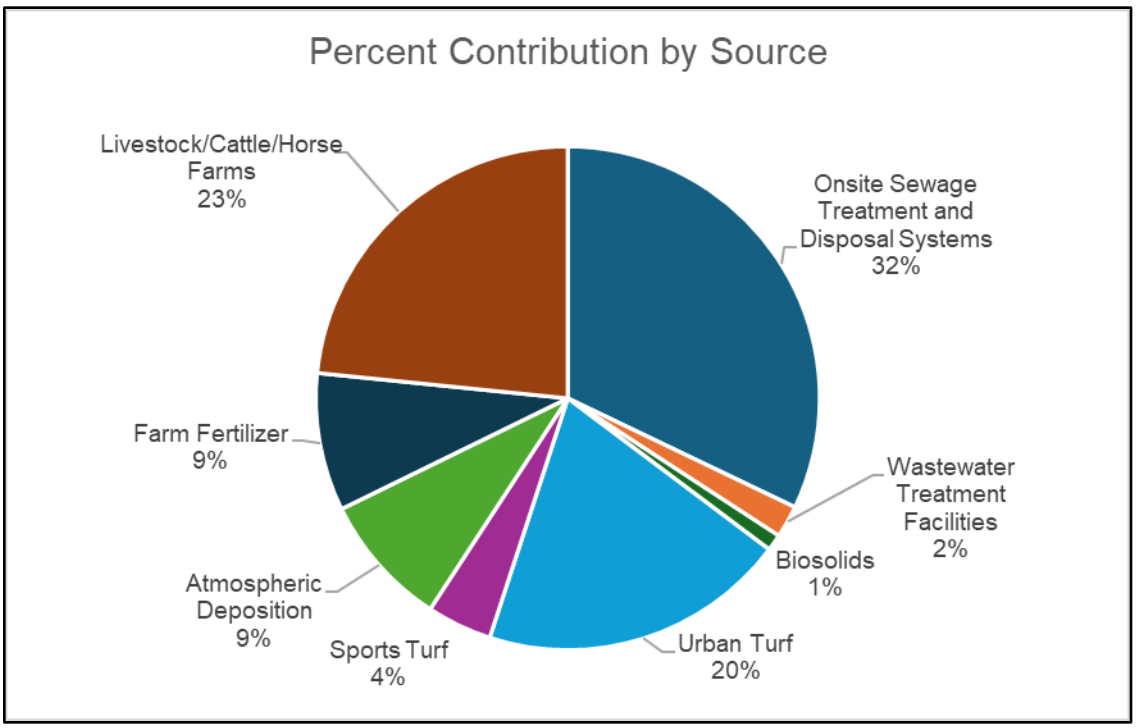

Figure 3. Loading to groundwater by source in the Silver and Rainbow BMAP area

2.1.4 Loading Allocation

The nitrogen source reductions are based on the estimated current nitrogen loading to groundwater in the NSILT, the measured nitrate concentrations and flows at the vents, and the TMDL target nitrate concentration. **Table 4** lists the measured nitrate (as nitrogen) loads at the spring vents compared with the TMDL nitrate target concentrations of 0.35 mg/L. The difference between the spring vent loading and the TMDL loading target is the required percent reduction to meet the TMDLs. The total required load reduction is allocated to sources and to entities based on existing loads.

Table 4. Total reduction required to meet the TMDL

Description	Nitrogen Loads (lbs/yr)	Notes Regarding Data Used
Total Load at Spring Vent	4,313,434	Upper 95% confidence interval - nitrate and flow data from 2012 to 2022
TMDL Load	872,682	TMDL target is 0.35 mg/L and using the same flow data and proportions
Percent Reduction	80%	Calculated reduction needed based on the total load at the spring vent and the TMDL load
NSILT Load	3,938,958	Total load to groundwater from the updated NSILT

Description	Nitrogen Loads (lbs/yr)	Notes Regarding Data Used
Required Reduction	**3,142,039**	**Percent reduction multiplied by the NSILT load**

In this BMAP, the total load at the spring vent is larger than the NSILT estimated load to groundwater. In most of the springs BMAPs, the NSILT estimated load is larger. In evaluating the baseline for establishing reductions in this BMAP, it was determined that use of the NSILT loading was appropriate and protective. The discrepancy between spring vent and NSILT loading is believed to be primarily the result of the generalized attenuation and recharge rates used in the NSILT. From a practical perspective, uncertainty due to generalized attenuation and recharge rates does not lessen the required real-world reductions. The same attenuation and recharge factors used in NSILT computations are also applied to BMAP project credits. By applying these factors to both sides of the ledger, uncertainty in the recharge and attenuation rates is inherently offset.

Prior to the next BMAP update, DEP will examine the need to further refine the methodology for estimating nitrogen loads, including recharge and attenuation rates, and will evaluate the impact that a refined load estimate would have on implementation in future iterations of the BMAP.

2.1.5 Description of 2028, 2033, and 2038 Milestones/Reduction Schedule

In 2023, section 403.067, F.S., was amended to require that TMDL implementation be addressed through milestones that include a list of projects that will achieve the pollutant load reductions to meet the TMDLs or the load allocations established pursuant to subsection 403.067(6), F.S. Each project must include a planning-level cost estimate and an estimated completion date. Any responsible entity within the BMAP that has a pollutant load reduction requirement must identify projects or strategies to undertake to meet the current 5-year pollution reduction milestone. The overall load reduction targets are 30% of the total by 2028, 80% of the total by 2033, and 100% of the total by 2038. DEP will evaluate progress towards these milestones and will report implementation progress and project information to the Governor and Florida Legislature annually through the statewide annual report. DEP will adjust management strategies if needed to reduce loading to the aquifer to ensure the target concentrations at the spring vents are achieved. This may include expanding the area to which the OSTDS remediation policies apply, requiring additional projects or management strategies, or developing other nutrient reduction policies. Any changes would be incorporated into a future BMAP update through a formal adoption process.

Table 5 lists the estimated nitrogen reduction schedule by milestone. Progress will be tracked yearly and adjustments made as needed. At the 2028 milestone, progress will be assessed and load reductions adjusted as necessary. Entities have flexibility in the types and locations of projects as long as they achieve their required load reductions. Consideration may be given to entities with projects that are planned or underway that will be completed in a future milestone phase to allow adequate time for projects to be fully implemented. **Section 2.2** describes detailed source reduction strategies.

Table 5. Nitrogen reduction schedule (lbs/yr)

2028 Milestone (30% of Total)	2033 Milestone (+50% of Total)	2038 Milestone (+20% of Total)	Total Nitrogen Reduction (100%)
942,612	1,571,020	628,408	3,142,039

2.2 Load Reduction Strategy

A precise total load reduction to groundwater needed to meet the TMDLs is dependent on a number of complex factors and may be refined if additional information becomes available. Based on current information, there must be a reduction of at least 3,142,039 lbs/yr TN by 2038. However, due to the distance of some reductions in relation to the spring vents and the uncertainties of fate and transport in the karst geology, additional studies, projects or management strategies may be necessary to ensure that loading at the spring vents is reduced to achieve the TMDL targets within the timeline of the BMAP.

To increase our understanding of the relationship between project reductions and changes in concentrations at the spring vents, as well as the time lag of water movement within the springsheds to the springs, water quality monitoring of existing groundwater within the BMAP and at the spring vents is essential.

2.3 Entity Allocations

The results from the NSILT and spring vent load analysis were used to calculate the nitrogen loads associated with each responsible stakeholder. **Table 6** summarizes the total required reductions assigned to each entity. Regional projects are state-sponsored management actions that treat nutrient loading from one or many urban sources. Agriculture in **Table 6**, **Table 7** and **Table 8** includes loading from FF, LW, and biosolids applications. A list of private golf courses with allocations can be found in **Appendix I**. A list of WWTFs can be found in **Appendix J**.

Table 6. Total required reductions by entity

**Total excludes reductions of atmospheric deposition.*

Entity	Total Assigned Reductions by Entity (lbs/yr)
Alachua County	16,004
City of Hawthorne	2,153
Town of Micanopy	2,706
Lake County	52,495
City of Fruitland Park	22,843
Town of Lady Lake	18,279
City of Leesburg	1,381
Levy County	80,825
Town of Bronson	3,474

Entity	Total Assigned Reductions by Entity (lbs/yr)
City of Williston	18,598
Marion County	1,203,915
City of Bellview	7,674
Town of McIntosh	3,848
City of Ocala	105,931
Town of Reddick	3,851
The Villages	66,440
City of Dunnellon	4,891
Putnam County	21,435
Sumter County	28,518
City of Wildwood	7,464
State of Florida (Fire Marshal and State Parks)	83
Agriculture	1,025,851
Private WWTFs	24,161
Golf Courses	107,016
Regional Projects	43,539
Total	**2,873,374***

Table 7 includes the 5-year milestone required reductions for each entity. **Table 8** compares the current list of planned, underway, ongoing, and completed projects compared to the first 5-year milestone. Reductions are based on projects completed through October 2024. This date was chosen to allow adequate time to review project documentation and calculate reductions based on accepted methodologies and best management practice (BMP) efficiencies. Updated project information will be provided each year in the Statewide Annual Report and at annual meetings. The management actions provided by responsible stakeholders to achieve these reductions are described in **Appendix B**.

Responsible entities must submit a sufficient list of creditable projects with estimated reductions which demonstrates how the entity is going to meet their milestone to DEP no later than January 14, 2026, to be compliant with the upcoming BMAP milestone or be subject to department enforcement.

If any lead entity is unable to submit a sufficient list of eligible management strategies to meet their next 5-year milestone reductions, specific project identification efforts are required to be submitted by January 14, 2026. Any such project identification efforts must define the purpose of and include a timeline to identify sufficient projects to meet the upcoming milestone. The project description and estimated completion date for any such project identification effort must be provided and reflect the urgency of defining, funding, and implementing projects to meet the

upcoming and future BMAP milestones. These planning efforts are ineligible for BMAP credit themselves but are necessary to demonstrate that additional eligible management actions will be forthcoming and BMAP compliance will be achieved. Examples of project identification efforts are included in **Appendix C**. Only those entities that provide sufficient project identification efforts will be deemed as possessing a defined compliance schedule. Those entities without an adequate project list nor a defined compliance schedule to meet their upcoming 5-year milestone may be subject to enforcement actions.

Table 7. 5-year milestone required reductions by entity

Entity	2028 Milestone/ 30% Reduction TN (lbs/yr)	2033 Milestone/ 80% Reduction TN (lbs/yr)	2038 Milestone/ 100% Reduction TN (lbs/yr)
Alachua County	4,801	12,803	16,004
City of Hawthorne	646	1,723	2,153
Town of Micanopy	812	2,165	2,706
Lake County	15,748	41,996	52,495
City of Fruitland Park	6,853	18,274	22,843
Town of Lady Lake	5,484	14,623	18,279
City of Leesburg	414	1,105	1,381
Levy County	24,247	64,660	80,825
Town of Bronson	1,042	2,779	3,474
City of Williston	5,579	14,879	18,598
Marion County	361,174	963,132	1,203,915
City of Bellview	2,302	6,139	7,674
Town of McIntosh	1,154	3,078	3,848
City of Ocala	31,779	84,745	105,931
Town of Reddick	1,155	3,081	3,851
The Villages	19,932	53,152	66,440
City of Dunnellon	1,467	3,913	4,891
Putnam County	6,430	17,148	21,435
Sumter County	8,555	22,814	28,518
City of Wildwood	2,239	5,971	7,464
State of Florida (Fire Marshal and State Parks)	25	66	83
Agriculture	307,755	820,681	1,025,851
Private WWTFs	7,248	19,329	24,161
Golf Courses	32,105	85,613	107,016
Regional Projects	13,062	34,831	43,539
Total	**862,012**	**2,298,699**	**2,873,374**

Table 8. Progress towards next 5-year milestone by entity

** Planned and underway project reduction estimates are not verified by DEP.*

*** Projected reductions include projects with a project status of completed, ongoing, planned, and underway.*

[+]These reductions are a combination of projects completed by FDACS and the WMDs.

Entity	2028 Milestone Assigned Reductions (30%)(lbs/yr)	TN Reductions from Completed & Ongoing Projects (lbs/yr)	TN Reductions from Planned & Underway Projects* (Not Verified) (lbs/yr)	Total Projected** Project TN Reductions by Entity Through 2028 (lbs/yr)	TN Reduction Needed to Achieve 30% Milestone (2028) (lbs/yr)
Alachua County	4,801	164	0	164	4,637
City of Hawthorne	646	26	774	800	0
Town of Micanopy	812	26	0	26	786
Lake County	15,748	1,128	0	1,128	14,620
City of Fruitland Park	6,853	620	0	620	6,233
Town of Lady Lake	5,484	372	0	372	5,112
City of Leesburg	414	0	0	0	414
Levy County	24,247	0	0	0	24,247
Town of Bronson	1,042	0	2,861	2,861	0
City of Williston	5,579	0	714	714	4,865
Marion County	361,174	31,801	10,981	42,782	318,392
City of Bellview	2,302	233	0	233	2,069
Town of McIntosh	1,154	50	0	50	1,104
City of Ocala	31,779	14,559	1,596	16,155	15,624
Town of Reddick	1,155	35	0	35	1,120
The Villages	19,932	3,356	0	3,356	16,576
City of Dunnellon	1,467	202	0	202	1,265
Putnam County	6,430	378	0	378	6,052
Sumter County	8,555	676	0	676	7,879
City of Wildwood	2,239	364	0	364	1,875
State of Florida (Fire Marshal and State Parks)	25	0	0	0	25
Agriculture[+]	307,755	124,399	39	124,438	183,317
Private WWTFs	7,248	0	18,497	18,497	0
Golf Courses	32,105	0	0	0	32,105
Regional Projects	13,062	10,573	7	10,580	2,482
Total	**862,012**	**188,962**	**35,469**	**224,431**	**-**

2.4 Prioritization of Management Strategies

Required under Chapter 373.807, F.S., management strategies listed in **Appendix B** are ranked

with a priority of high, medium, or low. To help prioritize projects towards the next milestone as required under 403.067, F.S., planning-level details for each listed project, along with their priority ranking have been determined.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on if the project is going towards the next 5-year milestone, as well as need for funding. Overall, any project that is needed by a responsible entity to meet their next reduction milestone is considered a priority. Projects classified as "underway" were assigned a high or medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" that are needed to meet the next milestone, as well as certain "completed" projects that are designated as "ongoing" each year, and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

2.5 OSTDS Management Strategies

2.5.1 Management of New OSTDS Loads

As of July 1, 2023, sections 373.811 and 403.067, F.S., prohibited the installation of new conventional OSTDS serving a lot of one acre or less where central sewer is available. Within the BMAP area, if central sewer is unavailable on any lot size, then the owner must install a DEP-approved enhanced nutrient-reducing OSTDS that achieves at least 65% nitrogen reduction, or other wastewater system that achieves at least 65% reduction. The OSTDS remediation plan pursuant to section 373.807, F.S., (**Appendix E**) was updated in this BMAP iteration to include this additional requirement for new systems.

2.5.2 Existing OSTDS Remediation

Existing OSTDS on all lot sizes must receive additional nitrogen treatment. This BMAP contains remediation plans for OSTDS consisting of management actions, including those described in **Appendix B** and updated annually through the statewide reporting process that reduce loads from existing OSTDS through either sewer connection, adding enhancement nitrogen treatment to OSTDS, or installing another type of wastewater system on the property, as applicable.

If DEP receives a complete construction permit application for an authorization under Chapter 62-6, F.A.C., related to an existing OSTDS and enhanced nutrient reducing technology is required for existing OSTDS through this BMAP, then the existing OSTDS must be replaced with or upgraded to enhanced nutrient-reducing OSTDS as defined in subsection 381.0065(2)(f), F.S., or other wastewater system that achieves at least 65% nitrogen reduction, unless connection to central sewer is required pursuant to 381.00655, F.S.

Enhanced OSTDS can achieve an estimated 50% improvement in the load to groundwater compared to a conventional system. OSTDS replaced by sewer reduces the conventional nitrogen inputs by an estimated 95%, assuming a sewer connection to a WWTF meeting AWT levels. For projects addressing OSTDS loads, load reductions are estimated based on average nitrogen loads per person and the U.S. Census information on the county's average number of persons per

household. The OSTDS location determines the applicable county. The improvement to groundwater is calculated by applying an attenuation rate as well as a location-based recharge factor, which estimates how likely the improved loading will travel into the deep groundwater system. For more information about how OSTDS loads were estimated, see the NSILT Technical Support Document in **Appendix F**.

2.5.2.1 Section 373.807, F.S.

Subsection 373.807(3), F.S., specifies that if, during the development of a BMAP for an Outstanding Florida Spring (OFS), DEP identifies OSTDS as contributors of at least 20% of nonpoint source nitrogen pollution in a PFA, or if DEP determines OSTDS remediation is necessary to achieve the TMDL, the BMAP must include an OSTDS remediation plan. The OSTDS remediation plan requires policies for new and existing OSTDS to provide load reductions consistent with achieving the TMDL within 20 years of plan adoption (subparagraph 373.807(1)(b)8., F.S.).

DEP assessed the overall OSTDS loading compared to other nitrogen sources in the BMAP area. Based on these assessments, DEP has determined that OSTDS contribute more than 20% of nonpoint source nitrogen pollution to the OFS. Based on the Silver and Rainbow NSILT update, OSTDS contribute 32% pollutant loading in the springshed areas (1,265,209 lbs/yr). Cumulatively, nitrogen loading from OSTDS within the springsheds results in degradation of groundwater that impacts the Silver and Rainbow BMAP area. Therefore, the comprehensive remediation of OSTDS, consistent with the requirements of this BMAP, is necessary to restore associated groundwater and surface to achieve the TMDLs and to minimize nitrogen loads from future growth. Existing OSTDS on all lot sizes must receive additional nitrogen treatment. The OSTDS remediation plan pursuant to section 373.807, F.S., is incorporated as **Appendix E**.

Based on FLWMI data (2023), there are approximately 28,188 known and likely OSTDS in the Silver PFA, 3,724 known and likely OSTDS in the Rainbow PFA, and approximately 103,960 known and likely OSTDS in the BMAP (**Figure 4**). **Table E-1** in **Appendix E** summarizes the estimated count of OSTDS throughout the basin. **Figure E-1** shows the locations of all OSTDS in the BMAP area based on FLWMI; however, local governments or utilities may have more current information about OSTDS locations in their jurisdiction.

This remediation plan (**Appendix E**) establishes the policy applicable to all existing OSTDS within the BMAP on lots of all sizes, based on (a) potential for reducing nitrogen loads by converting existing OSTDS to enhanced nitrogen removing systems or other wastewater systems achieving at least 65% nitrogen reduction, or by connecting existing OSTDS to central sewer; (b) total nitrogen load that must be reduced to achieve the TMDLs; and (c) relative contribution of nitrogen load from existing OSTDS. Upon the need for a repair (major or minor) or a replacement OSTDS permit, an existing OSTDS must be upgraded to an enhanced nutrient-reducing OSTDS or other wastewater treatment system that achieves at least 65% nitrogen reduction. Repairs that qualify as new OSTDS permits will follow the requirements for new OSTDS as described above.

2.5.2.2 Subsection 403.067(7)(a)9., F.S

Subparagraph 403.067(7)(a)9., F.S., also requires local governments within a BMAP to develop an OSTDS remediation plan that is adopted as part of the BMAP no later than July 1, 2025, if DEP identifies OSTDS as contributors of at least 20% of point source or nonpoint source nutrient pollution or if DEP determines remediation is necessary to achieve the TMDLs. When applicable, the OSTDS remediation plans must be developed by each local government in cooperation with DEP, WMDs, and public and private domestic wastewater facilities. Each OSTDS remediation plan for this BMAP must contain the information outlined in DEP Final Order 23-0131.

This BMAP contains a remediation plan for OSTDS consisting of management actions, including those described in **Appendix B** and updated annually through the statewide reporting process that reduce loads from existing OSTDS through either sewer connection, adding enhancement nitrogen treatment to OSTDS, or installing another type of wastewater system on the property, as applicable. Local governments are required to submit projects describing how OSTDS loads are addressed as part of BMAP reporting and estimate the load reductions associated with each project. The estimated reductions to the springs from addressing these septic systems will be based on several factors, including how they are addressed (i.e., connection to sewer or enhancement) and the amount of attenuation and recharge that occurs. The OSTDS remediation plans are incorporated into this BMAP through the related management actions listed in this Section as well as those in **Appendix B**. Copies will be made available upon request subject to any public records requirements.

2.5.2.3 Local Government Ordinances

Local governments may have existing ordinances or could adopt new ordinances that add additional requirements for enhancement of OSTDS. To expedite remediation of wastewater sources and to facilitate achievement of assigned milestones in this BMAP, DEP encourages local governments to adopt such ordinances.

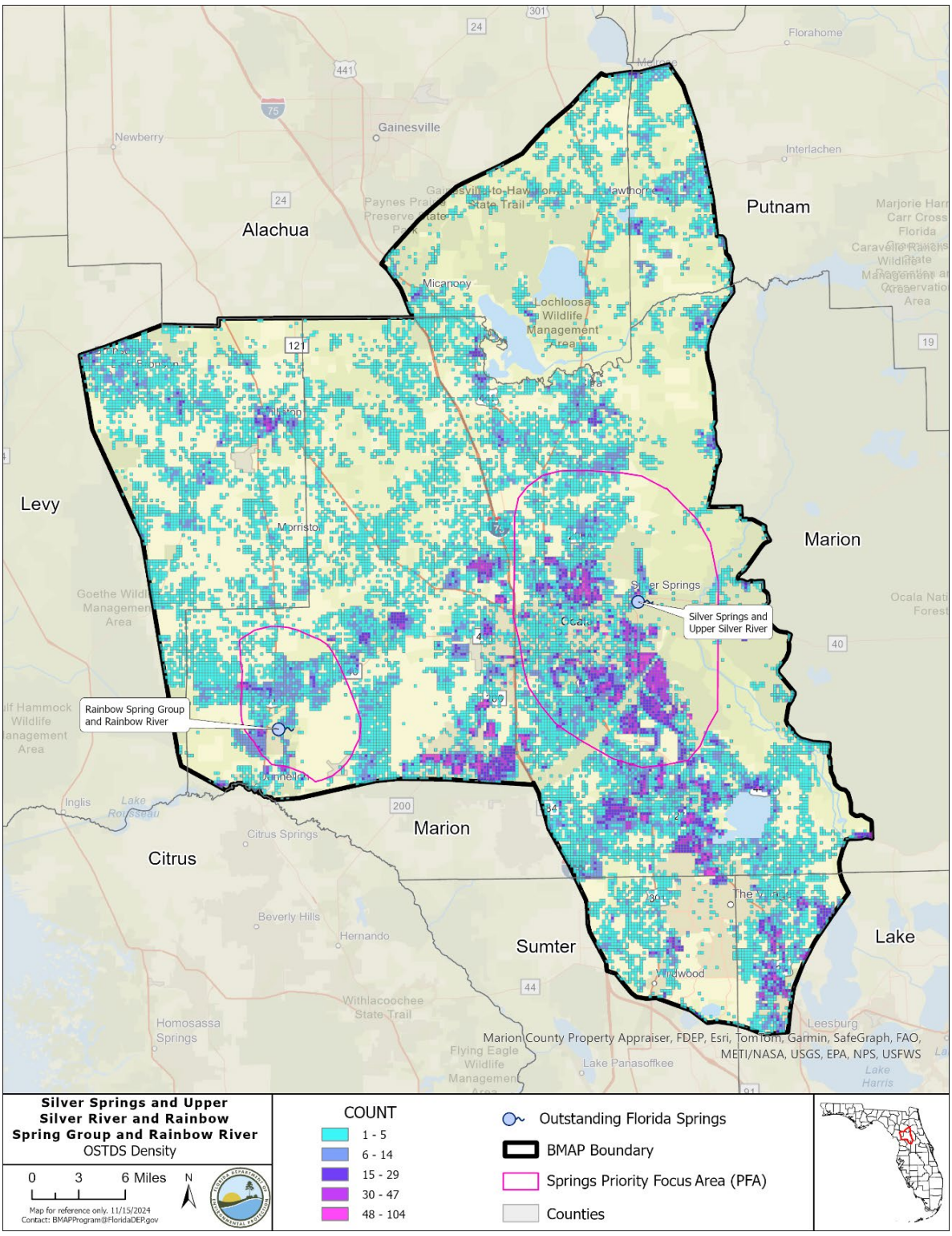

Figure 4. Estimated OSTDS location density in the Silver and Rainbow BMAP area and PFAs

2.6 WWTF Management Strategies

2.6.1 Facility Improvements and Effluent Limits

There are many WWTFs located in the Silver and Rainbow BMAP area, including 22 domestic WWTFs permitted to discharge more than 100,000 gallons of treated effluent per day (or 0.1 million gallons per day [mgd]). **Figure 5** shows the locations of domestic WWTFs in the Silver and Rainbow BMAP.

In the Silver and Rainbow BMAP area, treated effluent containing nitrogen is discharged to sprayfields and RIBs, or is reused for irrigation water. The nitrogen load from WWTFs is 81,898 lbs-N/year. The discharge location (such as proximity to the spring, highly permeable soils, etc.) and level of wastewater treatment are important factors to consider when calculating loadings to groundwater.

The U.S. EPA authorizes DEP to issue permits for discharges to surface waters under the National Pollutant Discharge and Elimination System (NPDES) Program. Permits for discharges to groundwater are issued by DEP based on Florida law and rules. Wastewater discharge permits establish specific limitations and requirements based on the location and type of facility or activity releasing industrial or domestic wastewater from a point source. In areas with an adopted, nutrient-related BMAP prior to July 1, 2023, section 403.086, F.S., requires any facility discharging to a waterbody to upgrade to AWT by January 1, 2033. Further, for any waterbody determined not to be attaining nutrient or nutrient-related standards after July 1, 2023, or subject to a nutrient or nutrient-related BMAP or adopted RAP after July 1, 2023, sewage disposal facilities are prohibited from disposing any waste into such waters without providing advanced waste treatment, as approved by the department within 10 years after such determination or adoption.

Further, section 373.811, F.S., prohibits new domestic wastewater disposal facilities, including those discharging to RIBs, with permitted capacities of 100,000 gallons per day or more, unless the discharge meets the AWT standard of no more than 3 mg/L TN, on an annual permitted basis, or a more stringent treatment standard if the department determines the more stringent standard is necessary to attain a TMDL for the OFS.

The nitrogen effluent limits set forth in **Table 9** will be applied as an annual average, taken at end of pipe before any land disposal, to all new and existing WWTFs with a DEP-permitted discharge or disposal area within this BMAP.

Because the Silver and Rainbow BMAP overlaps with multiple surface water BMAPs and Lake Weir, which have phosphorous impairments, phosphorous effluent limits set forth in **Table 10** will be applied as an annual average, taken at end of pipe before any land disposal, to all new and existing WWTFs with a DEP-permitted discharge or disposal area within this BMAP pursuant to sections 403.067(7)(b), 403.086(1)(c)1.c., 2., or (2), F.S., as applicable. If a facility has effluent disposal located in an area where the boundaries of a surface water and an OFS

BMAP overlap, the more stringent wastewater effluent limits apply. DEP will evaluate the need for more stringent nutrient effluent limits as appropriate. Unless otherwise required by law, facilities located within the BMAP area that have a discharge or disposal located outside of the 1,000 year capture zone are not required to meet the effluent limits in **Tables 9** and **10** if they provide reasonable assurance that their current disposal of effluent does not cause or contribute to an exceedance of the nitrate concentrations established by the TMDLs, though these facilities must, at a minimum, maintain current permitted effluent limits.

Table 9. Nitrogen effluent standards for the BMAP area

**Including rapid-rate land application systems permitted under Part V of Chapter 62-610, F.A.C.*

95% of the Permitted Capacity (gpd)	Surface Water Discharges (mg/L)	Slow-Rate Land Application (SRLA) and Rapid-Rate Land Application (RRLA) Systems (mg/L)	All Other Reuse or Effluent Disposal Methods, excluding SRLA and RRLA* (mg/L)
Greater than 100,000	3	3	3
20,000 to 100,000	3	3	6
Less than 20,000	3	6	6

Table 10. Phosphorous effluent standards for the BMAP area

**Including rapid-rate land application systems permitted under Part V of Chapter 62-610, F.A.C.*

95% of the Permitted Capacity (gpd)	Surface Water Discharges (mg/L)	Slow-Rate Land Application (SRLA) and Rapid Rate Land Application (RRLA) Systems (mg/L)	All Other Reuse or Effluent Disposal Methods, excluding SRLA and RRLA* (mg/L)
Greater than 100,000	1	1	6
20,000 to 100,000	1	3	6
Less than 20,000	1	6	6

Where the law does not provide a compliance timeframe, new effluent standards will take effect at the time of permit renewal or no later than five years after BMAP adoption, whichever is sooner.

Additionally, new and existing wastewater permits in the BMAP area must require at least quarterly sampling of the effluent discharge for TN concentrations and report these sampling results in the discharge monitoring reports (DMRs) submitted to DEP.

In 2021, subsection 403.064(16), F.S., was amended to require domestic wastewater utilities that dispose of effluent, reclaimed water, or reuse water by surface water discharge to submit for DEP review and approval, a plan for eliminating non-beneficial surface water discharge by January 1, 2032. A utility must fully implement the approved plan by January 1, 2032. If a plan

was not timely submitted or approved by DEP, the utility's domestic WWTFs may not dispose of effluent, reclaimed water, or reuse water by surface water discharge after January 1, 2028. Violations are subject to administrative and civil penalties pursuant to sections 403.121, 403.131, and 403.141, F.S.

2.6.2 Reclaimed Water Effluent Limits

In accordance with section 403.086(1)(c)3., F.S., 10 years after adoption of this BMAP, any WWTF providing reclaimed water that will be used for commercial or residential irrigation or be otherwise land applied within a nutrient BMAP or RAP area is required to meet AWT standards for TN and total phosphorus (TP), such that the reclaimed water product contains not more, on a permitted annual average basis, of 3 mg/L of TN and 1 mg/L of TP if DEP has determined in an applicable basin management action plan or reasonable assurance plan that the use of reclaimed water is causing or contributing to the nutrient impairment being addressed. These requirements do not apply to reclaimed water that is land applied as part of a water quality restoration project or water resource development project approved by DEP to meet a TMDL or minimum flow or level and where the TN and TP will be at or below AWT standards prior to entering groundwater or surface water.

At the time of this BMAP adoption, all facilities providing reclaimed water that will be used for commercial or residential irrigation or be otherwise land applied within the BMAP area that were determined to be causing or contributing to the nutrient impairment pursuant to section 403.086(1)(c)3., F.S., are already subject to the 3 mg/L of TN and 1 mg/L of TP AWT effluent standards established in **Table 9** and **Table 10**. DEP may determine in a future iteration of the BMAP that certain WWTFs providing reclaimed water for the purpose of commercial or residential irrigation or that is otherwise being land applied within this BMAP area are causing or contributing to the nutrient impairments, which would require the WWTF to be at AWT standards or an alternative treatment standard pursuant to section 403.086(1)(c)3., F.S., to achieve the TMDL(s) or applicable water quality criteria.

For facilities that did not have adequate information to complete an evaluation or where a change occured to the facility's application of reclaimed water after the initial evaluation (e.g., an increase in facility capacity or change in location of reclaimed water application), the department will evaluate the land application of reclaimed water as more information becomes available pursuant to section 403.086(1)(c)3., F.S.

All new permitted facilities providing reclaimed water that will be used for commercial or residential irrigation or be otherwise land applied within the BMAP area are required to meet AWT standards for TN in accordance with section 403.086(1)(c)3., F.S.

DEP encourages the reuse of treated wastewater for irrigation as a water conservation measure. The expansion of reuse water for irrigation can reduce reliance on the Floridan aquifer for water supply. The nitrogen load to groundwater from reuse water is expected to be reduced through these WWTF policies, as improvements in reuse water quality will both reduce loads from this source and minimize future increases in nutrient loading from reuse because of higher treatment

levels.

2.6.3 Wastewater Treatment Facility Plans

Subparagraph 403.067(7)(a)9., F.S., requires local governments within a BMAP to develop WWTF plans to be adopted as part of nutrient BMAPs no later than July 1, 2025, if DEP identifies domestic wastewater as contributors of at least 20% of point source or nonpoint source nutrient pollution or if DEP determines remediation is necessary to achieve the TMDL. The WWTF plans must be developed by each local government in cooperation with DEP, WMDs, and public and private domestic wastewater facilities within the jurisdiction of the local government. Each local government's wastewater treatment plan for this BMAP must contain the information outlined in Final Order 23-0131 for each existing or proposed domestic wastewater facility in the local government's jurisdiction. The WWTF plans are incorporated into this BMAP through the related management actions listed in this Section as well as those in **Appendix B**. Copies will be made available upon request subject to any public records requirements.

Subparagraph 403.067(7)(a)9., F.S., was amended in 2024 to clarify that private domestic wastewater facilities must provide this information to local governments effective July 1, 2024. Information related to private facilities will need to be included in future local government WWTF plans if not captured in the initial plans.

2.6.4 Connection to Sewer

The installation of new OSTDS within a BMAP area is prohibited where connection to sewer lines is available. For existing OSTDS, the owner must connect to sewer within 365 days of written notification by the utility that connection to its sewer line is available. A utility is statutorily required (section 381.00655, F.S.) to provide written notice to existing OSTDS owners regarding the availability of sewer lines for connection. Additionally, existing OSTDS needing repair or modification must connect to available sewer lines within 90 days of notification by DEP.

To facilitate an inventory of noncompliant properties, by February 2, 2026, and every two years thereafter, each utility with sewer lines in the BMAP shall provide DEP a list of properties with existing OSTDS where sewer is available (as defined in 381.00655, F.S.) but have not been connected. For each identified property, include the date(s) which the utility provided written notice to the owners of the availability of sewer.

2.6.5 Biosolids and Septage

To provide assurance that nitrogen and phosphorus losses to surface water and groundwater are minimized from the permitted application of biosolids and septage in the BMAP area, the requirements in Chapter 62-640 F.A.C. apply to newly permitted application sites and existing application sites upon permit renewal. Where biosolids materials mixed with yard waste or other organic materials are distributed as compost or soil amendments, DEP recommends the recipients of these materials be notified of their increased nutrient content, so that any fertilization practices on the site can be adjusted accordingly.

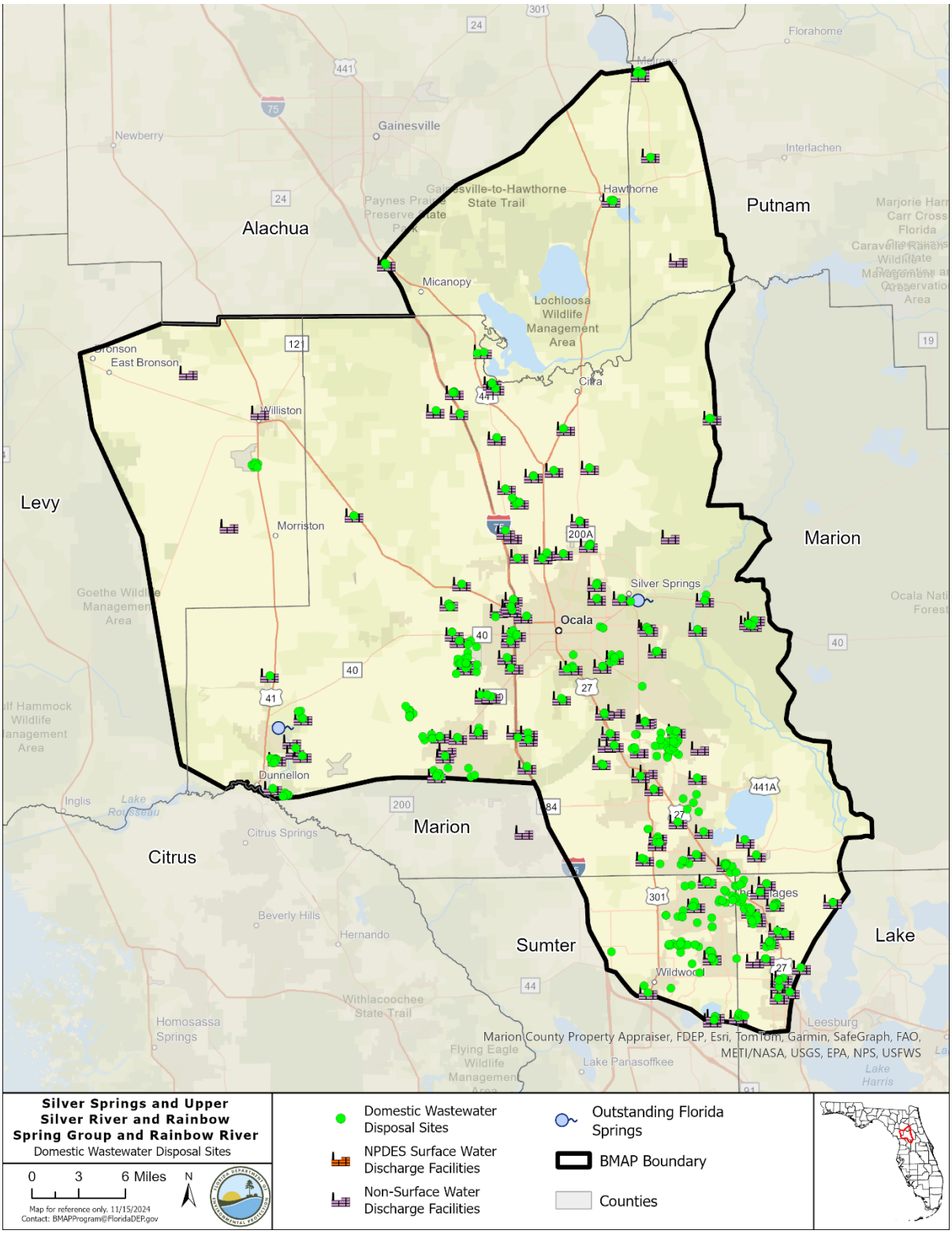

Figure 5. Locations of domestic WWTFs in the Silver and Rainbow BMAP area

2.7 UTF Management Strategies

UTF consists of fertilizers applied to turfgrass typically found in residential and urban areas (including residential lawns and public green spaces). It is applied by either the homeowner or a lawn service company on residential properties, while on nonresidential properties they may be applied by contractors or maintenance staff. UTF can be addressed through a mix of efforts, including public education, enforcement of local ordinances (regulating fertilizer use and irrigation), land development codes or stormwater projects. Based on progress towards meeting the TMDLs and water quality monitoring results, reduction requirements and crediting of projects such as fertilizer ordinances and education efforts may be reevaluated in future BMAP updates, particularly with respect to enforcement of fertilizer ordinances. As part of the annual reporting process, stakeholders will be required to provide a detailed and quantified description of their ordinance enforcement and environmental education activities to receive credits for these activities.

It is recommended that appropriate grasses are used based on soil characteristics, irrigation needs and fertilization needs. It is recommended that Bahia grass (*Paspalum notatum*), which is a durable grass that can be drought and heat tolerant should be used over St. Augustinegrass (*Stenotaphrum secundatum*) on sandy soils within spring BMAPs. Both homeowners and developers should follow the recommendations within the BMAP. If a local government has recommendations for what grasses should be used, DEP recommends that homeowners and developers follow them for the protection of water resources, if they are different than the BMAP.

Using reclaimed water is a way to distribute nutrients that need to be disposed of onto locations where nutrients are needed. However, caution needs to be exercised when applying nutrients (through fertilizer or reclaimed water) in the recharge area for the springs. For areas using reclaimed water for irrigation, it is important to understand the amount of nitrogen and phosphorus that is needed for the landscape and how much is being applied through reclaimed water. Monitoring the concentration of nitrogen and phosphorus in reclaimed water is important for understanding how much nutrients are being applied onto the urban landscape. The result may be that reclaimed water customers will not need to add more phosphorus or nitrogen, resulting in lower fertilizer costs and possibly fewer maintenance requirements and costs (e.g., mowing, turf replacement).

Given the limitations with the data used in the NSILT to estimate the UTF loading to groundwater, DEP will work with entities and other agencies to collect better data by requiring more detailed documentation on behavior changes and water quality improvements. In addition, DEP will work with stakeholders to improve measures to reduce residential and commercial property fertilizer application, such as requiring annual reporting on ordinance enforcement and results from local governments.

2.7.1 Fertilizer Ordinance Adoption

Subsection 373.807(2), F.S., requires local governments with jurisdictional boundaries that

include an OFS or any part of a springshed or delineated PFA of an OFS to develop, enact and implement a fertilizer ordinance by July 1, 2017. The ordinance is required to be based, at a minimum, on the DEP model ordinance for Florida-friendly fertilizer use on urban landscapes. As part of the annual reporting process, stakeholders will be required to provide a detailed and quantified description of their ordinance enforcement to receive credits for these activities.

2.7.2 Municipal Separate Stormwater Sewer System (MS4) Designations

Although loading from urban stormwater is not specifically estimated in the NSILT, urban stormwater is a considerable source of nutrient loading to Silver and Rainbow Springs and many urban areas are already regulated under the Municipal Separate Storm Sewer System (MS4) NPDES Stormwater Program. An MS4 is a conveyance or system of conveyances, such as roads with stormwater systems, municipal streets, catch basins, curbs, gutters, ditches, constructed channels, or storm drains. If an MS4 permittee is identified as a contributor in the BMAP, the permitted MS4 must undertake projects specified in the BMAP.

Regulated MS4s are required to implement stormwater management programs (SWMP) to reduce pollutants to the maximum extent practicable and address applicable TMDL allocations. Both Phase I and Phase II MS4 permits include provisions for the modification of SWMP activities. Phase I medium and large MS4s are regulated under an individual permit, with multiple permittees having coverage under the same permit as "co-permittees." Phase II small MS4s are regulated under a generic permit. Under the "NPDES Two-Step Generic Permit for Discharge of Stormwater from Phase II MS4s" (paragraph 62-621.300(7)(a), F.A.C.), regulated Phase II MS4s must develop a SWMP that includes BMPs with measurable goals and a schedule for implementation to meet six minimum control measures.

DEP can designate an entity as a regulated MS4 if its discharges meet the requirements of the rule and are determined to be a significant contributor of pollutants to surface waters of the state in accordance with Rule 62-624.800, F.A.C. A Phase II MS4 can be designated for regulation when a TMDL has been adopted for a waterbody or segment into which the MS4 discharges the pollutant(s) of concern. Because urban areas located in the BMAP that are not currently covered by an MS4 permit also significantly contribute to nutrient loading, individually or in aggregate, the NPDES Stormwater Program will evaluate any entity located in the BMAP area that serves a minimum resident population of at least 1,000 individuals that is not currently covered by an MS4 permit and designate eligible entities as regulated MS4s, in accordance with Chapter 62-624, F.A.C.

2.7.3 Stormwater Rule

On June 28, 2024, Governor Ron DeSantis signed Senate Bill 7040 into law, which updates Florida's stormwater rules and design criteria, including Chapter 62-330 F.A.C., to protect the state's waterways. The new regulations aim to manage runoff from developments, ensuring that future stormwater systems are better maintained. Operation and maintenance entities will be required to have estimates for the expected routine maintenance costs and to certify that they have the financial capability to maintain the stormwater system over time. The rule will also provide for more consistent oversight through a required periodic inspection routine and

reporting on the inspection results to the permitting agency.

Additionally, Chapter 62-330 F.A.C. establishes requirements for applicants to demonstrate, through calculations or modeling, that the future stormwater management systems would provide additional treatment to meet new Environmental Resource Permits stormwater treatment performance standards for an 80% reduction for TP and 55% reduction for TN, along with additional requirements that would apply where a project discharges to Outstanding Florida Waters or impaired waters. Additional permitting requirements to protect groundwater can be found within the Applicant Handbook Volume I, Section 8.5.2.

2.8 STF Management Strategies

Sports turfgrass areas fall into two main categories that are evaluated separately: golf courses and sporting facilities (such as baseball, football, soccer and other fields). There are over 40 golf courses covering approximately 8,612 acres in the Silver and Rainbow BMAP area as well as other sports fields. The majority of the golf course acreage is located in areas of medium and high recharge. DEP and UF-IFAS are collaborating to create a BMP manual addressing sports turfgrass management for public and private entities, which will be completed in 2025.

DEP will work with sports field managers and golf course superintendents to ensure relevant BMPs are implemented and to estimate reductions associated with these efforts. To improve the golf course loading estimate to groundwater over a literature-based approach, DEP will also confer with golf course superintendents to update fertilizer application rates based on site-specific data.

For other sports facilities, managers of sports fields can assist by reducing fertilizer use, using products that reduce leaching, and irrigating sports turf more efficiently.

2.8.1 Golf Courses

All golf course superintendents within the BMAP must obtain certification for golf course BMPs (UF-IFAS Florida Golf Courses Best Management Practices Program) under section 403.9339 F.S. and all golf courses must implement the BMPs described in the DEP golf course BMP manual, *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses (DEP, 2021)*. All golf courses located within a BMAP are required to submit an NMP to DEP that is designed to sustain even plant growth while minimizing excessive growth and nutrient losses. Required information for the NMP is available in **Appendix G**. A draft NMP must be submitted to DEP within one year of BMAP adoption and a final document is due two years after adoption. All soil, water, and tissue sampling must include appropriate nitrogen and phosphorous analyses.

If a facility (either golf course or other sporting facility) uses fertilizer rates greater than those in the BMP manuals, the facility is required to conduct water quality monitoring prescribed by DEP or a WMD that demonstrates compliance with water quality standards. Private golf courses in the BMAP area are listed in **Appendix I**.

2.9 Agricultural Sources Management Strategies

Based on data including Florida Statewide Agricultural Irrigation Demand (FSAID) IX geodatabase land use, FDACS identified agricultural acreage within the BMAP. An estimated 334,612 acres of land in the BMAP are considered agricultural.

While agriculture is essential, it is important to manage potential environmental impacts associated with agricultural operations. Nitrogen and phosphorus, essential for crop growth, can enter waterways through various agricultural activities, including fertilizer application, livestock waste disposal and irrigation runoff. To address nutrient loading from agricultural operations effectively, it is necessary to have a balanced approach that supports agricultural productivity while safeguarding water resources. This entails promoting farming practices that optimize nutrient and water use efficiency, minimize runoff and enhance soil health.

Section 403.067, F.S., requires agricultural producers in adopted BMAPs either enroll and properly implement the applicable FDACS BMPs for their operation or to conduct water quality monitoring activities as required by Chapter 62-307, F.A.C. BMPs include practices such as nutrient management, irrigation management. and water resource protection. They can mitigate nutrient loading while promoting environmental stewardship. In many BMAPs, however, the implementation of BMPs alone will not be sufficient to meet water quality restoration goals, and regional projects and innovative technologies will be needed.

Information on agricultural enrollment and reductions in this BMAP was provided by FDACS and is available in **Appendix H.**

2.9.1 FF Loading

Nitrogen in agricultural fertilizer is applied at varying rates, depending on the crop and individual farm practices. The NSILT estimated total nitrogen load to groundwater from FF is 348,742 lbs/yr TN, or 9% of the total nitrogen load to groundwater in the BMAP area. FF includes commercial inorganic fertilizer applied to row crops, field crops, pasture, hay fields, and nurseries.

2.9.2 LW Loading

Agricultural practices specific to livestock management were obtained through meetings with UF-IFAS extension, FDACS, agricultural producers and stakeholders. The NSILT estimated total nitrogen load to groundwater from LW is 921,420 lbs/yr TN, or 23% of the total nitrogen load to groundwater in the BMAP area.

2.9.2.1 Dairies and Other Concentrated Animal Feeding Operations (CAFOs)

Dairies and other CAFOs permitted under Chapter 62-670, F.A.C., located within a BMAP, may not cause or contribute to a violation of water quality standards and must implement nutrient management practices identified in their permits. To minimize infiltration of liquid manure, if a dairy uses a clay liner or some other type of engineered waste storage pond system, within two years of the BMAP adoption, the dairy will submit to DEP an evaluation identifying the environmental, technical and

economic feasibility of upgrading to a concrete or geosynthetic liner. The evaluation may alternatively demonstrate that the existing liner/pond does not allow leaching that causes or contributes to water quality exceedances. Upon review of the evaluation, DEP may identify required upgrades in a subsequent BMAP update.

Additionally, sampling for TN and TP of land applied effluent/wastewater must be included in the DEP-approved nutrient monitoring plan established in the permit and implemented in accordance with the monitoring plan.

2.9.2.2 Livestock Operations Without CAFO Permits

Livestock operations may not cause or contribute to a violation of water quality standards. Not all livestock operations are large enough to require an NPDES CAFO permit under Chapter 62-670, F.A.C. For these operations, section 403.067, F.S., requires the operation to enroll in the FDACS BMP Program and implement applicable BMPs or to conduct a monitoring program according to Chapter 62-307, F.A.C., that is approved by DEP or the applicable WMD.

2.9.3 Aquaculture

Under the federal Clean Water Act, aquaculture activities are defined as a point source. In 1999, the Florida Legislature amended Chapter 597, F.S., Florida Aquaculture Policy Act, to create a program within FDACS that requires those who sell aquatic species to annually acquire an Aquaculture Certificate of Registration and implement Chapter 5L-3, F.A.C., Aquaculture BMPs. Permit holders must be certified every year.

2.9.4 Silviculture

The Florida Forest Service (FFS) within FDACS is the lead entity responsible for assisting landowners, loggers, and forestry professionals with silviculture BMP implementation as well as for conducting statewide silviculture BMP training and compliance monitoring. The FFS implements Chapter 5I-6, F.A.C., and assists both private and public forest landowners across the state with BMP compliance and the rule. Compliance with the rule involves submitting a Notice of Intent to Implement BMPs (NOI) to the FFS and thereby committing to follow BMPs during all current and future silviculture operations.

2.9.5 Prioritized Management Strategies and Milestones

In addition to the above requirements, subsection 373.811(5), F.S., prohibits any new agricultural operations that do not implement either applicable FDACS BMPs, or measures necessary to achieve pollution reduction levels established by DEP, or groundwater monitoring plans approved by a WMD or DEP. Failure to implement BMPs or conduct water quality monitoring that demonstrates compliance with pollutant reductions may result in enforcement action by DEP (paragraph 403.067(7)(b), F.S.).

Every two years, FDACS is required to perform onsite inspections of each agricultural producer that enrolls in BMPs to ensure that the practices are being properly implemented. The verification includes: review and collection of nutrient application records that producers must maintain to demonstrate compliance with the BMP Program; verification that all other applicable BMPs are being properly implemented; verification that any cost shared practices are being

properly implemented; and identification of potential cost share practices, projects or other applicable BMPs not identified during enrollment. Rule 5M-1.008, F.A.C., outlines the procedures used to verify the implementation of agricultural BMPs. Producers not implementing BMPs according to the process outlined in Chapter 5M-1, F.A.C., are referred to DEP for enforcement action after attempts at remedial action by FDACS are exhausted. Failure to implement BMPs or conduct water quality monitoring that demonstrates compliance with pollutant reductions may result in enforcement action by DEP (paragraph 403.067(7)(b), F.S.).

Pursuant to paragraph 403.067(7)(c), F.S., where water quality problems are demonstrated despite the appropriate implementation, operation, and maintenance of adopted BMPs, DEP, a WMD or FDACS, in consultation with DEP, must conduct a reevaluation of the BMPs. If a reevaluation of the BMPs is needed, FDACS will include DEP, the appropriate WMD, and other partners in the reevaluation and BMP update processes.

FDACS works with applicable producers within the BMAP area to implement BMPs. As of July 2024, Notices of Intent (NOIs) covered 123,420 acres in the Silver and Rainbow BMAP area (123,420 of 275,544 agricultural acres). FDACS conducts an evaluation to determine if lands classified as agricultural have verified agricultural activity, and then adjusts the total agricultural acreage for enrollment accordingly, as described in **Appendix H.** Currently, no producers are conducting water quality monitoring in lieu of implementing BMPs. **Appendix B** lists project information. **Appendix H** provides detailed information on BMPs and agricultural practices in the BMAP area.

2.9.6 Agricultural Cooperative Regional Elements

Section 403.067, F.S., requires FDACS, DEP, and agricultural producers to work together to establish Agricultural Cooperative Regional Water Quality Elements (ACE) in BMAPs where agricultural nonpoint sources contribute at least 20% of nonpoint source nutrient discharges to impaired waterbodies, or where DEP determines this element is necessary to achieve the TMDLs. FDACS is responsible for providing DEP a list of projects which, in combination with BMPs, state-sponsored regional projects and other management strategies, will achieve the needed pollutant load reductions established for agricultural nonpoint sources. The list of projects included in the ACE must include a planning-level cost estimate of each project along with the estimated amount of nutrient reduction that project will achieve. Partner agencies and key stakeholders referred to in this process include FDACS, DEP and agricultural producers.

Addressing nutrient loading from agricultural sources requires partnership among the key stakeholders, and consultation with the WMDs. By fostering cooperation and engagement, the ACE framework facilitates the exchange of knowledge, resources, and expertise, leading to innovative solutions and effective strategies for tackling water quality challenges. Engaging producers in the decision-making process ensures that projects are practical, feasible, and tailored to the needs and realities of agricultural operations. Partner agencies provide technical support, regulatory guidance, and funding opportunities that will enhance the implementation and success of regional water quality improvement initiatives. This cooperative effort is essential

for implementing targeted actions that balance the economic and social benefits of agriculture with the obligation to address agricultural nonpoint source loading beyond BMP implementation and cost share.

The ACE framework leverages resources and technical expertise to efficiently identify regional projects and other strategies tailored to the diverse agriculture production methods, landscapes, and watersheds that will need to be implemented to achieve the TMDLs. Regional project types will vary among the different BMAPs, and can include, but are not limited to, a combination of traditional projects that focus on water treatment, land acquisition in fee or conservation easements on the lands of willing sellers, site-specific water quality improvement projects, dispersed water management projects, innovative technologies, and regional projects funded through existing or enhanced cost share programs administered by FDACS or the WMDs.

While FDACS is assigned the lead role on project solicitation, development, selection, and implementation, they work closely with all the key stakeholders, including DEP, to define and identify regional projects that will be included in the BMAP and to leverage existing programs and resources. FDACS will lead engagement with producers and industry groups through workshops to identify potential regional projects. Identified projects will be implemented through various mechanisms, such as existing cost share or grant programs or through a legislative budget request and eventual appropriation. Upon identification of a project, FDACS will update DEP on project development and implementation, including the funding strategy.

FDACS and DEP will work together to track progress on agricultural water quality projects under the ACE framework through the development of performance metrics and evaluation of water quality monitoring data in the basin or, if necessary, at the project level. The default performance measures will be the expected range of pollutant removal efficiencies associated with a project or strategy. Tools may be needed to determine the effectiveness of projects, such as modeling and where feasible onsite water quality monitoring.

FDACS will report on ACE projects annually through DEP's Statewide Annual Report (STAR) process and during BMAP update and/or development. Projects and other management strategies implemented through the ACE will be evaluated cooperatively by partner agencies using the predetermined performance metrics. The ACE process provides for adaptive management, allowing flexibility to adapt and improve based on regional project or management strategy results.

Agricultural nonpoint sources contribute 32% of the TN nutrient sources in the Silver and Rainbow BMAP. Pursuant to subparagraph 403.067(7)(e)1., F.S., an ACE is required in this BMAP. Most agricultural lands are engaged in livestock production. **Table 11** shows the three dominant crop types within the Silver and Rainbow BMAP.

Table 11. Dominant crop types in the Silver and Rainbow BMAP

Crop Type	Acres
Grazing Land	145,759
Row Crops	81,386
Livestock	64,219

Targeting future funding toward precision agriculture, manure management, innovative technologies or soil health practices, including combining practices where applicable, to address nutrient impacts from row crop production on a regional scale could provide additional reductions.

FDACS will continue to work with key stakeholders in the Silver and Rainbow BMAP to identify additional options for addressing agricultural nonpoint source nutrient loading. For more information on the FDACS Regional Projects Program, see the links in **Appendix H**.

2.10 Atmospheric Deposition Management Strategies

2.10.1 Summary of Loading

Atmospheric deposition is largely a diffuse, albeit continual, source of nitrogen. Nitrogen species and other chemical constituents are measured in wet and dry deposition at discrete locations around the U.S. In 2014, Schwede and Lear developed a hybrid model for estimating the total atmospheric deposition of nitrogen and sulfur for the entire U.S., referred to as the total atmospheric deposition model (TDEP). Deposition data from several monitoring networks, including the Clean Air Status and Trends Network (CASTNET); the National Atmospheric Deposition Program (NADP) Ammonia Monitoring Network; the Southeastern Aerosol Research and Characterization Network; and modeled data from the Community Multiscale Air Quality (CMAQ) Modeling System—are combined in a multistep process with National Trends Network (NTN) wet deposition values to model total deposition. The TDEP model run used for the NSILT included data from 2019 to 2020.

2.10.2 Description of Approach

Atmospheric sources of nutrients are local, national, and international. Nitrogen atmospheric sources are generally of low concentration compared with other sources and are further diminished through additional biological and chemical processes before they reach groundwater. Himes and Dawson (2017) indicates that emissions of nitrogen have been generally decreasing in Florida with an up to 55% decrease in emissions estimated by 2028, possibly related to power plant fuel source changes and air treatment upgrades as well as the increased use of electric vehicles, decreasing mobile sources (Himes and Dawson, 2017). This gradual decrease in emissions is likely to result in reductions to atmospheric deposition (**Figure 6**). Currently, since the scale of the national and international programs to address these air deposition loads are difficult to integrate into the much smaller scale of this water quality plan, there are no specific reductions assigned to this source category. Atmospheric deposition sources and trends will be re-evaluated periodically.

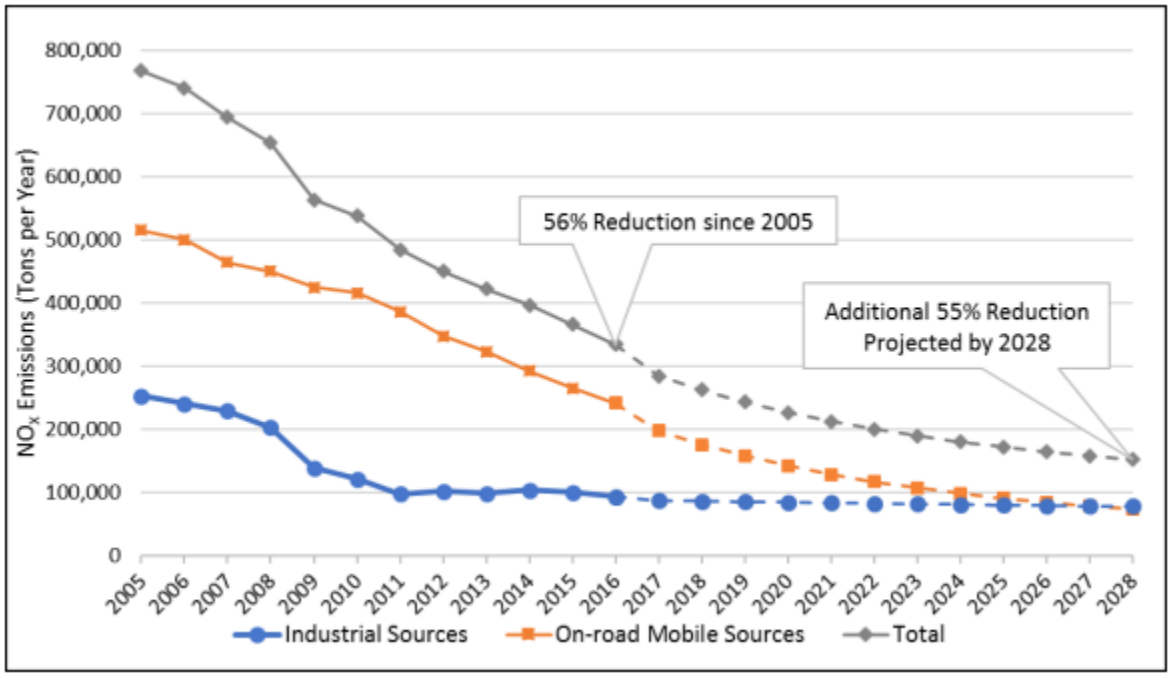

Figure 6. Florida NOx emissions for 2005 to 2016 and projected emission decreases for 2017 to 2028 from industrial and on-road mobile sources

2.11 Future Growth Management Strategies

Nutrient impacts from new development are addressed through a variety of mechanisms outlined in this BMAP, as well as provisions of Florida law. While most of the restoration projects and management strategies listed in this BMAP address current nutrient loading, the need to plan and implement sound management strategies to address additional population growth must be considered.

DEP has included in this BMAP specific elements to address current and future WWTF effluent, OSTDS loading and stormwater sources. Broader requirements—such as local land development regulations, comprehensive plans, ordinances, incentives, environmental resource permit requirements, and consumptive use permit requirements—all provide additional mechanisms and avenues to protect water resources and reduce the impact of new development and other land use changes as they occur.

Further strengthening of comprehensive plans is assessed under section 163.3177, F.S., which required local governments to amend their comprehensive plans with the following considerations:

- Identify and prioritize projects to meet the TMDLs.
- Update the wastewater section to include plans for treatment updates—not just capacity—and AWT must be prioritized.
- In developments with more than 50 lots with more than one OSTDS per acre, the plan must consider the feasibility of providing sanitary sewer within a 10-year planning

horizon and identify the facility that could receive the flows. The plan must review the capacity of the facility and any associated transmission facilities; projected wastewater flow at that facility for the next 20 years, including expected future new construction and connections of OSTDS to sanitary sewer; and timeline for the construction of the sanitary sewer system. The plan was required to be updated by July 1, 2024.

- Comprehensive plans must contain capital improvements element to consider the need for and the location of public facilities:
    - Construction, extension, or increase in capacity of public facilities as well as principals for correcting existing public facility deficiencies. Components must cover at least a 5-year period.
    - Costs, timeline, general location, and projected revenue sources to fund the facilities.
    - Standards to meet an acceptable level of service.
    - Schedule of capital improvements, which may include privately funded projects.
    - A list of projects necessary to achieve the pollutant load reductions attributable to the local government, as established in a BMAP.
    - The element must address coordinating the extension of, increase in the capacity of, or upgrade in treatment of facilities to meet future needs; prioritizing AWT while maximizing the use of existing facilities and discouraging urban sprawl; conserving potable water resources; and protecting the functions of natural groundwater recharge areas and natural drainage features.

Through this array of laws and the requirements in this BMAP, new development must undertake certain nutrient-reduction measures before the development is complete. DEP recommends that local governments revise their planning and land use ordinance(s) to adequately address future growth and the associated environmental impact. Maintaining land at lower intensity uses through land purchases or easements for conservation and recreational use is one strategy that can help reduce water quality impacts in the basin. Any additional nutrient loading from land use intensification will be evaluated during future BMAP update efforts. If an increase in loading occurs, a responsible entity may receive new reduction allocations that will require additional management actions by the responsible entity to mitigate those water quality impacts.

2.11.1 Future Growth Analysis

An analysis was done to consider the impacts of future population growth and urban development on loading in the basin. Wastewater sources were evaluated using per-person estimations calculated for portions of the population estimated to be served by OSTDS and those connected to central sewer. Stormwater sources were evaluated using per-acre estimations calculated for portions of a jurisdictional area that may be developed.

First, population growth for each county was taken from the Bureau of Economic and Business

Research (BEBR) 2040 Medium Growth Projections. Then, a spatial analysis was performed to determine the proportion of developable land area attributed to each entity within each county. Areas where there are permanent waterbodies or which have been set aside for conservation are unlikely to see future development or increased population, so lakes and ponds identified in the National Hydrography Database (NHD) and Florida Natural Areas Inventory (FNAI) conservation lands were not considered developable and were removed from the analysis. The percentage of remaining land attributed to each entity was applied to the county projected population growth to determine the number of additional people anticipated to contribute to loading by 2040.

The next step was to distinguish the future population expected to be served by sewer versus those with OSTDS based on the most recent FLWMI for each BMAP county. For this, FLWMI parcels within each entity's jurisdiction were counted and categorized based on the Wastewater Type field. The number of points in "Known Sewer," "Likely Sewer," and "Somewhat Likely Sewer" divided by the total number of points estimated a portion of the population that are served by central wastewater collection system. The remainder are assumed to have an OSTDS.

Per person loading calculations were used to estimate future loads from WWTFs and OSTDS under different planning scenarios, described below. DEP's Domestic Wastewater Program estimates each person in Florida generates 100 gallons of wastewater per day. For OSTDS, FDOH estimates each person in Florida generates 10 lbs TN/yr. Average attenuation for wastewater effluent disposal and a weighted basin recharge factor were applied to loading calculations to derive the estimated future load to groundwater.

Per acre loading calculations were used to estimate future loads from increased urban turfgrass as a result of development under different planning scenarios, described below. First, a number of developed acres were derived by applying percentages to the developable lands from the initial GIS analysis for each entity. Then, the loadings were based on UF-IFAS recommended fertilization rates for different turfgrass species. Finally, attenuation for UTF and a weighted basin recharge factor were applied to loading calculations to derive the estimated future load to groundwater.

Scenario 1 represents a future planning scenario with the highest levels of treatment feasible. It assumes all local governments within the BMAP have a minimum of 90% of their population served by centralized sewer, and all domestic wastewater will be treated to AWT standards (3 mg/L TN or less and 1mg/L TP or less) by 2040 based on current Florida law and BMAP management strategies. This scenario also assumes that all future OSTDS will be enhanced nutrient-reducing systems or other wastewater systems with a nitrogen treatment efficiency of at least 65%. For urban development, this scenario represents a conservative growth future where 2% of developable land is converted to urban, development codes only allow a 10% coverage of turfgrass, and the species used is centipedegrass, which has low TN fertilization requirements.

Scenario 2 utilizes the current rates of sewer availability based on the FLWMI parcels to estimate the population served by central wastewater collection system. This future planning

scenario assumes that all domestic wastewater will be treated to AWT standards (3 mg/L TN or less and 1 mg/L TP or less) by 2040 based on current Florida law and BMAP management strategies. This scenario also assumes that all future OSTDS will be enhanced nutrient-reducing systems or other wastewater systems with a nitrogen treatment efficiency of at least 65%. For urban development, this scenario represents a moderate growth future where 10% of developable land is converted to urban, development codes only allow a 10% coverage of turfgrass, and the species used is centipedegrass, which has low TN fertilization requirements.

Scenario 3 represents a future planning scenario with the lowest levels of treatment feasible. It utilizes the current rates of sewer availability based on the FLWMI parcels to estimate the population served by central wastewater collection system and assumes that all domestic wastewater will be treated to 6 mg/L TN and 3 mg/L TP by 2040. This scenario also assumes that all future OSTDS will be conventional systems. For urban development, this scenario represents an extreme growth future where 17% of developable land is converted to urban, development codes allow up to 25% coverage of turfgrass, and the species used is St. Augustine grass, which has higher TN fertilization requirements.

Based on the methodology above, **Table 12** shows the estimated future loads from wastewater and urban stormwater sources that may be assigned to local governments if growth continues as projected under the three planning scenarios. DEP encourages local governments to consider these additional nutrient loads when authorizing new development or changes in land uses, and when developing local plans for wastewater infrastructure expansion and maintenance, to ensure that the TMDL targets are achieved and maintained.

Table 12. Estimated nitrogen load from future growth in the BMAP area

Entity	BEBR 2040 Additional Population	2040 Additional Nitrogen Loading – Scenario 1 (lbs/yr)	2040 Additional Nitrogen Loading – Scenario 2 (lbs/yr)	2040 Additional Nitrogen Loading - Scenario 3 (lbs/yr)
Alachua County	4603	1,855	7,005	53,366
City of Hawthorne	418	154	405	4,388
City of Micanopy	66	24	119	803
Lake County	6366	2,790	9,774	35,657
City of Fruitland Park	1342	588	1,566	6,527
Town of Lady Lake	1872	399	653	6,043
City of Leesburg	474	110	183	1,566
Marion County	71,067	24,331	86,599	635,841

Entity	BEBR 2040 Additional Population	2040 Additional Nitrogen Loading – Scenario 1 (lbs/yr)	2040 Additional Nitrogen Loading – Scenario 2 (lbs/yr)	2040 Additional Nitrogen Loading - Scenario 3 (lbs/yr)
City of Belleview	337	79	204	2,603
Town of McIntosh	61	14	26	449
City of Ocala	4,076	956	2,541	31,617
Town of Reddick	109	26	48	806
Putnam County	234	185	1,734	29,431
Sumter County	6731	1,521	2,641	23,539
City of Wildwood	2156	498	856	7,560
The Villages	5456	1,375	2,418	21,837
Levy County	1939	1,326	10,947	140,578
Town of Bronson	17	11	87	1,213
City of Williston	63	41	334	4,521
City of Dunnellon	572	263	497	4,716
Total	**108,297**	**36,546**	**128,636**	**1,013,062**

Scenario 1 resulted in an additional basin load of 36,546 lbs/yr TN. Scenario 3 resulted in an additional basin load of 1,013,062 lbs/yr TN. When compared to the results of the Silver and Rainbow NSILT (3,938,958 lbs/yr TN), it is estimated that growth in the basin could result in a 1% to 26% increase in nitrogen loading to the groundwater by 2040.

While it is unlikely that additional nutrient loading from future populations can be entirely avoided, the results of this analysis provide local governments information on how to mitigate future nitrogen loading by pursuing planning scenarios which prioritize the expansion of centralized sewer services that meet or exceed AWT standards for wastewater effluent. Entities with minor changes in 2040 loading under Scenarios 1 and 2 already have a high rate of sewering in their jurisdiction.

This broad analysis is not being used to determine allocated reductions for responsible entities because it does not capture all local considerations and complexities of mixed land use, or current allocation approaches for wastewater. In addition, changes in nutrient loading from future population and development are difficult to model because much of it is dependent on the type

and location of development, enforcement of local ordinances, future home values, and future social attitudes towards lawn maintenance and waste management. There are also complex dynamics associated with new urban development in which loading from human activities is compounded by potential removal or conversion of forest lands or green spaces, which had previously provided natural remediation of atmospheric and soil nutrients, as well as other ecosystem benefits. However, the results show trends in how loading in the basin might change in the coming decades without comprehensive local and regional planning.

Other mechanisms discussed in this section are available to local governments to further mitigate future nutrient loading from existing and future developed land. For example, strengthening and enforcing fertilizer ordinances, working with homeowners' associations or neighborhood groups to reduce fertilizer use on community landscaping, or incentivizing Florida Friendly development practices could reduce the overall impact of additional nutrient loading associated with urban fertilizer. Additionally, wastewater can be treated to higher standards than those built into this analysis through upgrades to WWTFs and use of enhanced nutrient-reducing OSTDS certified with higher nitrogen treatment efficiencies or other wastewater treatment systems with higher treatment levels. Local governments can use this information to incorporate water quality considerations when developing and implementing local ordinances, comprehensive plans, stormwater planning, and enhanced OSTDS incentive programs in areas of urban expansion.

2.12 Funding Opportunities

Chapter 2023-169, Laws of Florida, expanded grant opportunities for local governments and eligible entities working to address a TMDL or impaired water. When funding is available, eligible entities can also apply for grant funding for stormwater, regional agricultural projects, and a broader suite of wastewater projects including collection systems and domestic wastewater reuse through the Water Quality Improvement Grant program. Projects are prioritized that have the maximum nutrient load per project, demonstrate project readiness, are cost-effective, have cost-share by the applicant (except for Rural Areas of Opportunity), have previous state commitment, and are in areas where reductions are most needed. There are multiple competitive funding resources available under the Protecting Florida Together website, including $50 million in springs-specific funding.

Financial and technical assistance through FDACS, SJRWMD, and SWFWMD are available to agricultural producers within the Silver and Rainbow BMAP. FDACS provides outreach and education on BMP implementation for enrolled operations, as well as working with interested producers to provide cost share funding for projects to improve on-farm nutrient and irrigation efficiencies that work in tandem with the applicable practices from the producer’s BMP checklist. The SJRWMD and SWFWMD cost share programs also provide outreach and funding for projects that provide nutrient and irrigation management benefits. FDACS and the WMD’s work closely to ensure their cost share programs complement each other to meet the needs of the producers while considering the characteristics of the region.

Section 3: Monitoring and Reporting

3.1 Methods for Evaluating Progress

DEP will work with stakeholders to track project implementation and organize and evaluate the monitoring data collected each year. The project and monitoring information will be presented in an annual update. Stakeholders have agreed to meet annually after the adoption of the BMAP to follow up on plan implementation, share new information, and continue to coordinate on TMDL restoration related issues. The following activities may occur at annual meetings~

Implementation data and reporting:

- Collect project implementation information from stakeholders, including FDACS agricultural BMP enrollment and FDOH-issued permits, and compare with the BMAP schedule.
- Discuss the data collection process, including any concerns and possible improvements to the process.
- Review the monitoring plan implementation, as detailed in **Section 3.3**.

Sharing new information:

- Report on results from water quality monitoring and trend information.
- Provide updates on new management strategies in the basin that will help reduce nutrient loading.
- Identify and review new scientific developments on addressing nutrient loads and incorporate any new information into annual progress reports.

Coordinating on TMDL restoration-related issues:

- Provide updates from DEP on the basin assessment cycle and activities related to any impairments, TMDLs, and BMAP.
- Obtain reports from other basins where tools or other information may be applicable to the TMDLs.

3.2 Adaptive Management Measures

Adaptive management involves making adjustments in the BMAP when circumstances change or monitoring indicates the need for additional or more effective restoration strategies. Adaptive management measures may include the following:

- Implementing procedures to determine whether additional cooperative strategies

are needed.

- Using criteria/processes for determining whether and when plan components need revision because of changes in costs, project effectiveness, social effects, watershed conditions or other factors.

- Revising stakeholders' roles during BMAP implementation and after BMAP completion.

- Updating information on corrective actions (and any supporting documentation) being implemented as data are gathered to refine project implementation schedules and performance expectations.

Key components of adaptive management are tracking plan implementation, monitoring water quality and pollutant loads, and holding periodic meetings.

3.3 Water Quality Monitoring

The purpose of the monitoring network is to support the evaluation of progress made toward achieving the TMDL target nitrate concentration of 0.35 mg/L. The sampling locations, frequency, and sampled parameters identified in this chapter represent the minimum requirements needed to achieve this purpose. The monitoring strategy includes the following distinct sampling networks:

- A *Surface Water Network* to evaluate the water quality of Silver River and Rainbow River and their associated springs and identify and track changes.
- A *Groundwater Network* to evaluate changes in groundwater quality in the Silver Springs and Rainbow Springs BMAP areas, as well as the response of the aquifer to different land uses.
- An *Aquatic Vegetation Monitoring Network* for Silver River and Rainbow River.

3.3.1 Objectives

Focused objectives are critical for a monitoring strategy to provide the information needed to evaluate implementation success. Since the BMAP implementation involves an iterative process, the monitoring efforts are related to primary and secondary objectives. The primary objectives focus on achieving water quality targets, while the secondary objectives focus on sub-regional effectiveness of projects and management strategies and other water quality parameters that can be used to provide information for future refinements of the BMAP. The monitoring strategy may be updated as necessary.

Surface Water Monitoring Network Goals and Objectives:

- Primary Objective: Identify and track changes in nitrate concentration in spring discharges and in Silver River and Rainbow River to determine if TMDL targets are being achieved.

- Secondary Objective: Estimate TN loadings and track changes in TN loading for Silver River and Rainbow River.

Groundwater Monitoring Network Goals and Objectives:

- Primary Objective: Identify and track changes in nitrate concentration in the UFA at specific well locations to estimate progress made towards achieving the TMDL target concentration.
- Secondary Objective: Determine the response of UFA nitrate concentrations to different land uses.
- Secondary Objective: Provide a comparison of nitrate concentrations between the surficial and Floridan Aquifers.

Aquatic Vegetation Monitoring Network

- Primary Objective: Map, monitor, and evaluate submerged aquatic vegetation (SAV).
- Secondary Objective: Identify and track the biological response of the springs and rivers to changes in nitrate concentration.

3.3.2 Parameters, Frequency and Network

To achieve the objectives listed above, the monitoring strategy will focus on two types of indicators to track improvements in water quality at the spring vents and in the groundwater: core and supplemental (**Table 13** and **Table 14**, respectively). The core indicators are directly related to the parameters causing impairment in the associated springs. Supplemental indicators will be monitored primarily to support the interpretation of core water quality parameters. The monitoring network is established for a variety of purposes.

For this BMAP, nitrate is the core parameter measured, to track progress in decreasing nitrogen concentrations in groundwater and the water surfacing at the spring vents. The other parameters are considered supplementary parameters for the BMAP, as they build information about groundwater and the springs but are not direct measurements of impairment.

At a minimum, the core parameters will be tracked to determine the progress that has been made toward meeting the TMDLs and/or achieving the numeric nutrient criteria (NNC). Resource responses to BMAP implementation may also be tracked. A significant amount of time may be needed for changes in water chemistry to be observed.

Table 13. Core water quality indicators and field parameters for spring vents and groundwater

Core Parameters
Total Nitrogen (TN)
Total Kjeldahl Nitrogen
Nitrate as Nitrogen

Core Parameters
Orthophosphate as Phosphorus
Total Phosphorus (TP)

Table 14. Supplemental water quality indicators and field parameters for spring vents and groundwater

Supplemental Parameters
Specific Conductance
Dissolved Oxygen (DO)
pH
Temperature
Total Suspended Solids (TSS)
Total Dissolved Solids (TDS)
Turbidity
Chloride
Color
Ammonia (as nitrogen [N])
Total Organic Carbon
Calcium
Magnesium
Sodium
Potassium
Sulfate
Fluoride
Alkalinity

Surface Water and Groundwater Monitoring Network locations were selected to represent the minimum density of data collection sites needed to track changes in water quality and allow the evaluation of progress toward achieving the TMDLs.

Figure 7 shows the location of active Silver and Rainbow water quality monitoring stations. SJRWMD and SWFWMD conduct most of the groundwater sampling for the Silver Springs and Upper Silver River and Rainbow Springs Group and Rainbow River BMAP area.

Station locations for the monitoring networks will be reviewed and modified as needed.

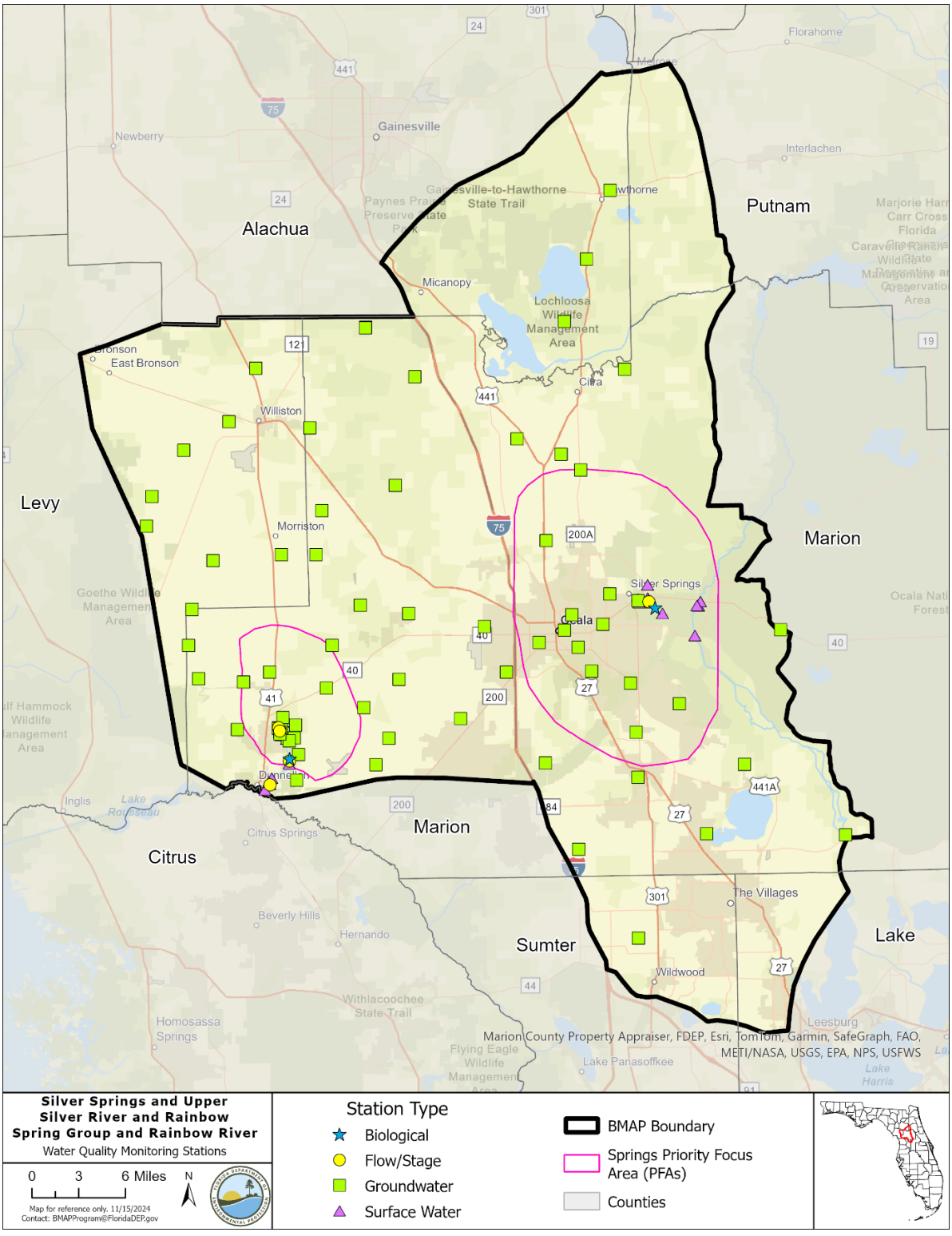

Figure 7. Water quality monitoring stations in Silver and Rainbow BMAP

3.3.3 Nutrient Monitoring

Water quality is monitored to evaluate progress toward achieving the TMDL targets of

0.35 milligrams per liter (mg/L) of nitrate-nitrite to be protective of the aquatic flora and fauna. Surface water quality data are collected at the spring vents to determine if the TMDL nitrate targets are being achieved, and once achieved, are being maintained. Flow data are collected in support of the secondary objective of estimating total mass loading of nitrate at the vent and can be used to evaluate TN loading in the BMAP. Groundwater well data are collected to evaluate aquifer conditions in the source water for the springs. A robust groundwater monitoring program can be used to evaluate TN loading in the BMAP. Monitoring may give an indication of future changes in spring vent concentrations as nutrient levels in the groundwater are expected to respond to changes in loading prior to the spring vents due to transport time to the spring vents.

3.3.3.1 Spring Sampling

Surface water data are collected to represent conditions in each of the impaired waterbodies as well as downstream conditions. SJRWMD, SWFWMD, DEP's Oklawaha River Aquatic Preserve, and DEP's Rainbow River Aquatic Preserve collect surface water quality data. SJRWMD typically samples at stations every other month, or six times per year, and the Oklawaha River Aquatic Preserve samples quarterly for Silver. Discharge information is collected downstream of Mammoth Spring, at USGS site number 02239501, Silver River near Ocala, Fl. There are additional sampling locations in the Ocklawaha River upstream and downstream of Silver River. SWFWMD and DEP's Rainbow River Aquatic Preserve staff collect samples quarterly for Rainbow. Rainbow River discharge information is collected downstream near Dunnellon, at USGS site number 02313100, Rainbow River at Dunnellon.

Figure 8 and **Figure 9** display the nitrate plus nitrite concentration at the spring vents.

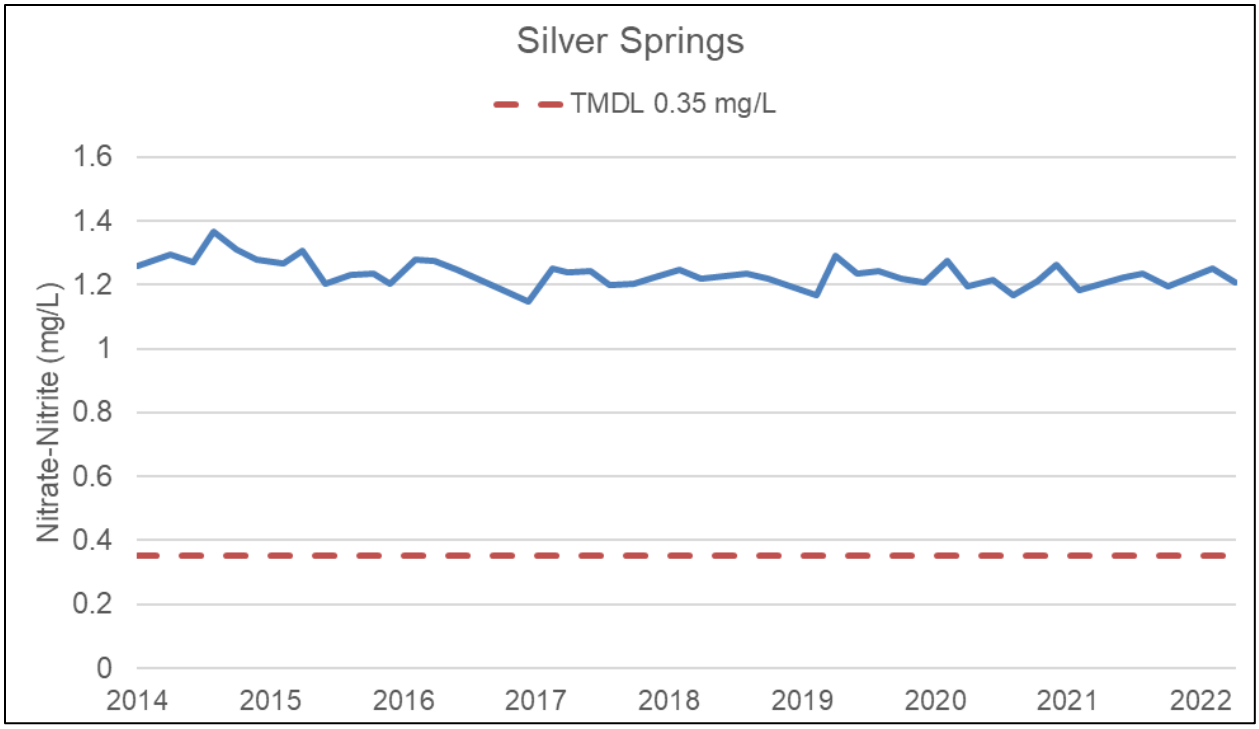

Figure 8. Nitrate plus nitrite concentration over time for Silver Springs

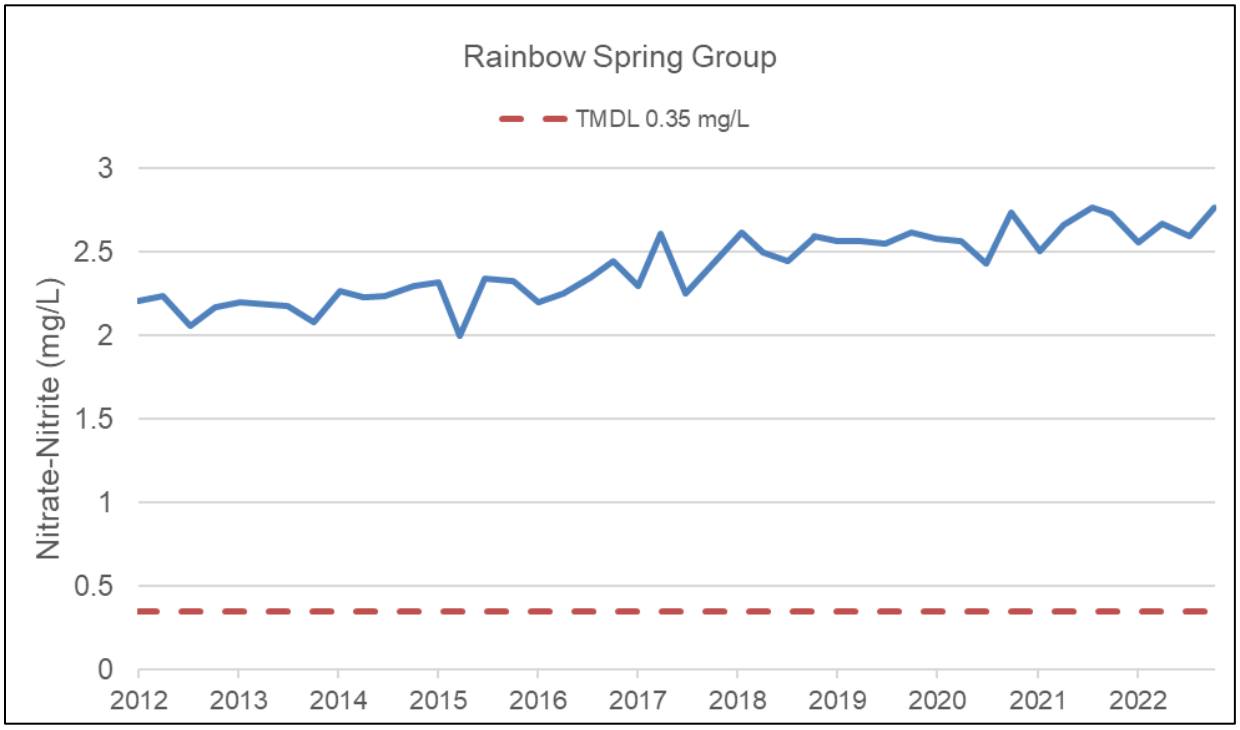

Figure 9. Nitrate plus nitrite concentration over time for the Rainbow Springs Group

3.3.3.2 Groundwater Results and Discussion

Data from groundwater monitoring wells were obtained from DEP's Water Information Network

(WIN) database, SJRWMD and SWFWMD. The analyte of concern is nitrate, including both the total and the dissolved species. For these analyses, no differentiation between the two species was made. There was insufficient data to perform statistically robust trends analyses in many of the springs BMAPs. Available data was evaluated to perform a visual analysis using box plots to review change in nitrate concentrations for two periods of time within the available period of record. To determine what wells would be included in the analysis, the frequency of sampling was considered. Wells that were sampled regularly through the period of record were considered "fixed." Wells with inconsistent sampling (i.e. less than four samples over the period of record) were considered "sporadic." Data from the fixed wells were preferred for analysis because comparisons between time periods represent changes in the same set of wells. Silver and Rainbow had enough data from fixed wells so no sporadic well data was used.

Groundwater data is subject to serial and spatial autocorrelation (AC), meaning that sampling that occurs temporally or spatially close can potentially affect the results of any trend-analysis hypothesis test. The effect of serial correlation in groundwater samples can be accounted for by using increments of time one year or longer, (Helsel, 2006). Regarding spatial AC, nitrate concentrations from wells located close to each other (clusters) often have significant correlations. Using the annual medians of all samples within the basins was determined to be the best way to reduce the effect of spatial AC before a more thorough correlation matrix can be completed. For these reasons, after initial data clean up to remove qualified data results, an annual grand median of the median nitrate concentration from each well in its corresponding basin were used for the visual analysis of the resulting dataset.

Box plots were generated for each spring basin as seen in **Figure 10** and **Figure 11** below. To create the box plots, the period of record was divided into early (2017 to 2020) and late (2021 to 2024) subperiods. For each box plot, the upper horizontal line of the box represents the 75th percentile. The lower horizontal line of the box represents the 25th percentile (Q1). The middle horizontal line in the box represents the median (50th percentile or Q2). The top of the point of the upper whisker is the 95th percentile. The bottom point of the lower whisker is the 5th percentile. Circles represent outliers.

In the Silver springshed, 19 fixed sampling points were evaluated and used to develop 69 median annual nitrate values for the early period and 58 for the late period. The overall basin median value in the early period was 0.94 mg/L nitrate, and the basin median for the late period was 0.76 mg/L nitrate.

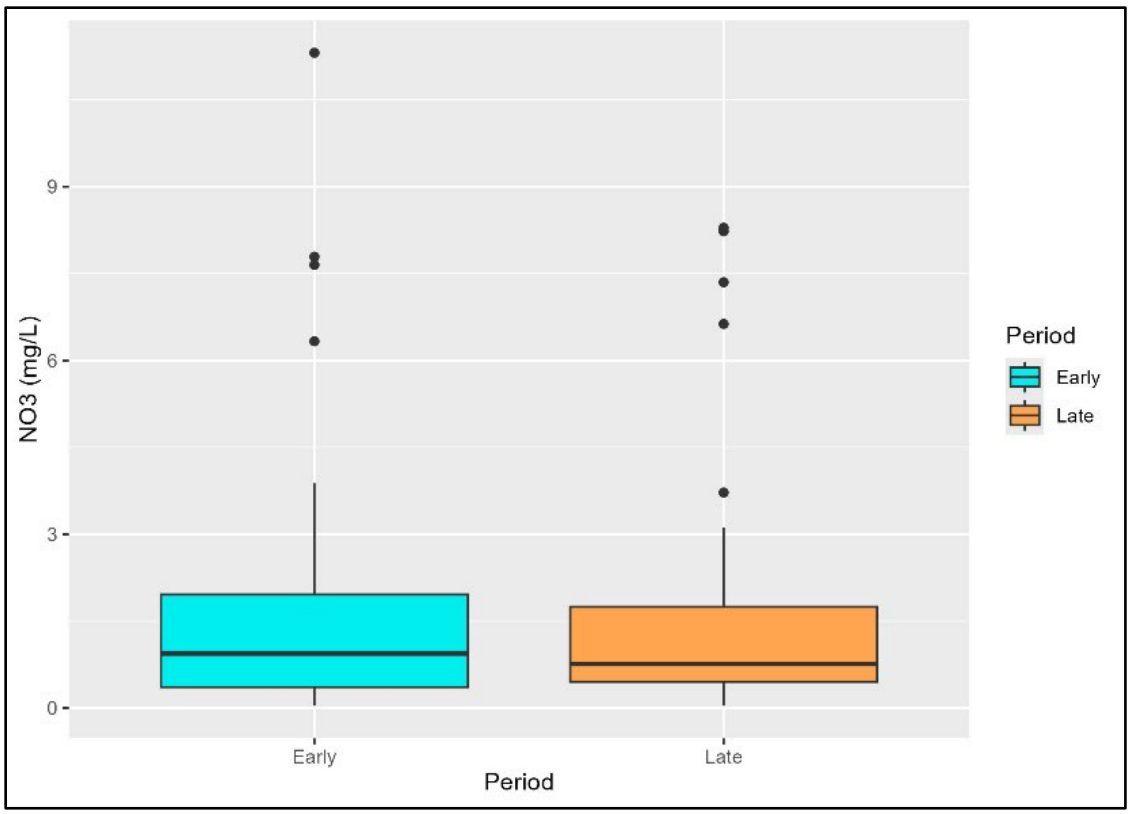

Figure 10. Silver Springshed nitrate concentrations of early and late periods with outliers

In the Rainbow springshed, 39 fixed sampling points were evaluated and used to develop 117 median annual nitrate values for the early period and 107 for the late period. The overall basin median value in the early period was 1.30 mg/L nitrate, and the basin median for the late period was 1.44 mg/L nitrate.

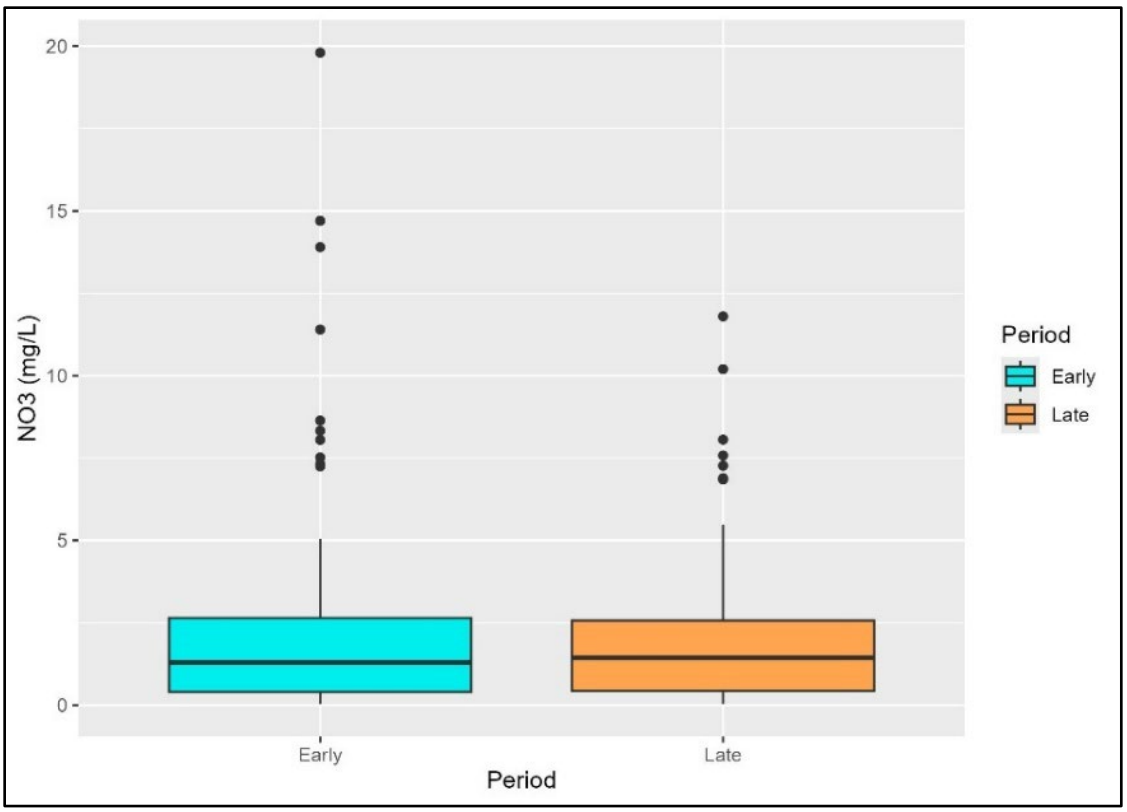

Figure 11. Rainbow Springshed nitrate concentrations of early and late periods with outliers

In a combined Silver and Rainbow Basin (**Figure 12**), annual weighted medians were generated per year. For this portion, the weighted mean formula was used to determine the annual weighted mean of the grand medians of the two springsheds. The weighted median equation favors the variable with the greatest weight. In this exercise, only two variables are used (e.g. the two grand medians). Since weights are based on area, the medians in the Silver Springs Springshed would always be used. To avoid this bias, the weighted mean, not the weighted median, equation was used. As a result, for the Silver and Rainbow Basin, for each of the eight years of the investigation, the weighted mean of the grand medians for each of the two springsheds was generated. There were 186 median annual nitrate values for the early period and 165 for the late period. The overall basin median value in the early period was 0.83 mg/L nitrate, and the basin median for the late period was 0.85 mg/L nitrate.

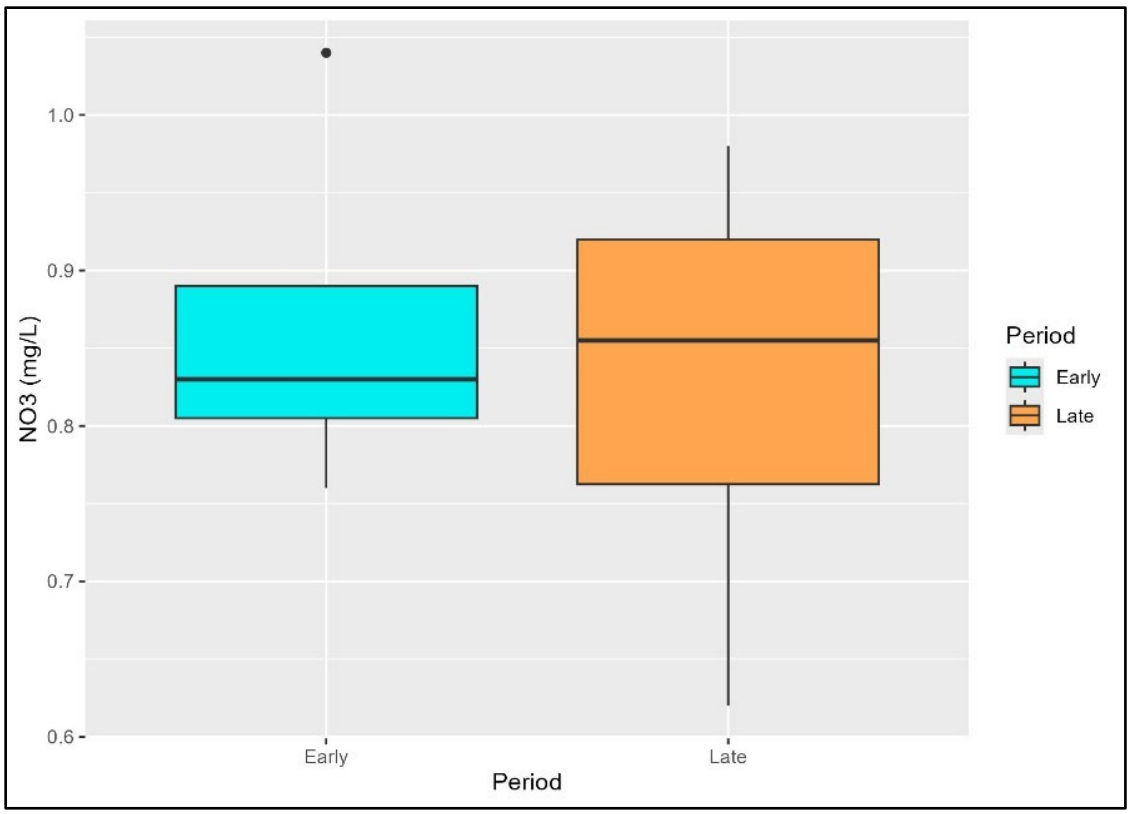

Figure 12. Combined Silver and Rainbow springsheds nitrate concentrations of early and late periods with outliers

DEP is working to evaluate monitoring networks in these basins and develop a sampling schedule that will allow for trend analysis of groundwater conditions in future iterations of the BMAP. A review of spatial distribution and well construction details will allow DEP to focus monitoring efforts that will provide the most informative data about groundwater trends and potentially nitrogen loading in the Upper Floridan aquifer.

3.3.4 Biological Monitoring

Biological resource responses represent improvements in the overall ecological health of the Silver and Rainbow BMAP area (see **Table 15**). DEP recommends that several types of biological monitoring be conducted to assess the health of the Silver and Rainbow Springs and Rivers.

Table 15. Biological response measures for spring runs

Biological Response Measures	Target Community	Sampling Methods
Chlorophyll *a*	Phytoplankton	DEP standard operating procedure (SOP) FS 2100
Stream Condition Index (SCI) score	Aquatic Macroinvertebrates	DEP SOP SCI 1000
Linear Vegetation Survey (LVS) score	Aquatic Vegetation	DEP SOP FS 7320
Rapid Periphyton Survey	Attached Algae	DEP SOP FS 7230

Biological Response Measures	Target Community	Sampling Methods
(RPS) score	(Periphyton)	

The RPS is a rapid assessment tool for evaluating streams' ecological condition based on the attached algae. The RPS quantifies periphyton length and extent in a 100-meter stretch of a stream by assigning a rank category to the length of periphyton filaments. The LVS is a rapid assessment tool for evaluating the ecological condition of streams based on the nativity status and relative human disturbance tolerance of vascular plants. The RPS, LVS, and chlorophyll *a* are used to evaluate the floral integrity of the springs.

The SCI evaluates the aquatic macroinvertebrate community present in the river and/or springs. In addition, habitat assessments are conducted per DEP SOP FT 3100 to assess the habitat present to support the aquatic macroinvertebrates. For the Silver River, SJRWMD collects annual SAV data. SWFMWD surveys the Rainbow River for SAV biannually. Water quality samples and field measurements of physical water quality are collected with the biological monitoring.

3.3.5 Data Management and Assessment

As of June 30, 2017, entities that collect water quality data in Florida enter the data into the Florida Watershed Information Network (WIN) Database, which replaced the Florida Storage and Retrieval System (STORET). DEP pulls water quality data directly from WIN and U.S. Geological Survey (USGS) databases to evaluate waters according to the Impaired Waters Rule, Chapter 62-303, F.A.C., and for TMDL development. Data providers must upload their data regularly, so DEP can use the information as part of the water quality assessment process, for annual reporting and trend analyses. Data providers should upload their data to WIN upon completion of the appropriate quality assurance/quality control (QA/QC) checks. All data collected in the last quarter of the calendar year should be uploaded no later than April 1 of the following year.

DEP sampling teams enter their biological data into the DEP Statewide Biological (SBIO) database. Biological data should be collected and regularly provided to DEP following the applicable standard operating procedures. All biological data collected in the last quarter of the calendar year should be uploaded or provided no later than April 1 of the following year.

Available water quality data will be analyzed during BMAP implementation to determine trends in water quality and the health of the biological community. A wide variety of statistical methods are available for the water quality trend analyses. The selection of an appropriate data analysis method will depend on the frequency, spatial distribution, and period of record available from existing data. Specific statistical analyses were not identified during BMAP development.

3.3.6 QA/QC

Stakeholders participating in the BMAP monitoring plan must collect water quality data in a manner consistent with Chapter 62-160, F.A.C. Therefore, field samples must

be collected following the DEP SOPs, and lab analyses must be conducted by National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratories.

Section 4. Commitment to Plan Implementation

4.1 Adoption Process

The 2025 BMAP update is adopted by Secretarial Order and assigns TN load reductions to the responsible stakeholders in the Silver and Rainbow BMAP area.

4.2 Tracking Reductions

The required loading reductions are expected to be met by 2038. Each entity responsible for implementing management actions to meet their upcoming 5-year milestone as part of the BMAP will provide DEP, via the statewide annual report process, with an annual update of progress made in implementing load reductions. The update will track the implementation status of the management actions listed in the BMAP and document additional projects undertaken to further water quality improvements in the basin. FDACS will continue to report acreage enrolled in NOIs at least annually to DEP.

4.3 Revisions to the BMAP

Adaptive management involves setting up a mechanism for making course corrections in the BMAP when circumstances change, or feedback mechanisms indicate that a more effective strategy is needed. Section 403.067, F.S., requires that the plan be revised, as appropriate, in collaboration with basin stakeholders. All or part of a revised BMAP must be adopted by Secretarial Order. Adaptive management measures include the following:

- Need to update based on new information, including model updates.
- New law requirements.
- Procedures to determine whether additional cooperative actions are needed.
- Criteria/process for determining whether and when plan components need to be revised because of changes in costs, environmental impacts, social effects, watershed conditions, or other factors.
- Descriptions of the stakeholders' role after BMAP completion.

Tracking implementation, monitoring water quality and pollutant loads, and holding periodic meetings to share information and expertise are key components of adaptive management.

Section 5. References

Arthur, J.D., A.E. Baker, J.R. Cichon, A.R. Wood, and A. Rudin. 2005. *Florida Aquifer Vulnerability Assessment (FAVA): Contamination potential of Florida's principal aquifer systems.* A report submitted to the Division of Water Resource Management, Florida Department of Environmental Protection. Tallahassee, FL: Division of Resources Assessment and Management, Florida Geological Survey, Florida Department of Environmental Protection.

Baker, A.E., A.R. Wood, J. R. Cichon, and J.D. Arthur. 2005. *Alachua County aquifer vulnerability assessment*. Report submitted to the Alachua County Planning & Development Office. Tallahassee, FL: Florida Geological Survey, Florida Department of Environmental Protection

Baker, A.E., A.R. Wood, and J.R. Cichon. 2007. *The Marion County aquifer vulnerability assessment A ground-water protection and management tool*. Prepared for the Marion County Board of County Commissioners by Advanced GeoSpatial Inc. Tallahassee, FL.

Boniol, D. March 2013. "*Silver Springs Group Springshed Delineation and Dye Trace Studies*" presentation given at March 14, 2013 Silver Springs BMAP meeting. St. Johns River Water Management District.

Canion, A., D. Dobberfuhl, and l. McCloud. 2017. *Predictive modeling of elevated groundwater nitrate in major springsheds of the St. Johns River Water Management District*. Draft Report. Palatka, FL: St. Johns River Water Management District.

Florida Department of Environmental Protection. 2021. *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses*. Tallahassee, FL.

Florida Stormwater Association. 2012. *Methodology for calculating nutrient load reductions using the FSA assessment tool.*

Helsel, D.R., and Frans, L.M., 2006, Regional-Kendall test for trend. Environmental Science and Technology, v. 40, no. 13, pp. 4066-4073.

Hicks, R.W., and K. Holland. November 2012. *Nutrient TMDL for Silver Springs, Silver Springs Group, and Upper Silver River (WBIDs 2772A, 2772C, and 2772E)*. Tallahassee, FL: Florida Department of Environmental Protection, Division of Environmental Assessment and Restoration, Bureau of Watershed Restoration

Himes, B., and J. Dawson. 2017. *Florida Nitrogen Oxides Emissions Trends*. Florida Department of Environmental Protection.

Holland, K. and R.D. Hicks. 2013. *Nutrient TMDL for Rainbow Springs Group and Rainbow Springs Group Run (WBIDs 1320A and 1320B)*. Tallahassee, FL: Florida Department of Environmental Protection.

Jones, G.W. et al. 1996. *Origin of nitrate in ground water discharging from Rainbow Springs, Marion County, Florida*. Brooksville, FL: Southwest Florida Water Management District.

McGurk, B. E., J. B. Davis, J. A. Stokes, D. J. Toth, with URS Corporation and Karst Environmental Services. 2012. *Silver Springs nutrient pathway characterization project*. Special Publication SJ2012-SP3. Palatka, FL: St. Johns River Water Management District.

Phelps, G.G. 2004. *Chemistry of ground water in the Silver Springs Basin, Florida, with an emphasis in nitrate*. United States Geological Survey Scientific Investigations Report 2004-5144.

Schwede, D.B., and G.G. Lear. 2014. A novel hybrid approach for estimating total deposition in the United States. *Atmospheric Environments* 92:207–220.

Southwest Florida Water Management District (SWFWMD). 2014. *2013–2017 springs management plan*. Brooksville, FL: Southwest Florida Water Management District.

———. 2016. *2015–2019 springs management plan*. Brooksville, FL: Southwest Florida Water Management District.

———. 2001. *Springs Coast comprehensive watershed management plan*. Brooksville, FL: Southwest Florida Water Management District.

———. 2002. *Springs Coast initiative*. Brooksville, FL: Southwest Florida Water Management District.

———. 2015. *Rainbow River Surface Water Improvement and Management (SWIM) Plan A Comprehensive Conservation and Management Plan*. Brooksville, FL: Southwest Florida Water Management District.

University of Wisconsin. December 2024. *National Trends Network*. National Atmospheric Deposition Program. Retrieved December 31, 2024, from https://nadp.slh.wisc.edu/networks/national-trends-network/.

Appendices

Appendix A. Important Links

The links below were correct at the time of document preparation. Over time, the locations may change and the links may no longer be accurate. None of these linked materials are adopted into this BMAP.

DEP Website: https://floridadep.gov/

DEP Map Direct Webpage: https://ca.dep.state.fl.us/mapdirect/

Florida Statutes: http://www.leg.state.fl.us/statutes:
Florida Watershed Restoration Act (Section 403.067, F.S.)
Florida Springs and Aquifer Protection Act (Part VIII of Chapter 373, F.S.)

DEP Model Ordinances: https://ffl.ifas.ufl.edu/ffl-and-you/gi-bmp-program/fertilizer-ordinances/

DEP Onsite Sewage Program: https://floridadep.gov/water/onsite-sewage/content/permitting-enhanced-nutrient-reducing-onsite-sewage-treatment-and

DEP Standard Operating Procedures for Water Quality Samples: https://floridadep.gov/dear/quality-assurance/content/dep-sops

DEP Watershed Assessment Section WBID boundaries: https://floridadep.gov/dear/watershed-assessment-section/content/basin-411-0

NELAC National Environmental Laboratory Accreditation Program (NELAP): https://floridadep.gov/dear/florida-dep-laboratory/content/nelap-certified-laboratory-search

FDACS BMPs: https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices

FDACS BMP and Field Staff Contacts: https://www.fdacs.gov/Divisions-Offices/Agricultural-Water-Policy/Organization-Staff

Florida Administrative Code (Florida Rules): https://www.flrules.org/

SJRWMD 2025 Consolidated Annual Report: https://aws.sjrwmd.com/SJRWMD/plans/SJRWMD-2025-Consolidated-Annual-Report.pdf

SJRWMD Springs: https://www.sjrwmd.com/waterways/springs/

UF–IFAS Research: http://research.ifas.ufl.edu/

Appendix B. Projects to Reduce Nitrogen Sources

B.1 Prioritization of Management Strategies

BMAPs must now include projects that show how responsible entities will meet their 5-year milestones. To help prioritize projects towards the next milestone as required under 403.067, F.S., planning-level details for each listed project, along with their priority ranking have been determined. The management strategies listed in **Appendix B** are ranked with a priority of high, medium, or low.

Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on if the project is going towards the next 5-year milestone, as well as need for funding. Overall, any project that is needed by a responsible entity to meet their next reduction milestone is considered a priority. Projects classified as "underway" were assigned a high or medium priority because some resources have been allocated to these projects, but additional assistance may be needed for the project to be completed. High priority was assigned to projects listed with the project status "planned" that are needed to meet the next milestone, as well as certain "completed" projects that are designated as "ongoing" each year, and select projects that are elevated because substantial, subsequent project(s) are reliant on their completion.

B.2 Description of the Management Strategies

Responsible entities submitted these management strategies to the department with the understanding that the strategies would be included in the BMAP, thus requiring each entity to implement the proposed strategies as soon as practicable. However, this list of strategies is meant to be flexible enough to allow for changes that may occur over time. Any change in listed management strategies, or the deadline to complete these actions, must first be approved by the department. Substituted strategies must result in equivalent or greater nutrient reductions than expected from the original strategies.

While the 20-year planning period for this BMAP is 2018 to 2038, urban and agricultural stormwater projects completed since January 1, 2003, and OSTDS and wastewater projects completed since January 1, 2022, for Lake County, Levy County, Marion County and Putnam County and January 1, 2023, for Alachua County and Sumter County, count toward the overall nitrogen reduction goals. Estimated nitrogen reductions provided by the responsible entity are subject to refinement based on DEP verification and/or on adjustment to calculations based on loading to groundwater that takes into consideration recharge and attenuation.

Projects with a designation of TBD (to be determined) denote information is not currently available but will be provided by the responsible entity when it is available. Projects with a designation of NA (not applicable) indicate the information for that category is not relevant to that project. Projects with a designation of "Not Provided"

denote that information was requested by DEP but was not provided by the responsible entity.

Table B-1. Stakeholder projects to reduce nitrogen sources

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3730	Alachua County	S166	Public Education and Outreach Activities	Implement social marketing campaign designed to get citizens to make landscaping behavior changes that reduce nutrients in stormwater. Reduces nutrients sources in all watersheds.	Education Efforts	Ongoing	NA	164	$0	Alachua County	Alachua County - $0.00
3880	Alachua County	S001	Fertilizer and Landscape Irrigation Codes	Adopt and enforce Fertilizer Management and Landscape Irrigation Ordinances to reduce volume of runoff from over irrigation and reduce nutrient loading from the use of fertilizers.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Alachua County	Alachua County - $0.00
3909	Alachua County	S012	Freddy Wood Land Tract Acquisition	Conservation Easement Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2008	0	$1,136,000	Alachua County; FFLP	Alachua County - $0.00; FFLP - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3910	Alachua County	S011	Rayonier Tract Acquisition (River Styx)	Land Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2008	0	$4,603,600	SJRWMD; Alachua County	SJRWMD - $0.00; Alachua County - $0.00
3911	Alachua County	S010	Longleaf Flatwoods Preserve Land Acquisition	Land Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2003	0	$2,191,500	Alachua County	Alachua County - $0.00
3912	Alachua County	S009	Phifer Flatwoods Land Acquisition #2 - Lochloosa Creek; Little Lochloosa Creek	Land Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2009	0	$1,170,864	Alachua County	Alachua County - $0.00
3913	Alachua County	S008	Phifer Flatwoods Land Acquisition #1 - Lochloosa Creek	Land Acquisition in Little Lochloosa Creek watershed. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2006	0	$2,882,239	Alachua County	Alachua County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3914	Alachua County	S007	Little Orange Creek Land Acquisition	Land Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2012	0	$1,775,000	Alachua County; Wild Spaces and Public Places; North American Wetland Act; Alachua Conservation Trust	Alachua County - $0.00; Wild Spaces and Public Places - $0.00; North American Wetland Act - $0.00; Alachua Conservation Trust - $0.00
3991	Alachua County	S111	Higginbotham Ranch Acquisition	Conservation Easement Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2014	0	$756,000	Wild Spaces Public Places; FRPP	Wild Spaces Public Places - $0.00; FRPP - $0.00
3992	Alachua County	S110	Cypress Point Creamery Land Acquisition	Conservation Easement Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2014	0	$461,000	Wild Spaces Public Places; FRPP	Wild Spaces Public Places - $0.00; FRPP - $0.00
4015	Alachua County	S074	Landscaping Behavior Change Social Marketing	Implement social marketing campaign designed	Education Efforts	Underway	TBD	0	$0	Gainesville Clean	Gainesville Clean Water

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				to get citizens to make landscaping behavior changes that reduce nutrients in stormwater. Reduces nutrients sources in all watersheds.						Water Partnership	Partnership - $0.00
4019	Alachua County	S073	Quantifying Nutrient Improvement in Street Sweeping	Monitor and assess street sweepings to quantify nutrient reductions and subsequent potential water quality improvements.	Study	Completed	2016	0	$38,940	Gainesville Clean Water Partnership	Gainesville Clean Water Partnership - $0.00
4020	Alachua County	S072	Water Conservation and LID	Conduct targeted public outreach to encourage water conservation and rain harvesting. Includes rain barrel sales and LID promotion.	Education Efforts	Ongoing	NA	0	$0	Gainesville Clean Water Partnership	Gainesville Clean Water Partnership - $0.00
4023	Alachua County	S071	Landscape Debris Social Marketing	Implement social marketing campaign designed to get citizens to keep landscaping debris out of the roads and stormwater collection systems to reduces bacteria and nutrient sources in all watersheds.	Education Efforts	Ongoing	NA	0	$0	Gainesville Clean Water Partnership	Gainesville Clean Water Partnership - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4024	Alachua County	S070	Pet Waste Outreach	Implement social marketing campaign to motivate citizens to scoop, bag, and trash dog wastes at home and in the community. Benefits: Reduces bacteria and nutrient sources in all watersheds.	Education Efforts	Ongoing	NA	0	$40,655	Gainesville Clean Water Partnership	Gainesville Clean Water Partnership - $0.00
4025	Alachua County	S069	Water Quality Protection BMP Training	Alachua County. Training and education for contractors, government, and citizens in sedimentation and erosion control to improve stormwater quality.	Education Efforts	Ongoing	NA	0	$0	Gainesville Clean Water Partnership	Gainesville Clean Water Partnership - $0.00
4571	Alachua County	S177	Aquifer Model	Mobile model used for outreach to children and adults designed and created to teach the public about the connection between how what we do on the land surface and how we use water affects our springs, rivers, and aquifer.	Education Efforts	Ongoing	NA	0	$6,000	Wildlife Foundation of Florida Springs Protection License Plate Grant; Alachua County	Wildlife Foundation of Florida Springs Protection License Plate Grant - $0.00; Alachua County - $0.00
4572	Alachua County	S178	Fertilizer Social Marketing Campaign	Implement a social marketing campaign designed to reduce fertilizer	Enhanced Public Education	Ongoing	NA	0	$435,000	DEP	DEP - $135,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				use and to estimate the resultant load reduction. Benefits: Reduces nutrient sources in all watersheds.							
4573	Alachua County	S179	Interactive Stormwater/Wastewater Model	Interactive table top model for teaching children and adults about the difference between storm sewers and sanitary sewers. Benefits: Reduces nutrient sources and bacteria sources in all watersheds.	Education Efforts	Ongoing	NA	0	$6,500	SJRWMD; Gainesville Clean Water Partnership	SJRWMD - $0.00; Gainesville Clean Water Partnership - $0.00
4574	Alachua County	S180	Alachua County Water Quality Code Implementation	Alachua County Water Quality Code Implementation, includes Public education, outreach, and enforcement.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$17,400	SJRWMD; Gainesville Clean Water Partnership	SJRWMD - $0.00; Gainesville Clean Water Partnership - $0.00
5477	Alachua County	S203	Smith & Smith	Alachua County. Land donation from owner. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2019	0	$0	Donation	Donation - $0.00
5478	Alachua County	S204	Lochloosa Slough	Conservation Easement Acquisition. No increase in surface	Land Acquisition	Completed	2019	0	$4,821,882	Wild Spaces Public	Wild Spaces Public Places - $4,821,882.00; FRPP - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.						Places; FRPP	
5479	Alachua County	S205	Franklin Crates	Conservation Easement Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2019	0	$313,797	Wild Spaces Public Places	Wild Spaces Public Places - $313,796.83
5481	Alachua County	S207	Brown	Fee Simple Conservation Land Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation. Lochloosa Creek Basin.	Land Acquisition	Completed	2022	0	$1,539,807	Wild Spaces Public Places	Wild Spaces Public Places - $1,539,806.88
5482	Alachua County	S208	Fox Pen - Lochloosa Slough Connector	Fee Simple Land Conservation Acquisition. No increase in surface runoff of pollutants due to land use change, continued	Land Acquisition	Completed	2021	0	$10,588,781	Wild Spaces Public Places II Surtax	Wild Spaces Public Places II Surtax - $10,588,781.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				aquifer recharge and ecosystem/habitat preservation.							
5483	Alachua County	S209	Stephens	Alachua County. Land donation from owner. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2020	0	$0	Donation	Donation - $0.00
5488	Alachua County	S200	Countywide Stormwater Treatment Code	Adopt a stormwater treatment code for new development. Code requires 70/80% TN/TP reductions in stormwater discharges. 95% for OFWs and 10% below predevelopment for impaired waters. LID techniques are required in sensitive karst area.	Regulations, Ordinances, and Guidelines	Completed	2019	0	$0	Alachua County	Alachua County - $0.00
5489	Alachua County	S201	Countywide Florida Friendly Landscaping Homeowner Association Code	Adopt a FFL HOA Code that prohibits HOAs from prohibiting FFL. The Code also prohibits neighborhood Codes, Covenants, and Regulations	Regulations, Ordinances, and Guidelines	Completed	2019	0	$0	Alachua County	Alachua County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				adopted after 2016 from requiring irrigation .							
5490	Alachua County	S202	Aquifer Awareness Campaign	Billboards and social media to teach the public about the connection between our water use, the aquifer, and the health of our springs.	Enhanced Public Education	Completed	2020	0	$20,000	Alachua County; Gainesville Clean Water Partnership; Wildlife Foundation of Florida Springs Protection License Plate Grant; SJRWMD	Alachua County - $0.00; Gainesville Clean Water Partnership - $0.00; Wildlife Foundation of Florida Springs Protection License Plate Grant - $0.00; SJRWMD - $0.00
5933	Alachua County	S225	Turf Swap	Rebates to property owners that convert irrigated turf to FFL or implement water saving irrigation retrofits.	Education Efforts	Ongoing	NA	0	$1,000,000	DEP; SRWMD; SJRWMD	DEP - $0; SRWMD - $150,000; SJRWMD - $300,000
5934	Alachua County	S226	Springs Protection Videos	Five to six 30-second videos on various aspects of springs protection for social media and paid media outlets.	Education Efforts	Ongoing	NA	0	$17,000	Alachua County; Wildlife Foundation of Florida Springs Protection License Plate Grant	Alachua County - $12,000.00; Wildlife Foundation of Florida Springs Protection License Plate Grant - $0.00
5935	Alachua County	S227	White Pond	Fee Simple Land Conservation Acquisition. No increase in surface runoff of pollutants due to land use	Land Acquisition	Completed	2020	0	$0	Wild Spaces Public Places	Wild Spaces Public Places - $104,976.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				change, continued aquifer recharge and ecosystem/habitat preservation.							
5936	Alachua County	S228	Colasante	Fee Simple Land Conservation Acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation. Includes Lochloosa Slough.	Land Acquisition	Completed	2023	0	$1,815,441	Wild Spaces Public Places	Wild Spaces Public Places - $1,815,440.63
5937	Alachua County	S229	General Land Acquisition	Fee Simple & Conservation Easement acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Planned	2026	0	$0	Wild Spaces Public Places	Wild Spaces Public Places - $0.00
7066	Alachua County	S257	Sherouse Acquisition	Fee Simple acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and	Land Acquisition	Underway	2024	0	$0	Wild Spaces Public Places II Surtax	Wild Spaces Public Places II Surtax - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				ecosystem/habitat preservation.							
7071	Alachua County	S268	Rimes Acquisition	Fee Simple acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Underway	2024	0	$0	SJRWMD; Wild Spaces Public Places II Surtax	SJRWMD - $290,669.40; Wild Spaces Public Places II Surtax - $0.00
7074	Alachua County	S269	Jackson Heirs Acquisition	Fee Simple acquisition. No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Underway	2024	0	$0	Wild Spaces Public Places II Surtax	Wild Spaces Public Places II Surtax - $0.00
4179	Bay Laurel Center CDD	R072	Operational Improvements	Operational staff utilizing oxidation-reduction potential probes and cyclic aeration to provide denitrification.	WWTF Nutrient Reduction	Completed	2017	0	$1,500	Bay Laurel Center CDD	Bay Laurel Center CDD - $0.00
4180	Bay Laurel Center CDD	R073	Public Access Reuse	Design and construction of a reclaimed water system including, pumping, storage, and distribution main which provides reclaimed water for irrigation	WWTF Diversion to Reuse	Completed	2010	0	$2,198,000	SWFWMD; Bay Laurel Center CDD	SWFWMD - $0.00; Bay Laurel Center CDD - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				at the On Top of the World and Candler Hills golf courses.							
5457	Bay Laurel Center CDD	R116	On Top of the World North Advanced Wastewater Treatment Facility	A 2.5 MGD advanced WWTF to replace a 1.25 MGD conventional WWTF. Biosolids will no longer be land applied on site and will be disposed of off site outside the Rainbow Spring basin. Estimated TN Reduction of 17,556 lbs/year.	WWTF Nutrient Reduction	Underway	2025	9,814	$120,000,000	Bay Laurel Center CDD; DEP	Bay Laurel Center CDD - $60,000,000.00; DEP - $60,000,000.00
3770	City of Belleview	S129	Providing Water and Sewer to Residents in Utility Service Area Adjacent to and West of SE 92nd Loop	A Utility System Master Plan and Septic to Sewer Planning Study were completed. The studies addressed upgrades to water delivery systems, wastewater collection systems, and conversion of OSTDS for 1300 residences currently on wells and OSTDS.	Study	Completed	2022	0	$300,000	Not provided	Not provided - $0.00
3771	City of Belleview	S128	Provide Reuse Irrigation Water to the Belleview Sportplex	Meets a requirement of the Springs Protection by reducing ground water withdrawals.	WWTF Diversion to Reuse	Planned	TBD	0	$500,000	City of Belleview	City of Belleview - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3772	City of Belleview	S127	Sanitary Sewer and Water Main Loop along SE 132nd from US 441/27 to CR 484	Economic engine to promote residential and commercial growth along SE 132nd Street (Belleview Beltway).	Wastewater Service Area Expansion	Completed	2019	0	$1,300,000	DEP	DEP - $0.00
3896	City of Belleview	S034	US 441 Sewer Main Expansion	New sewer line south of City along US 441 will allow commercial and residential area hook up to centralized system. Project estimated to provide 79 central sewer connections to a developing corridor, with potential for up to 60 more connections. Original credit of 414 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2016	0	$1,000,000	Marion County; DEP	DEP - $0.00; Marion County - $0.00
4006	City of Belleview	S054	Collection System Maintenance Program	Rehabilitation of 200 brick manholes to date and pipe replacement as needed.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2010	0	$0	Not provided	Not provided - $0.00
4570	City of Belleview	S176	Collection System Maintenance Program Continued	Rehabilitation of brick manholes and pipe replacement as needed.	Sanitary Sewer and Wastewater Treatment Facility	Ongoing	NA	0	$325,000	Utility Funds; American Rescue	Utility Funds - $100,000.00; American Rescue Plan Act

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
					(WWTF) Maintenance					Plan Act Local Fiscal Recovery Funds	Local Fiscal Recovery Funds - $225,000.00
5491	City of Belleview	S215	Septic to Sewer Green Meadows Subdivision	Design and permit sewer system for Green Meadows Subdivision, 115 lots. Original credit of 610 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2020	0	$150,000	DEP	DEP - $150,000.00
6759	City of Belleview	S261	City of Belleview WWTF Expansion	Upgrade and expand plant capacity from 0.76 MGD to 1.5 MGD.	WWTF Capacity Expansion	Underway	2027	0	$30,000,000	DEP SRF	DEP SRF - $30,000,000.00
7413	City of Belleview	S276	Education and Regulation	Project consists of the passed ordinances for Florida Yards and Neighbors Program, Florida Friendly Fertilizer, Landscape Ordinance, and Irrigation Ordinance.	Education Efforts	Ongoing	2045	233	$0	City of Belleview	City of Belleview - $0.00
4174	City of Dunnellon	R057	Rio Vista WWTF Decommissioning	Planned project will decommission the Rio Vista WWTP and convert an existing lift station to pump waste water to the	Decommission/ Abandonment	Completed	2015	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Rainbow Springs plant.							
4205	City of Dunnellon	R099	Public Education and Outreach Activities	Outreach program (4.5 % credit) to residents of the City of Dunnellon that enhances knowledge and awareness of stormwater management. Includes FYN program; ordinance for fertilizer; PSAs; pamphlets; website; and inspection program.	Education Efforts	Ongoing	NA	202	$0	City of Dunnellon	City of Dunnellon - $0.00
4220	City of Dunnellon	R081	Dunnellon City Beach	Proposed project located at Dinkins Park/City Beach. The project would construct a riverwalk along the Rainbow River and provide for water quality for untreated stormwater runoff that currently sheetflows into the Rainbow River.	Regional Stormwater Treatment	Completed	2018	0	$110,000	City of Dunnellon	City of Dunnellon - $110,000.00
4255	City of Dunnellon	R001	River Protection Corridors	The City of Dunnellon River Protection Corridor Areas for both the Rainbow and Withlacoochee	Regulations, Ordinances, and Guidelines	Completed	2015	0	$0	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				River. Corridor extends 150 feet from the ordinary high water line and implements specific standards based on Ordinance 2008-01.							
4257	City of Dunnellon	R003	Blue Cove Emergency Overflow Project	Project to construct a retention pond with a control structure and pipe conveyance system to treat flood overflows from Blue Cove to the Rainbow River. Prior to construction, overflows sheet flowed through residential neighborhood to the river.	On-line Retention BMPs	Completed	2011	0	$9,305	City of Dunnellon	City of Dunnellon - $9,305.00
4259	City of Dunnellon	R058	Rio Vista Collection System Maintenance	Companion project to the Rio Vista WWTP decommissioning. The collection system is subject to high infiltration into the system after storm events resulting in overflows from the plant holding pond.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2015	0	$0	Not provided	Not provided - $0.00
4267	City of Dunnellon	R004	Datesman Park Overflow Parking Lot Improvement	Project retrofitted a car and boat trailer overflow parking	On-line Retention BMPs	Completed	2010	0	$116,195	City of Dunnellon	City of Dunnellon - $116,195.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				lot with pervious pavers and a stormwater retention pond.							
4269	City of Dunnellon	R019	Sewer Conversion Project, Phases 1-4	Project constructed new sewer system within the City limits allowing properties previously on OSTDS (140 in Phase 2) to hook up to central sewer. Original credit of 1153 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2012	0	$0	Not provided	Not provided - $0.00
4272	City of Dunnellon	R022	Dunnellon WMP	Includes a hydrologic and hydraulic model and water quality treatment recommendations for nine stormwater discharge outfalls to the Rainbow and Withlacoochee rivers.	Study	Completed	2005	0	$50,000	City of Dunnellon	City of Dunnellon - $0.00
4549	City of Dunnellon	R111	City of Dunnellon New Watershed Management Plan	City of Dunnellon will implement a watershed management plan. This project will perform the Watershed Evaluation and	Study	Underway	2026	0	$275,000	SWFWMD	SWFWMD - $275,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				develop a WMP. This funding request is for FY 2020.							
6752	City of Dunnellon	R135	Granada & Palmetto Way Drainage Improvements	This project will improve the drainage system along the Granada, Palmetto Way, and Magnolia Street to facilitate reduced flooding and improved water quality treatment. Swales will be installed with ditchblocks to improve nutrient uptake and delay runoff.	BMP Treatment Train	Underway	2025	0	$1,000,000	City of Dunnellon	City of Dunnellon - $1,000,000.00
3727	City of Fruitland Park	S170	Public Education and Outreach Activities to Protect Groundwater	Outreach program (6% credit) to residents of Fruitland Park enhances knowledge and awareness of stormwater management. Includes FYN program; ordinances for fertilizer, landscaping, irrigation, and pet waste; PSAs; pamphlets; website;	Education Efforts	Ongoing	NA	620	$0	City of Fruitland Park	City of Fruitland Park - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				and inspection program.							
3981	City of Fruitland Park	S121	Fruitland Park NPDES Permit Education and Outreach	Landscaping, irrigation, fertilizer, and pet waste ordinances. The city utilizes a consultant for education and outreach. Activities include PSAs, pamphlets, website, illicit discharge program, utility bill inserts, and informational displays.	Education Efforts	Ongoing	NA	0	$0	City of Fruitland Park	City of Fruitland Park - $9,000.00
3982	City of Fruitland Park	S120	Street Sweeping and Storm Drain Inlet Cleaning	Sweep streets 4 times per year and clean out 12 storm drain inlets.	Street Sweeping	Ongoing	NA	0	$0	City of Fruitland Park	City of Fruitland Park - $0.00
3984	City of Fruitland Park	S118	Fruitland Park WWTF Decommissioning	Remove existing WWTF from service. Construction of lift station to allow transfer of wastewater to Lady Lake for treatment. Improved treatment at Lady Lake facility.	WWTF Upgrade	Completed	2020	0	$1,500,000	Not provided	Not provided - $0.00
3728											

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
5938	City of Hawthorne	S231	0.2 MGD AWT Package Plant, Ph. I	Construction of a 0.2 MGD AWT Package Plant. Existing WWTF is failing, does not provide any level of redundancy or reliability, fails to meet AWT standards and nutrient reduction goals of the BMAP and has deteriorating components.	WWTF Upgrade	Planned	2026	774	$9,798,000	DEP Water Quality Improvement Grants Program	DEP Water Quality Improvement Grants Program - $9,798,000.00
7047	City of Hawthorne	S275	Lift Station Rehabilitation	This project is to rehabilitate three (3) of the City's sanitary sewer lift stations. The project will also provide emergency generators at the three (3) lift station sites. This project ensures the sewer system can remain fully accessible during storms.	Sanitary Sewer - Alum Injection System	Planned	2026	0	$1,861,000	Florida Legislature	Florida Legislature - $1,861,000.00
3723	City of Ocala	S174	Public Education and Outreach Activities	Outreach program (2 % credit) to residents of the City of Ocala that enhances knowledge and awareness of stormwater management.	Education Efforts	Ongoing	NA	3,744	$0	City of Ocala	City of Ocala - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Includes PSAs; pamphlets; website; and inspection program. FYN credit of 3% and fertilizer ordinance.							
3758	City of Ocala	S141	SkimBoss™ Filtration System	Retrofit Installation of SkimBossTM Filtration System with Bold & GoldTM media for Lake Anderson, Yum Yum Pond, and Heritage Pond.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2020	153	$660,000	DEP; Legislative Appropriation; City of Ocala	DEP - $328,000; Legislative Appropriation - $250,000; City of Ocala - $82,000
3764	City of Ocala	S135	Wetland Recharge Park	The wetland will utilize treated wastewater, along with some stormwater. The wetland area will receive 3-5 million gallons of treated waste/storm water a day. This water will then recharge the UFA. The wetland plants will reduce TN to near zero.	WWTF Diversion to Reuse	Completed	2020	0	$10,000,000	DEP Springs; SJWRMD; City of Ocala	DEP Springs - $0; SJWRMD - $0; City of Ocala - $0
3774	City of Ocala	S136	Southwood Villas and Lake Weir Sewer Expansion Project	The objective of this project is to design and construct a sanitary sewer system which will remove from service approximately 100 septic tanks from the associated	OSTDS Phase Out	Completed	2020	0	$2,565,950	DEP Springs; SJWRMD; City of Ocala	DEP Springs - $1,282,976; SJWRMD - $0; City of Ocala - $0

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				single family residential lots. Original credit of 525 lbs-TN/yr. Project was captured in the updated loading estimates.							
3907	City of Ocala	S014	City of Ocala Silver Spring/ River Pollution Reduction Project	Addresses surface water discharge. Project provided water quality treatment for four drainage basins in the city. Basins historically discharged untreated stormwater runoff to Half Mile Creek via the SR 40/Silver Springs Blvd. storm sewer system.	Regional Stormwater Treatment	Completed	2018	94	$3,501,034	DEP; FDOT; SJRWMD; CBIR; City of Ocala	DEP - $0; FDOT - $0; SJRWMD - $0; CBIR - $0; City of Ocala - $0
3926	City of Ocala	S124	City of Ocala - Retrofit Installation of SkimBoss™ Filtration System with Bold & Gold™	The installation of the SkimBoss Filtration Systems using Bold & Gold™ media to treat water leaving ponds and flowing into recharge wells at 613 SE 13th Ave, NE 10th St. @ 1200 Block, NE 14th St. and 12th Ct.	Biosorption Activated Media (BAM)	Completed	2020	0	$485,650	DEP; DEP TMDL; City of Ocala	DEP - $350,776; DEP TMDL - $0; City of Ocala - $0

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3929	City of Ocala	B056	Utility Public Education and Outreach	Programming focuses on water conservation, wetland education, what not to flush, and fats, oils, and grease. This is facilitated through public presentations, brochures, social media, special events, facility tours, workshops, and handouts.	Education Efforts	Ongoing	NA	0	$0	City of Ocala	City of Ocala - $50,000.00
3931	City of Ocala	B049	Meadow Oaks Sewer Expansion Project	The objective of the project is to design and construct a sanitary sewer system which can remove from service ~100 OSTDS from the associated single family residential lots. This project did not include OSTDS remediation and sewer connection.	Wastewater Service Area Expansion	Completed	2023	0	$4,705,000	DEP; Equity Lifestyle	DEP - $0.00; Equity Lifestyle - $0.00
3946	City of Ocala	S086	SkimBoss™ Filtration System - Chazal Park Pond	Addresses drainage well discharge. Retrofit installation of SkimBoss™ filtration system with Bold & Gold™ media - Chazal Park Pond.	Biosorption Activated Media (BAM)	Completed	2020	0	$711,594	DEP; City of Ocala	DEP - $490,474.00; City of Ocala - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3952	City of Ocala	S092	City of Ocala WRF 2 Nutrient Reduction Plan	Upgrade WWTP for advanced treatment and expand the availability of reclaimed water for irrigation use. The project consists of construction of two 3.25 mgd Carrousels. This will allow the City of Ocala to reduce effluent TN <3 mg/L.	WWTF Nutrient Reduction	Completed	2016	0	$12,144,000	DEP; SJRWMD; City of Ocala	DEP - $1,275,620.00; SJRWMD - $1,920,000.00; City of Ocala - $8,304,000.00
3953	City of Ocala	S091	City of Ocala Nitrogen Reduction Project	Upgrade of WRF 2 to AWT standard for TN and decommission WRF 1. WRF 1, a trickling filter facility and is not designed for the removal of nitrate. WRF 2 and #3 will handle the flows from WRF 1 and all of the plants will be interconnected.	WWTF Nutrient Reduction	Completed	2016	0	$16,000,000	City of Ocala	City of Ocala - $9,600,001.00
3958	City of Ocala	S087	Silver Springs Protection/ Stormwater Nutrient Reduction Project (Cameo Pond)	Addresses surface water discharge. Silver Springs Protection/Stormwater Nutrient Reduction Project.	Wet Detention Pond	Completed	2019	0	$3,000,000	DEP TMDL; FDOT; City of Ocala	DEP TMDL - $706,321; FDOT - $0; City of Ocala - $0
3969	City of Ocala	S085	SkimBoss™ Filtration System - Tuscawilla Pond	Addresses drainage well discharge. Retrofit installation	Biosorption Activated Media (BAM)	Completed	2020	0	$711,594	DEP; City of Ocala	DEP - $490,474.00;

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				of SkimBoss filtration system with Bold & Gold™ media-Tuscawilla Pond.							City of Ocala - $0.00
3987	City of Ocala	S115	Miscellaneous Water and Sewer	Miscellaneous extension of existing water, sewer, and reuse facilities to provide services.	Wastewater Service Area Expansion	Underway	2024	0	$500,000	City of Ocala	City of Ocala - $0.00
3990	City of Ocala	S035	Citywide Septic Tank and Well Elimination Program	This project includes the connection of OSTDS within the City of Ocala at no cost to the homeowners. Elimination of the OSTDS in this project is estimated to provide a reduction in nitrogen loading to the Silver Springs basin. Original credit of 4612 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2018	0	$10,500,000	DEP; SJRWMD; City of Ocala	DEP - $5,500,000; SJRWMD - $5,000,000; City of Ocala - $0
3997	City of Ocala	S116	Sanitary Sewer Smoke Testing, Televising, and Lining Program	Smoke testing and inspection of existing sanitary sewer system.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Underway	2024	0	$3,000,000	City of Ocala	City of Ocala - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4008	City of Ocala	S042	Reuse Projects	Public access reuse system provides reclaimed water for irrigation of golf courses and roadways.	WWTF Diversion to Reuse	Completed	2016	0	$0	Not provided	Not provided - $0.00
4014	City of Ocala	S036	Package Plant Abatement	Connection of White Oak Mobile Home Park (MHP), Magnolia Gardens, and 301 Plaza to central sewer.	Decommission/ Abandonment	Completed	2016	0	$0	Not provided	Not provided - $0.00
4022	City of Ocala	S055	Collection System Maintenance Program	TV inspection on entire collection system. Slip lining 175,000 ft. of clay pipe is complete and 40,000 feet/year scheduled through 2020. Approx. 3 lift stations are upgraded per year. System and plants are SCADA controlled and flows can be rerouted.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2020	0	$0	Not provided	Not provided - $0.00
4204	City of Ocala	R098	Public Education and Outreach Activities	Outreach program (2.0 % credit) to residents of the City of Ocala that enhances knowledge and awareness of stormwater management. Includes PSAs,	Education Efforts	Planned	TBD	501	$0	City of Ocala	City of Ocala - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				pamphlets, website, and inspection program. Includes 3% credit for FYN Program.							
4252	City of Ocala	B049	Meadow Oaks Sewer Expansion Project	The objective of the project s to design and construct a sanitary sewer system which will remove from service ~100 OSTDS from the associated single family residential lots. Connections were not included.	Wastewater Service Area Expansion	Completed	2024	0	$4,705,000	DEP; City of Ocala; Equity Lifestyle	DEP - $1,436,953.00; City of Ocala - $0.00; Equity Lifestyle - $1,436,953.00
4253	City of Ocala	B050	Fairfield Village Sewer Expansion Project	The objective of the project s to design and construct a sanitary sewer system which will remove from service ~350 OSTDS from the associated single family residential lots. The OSTDS contribute to the TN impairment of Rainbow Springshed.	OSTDS Phase Out	Completed	2022	5,027	$900,000	City of Ocala; DEP	DEP - $450,000.00; City of Ocala - $450,000.00
4586	City of Ocala	S192	Wetland Groundwater Recharge Park Education	This is the education effort specifically for the Wetland Park Project. This project will include	Enhanced Public Education	Completed	2021	0	$500,000	DEP	DEP - $319,208.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				an educational location at the park facility. The focus is on kinesthetic learning about the park's purpose and inciting behavior modifications.							
4587	City of Ocala	S193	OSTDS Abandonment and Connection to City Sewer NW 35th Street	In the future, this project will remove 52 OSTDS from properties located along NW 35th St. in Ocala between NE Jacksonville Rd and N. Pine Ave	Wastewater Service Area Expansion	Completed	2023	0	$0	City of Ocala	City of Ocala - $0.00
4588	City of Ocala	S194	OSTDS Abandonment and Connection to City Sewer SW 27th Avenue	In the future, this project will remove approx. 50 OSTDS from properties located along SW 27th Ave in Ocala between SW 16th St and SW 16th Pl.	Wastewater Service Area Expansion	Completed	2024	0	$0	City of Ocala	City of Ocala - $0.00
4589	City of Ocala	S195	Retrofit Installation of SkimBoss Filtration System with Bold & Gold Media on three drainage wells at Lake Tuscawilla	The installation of the SkimBoss Filtration Systems using media to treat water leaving ponds and flowing into recharge wells at Lake Tuscawilla.	Biosorption Activated Media (BAM)	Completed	2021	0	$760,000	DEP; City of Ocala	DEP - $380,000; City of Ocala - $0
5456	City of Ocala	B055	Saddle Oak Sewer Expansion Project	The objective of the project is to design and construct a sanitary sewer system which will remove from	OSTDS Phase Out	Completed	2022	4,596	$600,000	DEP; City of Ocala	DEP - $300,000.00; City of Ocala - $300,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				service ~320 OSTDS from the associated single family residential lots. The OSTDS contribute to the TN impairment of Rainbow Springshed.							
5486	City of Ocala	S213	Retrofit Installation of SkimBoss Filtration System with Bold & Gold Media on Three Drainage Wells at NW 10th St, NW 8th St. and SE 11th Ave	The installation of the SkimBoss Filtration Systems using media to treat water leaving ponds and flowing into recharge wells at NW 10th St, NW 8th St. and SE 11th Ave.	Biosorption Activated Media (BAM)	Completed	2022	0	$600,000	City of Ocala; DEP	City of Ocala - $0.00; DEP - $600,000.00
5912	City of Ocala	B058	Miscellaneous Force Main and Gravity Main Lining	Miscellaneous extension of existing water, sewer, and reuse facilities to provide services.	Wastewater Service Area Expansion	Underway	2024	0	$1,000,000	DEP; City of Ocala	DEP - $500,000.00; City of Ocala - $500,000.00
5913	City of Ocala	B059	Hazard Mitigation Grant Program	The purchase and installation of twenty permanent generators, automatic transfer switches and other electrical components for designated lift stations.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Underway	2024	0	$2,000,000	City of Ocala; FEMA	City of Ocala - $484,753.00; FEMA - $1,454,259.00
5914	City of Ocala	B060	OSTDS Abandonment and	This project is set to remove 200 OSTDS and	OSTDS Phase Out	Planned	2024	1,596	$1,000,000	City of Ocala; DEP	City of Ocala - $0.00; DEP - $800,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
			Connection to City Sewer	connect them to City sewer.							
5928	City of Ocala	B058	Miscellaneous Force Main and Gravity Main Lining	Miscellaneous extension of existing water, sewer, and reuse facilities to provide services.	Wastewater Service Area Expansion	Underway	2024	0	$1,000,000	DEP; City of Ocala	DEP - $500,000.00; City of Ocala - $500,000.00
5929	City of Ocala	B059	Hazard Mitigation Grant Program	The purchase and installation of twenty permanent generators, automatic transfer switches and other electrical components for designated lift stations.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Underway	2024	0	$2,000,000	FEMA; City of Ocala	FEMA - $1,454,259.00; City of Ocala - $484,753.00
5930	City of Ocala	B060	OSTDS Abandonment and Connection to City Sewer	This project removed 100 OSTDS and connected them to City sewer.	OSTDS Phase Out	Completed	2023	945	$1,000,000	DEP; City of Ocala	DEP - $800,000.00; City of Ocala - $0.00
5931	City of Ocala	S238	Retrofit Installation of Nutrient Removing Filtration System with Bold & Gold Media on Three Drainage Wells at Edgewood Park Pond	The installation of the Nutrient Removing Filtration Systems using media to treat water leaving ponds and flowing into recharge wells at Edgewood Park Pond.	Biosorption Activated Media (BAM)	Completed	2023	0	$420,000	DEP; City of Ocala	DEP - $420,000.00; City of Ocala - $0.00
5932	City of Ocala	S239	Lake Wyomina Drainage Area Retrofit Project	Reshape drainage retention area, relocation of	Biosorption Activated Media (BAM)	Completed	2021	0	$648,000	DEP; SJRWMD;	DEP - $162,000; SJRWMD -

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				recharge well and installation of 24" thick layer or Bioactivated Media at Lake Wyomina drainage area.						City of Ocala	$162,000; City of Ocala - $324,000
3722	City of Wildwood	S175	Wildwood Street Sweeping	Sweeping of local streets.	Street Sweeping	Ongoing	NA	17	$0	City of Wildwood	City of Wildwood - $0.00
3725	City of Wildwood	S172	Public Education and Outreach Activities	Outreach program (1 % credit) to residents of City of Wildwood that enhances knowledge and awareness of stormwater management. Includes SWFWMD requirements for water conservation and FFL recommendations for fertilizing and irrigating landscapes.	Education Efforts	Ongoing	NA	347	$0	City of Wildwood	City of Wildwood - $0.00
7401	City of Wildwood	S278	Huey Street Parking and Pond	Construction of a parking lot and the construction of a Stormwater Pond to improve the local drainage existing conditions.	100% On-site Retention	Completed	2024	0	$336,936	Sumter County School Board	Sumter County School Board - $336,935.50
7444	City of Wildwood	S279	Pleasantdale Drive Improvements	Project site consists of the right-of-way (ROW) along Pleasantdale Drive,	100% On-site Retention	Completed	2024	0	$1,204,699	City's CIP	City's CIP - $1,204,698.79

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				north of Cleveland Avenue and a proposed stormwater pond on Parcels G05N012 and G05E030.							
4184	City of Williston	R077	Williston WWTP Upgrade	Upgrade of the City of Williston WWTF to improve nitrogen removal. The new operating permit has a discharge limit of 6 mg/L N.	WWTF Nutrient Reduction	Underway	2025	714	$4,945,000	DEP Springs; CDBG; City of Williston; DEP WW Grant Program	DEP Springs - $2,300,000.00; CDBG - $750,000.00; City of Williston - $0.00; DEP WW Grant Program - $1,895,000.00
4027	DEP	S066	Groundwater - Surface Water Interaction Study Lake Lochloosa Area, Alachua and Marion Counties	Study of ground water pathways for nutrients to enter Lochloosa and Orange Lakes. Field investigation determined levels of TP and TN in different aquifers land use categories. Radon studies estimated ground water seepage into Lochloosa Lake.	Study	Completed	2007	0	$64,000	USGS	USGS - $0.00
4244	DEP	B012	Implementation of Outreach Program for Small Equine BMP Manual	An outreach program will be developed to implement the Small Equine BMP Manual on non-commercial horse farms in the Silver	Agricultural BMPs	Planned	TBD	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				and Rainbow Springs BMAP areas.							
3915	DEP - Division of State Lands	S006	Silver Springs Conservation Area	Acquisition of 346 acres of undeveloped land directly across SR 35 from Silver Springs State Park. The land was acquired under Florida's First Magnitude Springs Project by the Division of State Lands. Leased to and managed by Marion County.	Land Acquisition	Completed	2005	0	$7,847,000	FCT	FCT - $0.00
3916	DEP - Division of State Lands	S005	Acquisition of Indian Lake State Forest	Purchase of 4,400 acres previously known as the Avatar Property. The forest is within the 2 and 10 year modeled capture areas and contains Indian Lake, a karst feature connected to the Upper Floridan aquifer, and numerous sinkholes.	Land Acquisition	Completed	2007	0	$78,000,000	FCT; Marion County	FCT - $0.00; Marion County - $0.00
4175	DEP - Division of State Lands	R067	Bear Hammock	The Bear Hammock project in southern Marion County would enhances goals of better coordination	Land Acquisition	Planned	TBD	0	$32,576,529	FCT	FCT - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				of land-acquisition efforts by acting as a connector between Goethe State Forest and the Marjorie Harris Carr Cross Florida Greenway. No land acquired to date.							
4185	DEP - Division of State Lands	R068	Carr Farm/Price's Scrub	The Carr Farm/Price's Scrub located between Alachua County and Marion County is Peninsular Florida's northernmost example of scrub community. 962 acres, in Marion County, have been acquired to date with purchase of 305 acres to complete acquisition.	Land Acquisition	Underway	TBD	0	$1,975,000	FCT; Office of Greenways and Trails	FCT - $0.00; Office of Greenways and Trails - $0.00
4256	DEP - Division of State Lands	R002	Rainbow River Corridor	The Rainbow River Corridor project protects undeveloped or minimally developed private land remaining along the Rainbow River. Acquisition of 42 acres leaves the southern parcels 1,129 acres for	Land Acquisition	Underway	NA	0	$2,926,164	FCT	FCT - $2,606,164.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				future purchase as funds and sales agreements allow.							
4265	DEP - Division of State Lands	R066	South Goethe	Provides a corridor from the Goethe State Forest to Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area along Withlacoochee River, links to the Etoniah Cross Florida Greenway Florida Forever project. No land acquired yet.	Land Acquisition	Planned	TBD	0	$11,574,303	FCT	FCT - $0.00
4282	FDACS	B048	Enhanced IA Program	FDACS will implement the enhanced IA Program and more detailed reporting, as prescribed by the legislation, on site visits and surveys will be provided on an annual basis.	Agricultural BMPs	Ongoing	NA	0	$0	NA	NA - $0.00
4287	FDACS	FDACS-03	Cost-Share BMP Projects	Cost-share projects paid for by FDACS. Project treatment areas and reductions based on FDACS June 2024 Enrollment and NSILT Loading tool (based on	Agricultural BMPs	Ongoing	NA	41,820	$0	FDACS	FDACS - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				FSAID IX) developed by FDACS.							
5923	FDACS	FDACS-01	BMP Implementation and Verification - Farm Fertilizer	Enrollment and verification of BMPs by agricultural producers. Acres treated and reductions estimated using FDACS June 2024 Enrollment and NSILT Loading tool (based on FSAID IX) developed by FDACS.	Agricultural BMPs	Ongoing	NA	31,346	$0	FDACS	FDACS - $0.00
5924	FDACS	FDACS-02	BMP Implementation and Verification - Livestock Waste	Enrollment and verification of BMPs by agricultural producers. Acres treated and reductions estimated using FDACS June 2024 Enrollment and NSILT Loading tool (based on FSAID IX) developed by FDACS.	Agricultural BMPs	Ongoing	NA	12,633	$0	FDACS	FDACS - $0.00
3818	FDOT District 2	S125	Fertilizer Cessation	FDOT O&M fertilizer cessation.	Fertilizer Cessation	Completed	2012	826	$0	NA	NA - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3917	FDOT District 2	S015	SR 20 Widening	Addresses surface water. Eastern urban area of Gainesville and Alachua County. Widening of SR 20 from 2 lane to 4 lane road with stormwater runoff treatment. Three wet detention ponds installed to treat stormwater runoff.	Wet Detention Pond	Completed	2006	444	$10,763,788	DEP	DEP - $0.00
4036	FDOT District 2	S064	State Road Street Sweeping	Limited street sweeping of state roads within urbanized areas that have curb and gutter. Includes SR 20 and SR26.	Street Sweeping	Ongoing	NA	0	$0	Not provided	Not provided - $0.00
4194	FDOT District 2	R080	Wet Detention/ Retention Ponds in FDOT Roads	Nitrogen reduction from wet detention/retention ponds on SR 500 (US 27A). Ponds 1 and 5 were completed in 2002 and Pond 10 was completed in 2004.	Wet Detention Pond	Completed	2004	31	$0	Not provided	Not provided - $0.00
4225	FDOT District 2	R096	Sweeping of State Roads	Monthly street sweeping of SR 500 and SR 121. Total solids collected per year is approximately 7,356 pounds.	Street Sweeping	Ongoing	NA	1	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4233	FDOT District 2	R079	Fertilizer Cessation	FDOT Operations and Maintenance Fertilizer Cessation on SR 121 and SR 500 (US 27A). Cessation began in 2009 and is ongoing.	Fertilizer Cessation	Completed	2012	872	$0	NA	NA - $0.00
3786	FDOT District 5	S145	State Road Street Sweeping	Street sweeping of state roads within urbanized areas that have curb and gutter.	Street Sweeping	Ongoing	NA	539	$0	FDOT	FDOT - $0.00
3903	FDOT District 5	S027	SR35 Design Project - Pond 9	238677-1, SR 35 from SR 464 (Maricamp Rd.) to SR 40 - Basin 9 (Pond 9) / Dry Retention.	On-line Retention BMPs	Completed	2012	1	$0	DEP	DEP - $0.00
3904	FDOT District 5	S019	SR500 (US441) Design Project - Basin E	238395-4, SR 500 (US 441) From Martin Luther King to Lake Ella Rd. - Basin E / Dry Retention; Open Basin Discharge to Lake Griffin.	On-line Retention BMPs	Completed	2014	16	$0	DEP	DEP - $0.00
3905	FDOT District 5	S017	SR500 (US441) Design Project - Basin C	238395-4, SR 500 (US 441) From Martin Luther King to Lake Ella Rd.- Basin C / Wet Detention; Open Basin Discharge to Lake Griffin.	Wet Detention Pond	Completed	2014	3	$0	DEP	DEP - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3999	FDOT District 5	S053	SR40 Stormwater Pump Station Operation and Maintenance	O&M of the pump station and collection system constructed as part of the Marion County portion of the Silver/Springs River Pollution Reduction Project. Activities include servicing and repair of the pump station.	Regional Stormwater Treatment	Completed	2010	38	$595,927	DEP	DEP - $0.00
4005	FDOT District 5	S047	Fertilizer Cessation	FDOT O&M fertilizer cessation.	Fertilizer Cessation	Completed	2010	5,314	$0	DEP	DEP - $0.00
4227	FDOT District 5	R095	Street Sweeping	Not provided.	Street Sweeping	Ongoing	NA	31	$0	FDOT	FDOT - $0.00
4245	FDOT District 5	B022	State Road (SR) 40 Design Project - Pond 3	238719-1, SR 40 from CR 328 to SW 80th Ave. (CR 225A) - Pond 3/dry retention; closed basin in poorly drained soils.	On-line Retention BMPs	Completed	2016	3	$0	FDOT	FDOT - $0.00
4246	FDOT District 5	B023	SR 40 Design Project - Pond 4	238719-1, SR 40 from CR 328 to SW 80th Ave. (CR 225A) - Pond 4/dry retention; closed basin in poorly drained soils.	On-line Retention BMPs	Completed	2016	4	$0	FDOT	FDOT - $0.00
4247	FDOT District 5	B024	SR 40 Design Project - Pond 5	238719-1, SR 40 from CR 328 to SW 80th Ave. (CR 225A) - Pond 5/dry retention; closed	On-line Retention BMPs	Completed	2016	4	$0	FDOT	FDOT - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				basin in poorly drained soils.							
4248	FDOT District 5	B025	SR 40 Design Project - Pond 6	238719-1, SR 40 from CR 328 to SW 80th Ave. (CR 225A) - Pond 6/dry retention; closed basin in poorly drained soils.	On-line Retention BMPs	Completed	2016	3	$0	FDOT	FDOT - $0.00
4263	FDOT District 5	R064	Blue Cove Lake Water Quality Structure	Load reduction estimated using efficiency for baffle box. However, the box includes filter media which may reduce the estimated pollutant load more than estimated.	Baffle Boxes-Second Generation with Media	Completed	2013	0	$0	FDOT	FDOT - $0.00
4271	FDOT District 5	R021	Fertilizer Cessation	FDOT operations and maintenance fertilizer cessation.	Fertilizer Cessation	Completed	2012	2,443	$0	FDOT	FDOT - $0.00
6801	FDOT District 5	S260	FM: 238395-5	SR 500 Pond F2.	On-line Retention BMPs	Underway	2024	3	$0	Florida Legislature	Florida Legislature - $0.00
6802	FDOT District 5	S259	FM: 238395-5	SR 500 Pond G1.	On-line Retention BMPs	Underway	2024	2	$0	Florida Legislature	Florida Legislature - $0.00
6804	FDOT District 5	S258	FM: 238395-5	SR 500 Pond H2.	On-line Retention BMPs	Underway	2024	0	$0	Florida Legislature	Florida Legislature - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
6807	FDOT District 5	S256	FM: 238395-5	SR 500 Pond H1.	On-line Retention BMPs	Underway	2024	2	$0	Florida Legislature	Florida Legislature - $0.00
7105	FDOT District 5	S270	FM: 438562-1	I-75 (SR 93) Rest Area Marion County from N of SR 484 to S of SR 200 - Dry Retention Ponds.	Dry Detention Pond	Underway	2025	0	$0	Florida Legislature	Florida Legislature - $0.00
3897	FDOT Districts 2 and 5	B038	FDOT Public Education	FDOT conducts inspections and provides annual illicit discharge, spill prevention, and erosion and sediment control training to staff and contractors.	Education Efforts	Ongoing	NA	0	$0	DEP	DEP - $0.00
4266	FDOT Districts 2 and 5	B038	FDOT Public Education	FDOT conducts inspections and provides annual illicit discharge, spill prevention and erosion & sediment control training to staff and contractors.	Education Efforts	Ongoing	NA	0	$0	FDOT	FDOT - $0.00
3942	FFS	B009	Silviculture BMP Implementation and Compliance	Silviculture BMPs are applied to industrial, public, and private forestlands. Developed in mid-1970s as the minimum standards for protecting water quality on forestry	Agricultural BMPs	Ongoing	NA	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				activities. Projects include biennial surveys, training, and technical assistance.							
4250	FFS	B009	Silviculture BMP Implementation and Compliance	Silviculture BMPs are applied to industrial, public, and private forestlands. Developed in mid-1970s as the minimum standards for protecting water quality on forestry activities. Projects include biennial surveys, training, and technical assistance.	Agricultural BMPs	Ongoing	NA	0	$0	Not provided	Not provided - $0.00
4169	Florida Governmental Utility Authority	R052	Wastewater Level of Service Coordination - System Upgrade	Coordination between FGUA, MCU, and City of Dunnellon utility to improve level of treatment of wastewater in the Rainbow Springs area. The project would improve the existing level of treatment by constructing a new WWTF that meets AWT.	WWTF Nutrient Reduction	Planned	NA	0	$0	TBD	TBD - $0.00
4176	Florida Governmental	R053	Wastewater Level of Service	Coordination between FGUA, MCU and City of	OSTDS Phase Out	Planned	NA	2,123	$0	TBD	TBD - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
	Utility Authority		Coordination - OSTDS Abatement	Dunnellon utility to improve treatment of wastewater in the Rainbow Springs area. Project would allow about 266 OSTDS to hook up to central sewer, with the potential for additional connections in future.							
4192	Florida Governmental Utility Authority	R054	Wastewater Level of Service Coordination - Package Plant Abatement P113 Rainbow Springs Infrastructure Development	The project would initially allow 5 package plants to hook up to central sewer and dispose of wastewater at the City of Dunnellon WWTP, with the potential for additional connections in the future. Dunnellon water and sewer sold to FGUA October 2018.	Wastewater Service Area Expansion	Planned	TBD	0	$0	SWFWMD; City of Dunnellon	SWFWMD - $0.00; City of Dunnellon - $0.00
4207	Florida Governmental Utility Authority	R101	Burkett Road Septic to Sewer Project	The primary objective of the project is to design and construct a sanitary sewer system which will remove from service approximately 11 septic tanks from	OSTDS Phase Out	Underway	2023	158	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				the associated single family residential lots.							
4209	Florida Governmental Utility Authority	R103	Rainbow River and Rio Vista Septic-to-Sewer Project	The primary objective of this project is to design and construct a sanitary sewer system which will remove from service approximately 329 septic tanks from the associated single family residential lots.	OSTDS Phase Out	Underway	2023	4,726	$0	Not provided	Not provided - $0.00
4217	Florida Governmental Utility Authority	R102	Chatmire Septic to Sewer Project	The primary objective of the project is to design and construct a sanitary sewer system which will remove from service approximately 210 septic tanks from the associated single family residential lots.	OSTDS Phase Out	Underway	2024	1,676	$3,700,000	DEP Springs; Not provided	DEP Springs - $3,700,000.00; Not provided - $0.00
4223	Florida Governmental Utility Authority	R084	Rainbow Springs Water Reclamation Facility (WRF) Decommissioning	A force main from Rainbow Springs WRF to FGUA's Dunnellon WRF and decommissioning of Rainbow Springs WRF is under contract for design.	Decommission/ Abandonment	Underway	2024	0	$0	DEP	DEP - $2,742,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Estimated reduction upon completion is 8,943 lbs/yr TN.							
4251	Florida Governmental Utility Authority	R059	Supervisory Control and Data Acquisition (SCADA) Installation	Planned phased project for installation of SCADA at city WWTPs followed by installation at lift stations.	WWTF Upgrade	Underway	TBD	0	$0	Not provided	Not provided - $0.00
4548	Florida Governmental Utility Authority	R110	Rainbow Springs Infrastructure Development	Design and construct approximately 33,000 feet of wastewater force main, upgrades to one lift station and wastewater stub-outs to allow for future connections to approximately four existing WWTP sites.	Decommission/ Abandonment	Completed	2022	0	$0	DEP	DEP - $2,279,183.00
3732	Lake County	S167	Public Education and Outreach Activities	Outreach program (5.5 % credit) to residents that enhances knowledge and awareness of stormwater management. Includes FYN program; ordinances for landscaping, irrigation, and fertilizer; PSAs; pamphlets; website;	Education Efforts	Ongoing	NA	1,128	$0	Lake County	Lake County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				and inspection program.							
3761	Lake County	S138	Lake County Enhanced Fertilizer Ordinance	November 2017 Lake County Board of County Commissioners adopted an enhanced fertilizer ordinance. Includes 15 foot setback from water bodies, 50 % slow release requirement, and a summer TP and TN blackout period from June 1 to September 30.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Lake County	Lake County - $0.00
3766	Lake County	S133	Erosion Control Inspection Training and Certification	Recurring training provided by Lake County to instruct and certify contractors on erosion and sediment control BMPs. Reduces nutrient load by reducing sediment discharge to water bodies.	Education Efforts	Ongoing	NA	0	$0	Lake County	Lake County - $0.00
3817	Lake County	S084	Landscaper BMP Training	Landscape BMP education.	Education Efforts	Completed	2020	0	$1,276	Lake County	Lake County - $0.00
3886	Lake County	S003	Golf Course Resource Management Plan	Golf course resource management plans are applicable to	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Lake County	Lake County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				the unincorporated portion of Lake County for new and existing golf courses. Regulatory approach will provide protection to ground and surface waters.							
3888	Lake County	S004	Lake County Shoreline Protection Guide	Education outreach information provided on an ongoing basis through Adopt-a-Lake and Lake County Stormwater program outreach.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Lake County	Lake County - $0.00
3961	Lake County	S101	Lake County Irrigation Ordinance	Irrigation Ordinance 2009-17 implements SJRWMD watering requirements and encourages water efficient landscape design: codified into LDR.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Lake County	Lake County - $0.00
3962	Lake County	S100	Lake County Landscaping Ordinance	Landscaping Ordinance 2009-062 implements Water Wise and FFL, tree protection and buffer requirements: codified into land development regulations (LDR).	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Lake County	Lake County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3970	Lake County	S083	Lake County NPDES Permit Education and Outreach	Education outreach information provided on an ongoing basis through Adopt-a-Lake and Lake County Stormwater program outreach.	Education Efforts	Ongoing	NA	0	$0	Lake County	Lake County - $0.00
5484	Lake County	S223	Nutrient Pollution Awareness Campaign	Paid TV, Radio and Social Media advertising campaign to educate citizens on nutrient pollution and benefits of fertilizer ordinance.	Education Efforts	Ongoing	NA	0	$45,000	DEP; Lake County	DEP - $45,000.00; Lake County - $0.00
3790	Management Strategies	S150	Wastewater Treatment Facility Approach	Achieved by WWTF policy if implemented BMAP-wide. The policy will be implemented through the permit renewal process.	WWTF Upgrade	Planned	TBD	0	$0	TBD	TBD - $0.00
3792	Management Strategies	S148	Private Golf Course Approach	Private golf courses are expected to follow the BMP manual. Additionally, all golf courses will be required to submit nutrient management plans to DEP.	Golf Course or Sports Field BMPs	Planned	TBD	0	$0	NA	NA - $0.00
3729	Marion County	S168	Public Education and Outreach Activities	Outreach program (5.5 % credit) to residents that enhances	Education Efforts	Ongoing	NA	15,076	$0	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				knowledge and awareness of stormwater management. Includes FYN program; ordinances for landscaping, irrigation, and fertilizer; PSAs; pamphlets; website; and inspection program.							
3734	Marion County	S130	Silver Springs Shores Unit 7 Stormwater Retrofit - CP #77	Retrofit of Drainage Retention Areas 7244 and 7396 with Bold & Gold™ biosorption activated media for nitrogen reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2017	7	$1,400,000	DEP Springs; SJRWMD; Marion County	DEP Springs - $0; SJRWMD - $482,500; Marion County - $1,407,196
3878	Marion County	B036	Public Education Coordination	Comprehensive Education Plan prepared and implemented stakeholders to ensure uniform information and messaging regarding springs protection.	Education Efforts	Ongoing	NA	0	$21,000	Marion County; DEP	Marion County - $7,000.00; DEP - $14,000.00
3889	Marion County	B034	Marion County WMP	Countywide WMPs prepare that include creation and maintenance of a comprehensive geodatabase for Marion County storm sewer system	Study	Completed	NA	0	$337,000	SWFWMD; Marion County	SWFWMD - $0.00; Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				data, watershed boundaries and hydrologic features county-wide.							
3891	Marion County	B032	Sinkhole Repair Program in County DRAs	Part of ongoing stormwater system maintenance activities. Performed as needed by county crews or contractors depending on size and scope of repair. 2021 Silver Springs BMAP costs for sinkhole repairs was $332,958.	Stormwater System Rehabilitation	Completed	2018	0	$0	Marion County	Marion County - $0.00
3893	Marion County	B029	West Highway 316 at 119th Ave. Stormwater Retrofit	Proposed project to construct a stormwater pond to address a stormwater conveyance issue and reduce nitrate in stormwater runoff from adjacent land uses. The project was completed in 2016.	Wet Detention Pond	Completed	2016	4	$52,654	SWFWMD; Marion County	SWFWMD - $27,000.00; Marion County - $132,819.00
3894	Marion County	B028	SW 85th St/SW 40th Ave. Stormwater Retrofit	Construction of a drainage retention area lined with Bold & Gold™ soil amendment to enhance nitrogen removal. Post construction event	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2012	26	$330,000	SWFWMD; Marion County	SWFWMD - $105,000.00; Marion County - $225,347.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				monitoring has shown a 70 % reduction in TN through the soil amendment layer.							
3899	Marion County	S033	Country Gardens Stormwater Retrofit	Design complete. Proposed project to construct a retention area to treat stormwater runoff from residential land uses that currently discharging to a relic sinkhole/quarry. This project will be constructed with project S211.	On-line Retention BMPs	Underway	2026	0	$338,873	Marion County	Marion County - $254,155.00
3900	Marion County	S032	Hunter's Trace Retention Area Retrofit	The first use of the innovative Bold & Gold™ soil amendment. This research project confirmed the types of retention ponds/soil types the amendment would be successful in and to what degree.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2009	0	$500,000	DEP; SWFWMD; Marion County	DEP - $0.00; SWFWMD - $0.00; Marion County - $0.00
3901	Marion County	S031	Marion County Silver Springs River Pollution Reduction Project	Construction of stormwater management system to address historically untreated flow into the Half-Mile Creek, a tributary	Regional Stormwater Treatment	Completed	2010	293	$1,766,828	DEP; FDOT; SJRWMD; Marion County	DEP - $262,014; FDOT - $500,000; SJRWMD - $670,901; Marion County - $0

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				to Silver River. The system uses a dual-pump system to pump water to a retention pond for treatment.							
3902	Marion County	S030	31st Street Stormwater Retrofit	Construction of stormwater wetland to treat runoff from US 441 and adjacent commercial land uses prior to discharge to an active sinkhole. Target pollutant: nitrogen.	Constructed Wetland Treatment	Completed	2009	1	$600,000	DEP; SJRWMD; Marion County	DEP - $110,000; SJRWMD - $115,000; Marion County - $356,063
3928	Marion County	B001	Marion County TDR	TDR Program designed to protect natural resources, listed in Policy 1.1.2 of Conservation Element of Marion County Comprehensive Plan and locally important and prime farmlands. Program definition contained in Article 3 of Land Development Code.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
3938	Marion County	B003	Marion County Hamlet Design Option	Comprehensive Plan Future Land Use Element Policy 2.1.13 establishes Hamlet	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Development Option, for clustered low-density development patterns in rural designated lands. Article 3 of Land Development Code defines Hamlet design provisions.							
3941	Marion County	B010	Clean Farms Initiative	Marion County. The Clean Farms Initiative was originally passed under Resolution 04-R-384 and has evolved using a Farm Outreach Coordinator to educate farms regarding BMPs. The number of farm visits are tracked yearly. Amount of acres treated is unknown.	Agricultural BMPs	Ongoing	NA	0	$0	Not provided	Not provided - $0.00
3943	Marion County	B008	Marion County Fertilizer Ordinance	Florida-friendly fertilizer ordinance (2008) and land development code for urban landscapes regulates use of fertilizers by any applicator; training/licensing requirements;	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				application rates/methods, fertilizer-free & low-maintenance zones.							
3944	Marion County	B007	Marion County Irrigation Ordinance	Ordinance sets enforceable irrigation schedule and rates of irrigation for Marion County. It also identifies efficient irrigation systems that are exempt from schedule.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Not provided	Not provided - $0.00
3945	Marion County	B006	Marion County Springs Protection Zones	Comprehensive Plan Future Land Use Element Objective 7.2 establishes Springs Protection Overlay Zones (SPOZ) and identifies extent of Primary and Secondary Zones. Articles 5 and 6 of Land Development Code defines design and development criteria.	Regulations, Ordinances, and Guidelines	Completed	2005	0	$0	Not provided	Not provided - $0.00
3947	Marion County	B004	Marion County Rural Community Land Use Designation	Comprehensive Plan Future Land Use Element Policy 2.1.18 establishes rural community future land use	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				designation. Article 3 of Land Development Code defines rural community design provisions.							
3948	Marion County	B037	Marion County Stormwater Program NPDES MS4 Permit	Implementation of Stormwater Education Plan to ensure compliance with NPDES MS4 permit public education requirements.	Education Efforts	Ongoing	NA	0	$49,415	Marion County	Marion County - $0.00
3949	Marion County	B002	Marion County TVR	TVR Program to minimize dense development of vested properties without supporting infrastructure, permitting county to better plan for future growth. Article 3 of Land Development Code defines TVR Program and eligible sending and receiving areas.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
3950	Marion County	S094	Sports Field Maintenance Equipment Washdown Area	Construction of a “closed system equipment wash down area”, allowing parks staff to wash down equipment used for maintaining sports fields. Four sites	Regulations, Ordinances, and Guidelines	Planned	TBD	0	$0	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				close to Silver Springs are a priority for construction of the wash down facilities.							
3957	Marion County	B005	Marion County Community Redevelopment Area Program	Comprehensive Plan Future Land Use Element Objective 2.2 establishes limited density and specialized design standards for wetland areas slated for development. Articles 5 and 6 of Land Development Code lays out design and development criteria.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
3963	Marion County	S099	Aquifer-Friendly Fertilization Program for Sports Facilities	Creation and use of specific fertilizer formulas on the playing fields at the various sports complexes that the Marion County Parks Department manages to reduces pollutant loading while maintaining the health and safety of the fields.	Golf Course or Sports Field BMPs	Planned	TBD	0	$0	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3965	Marion County	S097	Gore's Landing Package Plant Upgrade	DEP has one wastewater package plant located at Gore's Landing, in a flood prone area located along the Ocklawaha River. The current system is antiquated and needs to be brought into compliance with current sewage disposal standards.	WWTF Upgrade	Planned	TBD	0	$0	Marion County	Marion County - $0.00
3967	Marion County	S095	Parks Retention Pond Retrofits	Inventory of stormwater facilities in Marion County Parks to identify potential retrofits to enhance nitrogen removal. Retrofits involve removal of a layer of soil from bottom of the basins and the construction of an engineered soil matrix.	Study	Planned	TBD	0	$0	Marion County	Marion County - $0.00
3977	Marion County	S096	Septic System Connection Removal in County Parks	Project focuses on the removal of OSTDS and connection to centralized WWTF in parks which are in close proximity to existing or planned wastewater facilities (Brick	OSTDS Phase Out	Planned	TBD	107	$0	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				City Adventure Park, Rotary Sportsplex, and Baseline Road Trailhead).							
3978	Marion County	B035	Marion County Aquifer Vulnerability Assessment	Marion County. The MCAVA project provides a scientifically defensible water-resource management and protection tool that uses a map to show relative aquifer vulnerability for use in guiding growth.	Study	Completed	2007	0	$82,850	Marion County	Marion County - $0.00
3979	Marion County	S123	Silver Springs Shores Unit 55 Stormwater Retrofit	Retrofit of two retention areas adjacent to Baseline Golf Course with the Bold & Gold™ biosorption activated media for nitrogen reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2016	29	$370,000	Marion County	Marion County - $323,041.00
3988	Marion County	S112	OSTDS 9-1-1 Strategy	Develop a strategy for addressing OSTDS and other wastewater management issues. Goal is to enhance communication and coordination among utilities and agencies.	Study	Completed	2018	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
3989	Marion County	S113	Silver Springs Sandhill Acquisition	Preserved 465 acres of high recharge sandhills within a mile of Silver Springs. The project is located just south of Indian Lake State Forest and east of the Cohadjoe Park (county). Property is managed by Marion County Parks and Recreation.	Land Acquisition	Completed	2017	0	$4,432,979	Florida Forever; Marion County	Florida Forever - $0.00; Marion County - $0.00
4162	Marion County	B029	West Highway 316 at 119th Ave Stormwater Retrofit-CP #41	Proposed project to construct a stormwater pond to address a stormwater conveyance issue and reduce nitrate in stormwater runoff from adjacent land uses. The project was completed in 2016.	On-line Retention BMPs	Completed	2016	4	$52,654	SWFWMD; Marion County	SWFWMD - $27,000.00; Marion County - $132,819.00
4164	Marion County	B036	Public Education Coordination	Comprehensive Education Plan prepared and implemented stakeholders to ensure uniform information and messaging regarding springs protection.	Education Efforts	Ongoing	NA	0	$21,000	DEP; SWFWMD; Marion County	DEP - $14,000.00; SWFWMD - $0.00; Marion County - $7,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4165	Marion County	B035	Marion County Aquifer Vulnerability Assessment	Marion County. The MCAVA project provides a scientifically defensible water-resource management and protection tool that uses a map to show relative aquifer vulnerability for use in guiding growth.	Study	Completed	2010	0	$82,850	Marion County	Marion County - $82,850.00
4166	Marion County	B034	Marion County Watershed Management Plan (WMP)	Countywide WMPs prepare that include creation and maintenance of a comprehensive geodatabase for Marion County storm sewer system data, watershed boundaries and hydrologic features county-wide.	Study	Completed	2011	0	$337,000	Marion County; SWFWMD	Marion County - $0.00; SWFWMD - $0.00
4168	Marion County	B032	Sinkhole Repair Program in County DRAs	Part of ongoing stormwater system maintenance activities. Performed as needed by county crews or contractors depending on size and scope of repair. 2019 Rainbow Springs BMAP costs for sinkhole	Stormwater System Rehabilitation	Completed	2003	0	$0	Marion County	Marion County - $38,677.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				repairs was $57,010.66.							
4170	Marion County	R071	OSTDS 9-1-1 Strategy	Springs protection educational effort targeting Marion County students.	Study	Completed	2015	0	$0	SWFWMD	SWFWMD - $0.00
4183	Marion County	R076	Rainbow Springs 5th Replat Stormwater Retrofit - CP #72	Retrofit of DRAs 2166, 2176 and 2188 with biosorption-activated media for nitrogen reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2019	36	$414,000	SWFWMD; Marion County	SWFWMD - $242,778.00; Marion County - $0.00
4203	Marion County	R097	Public Education and Outreach Activities	Outreach program (5.5 % credit) to residents of Marion County that enhances awareness of stormwater management. Includes FYN program; ordinances for landscaping, irrigation, and fertilizer; PSAs; pamphlets; website; and inspection program.	Education Efforts	Ongoing	NA	11,930	$0	SWFWMD; Marion County	SWFWMD - $0.00; Marion County - $0.00
4236	Marion County	B004	Marion County Rural Community Land Use Designation	Comprehensive Plan Future Land Use Element Policy 2.1.18 establishes rural community future land use designation for clustered urban density	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				development patterns in rural designated lands.							
4237	Marion County	B005	Marion County Community Redevelopment Area Program	Comprehensive Plan Future Land Use Element Objective 2.2 establishes specific limited density and specialized design standards for wetland and floodplain areas slated for development.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
4238	Marion County	B006	Marion County Springs Protection Zones	Comprehensive Plan Future Land Use Element Objective 7.2 establishes Springs Protection Overlay Zones (SPOZ) and identifies extent of Primary and Secondary Zones.	Regulations, Ordinances, and Guidelines	Completed	2005	0	$0	Not provided	Not provided - $0.00
4239	Marion County	B007	Marion County Irrigation Ordinance	Ordinance sets enforceable irrigation schedule and rates of irrigation for Marion County. It also identifies efficient irrigation systems that are exempt from schedule.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	NA	NA - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4240	Marion County	B008	Marion County Fertilizer Ordinance	Florida-friendly fertilizer ordinance (2008) and land development code for urban landscapes regulates use of fertilizers by any applicator; training/licensing requirements; application rates/methods, fertilizer-free & low-maintenance zones.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	NA	NA - $0.00
4241	Marion County	B037	Marion County Stormwater Program NPDES MS4 Permit	Implementation of Stormwater Education Plan to ensure compliance with NPDES MS4 permit public education requirements.	Education Efforts	Ongoing	NA	0	$49,415	Marion County	Marion County - $0.00
4242	Marion County	B010	Clean Farms Initiative	Marion County. The Clean Farms Initiative was originally passed under Resolution 04-R-384 and has evolved using a Farm Outreach Coordinator to educate farms regarding BMPs. The number of farm visits are tracked yearly.	Agricultural BMPs	Ongoing	NA	0	$0	NA	NA - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4243	Marion County	B001	Marion County Transfer of Development Rights (TDR)	TDR Program designed to protect natural resources, listed in Policy 1.1.2 of Conservation Element of Marion County Comprehensive Plan and locally important and prime farmlands. Program definition contained in Article 3 of Land Development Code.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
4258	Marion County	B003	Marion County Hamlet Design Option	Comprehensive Plan Future Land Use Element Policy 2.1.13 establishes Hamlet Development Option, for clustered low-density development patterns in rural designated lands.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00
4260	Marion County	B002	Marion County Transfer of Vested Rights (TVR)	TVR Program designed to minimize dense development of vested properties without supporting infrastructure, permitting county to better plan for future growth.	Regulations, Ordinances, and Guidelines	Completed	2000	0	$0	Not provided	Not provided - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4261	Marion County	R062	Sa-Te-Ke Village Stormwater Retrofit	Construction of retention storage along the Rainbow River to treat direct discharge to the river from a culvert discharging along SW 183rd Court and SW 102nd St.	On-line Retention BMPs	Completed	2011	1	$73,512	SWFWMD; Marion County	SWFWMD - $18,245.00; Marion County - $42,496.00
4262	Marion County	R063	Rainbow Springs 5th Replat Stormwater Retrofit- CP #67	This project will retrofit three drainage retention areas (2165, 2167, 3166) in Rainbow Springs 5th replat with the nitrogen reducing media. After geotech received, DRA 2165 was switched for DRA 2216. Please see project R113 for new project details.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2019	68	$931,510	SWFWMD; Marion County	SWFWMD - $319,927.00; Marion County - $551,460.00
4274	Marion County	B028	SW 85th St./SW 40th Ave. Stormwater Retrofit	Construction of a drainage retention area lined with Bold & Gold™ soil amendment to enhance nitrogen removal. Post construction event monitoring has shown a 70 % reduction in TN through the soil amendment layer.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2012	26	$330,000	SWFWMD; Marion County	SWFWMD - $105,000.00; Marion County - $225,347.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4276	Marion County	R016	Rainbow Park Unit 8 Stormwater Retrofit	Construction of three wet detention ponds to provide treatment of runoff prior to discharge to a relic karst feature and isolated surface wetlands.	Wet Detention Pond	Completed	2013	11	$443,399	SWFWMD; Marion County	SWFWMD - $216,626.00; Marion County - $216,626.00
4293	Marion County	R017	Rolling Hills unit 5 Stormwater Retrofit	Construction of an interconnected system of four retention ponds and one wet retention pond to treat stormwater runoff from roads, residential, and agricultural land uses.	BMP Treatment Train	Completed	2013	19	$484,097	SWFWMD; Marion County	SWFWMD - $244,280.00; Marion County - $244,280.00
4294	Marion County	R011	Village of Rainbow Springs Stormwater Retrofit	Retrofit of a retention area with aerobic filtration cells for conversion of TN to nitrate and an infiltration cell lined with Bold & Gold™ for nitrate removal. The project included a created wetland to treat runoff discharged into Section 16 Lake.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2015	8	$336,800	SWFWMD; Marion County	SWFWMD - $169,709.00; Marion County - $169,709.00
4295	Marion County	R012	CR 484 Stormwater Retrofit, Phase 1	Construction of a bioretention area and collection system to treat runoff from bridge	Bioswales	Completed	2010	1	$62,081	SWFWMD; Marion County	SWFWMD - $42,768.00; Marion County - $42,768.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				spanning the Rainbow River.							
4296	Marion County	R013	CR 484 Stormwater Retrofit, Phase 2	Construction of a wet detention pond to treat runoff discharged into the Rainbow River from CR 484.	Wet Detention Pond	Completed	2012	13	$73,890	SWFWMD; Marion County	SWFWMD - $35,469.00; Marion County - $42,469.00
4297	Marion County	R014	CR 484 Stormwater Retrofit, Phase 3	Construction of wet detention ponds to address runoff discharged into Rainbow river from limerock parking area.	Wet Detention Pond	Completed	2011	2	$223,700	SWFWMD; Marion County	SWFWMD - $21,789.00; Marion County - $203,076.00
4298	Marion County	R015	Rainbow Springs Country Club Estates Stormwater Retrofit	Expansion and conversion of an existing retention pond to a wetland/wet retention pond to enhance nitrate removal from runoff generated from county road, a golf course, and residential land uses.	Constructed Wetland Treatment	Completed	2012	3	$136,423	SWFWMD; Marion County	SWFWMD - $68,211.00; Marion County - $68,211.00
4550	Marion County	R112	Rainbow Springs Innovative Stormwater Retrofits-CP 71 (N848) Agreement No. 18CF0000859	Construction of stormwater BMPs to retrofit three dry retention systems that are within 1.5 miles of Rainbow Springs with a soil amendment. Marion County	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2018	125	$221	SWFWMD; Marion County	SWFWMD - $276,500.00; Marion County - $468,764.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Rainbow Springs DRAs 2162, 2190, and 2193.							
4551	Marion County	R113	Rainbow Springshed Stormwater Retrofits (WR04) Agreement No. 16CF0000154	Construction of stormwater BMPs to retrofit three dry retention systems that are within 2 miles of Rainbow Springs with a soil amendment. Marion County DRAs 3166, 2167 and 2216.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2019	202	$958,619	SWFWMD; Marion County	SWFWMD - $319,926.00; Marion County - $358,745.00
5458	Marion County	B052	NW 115th Ct Flood Relief Project	Area needs to be studied before design, permit, and construction of new DRAs and road to mitigate flooding in the area. Rebuild NW 115th Ct which has been damaged due to past flooding and potentially raise road to increase level of service.	Regional Stormwater Treatment	Planned	2026	0	$1,168,000	Marion County	Marion County - $100,000.00
5493	Marion County	B053	SW 52nd Street Flood Relief Project	Construct new DRAs and associated drainage conveyance system to meet 100yr/24hr storm. Raise road above flood elevation. Improvements will mitigate flooding of	Regional Stormwater Treatment	Underway	2026	0	$2,650,000	Future Marion County; Future FEMA; Marion County; FEMA	Future Marion County - $0.00; Future FEMA - $0.00; Marion County - $50,408.25; FEMA - $151,224.75

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				the road and surrounding area. Design complete. FDEM recommends Ph. 2 funds for land & const.							
5494	Marion County	S210	SW 27th Ave Flood Relief Project	Project area to be studied before design. Raise elevation of road and construct associated stormwater facilities to meet the 100yr/24hr storm. This project will mitigate flooding in the area and allow the County to maintain the road level of service.	Regional Stormwater Treatment	Planned	2026	0	$2,027,000	Marion County	Marion County - $2,027,000.00
5495	Marion County	S211	SE 34th Place Flood Relief Project	Design, permit, bid, & construct: Purchase 3 lots with homes that flooded during previous storm events. Demolish homes and expand 2 DRAs to mitigate flooding in Country Gardens. Rebuild and raise damaged road. FEMA funding not	Regional Stormwater Treatment	Underway	2026	0	$1,684,226	Marion County; FEMA	Marion County - $39,349.25; FEMA - $118,047.75

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				received for construction.							
5918	Marion County	R119	CP 74 Rainbow Springs 5th Replat Stormwater Retrofit	Construction of stormwater BMPs to retrofit three (3) dry retention systems, that are approximately 1.67 miles from the head springs at Rainbow Springs, with a soil amendment. Marion County DRAs 2160, 2169, and 2210.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2024	67	$944,254	Marion County; SWFWMD	Marion County - $677,103.98; SWFWMD - $267,150.00
5919	Marion County	R120	Rainbow River Watershed Management Plan Update	Marion County Rainbow Basin Watershed Management Plan (WMP) 2008/2014 model updates. Updates to the current model, watershed evaluation, floodplain analysis, Floodplain Level of Service, Surface Water Resource Assessment and BMPs Reports have begun.	Study	Underway	2025	0	$1,538,000	SWFWMD; Marion County	SWFWMD - $769,000.00; Marion County - $769,000.00
5920	Marion County	R121	West Ocala Watershed Management Plan Update	MC West Ocala Basin Watershed Management Plan (WMP) was from 2014. The current	Study	Underway	2024	0	$444,000	SWFWMD; Marion County	SWFWMD - $222,000.00; Marion County - $222,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				model, watershed evaluation, floodplain analysis, Floodplain Level of Service, Surface Water Resource Assessment and Best Management Practices Reports will need to be updated.							
5921	Marion County	R122	SR200 Watershed Management Plan Update	Marion County SR200 Basin Watershed Management Plan (WMP) 2009, with peer review completed in 2011. Due to a large amount of development along the corridor, the WMP needs to be updated. This is a high priority basin for Marion County and SWFWMD.	Study	Underway	2024	0	$425,000	Marion County; SWFWMD	Marion County - $212,500.00; SWFWMD - $212,500.00
5922	Marion County	R123	Street Sweeping of Marion County Roads	Sweep Marion County-maintained roads in Rainbow Basin. Swept 8 times/yr, about 71.8 miles in Basin. 2021 load yield is roughly 87.43 tons. 2021 Rainbow Springs BMAP pro-rata share costs for	Street Sweeping	Ongoing	NA	84	$0	Marion County	Marion County - $24,437.07

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				street sweeping was approximately $24,437.07. Average pro-rata nu							
5940	Marion County	S234	CP 76 Silver Springs Shores Unit 19 Stormwater Retrofit	Retrofit of Drainage Retention Areas 7219, 7237, and 7366 with Bold & Gold™ biosorption activated media for nitrogen reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2019	59	$1,450,550	SJRWMD; Marion County	SJRWMD - $343,232.00; Marion County - $1,107,279.00
5941	Marion County	S235	CP 78 Silver Springs Shores Unit 7 Stormwater Retrofit	Retrofit of Drainage Retention Areas 7209 and 7220 with Bold & Gold™ biosorption activated media for nutrient reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2021	110	$863,583	Marion County	Marion County - $863,583.48
5942	Marion County	S236	CP 75 Silver Springs Shores Unit 23 Stormwater Retrofit	Retrofit of Drainage Retention Areas 7049 and 7256 with Bold & Gold™ biosorption activated media for nutrient reduction. The project installed treatment cells to treat a portion (70 ac) of the total contributing areas (123.99 ac) for the existing DRAs.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2022	107	$1,116,367	Marion County; SJRWMD	SJRWMD - $251,214.29; Marion County - $865,152.36
5943	Marion County	S237	CP 79 Silver Springs Shores Unit 68 Stormwater Retrofit	Retrofit of Drainage Retention Areas 7282 and 7402 with Bold &	Retention/Detention BMP Retrofit with	Completed	2022	0	$767,472	Marion County; SJRWMD	Marion County - $599,447.78; SJRWMD - $168,024.16

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Gold™ biosorption activated media for nutrient reduction.	Nutrient Reducing Media						
5944	Marion County	S240	Street Sweeping of Marion County Roads	Sweep Marion County-maintained roads in Silver Basin. Swept 8 times/yr, about 126.1 miles in Basin. 2021 load yield is roughly 153.53 tons. 2021 Silver Springs BMAP pro-rata share costs for street sweeping was approximately $42,914.13. Average pro-rate nu	Street Sweeping	Ongoing	NA	90	$0	Marion County	Marion County - $42,914.13
6241	Marion County	S248	Silver Springs Shores Unit 29 & 30 Innovative Stormwater Retrofit CP 80	Retrofit of Drainage Retention Areas 7322 and 7403 with Bold & Gold biosorption activated media treatment cells for nutrient reduction.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Completed	2023	82	$1,723,436	DEP; Marion County	DEP - $789,572.86; Marion County - $933,863.24
6242	Marion County	R129	West Central Marion Watersheds - Watershed Management Plan Updates	MC West Central Marion Watersheds watershed management plan updates of Cotton Plant 1& 2, Martel, and Blitchton watersheds. Previous WMPs were completed in 2011. Due to	Study	Underway	2029	0	$800,000	SWFWMD; Marion County	SWFWMD - $400,000.00; Marion County - $400,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				development which has occurred since previous models.							
6243	Marion County	R128	NW 44th Avenue Innovative Stormwater Retrofit	Retrofit of Drainage Retention Area 1138 with Bold & Gold biosorption activated media treatment cell for nutrient reduction within the Rainbow Springs BMAP. Project has been funded by DEP for 50% construction costs. Project is currently in design.	Retention/Detention BMP Retrofit with Nutrient Reducing Media	Underway	2025	0	$820,000	Marion County; DEP	Marion County - $442,619.00; DEP - $377,381.00
6727	Marion County	S262	SE 64th Avenue Road DRA	Design, permit, and construct a new drainage retention area and associated conveyance system within Silver Acres 1st Add. subdivision to improve conveyance along SE 64th Ave Rd and Pine Road.	Dry Detention Pond	Completed	2023	3	$1,059,700	SJRWMD; Marion County	SJRWMD - $100,810.00; Marion County - $958,890.12
3756	Marion County Utilities	S143	US441 FM	Install about 17,000 LF of 12 forcemain along US 441 to connect Spruce Creek Golf and Country Club to Stonecrest. This will make service	Wastewater Service Area Expansion	Completed	2022	0	$1,791,600	Marion County; SJRWMD	Marion County - $996,326.00; SJRWMD - $795,274.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				available and provide an opportunity for septic to sewer conversion/prevention in this corridor.							
3757	Marion County Utilities	S142	CR464 FM Phase 2 & 3	Construct 5,800 LF of 12-inch forcemain, and 9,200 LF of 16-inch forcemain along CR 464. The project will provide infrastructure and capacity to connect future septic to sewer projects to the Silver Springs Shores (SSS) WWTF.	WWTF Capacity Expansion	Completed	2019	0	$6,424,210	Marion County	Marion County - $0.00
3759	Marion County Utilities	S140	Provide Central Sewer Service to Old Platted Subdivision Served by Septic (Silver Springs Shores Septic to Sewer Program)	The existing subdivision has approximately 3,000 platted lots without access to centralized sewer. The area has been divided into three phases of approximately 500 lots per phase, 859 existing homes. This area is within the PFA for Silver Springs.	OSTDS Phase Out	Underway	2025	0	$60,000,000	DEP; DEP; Department of Treasury	DEP - $3,000,000.00; DEP - $3,000,000.00; Department of Treasury - $60,000,000.00
3763	Marion County Utilities	S132	CR464 FM	Install new 12" forcemain to upsize existing forcemain.	WWTF Upgrade	Completed	2015	0	$654,416	Marion County	Marion County - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				The upsizing of the forcemain in this project will allow the County to handle future flows at the Silver Springs Shores WWTF from OSTDS abatement in the PFA for Silver Springs.							
3768	Marion County Utilities	S131	Sleepy Hollow Package Plant Abatement (LS and FM)	Remove existing wastewater package plant in subdivision and replace with new duplex lift station. Tie into the MCU forcemain on SE 58th Ave. Original credit of 365 lbs-TN/yr. Project was captured in the updated loading estimates.	Decommission/ Abandonment	Completed	2017	0	$456,025	SJRWMD; Marion County	SJRWMD - $30,900.00; Marion County - $117,389.00
3784	Marion County Utilities	S144	SSS WWTP Nutrient and Capacity Improvement	Enhance the nutrient removal capabilities to AWT standards and expand the capacity at the SSS WWTF by 500,000 GPD.	WWTF Upgrade	Completed	2020	0	$6,424,210	SJRWMD	SJRWMD - $3,487,038
3964	Marion County Utilities	S098	Silver Springs Shores Reuse to Spruce Creek Golf and Country Club	Install reclaim pumps, control valves, metering stations and about 21,600 ft of 16" RCWM from the	WWTF Diversion to Reuse	Completed	2016	0	$3,192,000	DEP; SJRWMD	DEP - $1,275,620.00; SJRWMD - $1,596,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Silver Springs Shores WWTF to the Spruce Creek Golf and Country Club golf course located about 13 miles from the Silver Springs.							
3993	Marion County Utilities	S109	Package Plant Abatement	Baseline Square, Truck stops at CR 326 and I75 package plants connected to central system. Removes 412 lbs TN/yr.	Wastewater Service Area Expansion	Completed	2015	0	$0	Not provided	Not provided - $0.00
4012	Marion County Utilities	S038	Silver Springs Shores WWTF Upgrade	Upgrading existing WWTP located in Silver Springs Shores, upgrading it to reclaimed quality effluent standards. Utility customers are already paying $5,031,738 for the treatment facility upgrades.	WWTF Upgrade	Completed	2015	0	$5,031,738	Marion County	Marion County - $0.00
4013	Marion County Utilities	S037	Divert Wastewater Flows from Silver Springs Regional WWTF to Silver Springs Shores WWTF	Install 3-mile forcemain to reroute sewage from the Silver Springs Regional WWTP to the Silver Springs Shores WWTF. The route of the new force main will	Wastewater Service Area Expansion	Completed	2015	0	$1,023,114	DEP TMDL; SJRWMD; Marion County	DEP TMDL - $463,057; SJRWMD - $100,000; Marion County - $563,057

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				allow for other decentralized WWTPs in the vicinity of Silver Springs to connect in the future.							
4032	Marion County Utilities	S056	Collection System Maintenance Program	Collection system maintenance program includes lift station maintenance and addition of SCADA. The Capital Improvement Plan calls for lift station renovation every 10 years and identifies pipe replacement needs. Pipes replaced as funding allows.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Ongoing	NA	0	$813,435	MCU	MCU - $813,435.00
4202	Marion County Utilities	R104	Northwest Regional WWTF Expansion	Expansion will improve treatment and capacity at existing WWTF. Existing facility treats to an average 46.95 mg/L TN. The new facility will treat to AWT. Project will allow County to remove package plants and OSTDS in the area in the future.	WWTF Upgrade	Completed	2023	2,728	$20,850,033	MC; DEP	MC - $14,000,000.00; DEP - $6,850,000.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4211	Marion County Utilities	R105	Package Wastewater Plant Removal Program	Remove 3 package plants and connect areas to County centralized wastewater system. The package plants will be connected to WWTFs that produce reclaimed water. The project includes constructing new lift stations and forcemains.	Decommission/ Abandonment	Completed	2024	0	$3,119,876	DEP; Marion County	DEP - $2,836,251.00; Marion County - $2,039,256.00
4212	Marion County Utilities	R106	State Road 200 Force Main Extension	Install about 10,750 LF of force main along SR200. Project will allow OSTDS to be abandoned, prevent OSTDS installation, and reduce groundwater withdrawals by increasing flow for reclaimed water at Oak Run WWTF.	Wastewater Service Area Expansion	Completed	2020	0	$4,014,096	DEP; SWFWMD; Marion County	DEP - $0.00; SWFWMD - $0.00; Marion County - $0.00
4579	Marion County Utilities	S185	Silver Springs Shores Unit 16 - Water and Sewer Extensions	Install utility infrastructure within part of Block Group 3 (Tract 001204) in Silver Springs Shores. The project includes survey, design, and construction of a gravity collection	OSTDS Phase Out	Underway	2024	0	$4,613,739	CDBG; US Treasury Dept.	CDBG - $584,844.00; US Treasury Dept. - $4,028,895.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				system, lift station, forcemain and a potable distribution system.							
4580	Marion County Utilities	S186	Countywide OSTDS Feasibility Study	Study will analyze the feasibility of septic to sewer projects throughout the entire County of Marion.	Study	Completed	2021	0	$500,000	DEP	DEP - $500,000.00
4582	Marion County Utilities	S188	Florida Horse Park and Anthony's Pizza Connection to Central Sewer	Coordinate with Florida Horse Park and Anthony's Pizza to abandon their septic systems and connect to Marion County central sewer. Includes installation of lift station, forcemain, and cap charges.	OSTDS Phase Out	Completed	2021	0	$1,296,553	DEP	DEP - $1,296,553.00
4583	Marion County Utilities	S189	Oak Bend/I-75 Water Quality Improvement Project	Coordinate with FDOT Rest Area and Oak Bend mobile home park to decommission their respective package plants and connect to Marion County central sewer. Includes installation of 2 lift stations and forcemain.	Decommission/ Abandonment	Underway	2025	0	$7,704,828	Oak Bend (private); MC; FDOT; DEP	Oak Bend (private) - $3,168,252.00; MC - $909,000.00; FDOT - $1,538,488.00; DEP - $2,089,088.00
4593	Marion County Utilities	S199	SSS RCWM Extension	Install about 8,000 ft of 12" RCWM from the Silver	WWTF Diversion to Reuse	Completed	2016	0	$0	DEP; SJRWMD; MCU CIP	DEP - $0; SJRWMD - $0; MCU CIP - $0

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				Springs Shores WWTF to the Silver Springs Shores golf course approximately 7 to 10 miles from Silver Springs.							
5459	Marion County Utilities	R115	Rainbow River Master Plan	Perform a master plan study for septic to sewer in the Rainbow Springs / Rainbow River area. The study will identify the best option and financial feasibility for converting parcels and package plants to a central sewer system. Project replaces R086.	Study	Completed	2022	0	$200,000	MCU; SWFWMD	MCU - $100,000.00; SWFWMD - $100,000.00
5496	Marion County Utilities	S212	Package Wastewater Plant Removal Program	Remove WWTFs and connect to County Sewer. Tradewinds, Cedar Hill & Ocala Springs Plaza (aka WinnDixie Plaza).	Decommission/ Abandonment	Underway	2024	0	$4,875,507	DEP; MCU	DEP - $2,836,251.00; MCU - $2,039,255.94
6432	Marion County Utilities	R126	State Road 200 Septic to Sewer	Connect 3 properties to the recently completed 12in force main on SR 200.	OSTDS Phase Out	Underway	2025	24	$0	DEP	DEP - $534,697.25
6449	Marion County Utilities	S243	Don Garlits Museum Septic to Sewer	Removed two existing septic tanks and	OSTDS Phase Out	Completed	2022	496	$150,000	MCU; Don Garlits Museum; SJRWMD	MCU - $12,848.00; Don Garlits Museum -

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				connected to County sewer.							$93,750.00; SJRWMD - $56,250.00
6450	Marion County Utilities	S244	4-H Farm Septic to Sewer	Removed two existing septic tanks and connected to County sewer.	OSTDS Phase Out	Completed	2023	44	$130,000	SJRWMD; MCU	SJRWMD - $65,000.00; MCU - $76,215.00
6451	Marion County Utilities	S140a	Silver Springs Shores Septic to Sewer Additional Phase	Remove approximately 385 septic tanks and connect to County sewer. Progressive design-build.	OSTDS Phase Out	Underway	2025	5,530	$40,000,000	MCU; DEP	MCU - $20,000,000.00; DEP - $20,000,000.00
6452	Marion County Utilities	S246	Septic to Sewer Initiative	Decommissioned 3 residential and 1 commercial septic tanks and connected to county sewer.	OSTDS Phase Out	Completed	2023	46	$278,740	DEP; Marion County CRA	DEP - $200,000.00; Marion County CRA - $45,138.00
6566	Marion County Utilities	R139	US27/NW 70th Ave Septic to Sewer	Connect existing shopping plaza on the southeast side of the intersection to MCU centralized sewer system. Flows will go to NWR WWTF which will treat to AWT. Original credit of 1,875 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2022	0	$814,327	DEP; MC	DEP - $419,229.00; MC - $395,098.00

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6569	Marion County Utilities	R138	Collection System Maintenance Program	Collection system maintenance program includes lift station maintenance and addition of SCADA. The Capital Improvement Plan calls for lift station renovation every 10 years and identifies pipe replacement needs. Pipes replaced as funding allows.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Ongoing	NA	0	$813,435	MCU; Not provided	MCU - $813,435.00; Not provided - $0.00
6685	Marion County Utilities	S263	SE Regional Water Treatment Facility - Lower Floridian Test Well	Construct Lower Floridian Aquifer test well to evaluate aquifer performance and water quality. This LFA well is intended to supply from a non-traditional water source, allowing MCU to reduce current and future Upper Floridian Aquifer withdrawals.	Monitoring/Data Collection	Underway	2025	0	$2,136,937	DEP; MCU	DEP - $1,000,000.00; MCU - $1,136,937.00
6695	Marion County Utilities	S266	Irish Acres to Silver Springs Regional Interconnect	This project is a continued effort in a multi-year program to interconnect potable water	Monitoring/Data Collection	Ongoing	NA	0	$7,520,000	DEP; MCU	DEP - $3,760,000.00; MCU - $3,760,000.00

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				systems. This project will relocate withdrawals further to the northwest away from Silver Springs.							
7031	Marion County Utilities	R142	Southwest Service Area Oak Run WWTP Improvements	Add additional treatment capacity to MCUD Oak Run to achieve 3.5 MGD. Capacity expansion will include upgrades to reduce nutrients in effluent per BMAP requirements.	WWTF Upgrade	Planned	2027	5,427	$0	MCU CIP	MCU CIP - $30,000,000.00
3980	Putnam County	S122	Education and Outreach	Provide educational materials about the importance of protecting Silver Springs and implementing small farm equine BMPs at Fort Gates Ferry kiosks and at agricultural center. FYN outreach, landscaping ordinance, website, PSA for 4.25% credit.	Education Efforts	Ongoing	NA	378	$0	Putnam County	Putnam County - $0.00
3885	Rainbow River Conservation	B039	Springs Awareness for Educators	A workshop for Marion County teachers and educators to provide resources on springs, water issues and wildlife	Education Efforts	Completed	2014	0	$0	SWFWMD; Florida Springs Institute	SWFWMD - $0.00; Florida Springs Institute - $0.00

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				which can be used in the classroom to enhance teaching the common core standards.							
4285	Rainbow River Conservation	B039	Springs Awareness for Educators	A workshop for Marion County teachers and educators to provide resources on springs, water issues and wildlife which can be used in the classroom to enhance teaching the common core standards.	Education Efforts	Completed	2014	0	$0	SWFWMD; FSI	SWFWMD - $0.00; FSI - $0.00
5917	Rainbow River Conservation	R118	Fourth Grade Springs Education Program	Annual Rainbow River and Springs education program.	Education Efforts	Ongoing	NA	0	$0	Not provided	Not provided - $0.00
3951	Silver Springs State Park	S093	Silver Springs State Park Management Plan Amendment - Sewer Upgrades	Management plan for Silver Springs State Park amended in May 2014 to include merger of Silver Springs attraction into Silver River State Park. Management goals were developed to provide maintenance of the former attraction's sewer system.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2014	0	$1,976,335	DEP	DEP - $1,976,335.00

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3954	Silver Springs State Park	S090	Silver Springs State Park Management Plan Amendment - State Park Sewer Connection	Management plan for Silver Springs State Park amended in 2014 to include merger of Silver Springs attraction into Silver River State Park. Goals were developed to connect park services in the former Silver River State Park to central sewer.	OSTDS Phase Out	Completed	2016	0	$1,737,963	DEP	DEP - $1,737,963.00
3955	Silver Springs State Park	S089	Silver Springs State Park Management Plan Amendment - Runoff	Management plan for Silver Springs State Park amended in 2014 to include merger of Silver Springs attraction into Silver River State Park. Animals removed from Ross Island before 2013. Swales added where moats removed. 20 buildings removed.	Land Use Change	Completed	2013	0	$0	DEP	DEP - $0.00
5492	Silver Springs State Park	S224	Silver Springs State Park Management Plan Amendment - Improved Stormwater Management	Management plan for Silver Springs State Park amended in May 2014 to include merger of Silver Springs Attraction (demolished 2019) into Silver River State Park. Plans to	Stormwater System Upgrade	Planned	TBD	0	$0	DEP	DEP - $0.00

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				better manage stormwater runoff with decreased runoff from parking lot.							
3755	SJRWMD	S134	Silver Springs Forest	The project will address water resources at the site and in the receiving system with hydrology, attenuation, and sediment transport improvements. Evaluation of the final project elements is still underway.	Hydrologic Restoration	Completed	2018	0	$2,370,000	DEP; SJRWMD	DEP - $475,000.00; SJRWMD - $1,895,000.00
3762	SJRWMD	S137	SJRWMD Submerged Aquatic Vegetation (SAV) and Algae Monitoring	SJRWMD monitors SAV and algae annually on the Silver River between April and June. SJRWMD staff estimate SAV cover by species and algal cover collectively, using 0.25 square-meter quadrats and the Braun-Blanquet cover scale.	Monitoring/Data Collection	Underway	TBD	0	$0	SJRWMD	SJRWMD - $0.00
3775	SJRWMD	S154	Colvin Farms Soil Grid Mapping and Variable Rater Fertilizer Applicator	Soil grid mapping and variable rate fertilizer applicator.	Agricultural BMPs	Completed	2015	5,432	$80,111	SJRWMD; Colvin Farms	SJRWMD - $72,100.00; Colvin Farms - $8,296.00

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3776	SJRWMD	S164	Yancey's Blueberry Farm Zone Irrigation and Soil Moisture Sensors and Weather Stations	Zone irrigation, soil moisture sensors, and weather stations.	Agricultural BMPs	Completed	2019	43	$25,687	DEP; SJRWMD; Yancey's Blueberry Farm	DEP - $9,632; SJRWMD - $9,632; Yancey's Blueberry Farm - $6,422
3777	SJRWMD	S163	North Caledonia Tailwater Storage and Recovery, Soil Moisture Sensors, and Telemetry	Tailwater storage and recovery, soil moisture sensors, and telemetry.	Agricultural BMPs	Completed	2019	118	$600,047	DEP; SJRWMD; North Caledonia	DEP - $225,018; SJRWMD - $225,018; North Calendonia - $150,011
3778	SJRWMD	S162	MacKay Farm Precision Irrigation and Fertigation	Precision irrigation and fertigation.	Agricultural BMPs	Completed	2019	15	$49,662	DEP; SJRWMD; Kenneth MacKay	DEP - $15,215; SRJWMD - $15,215; Kenneth MacKay - $10,144
3779	SJRWMD	S161	Lochloosa Creek Farms	Soil moisture probes and weather stations.	Agricultural BMPs	Completed	2019	43	$19,840	DEP; SJRWMD; Lochloosa Farm	DEP - $7,440; SJRWMD - $7,440; Lochloosa Farm - $4,960
3780	SJRWMD	S160	Brown's Farm Sprayer with GPS Guidance	Sprayer with GPS guidance.	Agricultural BMPs	Completed	2018	191	$13,450	SJRWMD; Island Grove	SJRWMD - $152,210.00; Island Grove - $56,071.00
3781	SJRWMD	S159	Island Grove Irrigation System Automation	Irrigation system automation.	Agricultural BMPs	Completed	2018	216	$208,280	SJRWMD; Island Grove	SJRWMD - $152,210.00; Island Grove - $56,071.00
3782	SJRWMD	S158	Brown's Farm Irrigation Conversion	Irrigation conversion.	Agricultural BMPs	Completed	2018	52	$137,000	SJRWMD; Brown's Farm	SJRWMD - $102,750.00; Brown's Farm - $34,250.00

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3783	SJRWMD	S157	North Caledonia Tailwater Storage and Recovery, Variable Rate Fertilizer Equipment	Tailwater storage and recovery, and variable rate fertilizer equipment.	Agricultural BMPs	Completed	2017	1,549	$388,350	SJRWMD; North Caledonia	SJRWMD - $291,263.00; North Caledonia - $97,087.00
3785	SJRWMD	S155	Mid-State Research Irrigation Conversion	Irrigation conversion.	Agricultural BMPs	Completed	2015	75	$48,682	SJRWMD; Mid-State Research	SJRWMD - $43,813.00; Mid-State Research - $4,869.00
3787	SJRWMD	S153	Colvin Farms Soil Moisture and Climate Sensor Telemetry	Soil moisture and climate sensor telemetry.	Agricultural BMPs	Completed	2015	11,039	$84,312	SJRWMD; Colvin Farms	SJRWMD - $75,881.00; Colvin Farms - $8,431.00
3788	SJRWMD	S152	Brown's Farm Irrigation Conversion	Irrigation conversion.	Agricultural BMPs	Completed	2016	346	$122,569	SJRWMD; Brown's Farm	SJRWMD - $110,312.00; Brown's Farm - $12,257.00
3789	SJRWMD	S151	Colvin Farms Center Pivot Nozzle Retrofit	Center pivot nozzle retrofit.	Agricultural BMPs	Completed	2015	5,549	$102,210	SJRWMD; Colvin Farms	SJRWMD - $91,989.00; Colvin Farms - $10,221.00
3795	SJRWMD	S156	Mid- State Research Soil Grid Mapping and Variable Rater Fertilizer Applicator	Soil grid mapping and variable rater fertilizer applicator.	Agricultural BMPs	Completed	2015	1,035	$44,864	SJRWMD; Mid-State Research	SJRWMD - $40,377.00; Mid-State Research - $4,487.00
3898	SJRWMD	S013	LochLoosa Wildlife Conservation Area	Acquisition of land around Lochloosa Lake and around north side of Orange Lake for Lochloosa Wildlife Conservation Area. Benefits: No increase in surface runoff of pollutants	Land Acquisition	Completed	2003	0	$16,058,211	SJRWMD; Preservation 2000; Alachua County	SJRWMD - $0; Preservation 2000 - $0; Alachua County - $0

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				due to land use change.							
3985	SJRWMD	S117	Heather Island /Ocklawaha River Project	Land acquired to date 6,262 acres. SJRWMD (4,879.64 acres) with surface water improvements underway. Identified as Phase 2 of the Silver Springs Watershed Forest Legacy project. Exchanged for additional 719.22 acres.	Land Acquisition	Completed	2016	0	$0	Not provided	Not provided - $0.00
4016	SJRWMD	S114	Silver Springs Forest	Project acquired 4,900 acres of managed forest land east of Indian Lake State Forest and west of CR 315. The tract is part of the Heather Island Florida Forever Project and US Forest Service Forest Legacy Project: Silver Springs Watershed (Phase 1).	Land Acquisition	Completed	2016	0	$11,617,000	DEP; SJRWMD; Marion County	DEP - $2,000,000; SJRWMD - $8,700,000; Marion County - $917,000
4018	SJRWMD	S068	SJRWMD Water Resource Information and Data Collection	SJRWMD has core monitoring consist of discharge monitoring, surface and ground water levels, surface and	Monitoring/Data Collection	Ongoing	NA	0	$0	SJRWMD	SJRWMD - $0.00

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				ground water quality, and biological monitoring.							
4026	SJRWMD	S067	SJRWMD Springs Protection Initiative Science (SPIS)	The SJRWMD SPIS was a strategic agency priority comprised of projects, science and management. SJRWMD partnered with the UF on the Collaborative Research Initiative on Sustainability and Protection of Springs (CRISPS), completed in 2018.	Study	Completed	2018	0	$0	SJRWMD	SJRWMD - $0.00
4575	SJRWMD	S181	Precision Fertilizer Application	GPS-guided fertilizer application.	Agricultural BMPs	Completed	2019	568	$35,000	DEP; SJRWMD; Seiler and Sons LLC	DEP - $13,125; SJRWMD - $13,125; Seiler and Sons LLC - $8,750
4584	SJRWMD	S190	Irrigation Conversion	Convert from overhead to micro-jet irrigation system.	Agricultural BMPs	Completed	2016	204	$229,590	SJRWMD; Black Bear Ranch	SJRWMD - $206,631.00; Black Bear Ranch - $22,959.00
4585	SJRWMD	S191	Pump Automation	Pump automation and soil moisture sensors with telemetry.	Agricultural BMPs	Completed	2019	96	$39,981	DEP; SJRWMD; Kenneth MacKay	DEP - $13,214; SJRWMD - $13,214; Kenneth MacKay - $13,554

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5497	SJRWMD	S220	Precision Fertilizer Application	Purchase of GPS Variable Rate Fertilizer Application System.	Agricultural BMPs	Completed	2019	3,205	$25,550	DEP; SJRWMD; James C LeFils	DEP - $9,582; SJRWMD - $9,582; James C LeFils - $6,386
5498	SJRWMD	S221	Biochar Application	Application of Biochar on hay/pasture.	Agricultural BMPs	Completed	2020	3,124	$59,268	SJRWMD; London Farm and Cattle	SJRWMD - $44,451.00; London Farm and Cattle - $14,817.00
5499	SJRWMD	S222	Soil Moisture Sensors and Telemetry, GPS Variable Rate Fertilizer Application	Soil moisture sensors with telemetry and variable rate fertilizer application equipment.	Agricultural BMPs	Completed	2020	1,057	$45,100	DEP; SJRWMD; Brown's Farm	DEP - $16,913; SJRWMD - $16,913; Brown's Farm - $11,275
6444	SJRWMD	S251	Compost Spreader-London Farm	Purchase and implementation of a compost spreader.	Agricultural BMPs	Completed	2021	1,800	$30,521	SJRWMD; DEP; London Farm and Cattle	SJRWMD - $11,445.00; DEP - $11,445.00; London Farm and Cattle - $7,630.00
6445	SJRWMD	S252	Irrigation Conversion and Fertigation-North Caledonia	Convert from micro-spray to drip and add fertigation.	Agricultural BMPs	Completed	2022	156	$64,227	DEP; SJRWMD; North Caledonia	DEP - $24,085.00; SJRWMD - $24,085.00; North Caledonia - $16,057.00
6446	SJRWMD	S253	Precision Fertilizer Application Equipment-North Caledonia	Purchase and implementation of precision fertilizer application equipment.	Agricultural BMPs	Completed	2021	1,224	$41,716	DEP; SJRWMD; North Caledonia	DEP - $15,644.00; SJRWMD - $15,644.00; North Caledonia - $10,429.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
6447	SJRWMD	S254	Precision Fertilizer Application Equipment-Roy Brown	Purchase and implementation of precision fertilizer application equipment.	Agricultural BMPs	Completed	2021	1,350	$21,436	DEP; SJRWMD; Roy Brown	DEP - $8,039.00; SJRWMD - $8,039.00; Roy Brown - $5,359.00
6448	SJRWMD	S255	Precision Fertilizer Application Equipment-Yancey's Blueberry Farm	Purchase and implementation of precision fertilizer application equipment.	Agricultural BMPs	Completed	2021	29	$13,775	DEP; SJRWMD; Yancey's Blueberries	DEP - $5,166.00; SJRWMD - $5,166.00; Yancey's Blueberries - $3,443.00
6547	SJRWMD	S265	Irrigation Retrofit - Island Grove	Retrofit of drip system on blueberries.	Agricultural BMPs	Completed	2023	2	$149,403	Island Grove; DEP; SJRWMD Cost Share	Island Grove - $37,350.70; DEP - $56,026.05; SJRWMD Cost Share - $56,026.05
6549	SJRWMD	S264	Irrigation Retrofit with Pump Automation - Browns Farms	Retrofit of five existing center pivots and adding pump automation on mixed vegetables.	Agricultural BMPs	Completed	2023	11	$83,500	DEP; Browns Farm; SJRWMD Cost Share	DEP - $31,312.50; Browns Farm - $20,875.00; SJRWMD Cost Share - $31,312.50
6953	SJRWMD	S273	Cover Crop for Citrus Row Middles - MacKay Farm	This project involves the purchase and implementation of a no till drill and side discharge mower for establishment of cover crop on approximately 65 acres of citrus.	Agricultural BMPs	Completed	2023	42	$48,199	MacKay Farm; SJRWMD Cost Share; DEP Springs	MacKay Farm - $12,049.01; SJRWMD Cost Share - $18,074.99; DEP Springs - $18,075.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
6955	SJRWMD	S274	Precision Fertilizer Equipment - GP Farms LLC	This project involves the purchase and implementation of a liquid fertilizer injection system and dry fertilizer banding equipment on approximately 13 acres of mixed vegetables and fruit trees.	Agricultural BMPs	Completed	2023	30	$22,626	GP Farms LLC; SJRWMD Cost Share	GP Farms LLC - $5,656.53; SJRWMD Cost Share - $16,969.60
7209	SJRWMD	S277	Island Grove Irrigation Retrofit 2	This project involves the installation of an irrigation retrofit on approximately 54 acres of blueberries.	Agricultural BMPs	Underway	2024	39	$74,900	SJRWMD Cost Share; Island Grove LLC	SJRWMD Cost Share - $56,175.00; Island Grove LLC - $18,725.00
5500	Sumter County	S216	Aquatic Vegetation Removal at Lake Miona	Maintenance spraying of vegetation around the boat dock.	Aquatic Vegetation Harvesting	Completed	2020	1	$0	Sumter County	Sumter County - $0.00
5501	Sumter County	S217	Sumter County Landscape and Irrigation Ordinance	Ordinance establishing Florida-Friendly Landscaping use in landscape and irrigation design. Pet waste ordinance and landscaping ordinance. 2.5% education credit.	Regulations, Ordinances, and Guidelines	Ongoing	NA	598	$0	Sumter County	Sumter County - $0.00
5502	Sumter County	S218	Street Sweeping of Sumter County Roads	Sweeping of Sumter County maintained roads within the Districts of the Villages.	Street Sweeping	Ongoing	NA	77	$122,049	Sumter County	Sumter County - $122,048.64

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				Sweeping of roads with curb and gutter is completed six times per year.							
5503	Sumter County	S219	Sumter County Little Jones Creek Watershed Management Plan	WMP study that include creation and maintenance of a comprehensive geodatabase for Marion County storm sewer system data, watershed boundaries and hydrologic features.	Study	Completed	2021	0	$960,000	SWFWMD; Sumter County	SWFWMD - $480,000; Sumter County - $480,000
7351	Sumter County	S280	Onsite Sewage Treatment and Disposal Systems Enhancement Public Outreach	This project will consist of public outreach to inform and educate residents on the importance of upgrading their Onsite Sewage Treatment and Disposal Systems (OSTDS)/Septic Tanks to meet DEP requirements.	Enhanced Public Education	Planned	2026	0	$0	Sumter County	Sumter County - $0.00
7370	Sumter County	S281	Sumter County Ordinance for Higher Nitrogen Removal Septic Systems	Sumter County will adopt an ordinance requiring property owners to meet the requirements set by DEP for higher nitrogen removal septic systems/onsite sewage treatment	Regulations, Ordinances, and Guidelines	Planned	2026	0	$0	Sumter County	Sumter County - $0.00

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				and disposal systems (OSTDS).							
4177	SWFWMD	R070	2015-2019 Springs Management Plan	District management plan which provides an overview of springs issues and potential actions to improve spring conditions.	Study	Completed	2014	0	$0	SWFWMD	SWFWMD - $0.00
4181	SWFWMD	R074	Dunnellon High School Legacy Program	Springs protection educational effort targeting Marion County students.	Education Efforts	Completed	2007	0	$11,853	SWFWMD	SWFWMD - $0.00
4182	SWFWMD	R075	Dunnellon Elementary School Rain Barrels	Students and families were educated on the use of rain barrels for irrigation as a way of conserving water.	Education Efforts	Completed	2014	0	$2,975	SWFWMD	SWFWMD - $0.00
4186	SWFWMD	R042	Community Landscape/Irrigation Evaluation Specialist	Consultant evaluated ten locations in five counties, including Marion, and made recommendations for water conservation in community landscapes and irrigation.	Education Efforts	Completed	2014	0	$6,000	SWFWMD	SWFWMD - $6,000.00
4187	SWFWMD	R035	Rainbow River Vegetation Education	Funding helped develop DVDs, brochures and posters describing the value of aquatic	Education Efforts	Completed	2011	0	$4,800	SWFWMD	SWFWMD - $4,800.00

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				vegetation to the sustainability of the aquatic community and recommending proper etiquette of river use.							
4188	SWFWMD	R109	Micro-irrigation Workshops	Through three educational workshops and distribution of micro-irrigation kits, this project educated homeowners living in 55+ communities about Florida-Friendly Landscaping principles and the benefits of using micro-irrigation.	Education Efforts	Completed	2011	0	$2,690	SWFWMD	SWFWMD - $2,690.00
4189	SWFWMD	R037	Soil Analysis by UF	Up to 200 soil analysis tests were conducted as part of the Crystal River/King's Bay/Rainbow River Watershed Education project.	Education Efforts	Completed	2010	0	$1,400	SWFWMD	SWFWMD - $1,400.00
4190	SWFWMD	R038	Best Management Practices Awareness Campaign	This project educated equine enthusiasts on the importance of protecting water resources to ensure water quality by utilizing proper manure	Education Efforts	Completed	2010	0	$4,988	SWFWMD	SWFWMD - $4,988.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				management, fertilization techniques and water conservation practices.							
4191	SWFWMD	R039	FFL Expo	This project encouraged Marion County homeowners to reduce water use by incorporating Florida-Friendly landscaping principles.	Education Efforts	Completed	2010	0	$4,999	SWFWMD	SWFWMD - $4,999.00
4193	SWFWMD	R041	Storm Drain Markers	Storm drain markers purchased to conduct storm drain marking events in Marion County.	Education Efforts	Completed	2014	0	$2,695	SWFWMD	SWFWMD - $2,695.00
4195	SWFWMD	R043	Rainbow River Springshed Tour	An educational program to inform local officials, homeowners, retail store managers and lawn care providers of how fertilizer impacts the local springshed.	Education Efforts	Completed	2014	0	$1,500	SWFWMD	SWFWMD - $1,500.00
4196	SWFWMD	R044	Aquatic Vegetation Video	A ten-minute video showing the value of submerged and emergent aquatic vegetation in the Rainbow Springs Aquatic Preserve and the impact of	Education Efforts	Completed	2014	0	$4,289	SWFWMD	SWFWMD - $4,289.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				recreational use on vegetation.							
4197	SWFWMD	R045	Florida Friendly Demonstration Garden at Dunnellon Library	Florida-Friendly demonstration garden was installed to educate visitors to the Dunnellon Library about the benefits of Florida-Friendly landscaping principles.	Education Efforts	Completed	2014	0	$4,550	SWFWMD	SWFWMD - $4,550.00
4198	SWFWMD	R047	TDR Program for Watershed Protection	Through a series of five workshops, landowners, developers and citizens were educated about the TDR Program and the Farmland Preservation Area in Northwest Marion County.	Education Efforts	Completed	2014	0	$3,000	SWFWMD	SWFWMD - $3,000.00
4199	SWFWMD	R048	FYN Program Color in the Landscape Spring Festival	This Florida-Friendly landscaping festival provided information workshops on practices.	Education Efforts	Completed	2014	0	$5,000	SWFWMD	SWFWMD - $5,000.00
4200	SWFWMD	R049	Splash! Grants to Teachers in Marion County	Various water resources grants most projects were directly related to education about Rainbow Springs.	Education Efforts	Completed	2013	0	$35,240	SWFWMD	SWFWMD - $35,240.00

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4201	SWFWMD	R040	Blue Run Aquatic Planting	Approx. 30 volunteers learned how aquatic plants help filter stormwater and participated in planting at Blue Run.	Education Efforts	Completed	2014	0	$2,000	SWFWMD	SWFWMD - $2,000.00
4208	SWFWMD	R078	Save Our Springs, Manage the Manure	The project educated the equine community within the Rainbow Springs springshed about the need for BMPs to protect the springs. An informational brochure was created to accompany a promotional item that was passed out at local tack stores. An reduction of	Education Efforts	Completed	2016	0	$1,600	SWFWMD	SWFWMD - $0.00
4219	SWFWMD	R032	Springs Awareness Week Springs Neighborhood Challenge	One-day workshop taught participants about water quality issues specific to Rainbow Springs and Crystal River/Kings Bay. Main focus was proper fertilizer application.	Education Efforts	Completed	2011	0	$3,000	SWFWMD	SWFWMD - $3,000.00
4221	SWFWMD	R082	Composting at Animal Stock Facilities	This research project will evaluate the nutrient removal	Study	Completed	2019	0	$0	SWFWMD	SWFWMD - $0.00

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				efficiency from composting equine waste stream and will investigate leaching efficiency for manure stockpiling and composting facilities.							
4249	SWFWMD	R034	Marion County Earth Day	One-day event educated Marion County residents about springs and water quality protection.	Education Efforts	Completed	2011	0	$1,500	SWFWMD	SWFWMD - $1,500.00
4268	SWFWMD	R026	Restoring Our Springs! Media Campaign	PSA to promote SWFWMD "Restoring Our Springs!" media campaign. Advertising will be in Citrus, Hernando and Marion counties and will direct people to "Join us in the community effort to restore our springs."	Education Efforts	Completed	2016	0	$35,698	SWFWMD	SWFWMD - $35,698.00
4270	SWFWMD	R020	P301 Feasibility Phase Wastewater Disposal Treatment Wetlands	Siting and feasibility assessment for treatment wetlands to polish wastewater treatment plant (WWTP) effluent.	Study	Completed	2016	0	$0	Not provided	Not provided - $0.00

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4277	SWFWMD	R027	Newspaper in Education: Springs in West Central Florida	In-depth look at springs in west-central Florida through Newspaper in Education (Tampa Bay Times). Distributed to middle school students in Citrus, Hernando, and Marion counties as well as Tampa Bay Times and Citrus County Chronicle readers.	Education Efforts	Completed	2014	0	$16,600	SWFWMD	SWFWMD - $16,600.00
4278	SWFWMD	R028	Crystal River/King's Bay/Rainbow River PSAs	Messaging on how residents can help protect the quality of local springs through proper application of fertilizer. Social research was used to help develop messages.	Education Efforts	Completed	2011	0	$83,641	SWFWMD	SWFWMD - $83,641.00
4279	SWFWMD	R029	Crystal River/King's Bay/Rainbow River Outreach Coordinator	Educational effort to reduce nutrient loads from landscaping practices and OSTDS systems.	Education Efforts	Completed	2011	0	$82,600	SWFWMD	SWFWMD - $82,600.00
4280	SWFWMD	R030	Marion County Springs Festival Sponsorship	Event to educate the public on the protection of Marion County's springs and other water resources. Event alternates	Education Efforts	Completed	2016	0	$25,598	SWFWMD	SWFWMD - $25,598.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				between Rainbow Springs State Park and Silver Springs State Park.							
4281	SWFWMD	R031	Marion County Master Gardeners Spring Festival Sponsorship	Festival supporting Florida-Friendly Landscaping outreach and education including a focus on water conservation, watersheds and water quality.	Education Efforts	Completed	2011	0	$30,750	SWFWMD	SWFWMD - $30,750.00
4283	SWFWMD	R024	Efficient Irrigation Workshops	Community presentations on efficient-irrigation practices.	Education Efforts	Completed	2005	0	$2,500	SWFWMD	SWFWMD - $2,500.00
4299	SWFWMD	R033	Get Out and Explore Marion County Springs	Guided canoe trip, hiking trip and water quality demonstration to educate residents about aquatic ecology, karst geology, native and invasive plants, water sampling and human impacts to springs.	Education Efforts	Completed	2012	0	$1,945	SWFWMD	SWFWMD - $1,945.00
6255	SWFWMD	R133	Investigation of Iron Stimulation of Filamentous Algal Growth in Rainbow River	The objective of this study is to investigate whether there is a correlation between iron concentrations and filamentous algae growth in Rainbow River.	Study	Completed	2022	0	$48,941	SWFWMD	SWFWMD - $48,941.40

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6262	SWFWMD	R132	Submerged Aquatic Vegetation Mapping	Submerged aquatic vegetation mapping at designated locations within the river.	Monitoring/Data Collection	Ongoing	NA	0	$0	SWFWMD	SWFWMD - $0.00
6950	SWFWMD	R140	Investigation of Iron Stimulation of Macroalgal Blooms in Rainbow River	The objective of this study is to investigate whether there is a correlation between iron concentrations and filamentous algae blooms in Rainbow River.	Study	Underway	2025	0	$49,057	SWFWMD	SWFWMD - $49,056.93
6951	SWFWMD	R141	Marshall Tree Farm	The proposed project will involve the automation of irrigation pumps to offset Upper Floridan aquifer groundwater used for supplemental daily irrigation for 181 acres of field nursery. FARMS project components consist of remotely operated pump automation.	Agricultural BMPs	Completed	2024	0	$0	SWFWMD; Marshall Tree Farm	SWFWMD - $31,707.00; Marshall Tree Farm - $31,707.00
4552	Town of Bronson	R114	Residential Connection to Central Sewer	The project will expand the town's existing wastewater collection and transmission system and eliminate the use of approximately 19 OSTDS at no cost	OSTDS Phase Out	Completed	2020	0	$750,000	CDBG; SRWMD	CDBG - $650,000.00; SRWMD - $100,000

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				to the homeowners. Original credit of 98 lbs-TN/yr. Project was captured in the updated loading estimates.							
6633	Town of Bronson	R136	Septic Tank Phase Out, Phase 3	The completed project would remove approx. 270 septic tanks from service by constructing approx. 26,000 LF of gravity sewer and approx. 34,000 LF of force main to provide wastewater collection system access to the large remaining portion of the Town.	OSTDS Phase Out	Planned	2028	2,861	$18,862,300	DEP Springs; DEP Water Quality Improvement Grants Program; SRWMD	DEP Springs - $0.00; DEP Water Quality Improvement Grants Program - $18,862,300.00; SRWMD - $0.00
6634	Town of Bronson	R137	Wastewater Treatment Facility AWT Expansion & Upgrade	Project completion would upgrade and expand various components of the Town of Bronson's (a designated RAO) aged and deteriorating WWTF to higher flow capacity, to meet AWT standards, to operate more reliably and efficiently, and	WWTF Upgrade	Planned	2026	0	$12,408,000	DEP Springs; DEP Water Quality Improvement Grants Program; SRWMD	DEP Springs - $0.00; DEP Water Quality Improvement Grants Program - $12,408,000.00; SRWMD - $0.00

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				provide aquifer recharge.							
7035	Town of Bronson	R143	Vulnerability Assessment	This vulnerability assessment project will provide a plan forward to identify critical assets that are vulnerable to flooding. The assessment will provide detailed information to mitigate flooding and flood related damages to municipal infrastructure.	Study	Underway	2025	0	$100,000	Resilient Florida	Resilient Florida - $100,000.00
3726	Town of Lady Lake	S171	Public Education and Outreach Activities to Protect Groundwater	Outreach program (6 % credit) for residents enhances knowledge and awareness of stormwater management. Includes FYN program; pet waste ordinances, landscaping, irrigation, and fertilizer; PSAs; pamphlets; website; and inspection program.	Education Efforts	Ongoing	NA	370	$0	Town of Lady Lake	Town of Lady Lake - $0.00
3960	Town of Lady Lake	S102	Lady Lake Landscape Requirements	County codes and ordinances require FFL principles to be applied in the	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Town of Lady Lake	Town of Lady Lake - $0.00

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				design and of landscapes and irrigation systems. Fertilizer application restrictions require 30 % or more slow release nitrogen and restrict frequency to "as needed."							
3966	Town of Lady Lake	S104	Lady Lake Pet Waste Management	County code related to illicit discharges includes provisions requiring removal of per waste.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Town of Lady Lake	Town of Lady Lake - $0.00
3971	Town of Lady Lake	S082	Lady Lake NPDES Permit Education and Outreach	Lady Lake contracts services for public education and participation program serving residents Lady Lake. This is a requirement of Phase II MS4 permit. Potential for increasing community participation in BMPs that protect water resources.	Education Efforts	Ongoing	NA	0	$0	Town of Lady Lake	Town of Lady Lake - $0.00
3986	Town of Lady Lake	S103	Lady Lake Irrigation Schedules	SJRWMD irrigation schedule adopted, specific water conservation measures	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Town of Lady Lake	Town of Lady Lake - $0.00

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				encouraged, and the seven basic principles of water efficient landscaping are incorporated. Establish minimum standards for landscaped areas with goal of water use efficiency.							
4000	Town of Lady Lake	S052	Lady Lake Stormwater System Maintenance	Townwide curb and gutter cleaning and catch basin vacuuming. Removes pollutants and debris before entering storm sewer system. Benchmark frequency for this routine maintenance shall be quarterly or as needed.	BMP Cleanout	Ongoing	NA	0	$0	Town of Lady Lake	Town of Lady Lake - $0.00
4001	Town of Lady Lake	S051	Skyline Drive Drainage Improvement	Improved stormwater conveyance system. Area covers Skyline Dr. north to Ray St., west to Summit St., and east to High St.	Stormwater System Upgrade	Completed	2014	0	$1,300,000	DEO; Town of Lady Lake	DEO - $0.00; Town of Lady Lake - $0.00
4028	Town of Lady Lake	S065	Lady Lake Street Sweeping	Townwide street sweeping to remove debris. The benchmark frequency is	Street Sweeping	Ongoing	NA	2	$0	Town of Lady Lake	Town of Lady Lake - $0.00

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				quarterly or as needed. Removal of debris and potential pollutants prevents entry into lakes. The performance benchmark shall be 250 cubic yards of material removed annually.							
5939	Town of Lady Lake	S230	Stormwater Master Plan	Town-wide determination and prioritization of stormwater improvements.	Study	Completed	2021	0	$65,000	LCWA	LCWA - $65,000.00
6637	Town of Lady Lake	S267	Skyline Drive Drainage Improvement, Ph. II	This project is Phase II of constructing an improved stormwater conveyance system for the Town of Lady Lake. The areas covered are Morningside Avenue and Longview Avenue, between Skyline Drive and Summit Street.	Stormwater System Upgrade	Planned	2025	0	$750,000	Community Development Block Grant (CDBG); Town of Lady Lake	Community Development Block Grant (CDBG) - $750,000.00; Town of Lady Lake - $50,000.00
7147	Town of Lady Lake	S271	WRF Expansion, Ph. 2	Expansion of the Town of Lady Lake's WWTF to a capacity of 1.2 MGD.	WWTF Capacity Expansion	Underway	2024	0	$16,442,600	Town of Lady Lake	Town of Lady Lake - $16,442,600.00
7151	Town of Lady Lake	S272	Hammock Oaks Reserve Reclaimed Water System Imp.	Expand storage to 3.6 million gallons, install a booster	WWTF Diversion to Reuse	Underway	2026	0	$6,500,000	Developer	Developer - $6,500,000.00

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				pump station, and increase wet-weather disposal capacity.							
7660	Town of Lady Lake	S282	WRF AWT Improvements & Expansion	This project will expand the Town's wastewater treatment capacity from 1.2 MGD to 2.5 MGD and will provide improvements that will allow the Town to treat wastewater to Advanced Wastewater Treatment (AWT) standards.	WWTF Upgrade	Planned	2030	2,053	$110,000,000	DEP; Town of Lady Lake	Town of Lady Lake - $0.00; DEP - $0.00
3773	Town of McIntosh	S126	Town of McIntosh Education and Outreach	Town provides information at city hall about Florida Friendly Landscaping, OSTDS maintenance, and agriculture BMPs. 3% FYN credit from Marion County applied.	Education Efforts	Ongoing	NA	50	$0	Town of McIntosh	Town of McIntosh - $0.00
4591	Town of Micanopy	S197	Public Education and Outreach Activities	Outreach program to residents of the City of Micanopy. 3.5% credit based on Alachua County FYN Program and fertilizer ordinance.	Education Efforts	Ongoing	NA	26	$0	Town of Micanopy	Town of Micanopy - $0.00

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4592	Town of Reddick	S198	Public Education and Outreach Activities	Outreach program to residents of the Town of Reddick. 3.0% credit based on Marion County FYN Program.	Education Efforts	Ongoing	NA	35	$0	Town of Reddick	Town of Reddick - $0.00
3939	UF-IFAS Extension Marion County	B012	Implementation of Outreach Program for Small Equine BMP Manual	An outreach program will be developed to implement the Small Equine BMP Manual on non-commercial horse farms in the Silver and Rainbow Springs BMAP areas.	Agricultural BMPs	Planned	TBD	0	$0	Not provided	Not provided - $0.00
3940	UF-IFAS Extension Marion County	B011	Water Quality Education and Equine Farm BMPs	Equine BMPs and Manure Management Education and Outreach Program sponsored by UF-IFAS Extension and Marion County. From 2010 to 2013, program developed educational materials, held client consultations and held group education events.	Agricultural BMPs	Ongoing	NA	0	$0	UF-IFAS	UF-IFAS - $0.00
4235	UF-IFAS Extension Marion County	B011	Water Quality Education and Equine Farm BMPs	Equine BMPs and Manure Management Education and Outreach Program sponsored by UF-	Agricultural BMPs	Ongoing	NA	0	$0	UF-IFAS	UF-IFAS - $0.00

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				IFAS Extension and Marion County. From 2010 to 2013, program developed educational materials, held client consultations and held group education events.							
5911	UF-IFAS Extension Marion County	B057	Exploring Manure Management BMPs Through Composting	Educational outreach project designed to be a demonstration site for continued use to encourage equine owners to adopt manure management BMPS.	Enhanced Public Education	Completed	2021	0	$4,000	FDACS	FDACS - $4,000.00
5925	UF-IFAS Extension Marion County	B057	Exploring Manure Management BMPs Through Composting	Educational outreach project designed to be a demonstration site for continued use to encourage equine owners to adopt manure management BMPS.	Enhanced Public Education	Completed	2021	0	$4,000	FDACS	FDACS - $4,000.00
6430	UF-IFAS Extension Marion County	R124	Establishment of Rhizoma Perennial Peanut into Bahiagrass Pasture	A research project to determine effects of establishing perennial peanut into existing Bahiagrass. This project aims to identify environmental	Study	Completed	2023	0	$11,000	FDACS	FDACS - $9,317.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				improvements based on the introduced legume and animal benefits from the peanut.							
6431	UF-IFAS Extension Marion County	R125	Private Well and Septic System Webinar Series	A webinar series that taught residents proper well and septic management practices.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6433	UF-IFAS Extension Marion County	R130	Irrigation Orientation	A webinar series that taught urban residents proper irrigation practices.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6434	UF-IFAS Extension Marion County	R131	Central Florida Ag BMP Working Group	A working group that shares and discusses the research and outreach of Ag BMP implementation.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6453	UF-IFAS Extension Marion County	S241	Establishment of Rhizoma Perennial Peanut into Bahiagrass Pasture	A research project to determine effects of establishing perennial peanut into existing Bahiagrass. This project aims to identify environmental improvements based on the introduced legume and animal benefits from the peanut.	Study	Completed	2023	0	$11,000	FDACS	FDACS - $9,317.00

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6454	UF-IFAS Extension Marion County	S242	Private Well and Septic System Webinar Series	A webinar series that taught residents proper well and septic management practices.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6455	UF-IFAS Extension Marion County	S249	Irrigation Orientation	A webinar series that taught urban residents proper irrigation practices.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6456	UF-IFAS Extension Marion County	S250	Central Florida Ag BMP Working Group	A working group that shares and discuses the research and outreach of Ag BMP implementation.	Enhanced Public Education	Completed	2021	0	$0	Not provided	Not provided - $0.00
6734	UF-IFAS Extension Marion County	R134	Private Well and Septic System Webinar Series	A webinar series that taught residents proper well and septic management practices. This is a statewide project that covers more than one BMAP. (The lead entity is UF-IFAS)	Enhanced Public Education	Completed	2022	0	$0	Not provided	Not provided - $0.00
3724	Villages Center CDD	S173	Public Education and Outreach Activities	Outreach program (1 % credit) to residents of The Villages that enhances knowledge and awareness of stormwater management. Includes PSAs;	Education Efforts	Ongoing	NA	2,878	$0	Village Center CDD	Village Center CDD - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				pamphlets; website; and inspection program.							
3760	Villages Center CDD	S139	CSU Waste Water Treatment Plant - Anaerobic Denitrification	WWTP includes an Anoxic Basin for denitrification of nitrate (NO3) which reduces NO3 discharge in the WWTP effluent.	WWTF Nutrient Reduction	Completed	2017	0	$0	CSU	CSU - $0.00
3906	Villages Center CDD	S002	Stormwater Management Policy Adoption	Adopted policy that prohibits illicit discharges for VCDD numbers 1-10.	Regulations, Ordinances, and Guidelines	Ongoing	NA	0	$0	Village Center CDD	Village Center CDD - $0.00
3959	Villages Center CDD	S076	Stormwater Management - Amenity Bill Inserts	Amenity bill inserts to address what residents can do to reduce impacts to stormwater.	Education Efforts	Ongoing	NA	0	$0	Village Center CDD; North Sumter County Utility Dependent District	Village Center CDD - $0.00; North Sumter County Utility Dependent District - $0.00
3968	Villages Center CDD	S105	VCSA WWTP - SCADA	Supervisory control and data acquisition (SCADA) installation and operation at the VCSA plant and collection system lift stations.	WWTF Upgrade	Completed	2015	0	$0	Village Center CDD	Village Center CDD - $0.00
3972	Villages Center CDD	S081	Stormwater Pollution on Website	Section of district website for residents dedicated to providing education and links	Education Efforts	Ongoing	NA	0	$0	Sumter Landing CDD; Village	Sumter Landing CDD - $0.00; Village Center CDD - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				on stormwater pollution.						Center CDD	
3973	Villages Center CDD	S080	Illicit Discharge Awareness Notifications	Provide illicit discharge awareness notifications and educational material to area businesses to make them aware of hazards associated with illicit discharges and improper disposal of waste.	Education Efforts	Ongoing	NA	0	$0	Village Center CDD; North Sumter County Utility Dependent District	Village Center CDD - $0.00; North Sumter County Utility Dependent District - $0.00
3974	Villages Center CDD	S079	Stormwater Management - CDD School/Hometown Social	Monthly public educational meeting with residents.	Education Efforts	Ongoing	NA	0	$0	North Sumter County Utility Dependent District; CSU; Sumter Water Conservation Authority; Village Center CDD	North Sumter County Utility Dependent District - $0.00; CSU - $0.00; Sumter Water Conservation Authority - $0.00; Village Center CDD - $0.00
3975	Villages Center CDD	S078	Stormwater Management - Public Service Newspaper Column	Created a public service newspaper column that is placed in the Villages newspaper to create awareness of the effects of	Education Efforts	Ongoing	NA	0	$0	The Villages	The Villages - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
				illicit discharges and illegal disposal.							
3976	Villages Center CDD	S077	Stormwater Management - Telephone Book Aid	Villages public service telephone book aid explaining the purpose of a stormwater program and how to participate in stormwater activities.	Education Efforts	Ongoing	NA	0	$0	North Sumter County Utility Dependent District; Village Center CDD	North Sumter County Utility Dependent District - $0.00; Village Center CDD - $0.00
3994	Villages Center CDD	S108	CSU WWTP - SCADA	SCADA Installation and operation at the CSU plant and collection system lift stations.	WWTF Upgrade	Completed	2015	0	$0	CSU	CSU - $0.00
3995	Villages Center CDD	S107	NSU WWTP - SCADA	SCADA Installation and operation at the NSU plant and collection system lift stations.	WWTF Upgrade	Completed	2015	0	$0	North Sumter County Utility Dependent District	North Sumter County Utility Dependent District - $0.00
3996	Villages Center CDD	S106	LSSA Waste WWTP - SCADA	SCADA Installation and operation at the LSSA plant and collection system lift stations.	WWTF Upgrade	Completed	2015	0	$0	Village Center CDD	Village Center CDD - $0.00
3998	Villages Center CDD	S044	LSSA WWTP Reuse	Public access reuse system provides reclaimed water for irrigation of golf courses.	WWTF Diversion to Reuse	Completed	2012	0	$0	Village Center CDD	Village Center CDD - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4002	Villages Center CDD	S050	Stormwater System Inspections	Routine stormwater system inspections, cleaning, and maintenance performed as needed.	Stormwater System Rehabilitation	Completed	2000	0	$0	Sumter Landing CDD; Village Center CDD	Sumter Landing CDD - $0.00; Village Center CDD - $0.00
4003	Villages Center CDD	S049	Pond Maintenance	Pond maintenance to ensure optimal pollutant removal and verify performance is at design criteria by monthly checks and treating nuisance species such as algae, grasses, hydrilla, spike rush, duckweed, cattails, etc. as necessary.	Stormwater System Rehabilitation	Completed	2000	0	$0	Sumter Landing CDD; Village Center CCD	Sumter Landing CDD - $0.00; Village Center CCD - $0.00
4004	Villages Center CDD	S048	Staff Training	Train staff and certain subcontractors to aid in identification of illicit discharges as well as to reduce/eliminate illicit discharges and improper disposal of waste internally.	Education Efforts	Ongoing	NA	0	$0	Village Center CDD; Sumter Landing CDD; North Sumter County Utility Dependent District	Village Center CDD - $0.00; Sumter Landing CDD - $0.00; North Sumter County Utility Dependent District - $0.00
4007	Villages Center CDD	S045	NSU WWTP Reuse	Public access reuse system provides reclaimed water for irrigation of golf courses.	WWTF Diversion to Reuse	Completed	2012	0	$0	North Sumter County Utility Dependent District	North Sumter County Utility Dependent District - $0.00

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
4009	Villages Center CDD	S043	VCSA WWTP Reuse	Public access reuse system provides reclaimed water for irrigation of golf courses and roadways.	WWTF Diversion to Reuse	Completed	2012	0	$0	Village Center CDD	Village Center CDD - $0.00
4010	Villages Center CDD	S041	North Sumter Utilities (NSU) WWTP Anaerobic Denitrification	WWTP includes an Anoxic Basin for denitrification of NO3 which reduces NO3 discharge in the WWTP effluent.	WWTF Nutrient Reduction	Completed	2012	0	$0	North Sumter County Utility Dependent District	North Sumter County Utility Dependent District - $0.00
4011	Villages Center CDD	S039	Village Center Service Area (VCSA) WWTP Anaerobic Denitrification	WWTP includes an Anoxic Basin for denitrification of NO3 which reduces NO3 discharge in the WWTP effluent.	WWTF Nutrient Reduction	Completed	2012	0	$0	Village Center CDD	Village Center CDD - $0.00
4017	Villages Center CDD	S046	CSU WWTP Reuse	Public access reuse system provides reclaimed water for irrigation of golf courses.	WWTF Diversion to Reuse	Completed	2013	0	$0	CSU	CSU - $0.00
4021	Villages Center CDD	S040	Little Sumter Service (LSSA) WWTP Anaerobic Denitrification	WWTP includes an Anoxic Basin for denitrification of NO3 which reduces NO3 discharge in the WWTP effluent.	WWTF Nutrient Reduction	Completed	2012	0	$0	Village Center CDD	Village Center CDD - $0.00
4029	Villages Center CDD	S058	Sanitary Sewer Cleaning	Cleaning of 10 % of collection system per year.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Ongoing	NA	0	$0	Village Center CDD; North Sumter County	Village Center CDD - $0.00; North Sumter County Utility Dependent

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
										Utility Dependent District; CSU	District - $0.00; CSU - $0.00
4030	Villages Center CDD	S063	Street Sweeping	All shopping centers and all 3 downtown areas anywhere from 3 times per week to quarterly, depending on the location.	Street Sweeping	Ongoing	NA	0	$0	Village Center CDD	Village Center CDD - $0.00
4031	Villages Center CDD	S062	Sanitary Sewer Replacement	VCSA sanitary sewer replacement.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2016	0	$250,000	Village Center CDD	Village Center CDD - $0.00
4033	Villages Center CDD	S061	Lift Station Rehab	VCSA List Station Nos. 16 and 33 replace risers and recoat wet well. LSSA List Station No. 16 replace risers and recoat wet well.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	2016	0	$118,000	Village Center CDD	Village Center CDD - $0.00
4035	Villages Center CDD	S059	Lift Station Rehab	Village Center Service Area (VCSA) and Little Sumter Service Area (LSSA) Lift Station rehabilitation.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Ongoing	NA	0	$2,500,000	North Sumter County Utility Dependent District; Village Center CDD; Little Sumter Service Area; CSU;	North Sumter County Utility Dependent District - $0.00; Village Center CDD - $0.00; Little Sumter Service Area - $0.00; CSU - $0.00; Sumter Water Conservation

Project ID	Lead Entity	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Cost Estimate	Funding Source	Funding Amount
										Sumter Water Conservation Authority	Authority - $0.00
4037	Villages Center CDD	S057	Sanitary Sewer Repairs	Inspection of main pipelines and manholes and timely repair of sewer and service line breaks.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Ongoing	NA	0	$0	North Sumter County Utility Dependent District; Village Center CDD; CSU	North Sumter County Utility Dependent District - $0.00; Village Center CDD - $0.00; CSU - $0.00
7801	Villages Center CDD	S284	OSTDS Adjustment	Removal of the OSTDS allocations assigned during the 2025 BMAP update. All parcels are connected to sewer service.	BMP Missing from Model	Completed	2025	478	$0	NA	NA - $0.00

Appendix C. Planning for Additional Management Strategies

Responsible entities must submit a sufficient list of creditable projects with estimated reductions which demonstrates how the entity is going to meet their milestone to DEP no later than January 14, 2026, to be compliant with the upcoming BMAP milestone or be subject to department enforcement.

If any lead entity is unable to submit a sufficient list of eligible management strategies to meet their next 5-year milestone reductions, specific project identification efforts are required to be submitted by January 14, 2026. Any such project identification efforts must define the purpose of and include a timeline to identify sufficient projects to meet the upcoming milestone. The project description and estimated completion date for any such project identification effort must be provided and reflect the urgency of defining, funding, and implementing projects to meet the upcoming and future BMAP milestones.

These planning efforts are ineligible for BMAP credit themselves but are necessary to demonstrate additional eligible management actions will be forthcoming and BMAP compliance will be achieved. Only those entities that provide sufficient project identification efforts will be deemed as possessing a defined compliance schedule. Those entities without an adequate project list or a defined compliance schedule to meet their upcoming 5-year milestone may be subject to enforcement actions. Examples of project identification efforts include the following:

- Planning and identifying water quality projects and related costs and schedules in specific plans.
  - Feasibility studies (e.g., stormwater feasibility studies or wastewater feasibility studies).
  - Flood mitigation plans with nutrient management components.
  - Basinwide water quality management plans.
  - Nutrient management plans.
- Applying for external project funding.
- Developing interagency/interdepartmental agreements or MOUs for collaboration on nutrient reduction projects that cross jurisdictional or administrative boundaries.
- Updating future growth considerations in local comprehensive plans, land development reviews, and audits of relevant codes and ordinances
- Updating existing remediation plans.
- Monitoring water quality in support of project planning and implementation.
- Researching innovative technologies.

Appendix D. Silver and Rainbow PFA Reports

During the development of the 2018 Silver and Rainbow BMAPs, the PFAs were defined as the area of the basin where the Floridan aquifer is generally most vulnerable to pollutant inputs and where there is a known connectivity between groundwater pathways and an OFS. As required by the Florida Springs and Aquifer Protection Act, DEP adopted PFAs, which are incorporated by reference into this BMAP. The PFAs delineated for Silver Springs and Rainbow Springs are based on Marion County's identified Primary Protection Zones and supported by local ordinance. Consistency in the enactment of policy was a factor in DEP's consideration of basing PFA boundaries on existing county ordinance.

Marion County's Spring Protection Resolution (05-R-106) was passed in 2005, and the county's Comprehensive Plan, Future Land Use Element, Objective 7.4 establishes the Springs Protection Overlay and identifies the extent of the primary and secondary zones, as well as design and development standards. Subsequent updates to the county Land Development Code incorporated these development standards. They include, but are not limited to, effluent concentration limits for WWTFs, lot size restrictions for septic tanks in new developments, septic tank maintenance requirements, groundwater recharge requirements, and stormwater management standards encouraging LID.

The PFAs delineate the approximate modeled 10-year time of travel to each spring system. Marion County contracted with a hydrogeological consulting firm as part of a comprehensive Water Resource Assessment and Management Study in 2005. One result of the effort was the ground-surface delineation of the estimated 10-year travel time of groundwater to the springs, based on potentiometric surface and hydrogeology. These generalized areas were adopted by the Board of County Commissioners to represent the Primary Springs Protection Zones in 2009 and to form the basis of the PFA.

Dye trace studies performed in the Silver Springs BMAP area confirm the movement of water to the springs in reasonably short times. The movement of groundwater to Silver Springs is a mix of conduit flow and matrix flow. However, comparing modeled results with dye tracer results, most of the groundwater movement in the 2-year capture zone (within the 10-year travel time) is probably by conduit flow, which moves groundwater more quickly toward the springs than matrix flow. (Boniol 2013, McGurk 2012).

Appendix E. OSTDS Remediation Plan

Section 373.807, F.S., requires that if, during the development of a BMAP for an OFS, DEP identifies OSTDS as contributors of at least 20% of nonpoint source nitrogen pollution in a PFA or if DEP determines remediation is necessary to achieve the TMDL, the BMAP must include an OSTDS remediation plan. Based on the Silver and Rainbow NSILT estimates and GIS coverages, OSTDS contribute approximately 32% of the pollutant loading in the BMAP. Irrespective of the percent contribution from OSTDS, DEP has determined that an OSTDS remediation plan is necessary to achieve the TMDLs and to limit the increase in nitrogen loads from future growth.

Permitting for OSTDS is implemented either by DEP, delegated counties, or by County Health Departments under an interagency agreement. To aid in implementation, the DEP Map Direct webpage includes a detailed downloadable springs PFA boundary shapefile for planning purposes. DEP also maintains on its website an interactive map of the PFA and BMAP boundaries; the map can be easily searched for specific street address locations (currently available at https://floridadep.gov/BMAPs-ARP-OSTDS).

E.1 Plan Elements

E.1.1 Installation of New OSTDS

As of July 1, 2023, sections 373.811 and 403.067, F.S., prohibited the installation of new OSTDS serving lots of one acre or less where central sewer is available. Within the BMAP area, if central sewer is unavailable on any lot size, then the owner must install a DEP-approved enhanced nutrient-reducing OSTDS that achieves at least 65% nitrogen reduction, or other wastewater system that achieves at least 65% reduction. The OSTDS remediation plan pursuant to section 373.807, F.S., was updated in this BMAP iteration to include this additional requirement for new systems.

Installation of new OSTDS is permitted pursuant to Chapter 62-6, F.A.C.., and includes not only systems installed on a property where one has not previously been installed, but also systems installed to replace illegal systems, systems installed in addition to existing systems, and other new systems. Permitting requirements with respect to the definition of "new" or “one acre or less" will be followed for this remediation plan. To meet the enhanced nitrogen treatment requirement, the system must be a DEP-approved enhanced nutrient reducing system meeting at least 65% nitrogen reduction.

E.1.2 Modification or Repair of Existing OSTDS

The OSTDS remediation plan must provide loading reductions consistent with achieving the TMDL within 20 years of plan adoption (see subparagraph 373.807(1)(b)8., F.S.). This plan therefore establishes the following remediation policy for existing systems, based on (a) the potential for reducing nitrogen loads by converting existing OSTDS to enhanced nitrogen removing systems or by connecting homes to central sewer, (b) the total amount of nitrogen load that must be reduced to achieve the TMDL, and (c) the relative contribution of nitrogen load from existing OSTDS.

The remediation policy for existing systems in the Silver and Rainbow BMAP applies to all existing OSTDS within the BMAP and is effective upon BMAP adoption. Upon the need for any construction permit under chapter 62-6, F.A.C. to repair, modify, or replace an existing OSTDS affected by the remediation policy, a DEP-approved enhanced nutrient reducing system meeting at least 65% nitrogen reduction must be installed unless the OSTDS permit applicant provides documentation that sewer connection to the property is planned and funded, and structures on the lot will be connected.

For existing OSTDS, the owner must connect to sewer within 365 days of written notification by the utility that connection to its sewer line is available. A utility is statutorily required (section 381.00655, F.S.) to provide written notice to existing OSTDS owners regarding the availability of sewer lines for connection. Additionally, existing OSTDS needing repair or modification must connect to available sewer lines within 90 days of notification by DEP.

To facilitate an inventory of noncompliant properties, by February 2, 2026, and every two years thereafter, each utility with sewer lines in the BMAP shall provide DEP a list of properties with existing OSTDS where sewer is available but have not been connected. For each identified property, include the date(s) which the utility provided written notice to the owners of the availability of sewer.

E.1.3 Achieving Necessary Load Reductions

All conventional OSTDS in areas subject to the remediation policy for existing systems are required to meet enhanced nutrient reducing OSTDS requirements, install other wastewater systems that can achieve at least 65% reduction, or connect to central sewer no later than 20 years after BMAP adoption.

E.1.4 Other Plan Elements

Section 373.807, F.S., also requires that the OSTDS remediation plan contain the following elements.

- An evaluation of credible scientific information on the effect of nutrients, particularly forms of nitrogen, on springs and spring systems. (See **Section E.2**.)
- Options for repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action. (See **Section E.3**.)
- A public education plan to provide area residents with reliable, understandable information about OSTDS and springs. (See **Section E.4**.)
- Cost-effective and financially feasible projects necessary to reduce the nutrient impacts from OSTDS. (See **Section 2** and **Appendix B**.)
- A priority ranking for each project for funding contingent on appropriations in the General Appropriations Act. (See **Section 2** and **Appendix B**.)

Section 373.807, F.S., defines an OSTDS as a system that contains a standard subsurface, filled, or mound drain field system; an aerobic treatment unit; a graywater system tank; a laundry wastewater system tank; a septic tank; a grease interceptor; a pump tank; a solids or effluent pump; a waterless, incinerating, or organic waste–composting toilet; or a sanitary pit privy that is installed or proposed to be installed beyond the building sewer on land of the owner or on other land on which the owner has the legal right to install such a system. The term includes any item placed within, or intended to be used as a part of or in conjunction with, the system. The term does not include package sewage treatment facilities and other treatment works regulated under Chapter 403, F.S.

E.2 Collection and Evaluation of Credible Scientific Information

As discussed in **Section 2,** DEP developed the Silver and Rainbow NSILT, a planning tool that provides estimates of nitrogen loading to groundwater based on best available scientific data for a particular geographic area. The NSILT results were peer reviewed by SJRWMD and FDACS. Additional technical support information concerning the NSILT can be found in **Appendix F**.

DEP developed calculation methods to estimate nitrogen reductions associated with OSTDS enhancement and replacement projects, WWTF projects, and stormwater projects.

Monitoring and research:

- OFS source marker evaluation includes wells in Silver Springs and Upper Silver River BMAP area.
- Research and develop advanced septic systems.
- Wekiva septic tank research activities.

Completed projects:

- Florida Onsite Sewage Nitrogen Reduction Strategies Study.
- Springs Protection Initiative Collaborative Research Initiative on Sustainability and Protection of Springs (CRISPS) for Silver Springs.
- 2015–2019 springs management plan includes Rainbow Springs Group and Rainbow River BMAP area.
- Groundwater nitrate concentration modeling in Silver Springs and Upper Silver River BMAP area as part of Springs Protection Initiative.
- Long Term Performance and Operational Experience for Non-Proprietary Passive Nitrogen Reducing Onsite Sewage Treatment And Disposal Systems (https://floridadep.gov/water/onsite-sewage/content/onsite-sewage-research-reports)

Ongoing projects:

- Periodic review and evaluation of groundwater quality data from public water

supply systems for nitrate levels and spatial distribution of nitrate.

- Groundwater quality monitoring for BMAP assessment.
- Septic tank and well elimination program.
- Monitoring of in-ground nitrogen reducing biofilters.

Proposed projects:

- Performance monitoring on advanced OSTDS in Florida.
- Nutrient source loading identification.

E.3 Remediation Options

As required by Florida law, this OSTDS remediation plan identifies remediation options for existing OSTDS, including repair, upgrade, replacement, drain field modification, the addition of effective nitrogen-reducing features, connection to a central sewer system, or other action. More simply, remediation options can be classified as enhancement or replacement. DEP's Onsite Sewage Program maintains a list of approved nitrogen-reducing systems on its website https://floridadep.gov/water/onsite-sewage/content/product-listings-and-approval-requirements.

The NSILT estimates that OSTDS contribute approximately 32% of the pollutant loading to groundwater in the Silver and Rainbow BMAP. **Table E-1** lists the number of existing OSTDS in the BMAP and the estimated nitrogen reductions associated with enhancement or connection to sewer. **Figure E-1** shows the areas where OSTDS are located.

Table E-1. Estimated reduction credits for OSTDS enhancement or sewer

Recharge Area	OSTDS Parcels	Credit for Enhancement (lbs/yr)	Credit for Sewer (lbs/yr)
High	64,664	489,602	930,245
Medium	32,621	136,876	260,315
Low	6,675	6,654	10,726
Total	**103,960**	**633,132**	**1,201,286**

Local governments can develop programs to help fund the additional costs required to upgrade existing OSTDS to include nutrient reducing features. The funding program will be designed to prioritize OSTDS where it is most economical and efficient to add nutrient reducing features (i.e., systems needing a permit for a repair or modification, within the PFA, and on lots of one acre or less). Local governments can apply for competitive grant funding from DEP programs, which are available at ProtectingFloridaTogether.com.

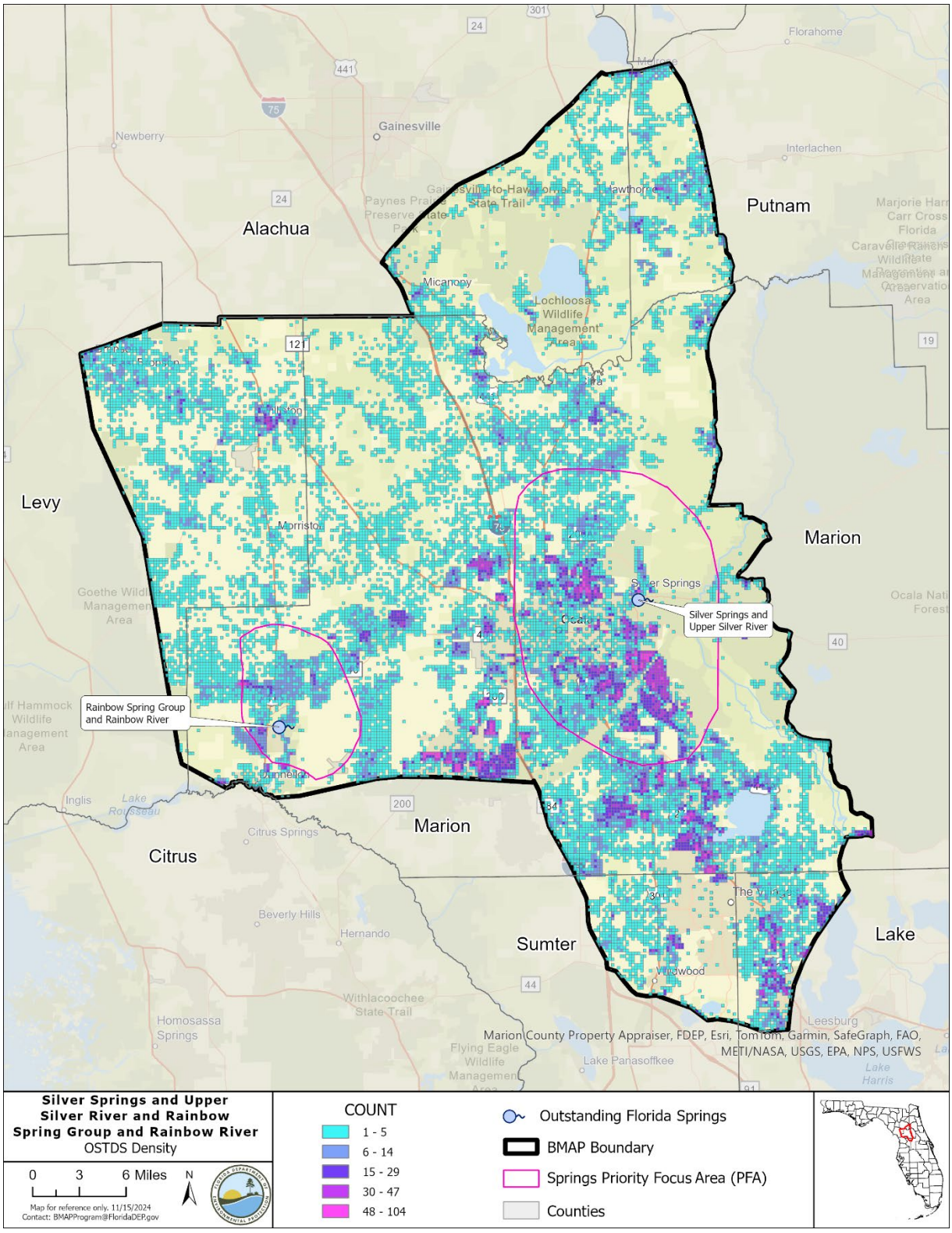

Figure E-1. Locations of OSTDS in the Silver and Rainbow BMAP

E.4 Public Education Plan

DEP will develop and disseminate educational material focused on homeowners and guidance for builders and septic system contractors. The materials will identify the need for enhanced nitrogen reducing OSTDS along with the requirements for installing nitrogen reducing technologies under this OSTDS remediation plan. DEP will coordinate with industry groups such as Florida Home Builders Association and Florida Onsite Wastewater Association (FOWA).

DEP's Onsite Sewage Program's website provides information on the following:

- The requirements for nitrogen-reducing systems for springs protection and BMAPs (https://floridadep.gov/water/onsite-sewage/content/springs-protection-and-basin-management-action-plans-bmaps).

- Information for septic system owners and buyers (https://floridadep.gov/water/onsite-sewage/content/information-septic-system-owners-and-buyers).

- Information for septic tank contractor (https://floridadep.gov/water/onsite-sewage/content/septic-tank-contractor-registration).

UF-IFAS has developed a website that includes frequently asked questions, and extensive information for septic system owners and local governments (https://water.ifas.ufl.edu/septic-systems/your-septic-system/).

Appendix F. Technical Support Information

The pages that follow are the Technical Support Document that describe the methods that were used for the NSILT. This document is a stand-alone report, so the pages, tables, and figures are numbered accordingly.

Technical Support Document
2023 Nitrogen Source Inventory Loading Tools for Springs
Basin Management Action Plans

Division of Environmental Assessment and Restoration
Watershed Planning & Coordination
Florida Department of Environmental Protection

June 2025

2600 Blair Stone Rd.
Tallahassee, FL 32399
Floridadep.gov

Acknowledgments

This document describes the data sources and values that were used by the Florida Department of Environmental Protection (DEP) in the 2023 Nitrogen Source Inventory Loading Tools (NSILTs) updates for the following basin management action plans (BMAPs) 2025 updates:

- Chassahowitzka/Homosassa Springs Groups
- Crystal River/Kings Bay
- DeLeon Spring
- Gemini Springs
- Jackson Blue Spring and Merritts Mill Pond Basin
- Lower and Middle Suwannee River Basin
- Rainbow Springs Group and Rainbow Springs Run/Silver Springs, Silver Springs Group, and Upper Silver River
- Santa Fe River Basin
- Upper Wakulla River and Wakulla Spring
- Volusia Blue Spring
- Wacissa River and Wacissa Spring Group
- Weeki Wachee/Aripeka Spring
- Wekiwa and Rock Springs

For additional information on NSILTs and springs water quality restoration efforts, please contact:

Florida Department of Environmental Protection/ Water Quality Restoration Program
2600 Blair Stone Road, Mail Station 3565
Tallahassee, FL 32399-2400
Email: BMAPProgram@FloridaDEP.gov

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Introduction

The Florida Department of Environmental Protection (DEP) developed a Nitrogen Source Inventory and Loading Tool (NSILT) to provide information on the major sources of nitrogen in the springs basin management action plan (BMAP) areas (Eller and Katz 2017). These major sources are as follows: Atmospheric deposition; wastewater treatment facilities (WWTFs); urban fertilizers; onsite sewage treatment and disposal systems (OSTDS, also known as "septic systems"); biosolids; livestock waste; and agricultural fertilizers. The approach applies to the groundwater contributing area (or springshed) for the impaired springs and the surface waters they augment. Over time, the nitrogen sources in the spring BMAP areas have changed and the DEP methodology for estimating nitrogen loads has improved. These improvements are a result of additional information as well as new tools that provide better estimates of nitrogen loads.

This technical support information identifies the data sources and methodology used for the 2023 NSILT estimates. This report documents the assumptions used by DEP when applying the NSILT approach to the adopted springs BMAPs as of January 2025. The NSILT is an Arc geographic information system (ArcGIS) and spreadsheet-based tool that provides spatial estimates of the relative current contributions from major nitrogen sources. The NSILT approach involves estimating the nitrogen load to the land surface for various source categories, then applying a source-specific biochemical attenuation factor and a location-specific recharge factor to determine the impact to groundwater quality in the Upper Floridan aquifer (UFA). The estimated load to groundwater determines the scope of reduction strategies needed for BMAP implementation for each source category. Multiple public meetings were held to share the NSILT methodology and results as well as to solicit comments. Between January 2023 to January 2025, location-specific adjustments were made based on feedback from stakeholders. Additional NSILT data and resources are available upon request.

Figure 1 shows the BMAPs that have updated NSILTs described by this document, which includes the following springsheds:

- Chassahowitzka Spring Group
- Homosassa Springs Group
- Crystal River/Kings Bay
- DeLeon Spring
- Gemini Springs
- Jackson Blue Spring
- Rainbow Springs Group
- Santa Fe: Devil's Ear, Hornsby, and Ichetucknee Springs, and Outside Springsheds
- Silver Springs Group
- Suwannee: Madison Blue, Middle Suwannee, Fanning/Manatee Springs, and Outside Springsheds
- Volusia Blue Spring
- Wacissa Spring Group
- Wakulla Spring
- Weeki Wachee/Aripeka Spring
- Wekiwa/Rock Springs

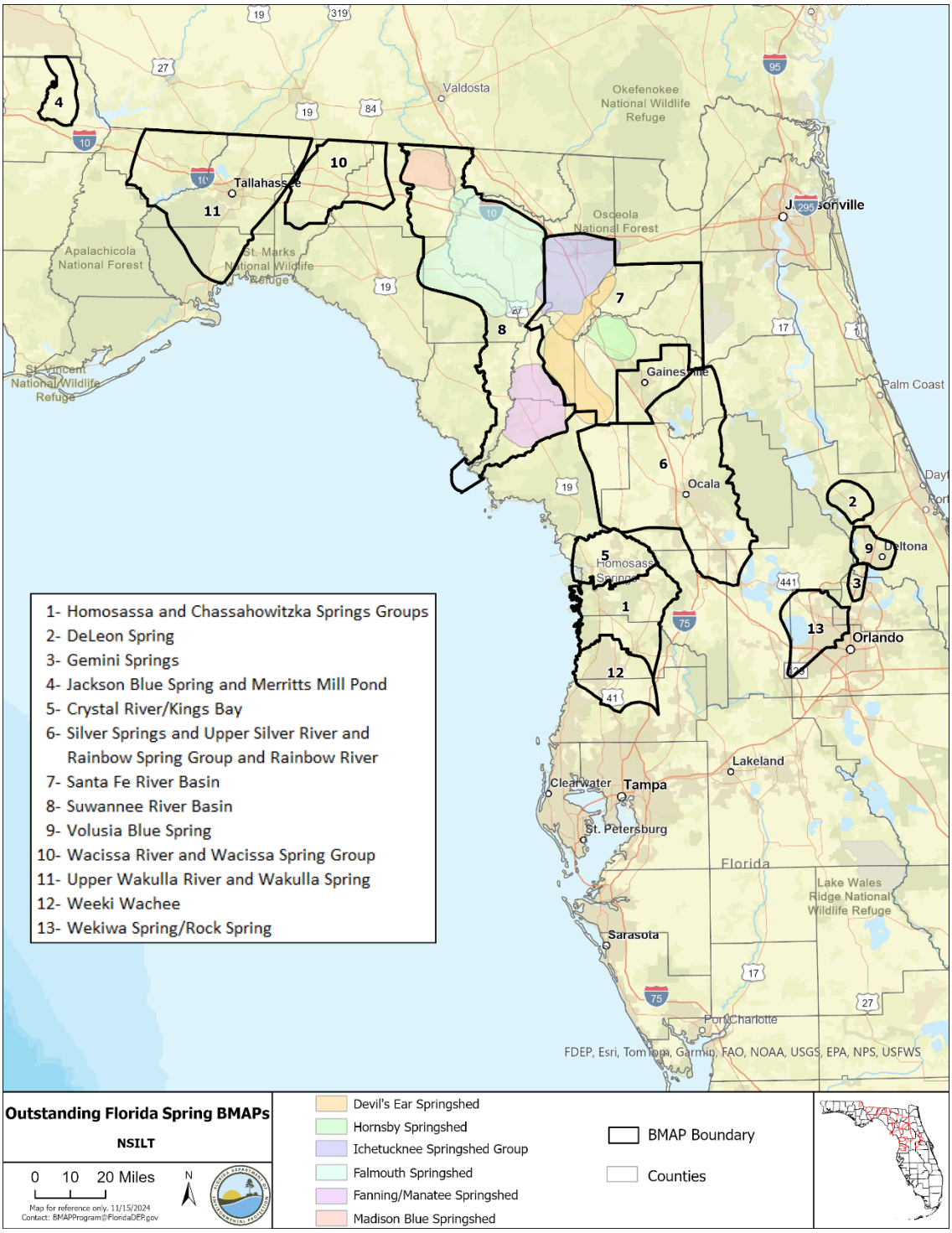

Figure 1. Map of the spring BMAPs and springsheds with updated NSILTs

Background

Florida springs provide sites of recreational and cultural value as well as sources of potable water and afford a way to assess regional groundwater quality. Springs integrate groundwater

vertically, spatially, and temporally from the UFA--the highly transmissive limestone aquifer that is the source of water flowing from the springs (Bush and Johnston 1988; Katz 1992, 2004; Davis 1996). Rainfall that infiltrates into the subsurface and recharges the aquifer system contains nitrogen and other dissolved chemicals of concern originating from anthropogenic activities at or near the land surface. Groundwater with elevated nitrate concentrations flows toward the spring. Elevated nitrate concentrations in Florida's springs contribute to water quality degradation in their receiving surface waters. Therefore, the NSILT results are used in the development and implementation of the BMAPs for impaired spring systems, by focusing nitrogen source reduction efforts on the sources in order to achieve the greatest improvement in water quality. A link to the Water Quality Restoration Program website and the BMAP documents is located in **Appendix A**.

The NSILT does not account for legacy loads of nitrogen that may already be present in the aquifer and continue to adversely impact groundwater quality. Several spring basin studies have reported increasing nitrate-N concentrations in groundwater and springs over time. Nitrogen that entered groundwater from past anthropogenic practices may slowly exit the groundwater flow system via springs, given that the average groundwater residence times in large spring basins in Florida is on the order of decades (Katz et al. 1999, Katz 2004, Phelps 2004, Happell et al. 2006, Toth and Katz 2006, and Knowles et al. 2010).

Estimating Nitrogen Inputs to the Land Surface

Springshed Boundary Adjustments

The NSILT analysis was run on the springshed boundaries which were consistent with the BMAP boundary or the springshed plus outside springshed areas (i.e., the Lower and Middle Suwannee BMAP and the Santa Fe BMAP) that were included in the BMAP boundary because there are adjacent areas that feed the groundwater system that supplies additional springs and baseflow for the river or augments the adjacent contributing tributaries and rivers. Springshed boundaries were previously defined in the first iteration of the NSILTs, published between 2015 and 2018. Where appropriate, the springshed boundaries remained consistent with the previous NSILT evaluation. Some springshed boundaries were adjusted to meet the requirements of priority focus area (PFA) boundaries as defined in the 2016 Springs and Aquifer Protection Act. Requirements of the act dictated that priority focus areas should follow easily identifiable landmarks or political boundaries. To address this requirement, the boundaries for DeLeon, Volusia Blue, Wekiwa, Jackson Blue, Wacissa, and Weeki Wachee springsheds were adjusted.

In their original NSILTs, the Weeki Wachee springshed overlapped the southern part of the Chassahowitzka and the Homosassa springsheds, respectively. In the updated NSILTs, the overlapping area was removed from the Chassahowitzka and Homosassa areas and accounted for in the Weeki Wachee contributing area. Comparably to the prior NSILT versions, the NSILT methodology was run separately on the Homosassa and Chassahowitzka springsheds.

Another boundary change made in the 2023 NSILTs is that the Aripeka and Weeki Wachee springsheds were analyzed as one, instead of separating the two springsheds. Rainbow and Silver springsheds were also analyzed as one area.

It is important to note that the Wekiva River surface water contributing area is a separate BMAP area from the Wekiwa Springs area. For the Wekiwa and Rock Springs NSILT, only the springshed area is evaluated; the surface watershed for the Wekiva River is excluded from the NSILT. Management actions in the Wekiva River BMAP are attributed to benefiting the surface watershed of the river, but projects are needed in the springshed area to benefit the springs.

In the Santa Fe BMAP area, there are three separate springshed areas that are analyzed separately; the Santa Fe springsheds are the following:

- Devil's Ear Complex;
- Ichetucknee; and
- Hornsby springsheds.

In the Suwannee BMAP area, there are also three separate springshed areas that are analyzed separately; the Suwannee springsheds are as follows:

- Fanning/Manatee;
- Falmouth/Troy/Lafayette/Peacock; and
- Madison Blue springsheds.

In Santa Fe and Suwannee springsheds, the areas outside the springsheds but within the BMAP boundary are considered contributing to the rivers. These areas were evaluated in a separate NSILT analysis. The total maximum daily loads (TMDLs) for the Suwannee and Santa Fe BMAPs include numeric nutrient criteria for river water quality. Due to this requirement, a nutrient loading evaluation was performed separately to better characterize impact on outside the springshed areas and surface water quality. The NSILT was applied to support nitrogen source identification and to estimate the nutrient reductions that are needed in these areas to ensure that water quality in both rivers meets the TMDL targets.

Boundary Data

For the 2023 updates, a springshed GIS layer was created for the NSILT analysis, which also includes the county boundaries and the recharge areas. These boundaries were used for all the county-level and recharge-based calculations. The springsheds boundaries used are the same as the BMAP boundary expect for Suwannee and Santa Fe which each are broken up into three springsheds plus the outside areas, respectively. This GIS boundary layer is available upon request.

Atmospheric Deposition

Estimates of nitrogen loading from atmospheric deposition are derived from the U.S. National Atmospheric Deposition Program (NADP) Total Deposition (TDEP) Science Committee's hybrid model. The TDEP model evaluates wet and dry deposition monitoring network data and calculates an estimated total nitrogen deposition load (Schwede and Lear 2014). TDEP data are provided as an annual total and presented in a four-kilometer by four-kilometer grid raster file. Data from the 2019 and 2020 datasets were averaged to estimate nitrogen loading (see link to the

NADP TDEP in **Appendix A**). Data were then spatially evaluated to determine the loading in areas of each groundwater recharge category within each BMAP or springshed. Recharge and biochemical attenuation factors (see **Table 11**) were then applied to the estimated loading to land surface to estimate loading to groundwater.

WWTFs

The average annual input of nitrogen to the land surface for WWTFs was estimated for each effluent land application site for all facilities disposing of effluent in the BMAP area. The average annual input was estimated using the mean total nitrogen (TN) concentration in milligrams per liter (mg/L) and mean discharge volume in million gallons per day (MGD) for each WWTF. The data were sourced from the DEP Wastewater Facility Regulation (WAFR) database for effluent discharged from January 2019 through December 2021.

WWTFs were considered to contribute to loading to a BMAP if the effluent was disposed of within the BMAP, regardless of whether the facility itself was within the BMAP. Some WWTFs were not required to monitor and report TN effluent concentrations, and, therefore, did not have TN data available in the WAFR database. Some of these facilities that did not report TN concentrations reported nitrate-N (NO_3-N) concentrations. For those facilities, an estimated TN concentration was calculated assuming that nitrate-N would compose 38.5% of the TN concentration (Helgeson and McNeal 2009). In cases where no TN data or nitrate-N data were collected at a facility during the data period or the data quality was questionable, an effluent value based on a review of similar-sized facilities within springs BMAP areas was used to estimate the TN concentration. The facilities were classified as "small," "medium," or "large" based on their average daily flow. The estimated TN concentrations for facilities with insufficient WAFR data for a direct estimate are summarized in **Table 1**.

Table 1. Average TN concentration by facility size for WWTFs with insufficient data

Facility Size	Flow (MGD)	Estimated Average TN Effluent Concentration (mg/L)
Large	> 0.1	4.34
Medium	0.1 – 0.02	7.22
Small	< 0.02	11.76

Facilities report nitrogen concentration data and flow data at different intervals depending on their specific permit requirements. When available, the reported monthly average data were used to calculate flow and concentration. If monthly average data were not available, summary data was prioritized in the following order: weekly average, quarterly average, annual average, 3-month rolling average, and maximum. When multiple flow and/or nitrogen monitoring sites existed for a facility, the effluent information that best reflected the effluent quality at the disposal site was used for evaluation.

All applicable wastewater effluent reuse and disposal practices were considered: direct surface water discharges; rapid infiltration basins (RIBs); sprayfields; public access reuse (e.g., golf course and residential reuse); absorption fields; and wetland disposal. Direct surface water discharges were considered surface water sources and excluded as loads to groundwater. For all

other reuse and disposal types, an appropriate biochemical attenuation factor was applied, dependent on the practice (**Table 11**). Effluent disposal locations were spatially evaluated to determine the recharge category of the deposition site, and the appropriate recharge factor was applied to determine the loading to groundwater.

OSTDS

OSTDS loading was calculated by estimating the number of septic systems within a BMAP and multiplying the number of OSTDS by the expected loading per system. The Florida Department of Health (DOH) Florida Water Management Inventory (FLWMI) data were used to estimate the number of OSTDS within each BMAP (see link to the FLWMI in **Appendix A.**

FLWMI data identifies a wastewater source for every parcel in the state in one of eight categories: "Known Septic," "Likely Septic," "Somewhat Likely Septic," "Known Sewer," "Likely Sewer," "Somewhat Likely Sewer," "Unknown," and "Undetermined." Parcels identified as "Known Septic," "Likely Septic," and "Somewhat Likely Septic" in the FLWMI database were considered to use septic systems for wastewater treatment. There was assumed to be one septic system per parcel. FLWMI data were spatially evaluated to determine the appropriate recharge category for each OSTDS location. FLWMI data are provided by county. For this analysis, all FLWMI data used were updated between 2021 and 2023. **Table 2** shows the year of OSTDS data that were used from the FLWMI for the estimated number of septic systems by county.

Table 2. Year the FWRI data were updated by county

County	Update Year
Citrus, Hernando, Orange, Pasco, and Sumter	2023
Alachua, Columbia, Dixie, Gilchrist, Hamilton, Lafayette, Lake, Levy, Madison, Marion, Putnam, Seminole, Suwannee, Taylor, Union, and Volusia	2022
Gadsden, Jackson, Jefferson, Leon, and Wakulla	2021

Loading per septic system was estimated by determining the persons per household and multiplying this by a per capita loading rate. The 2020 U.S. Census data were used to estimate the number of persons per household, by county, as shown in **Table 3.** A per capita contribution of 10 pounds of nitrogen per year (lbs-N/yr) was estimated based on the Florida Onsite Sewage Nitrogen Reduction Strategies Study Final Report (Armstrong 2015), which was an update to the prior NSILT estimates of 9.012 lbs-N/yr.

Loading to the land surface was calculated by multiplying the number of OSTDS by the loading rate. OSTDS locations were spatially evaluated as the centroid of the parcel, and the appropriate recharge factor was determined. A biochemical attenuation factor (**Table 11**) and a recharge factor were then applied to estimate loading to groundwater.

Table 3. 2020 U.S. Census persons per household by county

County	Persons Per Household Based On the 2020 U.S. Census
Alachua	2.48
Baker	2.91

County	Persons Per Household Based On the 2020 U.S. Census
Citrus	2.25
Columbia	2.62
Dixie	2.5
Gadsden	2.43
Gilchrist	2.53
Hamilton	2.6
Hernando	2.46
Jackson	2.27
Jefferson	2.21
Lafayette	2.8
Lake	2.56
Leon	2.38
Levy	2.39
Madison	2.38
Marion	2.4
Orange	2.87
Pasco	2.54
Putnam	2.43
Seminole	2.6
Sumter	2.04
Suwannee	2.82
Taylor	2.51
Union	2.36
Volusia	2.43
Wakulla	2.59

Farm Fertilizer

Farm fertilizer loading to land surface estimates were calculated by determining the agricultural area used for specific crops within a BMAP, multiplied by an estimated crop specific fertilizer application rate. The Florida Department of Agriculture and Consumer Services (DACS) Florida Statewide Irrigation Agricultural Demand 9 (FSAID 9) geodatabase was used to estimate the total area used to produce each crop type (**Appendix A**). Fertilization rates for each specific crop category are based on an annual average per acre and are based on estimates previously used in the NSILT with some updates based on feedback received from DACS, Florida water management districts (WMDs), and the University of Florida-Institute of Food and Agricultural Sciences (UF-IFAS).

When a parcel was identified as rotating crops (changes in crop type from year to year), the application rate was estimated as an average of the annual application rates for the individual crops. When crops are grown as double or triple crops (more than one crop grown on a parcel in a single year), the fertilizer application rate was estimated by summing the application rate for

each crop type. Some adjustments to application rates for crops grown in a multi-crop system were made based on feedback from DACS. Hay was assumed to be fertilized at 80 pounds of nitrogen per acre (lbs-N/ac) per cutting with an average of 2.5 cuttings per year. Crop-specific fertilizer application rates were consistent across all BMAP areas except for the following adjustments as described in the sections below.

Blueberries

Blueberries fertilizer application rate was reduced to 75 lbs-N/ac per year in the Wakulla BMAP area, based on stakeholder feedback and consistent with the previous NSILT.

Soybeans

Based on stakeholder feedback, soybeans are grown as a commodity crop in the Suwannee and Santa Fe BMAPs and are expected to have an annual application rate of 20 lbs-N/ac per year for these BMAPs. In other BMAPs, soybeans are used most commonly as a cover crop and have no expectation for fertilization.

Sorghum

Based on DACS feedback, sorghum is not grown for grain in the Suwannee and Santa Fe BMAPs and has a lower application rate of 50 lbs-N/ac per year as opposed to an estimated rate of 150 lbs-N/ac per year in other BMAPs.

Field Crops

Based on feedback from the DACS and SJRWMD, producers in the St. Johns River Region tend to grow more nutrient-intensive field crops and recommended an application rate of 90 lbs-N/ac per year for the field crop commodity in the region. **Table 4** describes the fertilizer application rates used in this NSILT update. Note that when more than one crop type is listed in the table, the category is a double or triple crop type.

Table 4. FSAID crop categories fertilizer application rates in lbs-N/ac

Crop	Default Fertilizer Application Rates (lbs-N/ac)	Wakulla Application Rates (lbs-N/ac)	Suwannee & Santa Fe Application Rates (lbs-N/ac)	DeLeon, Gemini, Volusia Bule, Wekiwa, and Silver Springs Application Rates (lbs-N/ac)
Asparagus Fern	90	90	90	90
Aspidistra	90	90	90	90
Beans	100	100	100	100
Berries	100	100	100	100
Blackberries	100	100	100	100
Blueberries	100	75	100	100
Cabbage	175	175	175	175
Cabbage_Kale	175	175	175	175
Cabbage_Onions_Vegetables	175	175	175	175
Carrots	300	300	300	300

Crop	Default Fertilizer Application Rates (lbs-N/ac)	Wakulla Application Rates (lbs-N/ac)	Suwannee & Santa Fe Application Rates (lbs-N/ac)	DeLeon, Gemini, Volusia Bule, Wekiwa, and Silver Springs Application Rates (lbs-N/ac)
Carrots_Corn	300	300	300	300
Carrots_Rye	340	340	340	340
Citrus	140	140	140	140
Container Nursery	150	150	150	150
Coontie Fern	90	90	90	90
Corn	240	240	240	240
Corn	180	180	180	180
Corn_Cotton	175	175	175	175
Corn_Cucumbers	270	270	270	270
Corn_Oats	280	280	280	280
Corn_Peanuts	130	130	130	130
Corn_Rye	280	280	280	280
Corn_Soybeans	120	120	130	120
Cotton	110	110	110	110
Cotton_Peanuts	65	65	65	65
Cropland_Pastureland	50	50	50	50
Cucumbers	150	150	150	150
Cucumbers Fall_Melons	150	150	150	150
Dry Beans_Tomatoes Spring	200	200	200	200
Fern	90	90	90	90
Field Corn	240	240	240	240
Field Corn_Hay	210	210	210	210
Field Crops	60	60	60	90
Field Nursery	90	90	90	90
Grass_Pasture	80	80	80	80
Fruit_Nuts	100	100	100	100
Grains	70	70	70	70
Grapes	90	90	90	90
GreenBeans	100	100	100	100
Hay	180	180	180	180
Hay_Improved Pastures	180	180	180	180
Hay_Melons	180	180	180	180
Hay_Oats	220	220	220	220
HorseFarms	50	50	50	50
Improved Pastures	50	50	50	50
Leatherleaf	90	90	90	90
Liriope	90	90	90	90

Crop	Default Fertilizer Application Rates (lbs-N/ac)	Wakulla Application Rates (lbs-N/ac)	Suwannee & Santa Fe Application Rates (lbs-N/ac)	DeLeon, Gemini, Volusia Bule, Wekiwa, and Silver Springs Application Rates (lbs-N/ac)
Melons	150	150	150	150
Millet	50	50	50	50
Millet_Rye	90	90	90	90
Mixed Crops	60	60	60	60
Nurseries and Vineyards	90	90	90	90
Nursery	90	90	90	90
Oats	70	70	70	70
Oats_Peanuts	60	60	60	60
Onions_Vegetables	150	150	150	150
Ornamentals	90	90	90	90
Other Groves	90	90	90	90
Other Hay_NonAlfalfa	180	180	180	180
Pasture	50	50	50	50
Pasture_Peanuts	50	50	50	50
Pasture_Rye	90	90	90	90
Peaches	60	60	60	60
Peanuts	20	20	20	20
Peanuts_Cotton	65	65	65	65
Peanuts_Rye	60	60	60	60
Peanuts_Wheat	60	60	60	60
Peas	60	60	60	60
Pecans	100	100	100	100
Pittosporum	90	90	90	90
Potatoes	300	300	300	300
Row Crops	60	60	60	60
Rye	70	70	70	70
Small Grains	70	70	70	70
Small Veg	150	150	150	150
Small Veg Fall_Small Veg Spring	150	150	150	150
Small Veg Spring	150	150	150	150
Snap Beans	100	100	100	100
Sod	200	200	200	200
Sorghum	150	150	50	150
Soybeans	0	0	20	0
Specialty Farms	30	30	30	30
Spring Onion_Vegetables	150	150	150	150
Squash	150	150	150	150

Crop	Default Fertilizer Application Rates (lbs-N/ac)	Wakulla Application Rates (lbs-N/ac)	Suwannee & Santa Fe Application Rates (lbs-N/ac)	DeLeon, Gemini, Volusia Bule, Wekiwa, and Silver Springs Application Rates (lbs-N/ac)
Squash_Vegetables	300	300	300	300
Strawberries	150	150	150	150
Sweet Corn	300	300	300	300
Sweet Corn_Zucchini	450	450	450	450
Sweet Potatoes	60	60	60	60
Timber Nursery	50	50	50	50
Tobacco	80	80	80	80
Tobacco_Rye	120	120	120	120
Tomatoes	200	200	200	200
Tomatoes Fall	200	200	200	200
Tomatoes Fall_Tomatoes Spring	400	400	400	400
Tomatoes Spring	200	200	200	200
Tree Nurseries	90	90	90	90
Vegetables	150	150	150	150
Watermelon	150	150	150	150
Wheat	80	80	80	80
Wildlife Strip Crops	30	30	30	30
Winter Wheat	40	40	40	40
Zucchini	150	150	150	150

Crop production areas were spatially evaluated to determine the appropriate acreage for each recharge category. Recharge and attenuation factors (**Table 11**) were applied to estimate the loading to groundwater.

Nurseries

Loading to land surface from nurseries was calculated in a similar way to general farm fertilizer. However, due to greater plant spacing and lower fertilizer leaching rates related due to containerization, adjustments were made to the application rates. It was estimated that only 80% of the acreage identified as nurseries is fertilized. Further, the fertilization leaching amount was reduced by 70% due to the applied fertilizer remaining in the container compared to typical, ground-planted agricultural operations. This container adjustment was not applied to fern crops in Volusia County based on feedback from SJRWMD that these operations are typically ground-planted and not container-based. The nursery crop categories are listed in **Table 5**. Recharge and attenuation factors (**Table 11**) were applied to estimate the loading to groundwater.

Pasture Lands

Loading to land surface from pasture lands was calculated in a similar way to farm fertilizer. However, based on information from DACS, pasture locations are rotated, and it is only

anticipated that 20% of pasture areas will be fertilized in a given year. The acreage of pasture lands identified in FSAID was reduced to 20% of the total, then multiplied by the expected application rate to determine the loading from land surface for pastures. The farm fertilizer biochemical attenuation factors were also used for pasture lands (**Table 11**). Where the rotation adjustment was applied for crop categories that were categorized as pasture lands are identified in **Table 5**.

Table 5. FSAID nursery and pasture crop categories

***** Denotes nursery crop categories adjusted for container practices outside Volusia County.

Nursery Crop Categories	Pasture Crop Categories
Asparagus Fern*	**Grass Pasture**
Aspidistra*	**Horse Farms**
Container Nursery	**Improved Pastures**
Coontie Fern*	**Pasture**
Fern*	
Field Nursery	
Leatherleaf*	
Nurseries and Vineyards	
Nursery	
Ornamentals	
Pittosporum*	
Timber Nursery	
Tree Nurseries	

Livestock Waste, Except Dairies

Twelve types of livestock waste were considered in NSILT loading estimates. However, dairy cows were evaluated differently than the other 11 livestock types (see **Dairies** section below). Cattle farms are included in the NSILT as non-dairy livestock operations. Livestock waste loading to land surface was calculated by estimating the population of each livestock type in each BMAP area and multiplying the estimated count by a livestock type specific waste factor. The livestock waste factors are consistent with the 2018 NSILT and are summarized in **Table 6** below. To estimate livestock populations, the 2017 U.S. Department of Agriculture (USDA) Census of Agriculture data were used (see link in **Appendix A** to the 2017 Census of Agriculture site). The 2017 census data provided estimated animal head count totals, by county, for each livestock type. For cattle, an average of the 2020 and 2021 USDA Survey of Agriculture (see

link in **Appendix A** to the USDA National Agricultural Statistics Service) estimates for cattle were used to determine head county by county. For basins with identified dairies, the estimated cows included in the dairy calculations were removed from the head count for the county in which the dairy was located. To estimate calf numbers, it was estimated that 35% of the cattle were calves.

USDA head counts for the whole county were adjusted based on the proportion of livestock land in the county that was also within the BMAP or springshed, as reported in FSAID 9. The headcounts were also evaluated by recharge category in each BMAP or springshed compared to the livestock land of that recharge category in the county as a whole.

Further adjustments included the consideration that broiler chickens and cow/calves are not anticipated to provide loading for the entire year because they are not *in situ* for an entire 12 months. Broiler chickens are anticipated to be on an eight-week rotation, and cow/calves are estimated to be on a six-month rotation. Annual loading was reduced accordingly to account for these rotations.

Once a livestock waste loading to the land surface was calculated based on the estimated headcount in the springshed by recharge area, waste load based on the type of animal, and rotation considerations, a biochemical attenuation factor (**Table 11**) and a recharge factor were then applied to estimate loading to groundwater.

Table 6. Livestock waste factors by livestock type

Sources: Goolsby et al. 1999; Katz et al. 1999; Chelette et al. 2002; Ruddy et al. 2006; Meyer 2012; and Sprague and Gronberg 2013.

Livestock Type	Waste Factor Per Animal (lbs-N/day)
Beef Cattle	0.337
Other Cattle	0.31
Calves	0.068
Donkeys	0.1
Horses	0.273
Chicken, Broilers	0.002
Chicken, Layers	0.003
Goats	0.035
Hogs	0.19
Sheep	0.198
Turkeys	0.006

Dairies

In the 2023 NSILTs, dairies were divided into concentrated animal feeding operations (CAFOs) where waste is managed under an industrial wastewater permit issued by DEP, and non-CAFO dairies, where a facility's presumption of compliance is through the Best Management Practice (BMP) Program administered by DACS. The evaluation for each type is described below.

CAFOs

CAFO dairies operate under an industrial permit from DEP that requires annual reporting of operations and a nutrient management plan that oversees the waste handling processes for dairy waste. For CAFO dairies, loading to land surface estimates were made by multiplying the number of animals at the operation based on the average of 2019 and 2020 annual reported herd counts as required by the permit, by a per animal waste factor calculated in the nutrient management plan, then reduced by waste load based on their waste handling processes as identified in the nutrient management plan. Nutrient management plans are site specific and vary from operation to operation. Attenuation (**Table 11**) and recharge factors were applied to the estimated loading to land surface to estimate loading to groundwater.

Non-CAFO Dairies

Non-CAFO dairies are governed by the adopted DACS Dairy BMP Manual and the applicable BMPs. Non-CAFO dairies in BMAP areas have a statutory obligation to enroll in the DACS BMP Program or conduct water quality monitoring that is approved by the state. Dairies enrolled in the BMP Program by DACS are subject to DACS Implementation Verification procedures. Non-CAFO dairy information was provided by DACS, including information on herd size, waste handling practices, and animal confinement.

If a dairy herd was identified as grazed in pasture, it was estimated that they would be confined for 15% of the time to account for time in the milking parlors. A waste factor of 0.36 lbs-N/day for dairy cows and 0.15 lbs-N/day for non-milking cows was estimated. Annual loading was estimated by multiplying the number of cows by the daily waste factor, multiplied by 365 days per year, multiplied by application loss coefficients based on waste handling practices. Generally, a 50% application loss factor was applied for waste generated in pasture. For waste generated and collected in confinement, nitrogen loss percentages for specific waste handling practices are identified in **Table 7**.

Table 7. Nitrogen loss percentages for non-CAFO manure handling practices

Manure Handling Practices	Nitrogen Loss %
Scraped Solids	25%
Applied Solids	20%
Concrete Waste Storage Ponds	60%
Sprayfields	30%
Direct Deposition	60%
Sand Separator	5%
Screen Separator	7%
Static "Vat" Separator Solids	85%
Static "Vat" Separator Effluent	15%
Screw Press Solids	80%

Manure Handling Practices	Nitrogen Loss %
Screw Press Effluent	20%
Earthen Lagoon	30%

Horse Farms/Cattle Farms

For the Rainbow Springs and Silver Springs BMAP where there are more such operations than other BMAPs, horse farms and cattle farms were evaluated as separate loading categories. For horse farms and cattle farms, loading from farm fertilizer crops that are associated with these operations were estimated, as well as loading from the livestock categories for the relevant livestock types.

In Silver Springs, of the total pasture lands and hay crop area, it was estimated that 20% of pasture lands and hay acreages were horse farms. Additionally, 100% of acres identified as horse farm area was associated with horse farm operations for the NSILT. In Rainbow Springs, it was estimated that of the total pasture lands and hay crop area in the springshed, 40% of pasture lands and hay acres were horse farms. Also, 100% of horse farmlands identified in the FSAID land use data were associated with horse farms. The remaining pasture lands and hay crop acreages in each springshed, respectively, were attributed to cattle farms.

For livestock waste estimates, 100% of horse livestock waste was attributed to horse farms, and 100% of beef cattle, "other" cattle, and calves were associated with cattle farms in both springsheds. Loading for farm fertilizer and livestock waste categories associated with horse farms and cattle farms were calculated as described above in the livestock waste section, including the spatial evaluation to determine recharge areas. The loading for these categories was removed from the general farm fertilizer and livestock waste categories to avoid double-counting loads. A horse farm- and cattle farm-specific attenuation factor (**Table 11**) was applied to the surface loading to determine the loading to groundwater.

UTF

Since the development of the original NSILT, the methodology used for estimating nitrogen inputs from urban fertilizer has significantly improved. Fertilizers applied to turfgrass typically found in urban areas (including residential lawns, commercial properties, and public green spaces) are referred to as urban turfgrass fertilizers. The UTF load to land surface was estimated separately for single family residential parcels and other UTF as described below. For all UTF loads, a recharge factor was applied based on location, as well as a biochemical attenuation factor (**Table 11**) was applied to land surface loading estimates to determine loading to groundwater.

Single Family Residential Fertilizer Loading

Single family residential UTF loading was estimated using a number of steps. The first step determined the area of single family residential parcels and an impervious area coefficient was applied to remove pervious area from the evaluation. Next, a maximum amount of fertilized area

per parcel was set to evaluate likeliness to fertilize, and finally estimating fertilization amount for the area expected to receive fertilization. The section below goes into these steps in more detail.

Determining Parcels

To determine the area of single family residential parcels, the Florida Department of Revenue CADASTRAL database and land use code DOR001 was used. It was estimated that 27.8% of all single family residential parcels are impervious (Tilley, 2006). For BMAPs with predominantly rural areas, it was estimated that a maximum of 0.5 acres of land per parcel would be fertilized because the parcels tend to be larger and less landscaped, while for predominantly urban BMAPs, it was estimated that a maximum of one acre of land per parcel would be fertilized.

Determining Likeliness to Fertilize

Prior to applying the fertilizer application rates to the pervious land area, the probability that a homeowner will fertilize the lawn needed to be considered. Based on socioeconomic studies, property values can be used as an indicator of probability of fertilization by homeowners in residential areas (Kinzig et al. 2005, Law et al. 2004, Zhou et al. 2008, Cook et al. 2012). Three tiers of property values were considered in each BMAP, where it was estimated that there was a 10%, 75%, and 90% likeliness to fertilize for the low, medium, and high property value categories, respectively. Property value ranges were BMAP specific and were based on property value estimates used in the previous NSILT analysis. There was an estimated increase of 79% since the prior NSILT based on State of Florida average home price evaluations (**Appendix A**) so low and high home value break points were adjusted accordingly.

Fertilization Rates by BMAP

The estimated urban turfgrass self-fertilization amounts were regional and based on survey data. The Florida panhandle region fertilization rate assumptions were updated from the previous NSILT evaluation. These revised NSILT used fertilization values determined by a recent City of Tallahassee survey and were applied in the Jackson Blue, Wakulla, and Wacissa estimates (Skybase7 2023). Fertilization rates for other BMAP areas were consistent with the previous NSILT evaluations (Martin 2008, Suoto 2009). Local ordinances were reviewed for seasonal fertilizer bans; where seasonal bans were in effect, fertilizer application was adjusted proportionately to the period of the year that fertilization was not allowed.

Table 8. Single family residential UTF information

Springshed	Max Fert. Acres	Low Value Break	High Value Break	Average Self Fertilizer Application (lbs-N/ac/year)	Lawn Service Application Rate (lbs-N/ac/year)	% Service	% Self	% None	Average Fert. Rate (lbs-N/ac/year)
Chassahowitzka Spring Group	1	89,500	268,500	96.30	131	32.0%	68.0%	0.0%	107.30
DeLeon Spring	1	89,500	268,500	98.27	131	33.0%	51.0%	16.0%	93.24
Devil's Ear Spring	0.5	136,040	257,402	93.03	108.9	32.0%	68.0%	0.0%	98.11
Falmouth Spring	0.5	89,500	223,750	93.03	108.9	32.0%	68.0%	0.0%	98.11

Springshed	Max Fert. Acres	Low Value Break	High Value Break	Average Self Fertilizer Application (lbs-N/ac/year)	Lawn Service Application Rate (lbs-N/ac/year)	% Service	% Self	% None	Average Fert. Rate (lbs-N/ac/year)
Fanning Springs and Manatee Spring	0.5	98,450	259,550	93.03	108.9	32.0%	68.0%	0.0%	98.11
Gemini Springs	1	89,500	268,500	98.27	131	33.0%	51.0%	16.0%	93.24
Homosassa Spring Group	1	89,500	268,500	96.30	131	32.0%	68.0%	0.0%	107.30
Hornsby Spring	0.5	141,410	304,300	93.03	108.9	32.0%	68.0%	0.0%	98.11
Ichetucknee Spring Group	0.5	108,653	239,860	93.03	108.9	32.0%	68.0%	0.0%	98.11
Jackson Blue Spring	0.5	89,500	268,500	56.91	108.9	19.0%	16.0%	65.0%	29.80
Kings Bay	1	89,500	268,500	96.30	131	32.0%	68.0%	0.0%	107.30
Madison Blue Spring	0.5	89,500	223,750	93.03	108.9	32.0%	68.0%	0.0%	98.11
Rainbow Spring Group	1	107,400	259,550	114.28	131	33.0%	51.0%	16.0%	101.41
Silver Springs	1	89,500	268,500	114.28	131	33.0%	51.0%	16.0%	101.41
Volusia Blue Spring	1	89,500	161100	85.14	131	34.4%	49.6%	16.0%	87.18
Wacissa Spring Group	0.5	85,920	214,800	56.91	108.9	19.0%	16.0%	65.0%	29.80
Wakulla Spring	0.5	89,500	268,500	56.91	108.9	19.0%	16.0%	65.0%	29.80
Weeki Wachee Spring Group	1	89,500	268,500	96.30	131	32.0%	68.0%	0.0%	107.30
Wekiwa Spring	1	89,500	268,500	98.27	131	33.0%	51.0%	16.0%	93.24

Due to different methodologies used in the previous NSILTs, some BMAPs captured the percentage of the population expected to apply zero fertilizer in the average self-application rate, while others separately defined a specific percentage of parcels that do not apply fertilizer that were not included in the self-application rate. The variability in the application rate calculations resulted in some BMAPs being described with 0% of the population applying no fertilizer, when the portion of the population with zero fertilizer application is already incorporated in the average self-application rate.

Other UTF

UTF loading to land surface from non-residential sources was estimated by determining the area of land use types likely to apply fertilizer, applying an impervious area coefficient to remove impervious area from the evaluation, estimating the pervious area likely to receive fertilizer, and estimating the fertilizer application rate for fertilized areas (**Table 9**). Water management district land cover data was used to determine the land area likely to receive fertilizer (**Appendix A**). Fifteen land cover categories were considered likely to receive fertilization, and an estimated impervious area was applied to each land cover category (Tilley 2006). The area of these land cover categories was evaluated against the areas already assessed as single family residential,

and any area that overlapped with single family residential areas was removed from evaluation as area that could receive fertilizer as "other UTF."

Table 9. Other UTF land use categories and estimated impervious area

WMD Land Cover Code	Percent Impervious	Percent of Pervious Area Receiving Fertilizer
1220: Medium Density, Mobile Home Units	32.6%	17.7%
1230: Medium Density, Mixed Units (Fixed and Mobile Home Units)	32.6%	15.4%
1320: High Density, Mobile Home Units	44.4%	20.7%
1330: Multiple Dwelling Units, Low Rise	44.4%	27.8%
1340: High Density, Multiple Dwelling Units, High Rise (Four Stories or More)	44.4%	32.8%
1400: Commercial and Services	72.2%	31.3%
1411: Shopping Centers	72.2%	31.3%
1480: Cemeteries	8.3%	42.2%
1700: Institutional	34.4%	43.3%
1710: Educational	30.3%	60.6%
1720: Religious	39.9%	37.7%
1740: Medical and Health Care	72.2%	33.8%
1750: Governmental	35.4%	41.0%
1850: Parks and Zoos	12.5%	44.9%
1860: Community Recreational Facilities	12.5%	59.8%

Not all pervious area for these land cover codes will be fertilized. To estimate the area of pervious area that will be fertilized, land cover tree canopy coverage data provided by the City of Tallahassee was used to estimate the percentage of pervious area that would receive fertilization as summarized in **Table 9**. It was assumed that all area expected to receive fertilization would be managed by landscaping professionals that would apply fertilizer consistent with the *Green Industries Best Management Practices Manual* (GI-BMP) guidelines (DEP 2010) (see link in **Appendix A**). An evaluation for the GI-BMP was performed to estimate the application rate by region for the north and central regions and is summarized in **Table 10** below.

Table 10. Green Industries BMP regional fertilizer application rates

Region	Annual Fertilizer Application Rate
North	2.5 lbs-N/1,000 square feet
Central	3.0 lbs-N/1,000 square feet

Sports Turfgrass Fertilizer

Golf Courses

Golf course loading to the land surface was estimated by evaluating the active golf courses in each BMAP area, estimating the total acreage of each golf course, and determining the fertilizer application rate based on prior NSILT course-specific survey responses or using an estimated regional fertilizer application rate. The estimated regional rate was derived from a survey of regional golf course practices published by Hort Technology (Shaddox et al. 2023) and

amounted to an estimated application rate of 2.2 lbs-N/1,000 square feet for the whole of the golf course property. Golf courses no longer in operation were excluded as current loading sources. Additionally, the management of each golf course was identified as a local government, special district, or private entity for possible consideration in the allocation process**.**

Other (Non-Golf) Sports Turfgrass Fertilizer

Sports turfgrass loading estimates were consistent with the previous NSILT evaluations. Sports turfgrass area was determined by reviewing areas with the property appraisers land use categories that may include sports turfgrass and performing an aerial review to determine the total acreage used as sports turfgrass. It was assumed that these lands are fertilized at rates and frequencies applied by lawn service companies following the GI-BMP recommendations (DEP 2010). Fertilizer application rates are consistent with the previous NSILT evaluations.

Biosolids

Biosolids loading to the land surface was estimated by determining what biosolid application sites were within BMAP boundaries and reviewing annual reports to determine the application quantity. Annual reports from 2018 to 2022 were evaluated. Data were provided in tons of material applied. It was estimated that biosolids had an approximate nitrogen concentration of five percent. The location of biosolids application sites was spatially evaluated to determine the appropriate recharge categories for the area, and attenuation and recharge factors were applied to estimate loading to groundwater. The biosolid application process and leaching is estimated based on site-specific data. Loading estimates will be refined in future updates to protect the aquifer under vulnerable karstic features. DEP will continue to evaluate data and update loads and allocations as appropriate.

Estimating Loading to Floridan Aquifer

Biochemical Attenuation

A source-specific specific biochemical attenuation factor (BAF) was applied to each loading source to account for near-surface biochemical process that result in a reduction of nitrogen available to leach to groundwater. Processes such as denitrification, volatilization, immobilization, and cation exchange all contribute to the reduction of leachable nitrogen. These processes occur to varying degrees depending on the application method, the form of nitrogen, soil properties, and other factors. BAFs used in this evaluation, listed in **Table 11**, represent the estimated percentage of the nitrogen attenuated or removed by subsurface processes.

Table 11. 2023 NSILT biochemical attenuation factors

*Includes sports turfgrass fertilizer and golf courses.

Nitrogen Source Category	BAF	Literature References
Atmospheric Deposition	90%	Katz et al. 2009; Lombardo Associates 2011; Howard T. Odum Florida Springs Institute 2011
WWTFs-Reuse	75%	Jordan et al. 1997; Candela et al. 2007; Rahil and Antonopoulos 2007

Nitrogen Source Category	BAF	Literature References
WWTFs-RIBs and Absorption Fields	25%	Merritt and Toth 2006; Sumner and Bradner 1996
WWTFs-Sprayfield	60%	Katz et al. 2009; Lombardo Associates 2011; Howard T. Odum Florida Springs Institute 2011
WWTFs-Wetland Treatment	85%	Thompson and Milbrandt, 2016; Liu et al. 2024
Urban Fertilizer*	70%	Goolsby et al. 1999; Erikson et al. 2001; Barton and Colmer 2006; Katz et al. 2009
OSTDS	30%	Armstrong, J.H. 2015
Livestock Waste (Non-Dairy)	90%	Dubeux et al. 2007; Silveira et al. 2007; Burns et al. 2009; Dubeux et al. 2009; Obour et al. 2010; Sigua 2010; Sigua et al. 2010; Silveira et al. 2011; Woodard et al. 2011; White-Leech et al. 2013a; White-Leech et al. 2013b
Farm Fertilizer	80%	McNeal et al. 1995; Wang and Alva 1996; Paramasivam and Alva 1997; Newton et al. 1999; Hochmuth 2000a; Hochmuth 2000b; Simonne et al. 2006; He et al. 2011; Liu et al. 2013
Farm Fertilizer – Irrigated	65%	McNeal et al. 1995; Wang and Alva 1996; Paramasivam and Alva 1997; Newton et al. 1999; Hochmuth 2000a; Hochmuth 2000b; Simonne et al. 2006; He et al. 2011; Liu et al. 2013
Livestock Waste - Dairy (non-CAFO)	50%	Woodard et al. 2002; Landig et al. 2010
Livestock Waste - Dairy (CAFO)	85%	Cabrera et al. 2006
Cattle Farms (Silver and Rainbow Only)	90%	Dubeux et al. 2007; Silveira et al. 2007; Burns et al. 2009; Dubeux et al. 2009; Obour et al. 2010; Sigua 2010; Sigua et al. 2010; Silveira et al. 2011; Woodard et al. 2011; White-Leech et al. 2013a; White-Leech et al. 2013b
Horse Farms (Silver and Rainbow Only)	90%	Dubeux et al. 2007; Silveira et al. 2007; Burns et al. 2009; Dubeux et al. 2009; Obour et al. 2010; Sigua 2010; Sigua et al. 2010; Silveira et al. 2011; Woodard et al. 2011; White-Leech et al. 2013a; White-Leech et al. 2013b
Biosolids	50%	Division of Water Resource Management Staff Feedback

Generally, biochemical attenuation factors are consistent with the prior NSILT evaluation, with a few exceptions. OSTDS attenuation for all BMAPs was revised based on Florida-specific data provided by the DEP Onsite Sewage Program (Armstrong 2015). Attenuation factors for the springsheds in the Suwannee BMAP were updated to be consistent with other BMAPs. The Jackson Blue NSILT was the only BMAP to evaluate farm fertilizer loading with separate irrigated and non-irrigated attenuation factors, respectively, consistent with the previous NSILT evaluation.

Recharge

Nitrogen that is not attenuated during biochemical attenuation processes can leach to groundwater and impact water quality at the spring vent. Subsurface processes dictate the impact of the leached nitrogen on water quality at the spring vents. To evaluate the relative impact of leached nitrogen, a recharge factor was applied to the attenuated load based on the hydrologic conditions of the location of the loading. Four recharge categories were considered: high, medium, low, and discharge. Leaching to groundwater is a function of the properties of the soil and unsaturated (vadose) zone, drainage, wetness, depth to water table, and hydraulic conductivity. In areas where water can readily recharge through the vadose zone into underlying formations that have high hydraulic conductivity, it is anticipated that the majority of nitrogen will impact water quality at the spring vent and would be considered a high recharge area. In areas where water cannot readily recharge the Floridan aquifer due to characteristics of overlying soils, the presence of a surficial aquifer, or other properties that would otherwise retard the movement of leached water to the Floridan aquifer, a low recharge factor was applied, reducing the expected impact on water quality at the spring vent. In areas where water is expected to discharge from the Floridan aquifer, such as in wetland areas, it is not anticipated that nitrogen deposited in these areas will impact at spring vents and the loading was not included in the NSILT evaluation.

For all BMAPs, in areas that were considered to have high recharge, it was estimated that 90% of the attenuated load would impact water quality at the spring vent. In areas that were considered to have low recharge, it was estimated that only 10% of the attenuated nitrogen would impact water quality at spring vents. At all BMAPs except for Wakulla Spring and Jackson Blue Spring, in areas considered to have medium recharge it is estimated that 50% of the attenuated load will impact the spring vent water quality. In Wakulla, the recharge evaluation was based on confinement of the Floridan aquifer, and it was estimated that in semiconfined areas only 40% of the attenuated load would impact the spring vent. In the Jackson Blue springshed, recharge was primarily based on soils. While there is some variation in soils in this springshed, it was determined that it would be unlikely that 50% of the attenuated load would be reduced due to areas with slightly different soils and it was considered that 60% of the load would impact the spring vent.

All recharge factors are consistent with the previous NSILT evaluation, additional information on BMAP specific recharge can be found in the technical support documents in the appendices of the previous BMAP documents.

References

Armstrong, J.H. 2015. Florida Onsite Sewage Nitrogen Reduction Strategies Study Final Report.

Barton, L., and T.D. Colmer. 2006. Irrigation and fertilizer strategies for minimizing nitrogen leaching from turfgrass. *Agricultural Water Management* 80: 160–175.

Burns, J.C., M.G. Wagger, and D.S. Fisher. 2009. Animal and pasture productivity of "Coastal" and "Tifton 44" Bermudagrass at three nitrogen rates and associated soil nitrogen status. *Agronomy Journal* 101 (1): 32–40.

Bush, P.W., and R.H. Johnston. 1988. Ground-water hydraulics, regional flow, and ground-water development of the Floridan aquifer system in Florida and parts of Georgia, South Carolina, and Alabama. *U.S. Geological Survey Professional Paper* 1403-C.

Cabrera, V.E., A. de Vries, and P.E. Hildebrand. 2006. Prediction of nitrogen excretion in dairy farms located in North Florida: A comparison of three models. *Journal of Dairy Science* 85:1830–1841.

Candela, L., S. Fabregat, A. Josa, J. Suriol, N. Vigues, and J. Mas. 2007. Assessment of soil and groundwater impacts by treated urban wastewater reuse: A case study: Application in a golf course (Girona, Spain). *Science of the Total Environment* 374: 26–35.

Chelette, A.R., T.R. Pratt, and B.G. Katz. 2002. Nitrate loading as an indicator of nonpoint source pollution in the lower St. Marks–Wakulla Rivers watershed. *Northwest Florida Water Management District Water Resources Special Report 02-1*.

Cook, E.M., S.J. Hall, and K.L. Larson. 2012. Residential landscapes as social-ecological systems: A synthesis of multi-scalar interactions between people and their home environment. *Urban Ecosyst* 15: 19–52.

Davis, J.H. 1996. Hydrogeologic investigation and simulation of ground-water flow in the UFA of north-central Florida and southwestern Georgia and delineation of contributing areas for selected city of Tallahassee, Florida, water-supply wells. *U.S. Geological Survey Water-Resources Investigations Report* 95-4296.

Dubeux, J.C.B., Jr., L.E. Sollenberger, B.W. Mathews, J.M. Scholberg, and H.Q. Santos. 2007. Nutrient cycling in warm-climate grasslands. *Crop Science* 47: 915–928.

Dubeux, J.C.B., Jr., L.E. Sollenberger, L.A. Gaston, J.M.B. Vendramini, S.M. Interrante, and R.L. Stewart, Jr. 2009. Animal behavior and soil nutrient redistribution in continuously stocked Pensacola bahiagrass pastures managed at different intensities. *Crop Science* 49: 1503–1510.

Eller, Kirstin T., and Brian G. Katz. 2017. "Nitrogen Source Inventory and Loading Tool: An integrated approach toward restoration of water-quality impaired karst springs." *Journal of Environmental Management.*

Erikson, J.E., J.L. Cisar, J.C. Volin, and G.H. Snyder. 2001. Comparing nitrogen runoff and leaching between newly established St. Augustine turf and an alternative residential landscape. *Crop Science* 41: 1889–1895.

Florida Department of Environmental Protection. 2010. Florida friendly best management practices for protection of water resources by the green industries. Tallahassee, FL.

Goolsby, D.A., W.A. Battaglin, G.B. Lawrence, R.S. Artz, and B.T. Aulenbach et al. 1999. Flux and sources of nutrients in the Mississippi–Atchafalaya River Basin. *National Oceanic and Atmospheric Administration Coastal Ocean Program* No. 17.

Happell, J.D., S. Opsahl, Z. Top, and J.P. Chanton. 2006. Apparent CFC and 3H/3He age differences in water from Floridan aquifer springs. *Journal of Hydrology* 319:410–426.

He, J., M.D. Dukes, G.J. Hochmuth, J.W. Jones, and W.D. Graham. 2011. Evaluation of sweet corn yield and nitrogen leaching with CERES-maize considering input parameter uncertainties. *Transaction of the American Society of Agricultural and Biological Engineers* 54(4):1257–1268.

Helgeson, T. and McNeal, M. 2009. A Reconnaissance-Level Quantitative Comparison of Reclaimed Water, Surface Water, and Groundwater. *WateReuse Foundation*.

Hochmuth, G.J., and Hanlon, E.A. 2000a. IFAS standardized fertilization recommendations for vegetable crops. *Circular 1152. Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences.*

———. 2000b. A summary of N, P, and K research with tomato in Florida. *Document SL355. Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences.*

Howard T. Odom Florida Springs Institute. 2011. Wakulla Spring–An adaptive management strategy. *Prepared for the Wakulla Springs Working Group. Gainesville, FL*.

Jordan, M.J., H.J. Nadelhoffer, and B. Fry. 1997. Nitrogen cycling in forest and grass ecosystems irrigated with 15N-enriched wastewater. *Ecological Applications* 7 (3): 864–881.

Katz, B.G. 1992. Hydrochemistry of the upper Floridan aquifer, Florida. *U.S. Geological Survey Water-Resources Investigations Report* 91-4196.

Katz, B.G. 2004. Sources of nitrate contamination and age of water in large karstic springs of Florida. *Environmental Geology* 46: 689–706.

Katz, B.G, H.D. Hornsby, J.F. Boklke, and M.F. Mokray. 1999. Sources and chronology of nitrate contamination in spring waters, Suwannee River Basin, Florida. *U.S. Geological Survey Water-Resources Investigations Report* 99-4252.

Katz, B.G., A.A. Sepulveda, and R.J. Verdi. 2009. Estimating nitrogen loading to ground water and assessing vulnerability to nitrate contamination in a large karstic springs basin, Florida. *Journal of the American Water Resources Association* 45: 3.

Kinzig, A.P., P. Warren, C. Martin, D. Hope and M. Katti. 2005. The effects of human socioeconomic status and cultural characteristics on urban patterns of biodiversity. *Ecology and Society* 10 (1).

Knowles, L., Jr., B.G. Katz, and D.J. Toth. 2010. Using multiple chemical indicators to characterize and determine the age of groundwater from selected vents of the Silver Springs Group, Central Florida, USA. *Hydrogeology Journal* 18:1825–1838.

Landig, F., O. Fenton, P. Bons, D. Hennessy, K. Richards, and P. Blum. 2010. Estimation of nitrate discharge in a fractured limestone aquifer below a dairy farm in Ireland. In: *Groundwater management in a rapidly changing world, Proceedings from the 7th International Groundwater Quality Conference* (Zurich, Switzerland).

Law, N.L, L.E. Band, and J.M. Grove. 2004. Nitrogen input from residential lawn care practices in suburban watersheds in Baltimore County, MD. *Journal of Environmental Planning and Management* 47 (5): 737–755.

Liu, G.D., E.H., Simonne, and G.J. Hochmuth. 2013. Soil and fertilizer management for vegetable production in Florida. *Document HS711. Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences.*

Liu, T., D. Li, Y. Tian, J. Zhou, Y. Qiu, D. Li, G. Liu, Y. Feng. 2024. Enhancing nitrogen removal in constructed wetlands: The role of influent substrate concentrations in integrated vertical-flow systems. *Environmental Science and Ecotechnology* 21 (2024) 100411.

Lombardo Associates. 2011. Onsite sewage treatment and disposal and management options. *Newton, MA.*

Martin, T. 2008. Lawn care behavior, Crystal River/Weeki Wachee Spring and Rainbow River survey. *Final report prepared for the Southwest Florida Water Management District.*

McNeal, B.L, C.D. Stanley, W.D. Graham, P.R. Gilreath, D. Downey, and J.F. Creighton. 1995. Nutrient loss trends for vegetable and citrus fields in west-central Florida: 1. Nitrate. *Journal of Environmental Quality* 24(1): 95–100.

Merritt, M., and D.J. Toth. 2006. Estimates of upper Floridan aquifer recharge augmentation based on hydraulic and water-quality data (1986–2002) from the Water Conserv II RIB systems, Orange County, Florida. *St. Johns River Water Management Special Publication SJ2006-SP3. Palatka, FL.*

Newton G.L., G.J. Gascho, G. Vellidis, R.N. Gates, and R.K. Hubbard et al. 1999. Nutrient balance for triple-crop forage production systems fertilized with dairy manure or commercial fertilizer. *Water Resource Conference. Athens, GA: University of Georgia.*

Obour, A.K., M.L. Silveira, J.M.B. Vendramini, M.B. Adjei, and L.E. Sollenberger. 2010. Evaluating cattle manure application strategies on phosphorus and nitrogen losses from a Florida spodosol. *Agronomy Journal* 102(5): 1511–1520.

Paramasivam, S., and A.K. Alva. 1997. Leaching of nitrogen forms from controlled-release nitrogen fertilizers. *Communications in Soil Science and Plant Analysis* 28(17&18): 1663–1674.

Phelps, G.G. 2004. Chemistry of ground water in the Silver Springs Basin, Florida, with emphasis on nitrate. *U.S. Geological Survey Scientific Investigations Report* 2004-5144.

Rahil, M.H., and V.Z. Antonopoulos. 2007. Simulating soil water flow and nitrogen dynamics in a sunflower field irrigated with reclaimed wastewater. *Agricultural Water Management* 92: 142–150.

Ruddy, B.C., D.L. Lorenz, and D.K. Mueller. 2006. County-level estimates of nutrient inputs to the land surface of the conterminous United States, 1982–2001. *U.S. Geological Survey Scientific Investigations Report* 2006-5012.

Schwede, D.B., and G.G. Lear. 2014. A novel hybrid approach for estimating total deposition in the United States. *Atmospheric Environment* 92: 207–220.

Sigua, G.C. 2010. Sustainable cow-calf operations and water quality: A review. *Agron. Sustain. Dev.* 30: 631–648.

Sigua, G.C., R.K. Hubbard, S.W. Coleman, and M. Williams. 2010. Nitrogen in soils, plants, surface water and shallow groundwater in a bahiagrass pasture of southern Florida, USA. *Nutrient Cycling in Agroecosystems* 86: 175–187.

Silveira, M.L., V.A. Haby, and A.T. Leonard. 2007. Response of coastal bermudagrass yield and nutrient uptake efficiency to nitrogen sources. *Agronomy Journal* 99: 707–714.

Silveira, M.L., A.K. Obour, J. Arthington, and L.E. Sollenberger. 2011. The cow-calf industry and water quality in south Florida: A review. *Nutrient Cycling in Agroecosystems* 89: 439–452.

Simonne, E., M. Dukes, G. Hochmuth, B. Hochmuth, D. Studstill, and A. Gazula, 2006. Monitoring nitrate concentration in shallow wells below a vegetable field. *Proc. Fla. State Hort. Soc.* 119: 226–230.

Shaddox, T.W., J. B. Unruh, M. E. Johnson, C. D. Brown, and G. Stacey. 2023. Nutrient Use and Management Practices on United States Golf Courses. *HortTechnology* 33(1): 79-97.

Skybase7. 2023. 2023 TAPP Residential Turf Grass Fertilizer Survey. *Report of Findings prepared for the City of Tallahassee.*

Souto, L., M. Collins, D. Barr, G. Milch, J. Reed, and M.D. Ritner. 2009. Wekiva residential fertilizer practices. Contract# G0078. University of Central Florida for the Florida Department of Environmental Protection

Sprague, L.A., and J.M. Gronberg. 2013. Estimation of anthropogenic nitrogen and phosphorus inputs to the land surface of the conterminous United States—1992, 1997, and 2002. U.S. *Geological Survey Scientific Investigations Report* 2012-5241.

Sumner, D.M., and L.A. Bradner. 1996. Hydraulic characteristics and nutrient transport and transformation beneath a rapid infiltration basin, Reedy Creek Improvement District, Orange County, Florida.

Thompson, M., Milbrandt, E. 2016. Nutrient Loading from Sanibel's Surficial Aquifer. *Sanibel-Captiva Conservation Foundation Marine Laboratory.*

Tilley, J.S., and E.T. Slonecker, 2006, Quantifying the Components of Impervious Surfaces: U.S. Geological Survey Open-File Report 2006-1008.

Toth, D.J., and B.G. Katz. 2006. Mixing of shallow and deep groundwater as indicated by the chemistry and age of karstic springs. *Hydrogeology Journal 14*: 1060-1080.

Wang, F.L., and A.K. Alva. 1996. Leaching of nitrogen from slow-release urea sources in sandy soils. *Soil Science Society of America Journal* 60: 1454–1458.

White-Leech, R., K. Liu, L.E. Sollenberger, K.R. Woodard, and S.M. Interrante. 2013a. Excreta deposition on grassland patches. I. Forage harvested, nutritive value, and nitrogen recovery. *Crop Science* 53: 688–695.

———. 2013b. Excreta deposition on grassland patches. II. Spatial pattern and duration of forage responses. *Crop Science* 53: 696–703.

Woodard, K.R., French, E.C., Sweat, L.A., Graetz, D.A., Sollenberger, L.E., Macoon, B., Portier, K.M.,Wade, B.L., Rymph, S.J., Prine, G.M., VanHorn, H.H. 2002. Plant and Environment Interactions: Nitrogen Removal and Nitrate Leaching for Forage Systems Receiving Dairy Effluent. *Journal of Environmental Quality* 31: 1980-1992.

Woodard, K.R., and L.E. Sollenberger. 2011. Broiler litter vs. ammonium nitrate as nitrogen source for bermudagrass hay production: Yield, nutritive value, and nitrate leaching. *Crop Science* 51: 1342–1352.

Zhou, W., A. Troy, and M. Grove. 2008. Modeling residential lawn fertilization practices: Integrating high resolution remote sensing with socioeconomic data. Environmental Management 41: 742–752.

TSD Appendix A. Important Links

The links below were correct at the time of document preparation. Over time, the locations may change, and the links may no longer be accurate. None of these linked materials were adopted into the BMAP.

- Atmospheric Deposition Program (NADP) Total Deposition (TDEP) data: https://catalog.data.gov/dataset/nadp-total-deposition-data

- DEP Springs BMAP documents: https://floridadep.gov/dear/water-quality-restoration/content/florida-springs-basin-management-action-plans

- Florida Friendly Best Management Practices for Protection of Water Resources by Green Industries, GI-BMP Manual: https://ffl.ifas.ufl.edu/ffl-and-you/gi-bmp-program/gi-bmp-manual/

- Florida Statewide Agricultural Irrigation Demand Geodatabase, Version 9: https://www.DACS.gov/Agriculture-Industry/Water/Agricultural-Water-Supply-Planning

- Florida Water Management Inventory with locations of known and estimated septic systems: https://ww10.doh.state.fl.us/pub/bos/Inventory/FloridaWaterManagementInventory/

- Home value price resources:
  - www.roofstock.com
  - www.neighborhoodscout.com
  - www.visualcapitalist.com

- Previous NSILT technical supporting documents: publicfiles.dep.state.fl.us -/DEAR/NSILT/

- Statewide Land Use Land Cover: https://geodata.dep.state.fl.us/datasets/FDEP::statewide-land-use-land-cover/about

- U.S Census Data, 2020: https://www.census.gov/programs-surveys/decennial-census/decade/2020/2020-census-results.html

- USDA Census of Agriculture, 2017: https://www.nass.usda.gov/Publications/AgCensus/2017/index.php

- USDA Survey of Agriculture: https://quickstats.nass.usda.gov/

- Water Quality Restoration Program, DEP: https://floridadep.gov/dear/water-quality-restoration

Appendix G: Golf Course NMPs

The fertilizers used to maintain golf courses can be significant sources of nutrients in watersheds that are impaired for nitrogen and/or phosphorous. To achieve the TMDL target(s), all nutrient sources need to reduce their nutrient loading. Similar to other sources, golf courses are required to implement management strategies to mitigate their nutrient loading and be in compliance with the BMAP. Florida BMAPs are adopted by Secretarial Order and therefore legally enforceable by the DEP. Requirements for golf courses located in BMAPs are below.

1. **Golf Course BMP Certification, Implementation, and Reporting.**
   a. In areas with an adopted BMAP, all golf courses must implement the BMPs described in DEP's golf course BMP manual, *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses* (DEP, 2021).
   b. At minimum, the superintendent for each golf course must obtain and maintain certification through the UF-IFAS Florida Golf Courses Best Management Practices Program. It is highly recommended that course managers and landscape maintenance staff also participate in the certification program to ensure proper BMP implementation and understanding of nutrient-related water quality issues and the role of golf courses in water quality restoration and protection. By no later than January 14, 2026, the golf course superintendents must confirm to DEP whether they have completed the certification. Certification must be completed by December 31, 2026. This certification must be renewed every four years.
   c. Beginning in 2026, nutrient application records and management action updates (fertilizer, reuse, BMPs, etc.) must be submitted each year during the BMAP statewide annual reporting process.
   d. Fertilizer rates should be no greater than the UF/IFAS recommendations to help prevent leaching (**Table G-1**). This includes nutrients from reuse or any other source applied. If a facility uses fertilizer rates greater than those in the BMP manual they are required to conduct water quality monitoring prescribed by DEP or WMD that demonstrates compliance with water quality standards.
   e. Example golf course BMPs applicable to protecting water quality are listed below.
      - Use slow release fertilizer to prevent volatilization.
      - Use of lined media in stormwater features.
      - Use of denitrification walls.
      - Use of rain gardens.
      - Use of tree boxes.
      - Use of bioswales.

Table G-1. Nutrient ranges for warm-season turfgrass species

Note: For more information refer to the *Best Management Practices for the Enhancement of Environmental Quality on Florida Golf Courses* (DEP, 2021).

Nutrient	Bermudagrass (%)	St. Augustinegrass (%)	Seashore Paspalum (%)	Centipedegrass (%)	Zoysia (%)
N	1.95 - 4.63	1.53 - 2.41	2.80 -3.50	1.5 - 2.9	2.04 - 2.36
P	0.15 - 0.43	0.30 - 0.55	0.30 - 60	0.18 - 0.26	0.19 - 0.22
Potassium (K)	0.43 - 1.28	1.1 - 2.25	2.00 - 4.00	1.12 - 2.50	1.05 - 1.27
Calcium (Ca)	0.15 - 0.63	0.24 - 0.54	0.25 - 1.50	0.50 - 1.15	0.44 - 0.56
Magnesium (Mg)	0.04 - 0.10	0.20 - 0.46	0.25 - 0.60	0.12 - 0.21	0.13 - 0.15
Sulfur (S)	0.07 - 0.02	0.15 - 0.48	0.20 - 0.60	0.20 - 0.38	0.32 - 0.37
Sodium (Na)	0.05 - 0.17	0.00 - 0.17	-	-	-

2. All golf courses located within a BMAP are required to submit a nutrient management plan (NMP) that is designed to, while maintaining even plant growth, prevent nutrient losses to the Floridan aquifer and surrounding surface waters. A draft NMP must be submitted to DEP within one year of BMAP adoption and a final document is due two years after adoption. The NMP must include the following:

a. A brief description of the goals of the nutrient management plan.

This should be a paragraph that describes the goals of your NMP. Talk about how you are managing for high quality turf and water quality.

b. Identification of areas where nutrient applications will be made including greens, tees, fairways and roughs.

Discuss the areas of the course where you plan to use fertilizer, and why. Also discuss the areas that do not need or get any fertilizer applications.

Include a GIS shapefile identifying all of these areas.

Complete the table(s) detailing your nutrient application practices.

Turf Details

Turf Type	Turf Species	Acreage
Tees		
Greens		
Fairways		
Roughs		
Totals		

Fertilizer Applications

Sample fertilizer application table

Month	Turf Type	TN Application Rate (lbs/acre)	TP Application Rate (lbs/acre)	Number of Applications	Total TN Applied (lbs/acre)	Total TP Applied (lbs/acre)
January	Tees					
	Greens					
	Fairways					
	Roughs					
February	Tees					
	Greens					
	Fairways					
	Roughs					
March	Tees					
	Greens					
	Fairways					
	Roughs					
April	Tees					
	Greens					
	Fairways					
	Roughs					
May	Tees					
	Greens					
	Fairways					
	Roughs					
June	Tees					
	Greens					
	Fairways					
	Roughs					
July	Tees					
	Greens					
	Fairways					
	Roughs					
August	Tees					
	Greens					
	Fairways					
	Roughs					
September	Tees					
	Greens					
	Fairways					
	Roughs					

Month	Turf Type	TN Application Rate (lbs/acre)	TP Application Rate (lbs/acre)	Number of Applications	Total TN Applied (lbs/acre)	Total TP Applied (lbs/acre)
October	Tees					
	Greens					
	Fairways					
	Roughs					
November	Tees					
	Greens					
	Fairways					
	Roughs					
December	Tees					
	Greens					
	Fairways					
	Roughs					
Totals						

Amount of Reuse/Reclaimed Water Applied*

Sample reclaimed water and fertilizer use table

**Supply reuse/reclaimed water volumes applied, if applicable.*

Month	Reuse/Reclaimed Water Quantity (Gallons)	Monthly Average TN (mg/L)	Monthly Average TP (mg/L)	Quantity of TN Applied (lbs)	Running Total of TN Applied per Acre (lbs/acre)	Quantity of TP Applied (lbs)	Running Total of TP Applied per Acre (lbs/acre)
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
Totals							

Are any other sources of nutrients (i.e. manure, etc.) applied to the grounds? If so, please detail in a table similar to the reuse and fertilizer tables.

c. Current BMP implementation.

Describe existing BMPs and other nutrient management actions here.

d. Soil sampling methods and results for each area receiving fertilizer applications. Areas receiving fertilizer applications shall be sampled once every three years. Soil samples shall be collected and analyzed according to UF-IFAS/DEP recommendations or standard industry practice. Soil samples shall be analyzed, at minimum, for:

1. Nitrogen
2. Phosphorus

Describe existing soil sampling here. Describe your planned soil sampling schedule. Provide information about how long you have been soil sampling and what part of the course you are prioritizing.

If soil samples from areas of similar soil, fertilizer use and management are combined, describe the process and justify combining for a "representative" sample.

Keep all soil test results (or copies of them) in this file as part of your nutrient management plan. Please do not send them in to DEP individually. If you've been soil testing for years, remember to add copies of all those past results to your NMP file.

e. Water quality sampling methods and results. Water quality sampling and analysis should be conducted in accordance with DEP's Standard Operating Procedures. Water quality samples shall be analyzed, at minimum, for:

1. Nitrogen
2. Phosphorus.

If applicable, describe existing water quality sampling. Describe your planned water quality sampling schedule. Provide information about how long you have been doing water quality sampling and what part of the course you are prioritizing.

Keep all water quality test results (or copies of them) in this file as part of your nutrient management plan. Please do not send them in to DEP individually. If you've been testing for years, remember to add copies of all those past results to your NMP file.

f. Tissue sampling methods and results. Tissue samples shall be collected and

analyzed according to UF-IFAS/DEP recommendations or standard industry practice.

Describe existing tissue sampling plan. Keep all test results (or copies of them) in this file as part of your nutrient management plan. Please do not send them in to DEP individually. If you've been testing for years, remember to add copies of all those past results to your NMP file.

g. Soil, tissue and water quality sample results shall be maintained for a minimum of five years. Please provide records.

h. When developing new (or expanding) golf courses, pre- and post- monitoring should be implemented in accordance with UF-IFAS/DEP recommendations.

Appendix H. Agricultural Enrollment and Reductions

FDACS provided the following information for this appendix for each BMAP.

Agricultural Landowner Requirements

Section 403.067, F.S., requires agricultural producers and landowners located within BMAP areas to either enroll in the FDACS Best Management Practices (BMP) Program and properly implement BMPs applicable to their property and operation or to conduct water quality monitoring activities as required by Rule Chapter 62-307, F.A.C. Producers or agricultural landowners who are enrolled in the FDACS BMP Program and are properly implementing the applicable BMPs identified on the BMP Checklist, or who are in compliance with the Equivalent Program requirements of Rule Chapter 5M-1, F.A.C., are entitled to a presumption of compliance with state water quality standards per section 403.067(7)(c)3., F.S.

FDACS Office of Agricultural Water Policy (OAWP) BMP Program

Best Management Practices (BMPs) Definition

For the purposes of the OAWP BMP Program, the term "best management practice" means a practice or combination of practices determined based on research, field-testing, and expert review, to be the most effective and practicable on-location means, including economic and technological considerations, for improving water quality in agricultural discharges. Section 403.067, F.S., requires that BMPs reflect a balance between water quality improvements and agricultural productivity. FDACS works closely with the FDEP, water management districts (WMDs), industry experts, and academic institutions to understand the environmental and agronomic effects addressed by BMPs.

Section 403.067, F.S., authorizes and directs FDACS to develop and adopt by rule BMPs that will help Florida's agricultural industry achieve the pollution reductions allocated in BMAPs. To date, FDACS OAWP has adopted 11 commodity specific BMP manuals by rule, covering cattle, citrus, equine, dairy, nurseries, poultry, sod, small farms and specialty livestock, specialty fruit and nut, vegetable and agronomic crops, and wildlife operations. All OAWP BMP manuals are periodically revised, updated, and subsequently reviewed and preliminarily verified by DEP before re-adoption. BMPs serve as part of a multidisciplinary approach to water resource restoration and protection that includes public/private partnerships, landowner agreements and regional treatment technologies, which together form the comprehensive strategy needed to meet the goals established in BMAPs.
Enrolling in a FDACS BMP Program

To initially enroll in the FDACS BMP Program, agricultural landowners and producers must meet with an FDACS representative on site to determine the appropriate practices that are applicable to their operation(s) and to document the BMPs on the Notice of Intent (NOI) and BMP Checklist. FDACS representatives consider site-specific factors when determining the applicability of BMPs including commodity type, topography, geology, location of production, soil type, field size, and type and sensitivity of the ecological resources in the surrounding areas. Producers collaborate with

the FDACS representative to complete an NOI to implement the BMPs and the BMP Checklist from the applicable BMP manual.

Once the NOI and Checklist are completed, signed, and submitted to OAWP, the producer is formally enrolled in the BMP Program. Because many agricultural operations are diverse and are engaged in the production of multiple commodities, a landowner may sign multiple NOIs for a single parcel. Producers must properly implement all applicable BMPs as soon as practicable, but no later than 18 months after completion and execution of the NOI and associated BMP Checklist.

Enrollment Prioritization

To address the greatest resource concerns, OAWP utilizes a phased approach based on commodity type, irrigation, and agricultural acreages, while ensuring that all entities identified as agriculture will be notified. Enrollment efforts have previously focused on enrolling parcels that are most impactful to water quality including parcels containing many agricultural acres, irrigated acres, or more intense agricultural land uses.

Implementation Verification

Section 403.067, F.S., requires FDACS to conduct an Implementation Verification (IV) site visit at least every two years to ensure that agricultural landowners and producers are properly implementing the applicable BMPs identified in the BMP Checklist. An IV site visit includes: review and collection of nutrient application records that producers must maintain to demonstrate compliance with the BMP Program; verification that all other applicable BMPs are being properly implemented; verification that any cost shared practices are being properly implemented; and identification of potential cost share practices, projects or other applicable BMPs not identified during enrollment. During the IV site visit, FDACS representatives also identify opportunities for achieving greater nutrient, irrigation, or water resource management efficiencies, including opportunities for water conservation. Procedures used to verify the implementation of agricultural BMPs are outlined in Rule 5M-1.008, F.A.C.

Nutrient Application Records

Enrolled landowners and producers are required to keep records on the total pounds of nitrogen (N) and phosphorus (P) fertilizer from all sources that are applied to their operations to comply with BMP program requirements, including AA bio-solids. Nutrient records from Class A or B biosolids applied in accordance with Chapter 62-640, F.A.C. are collected through the DEP permitting process as described in 5M-1.008(5). FDACS will collect information pertaining to these records for a two-year period identified when an IV site visit is scheduled. OAWP adopted a Nutrient Application Record Form (NARF) (FDACS-04005, rev. 06/24, incorporated in 5M-1.008(4), F.A.C.), to help simplify the record keeping requirement. The form is available under Program Resources at https://www.fdacs.gov/Agriculture-Industry/Water/Agricultural-Best-Management-Practices. As these records relate to processes or methods of production, costs of production, profits, other financial information, fertilizer application information collected during an IV site visit is

considered confidential and may be exempt from public records under chapters 812 and 815, Florida Statutes (F.S.), and Section 403.067, F.S. In accordance with subsection 403.067(7)(c)5., F.S., FDACS is required to provide DEP the nutrient application records.

Compliance Enforcement

If multiple efforts to contact agricultural landowners and producers within BMAPs about enrollment in the BMP Program are unsuccessful or if the landowner or producer chooses not to enroll in the BMP Program FDACS refers them to DEP for enforcement action per Section 403.067(7)(b), F.S.

If a producer is enrolled in the FDACS BMP program and the producer chooses not to properly implement the applicable BMPs, FDACS representatives provide the landowner or producer with a list of corrective measures and the timeframes within which they must be implemented. If a landowner or producer does not cooperate with FDACS to identify or implement corrective or remedial measures, or refuses an IV site visit, FDACS refers them to DEP for enforcement action after attempts at corrective and remedial action are exhausted. Chapter 5M-1, F.A.C. outlines the process to ensure compliance with the BMP Program requirements.

Equivalent Programs

Enrollees operating under one of the Equivalent Programs listed in Rule 5M-1.001(7), F.A.C., are required to complete an NOI and meet the other requirements for Equivalent Programs specified in Rule Chapter 5M-1, F.A.C. Compliance with BMPs on the area(s) of the NOI property subject to the Equivalent Program instrument is demonstrated by fulfilling the requirements of Rule 5M-1.008(8), F.A.C. An Enrollee under an Equivalent Program listed in Rule 5M-1.001(7)(a)-(b), F.A.C., that is not required to complete a BMP Checklist is not subject to IV site visits. For Enrollees under an Equivalent Program listed in Rule 5M-1.001(7)(a)-(b), F.A.C., implementation verification shall be undertaken by the agency that issued the permit pursuant to its statutory and/or rule authority.

Other FDACS BMP Programs

FDACS implements other regulatory programs that help minimize nonpoint source pollution from agricultural activities.

Aquaculture

The FDACS Division of Aquaculture develops and enforces regulations governing the commercial aquaculture industry in Florida. Chapter 597, F.S., Florida Aquaculture Policy Act, requires Floridians who engage in commercial aquaculture to annually acquire an Aquaculture Certificate of Registration and implement all applicable Aquaculture Best Management Practices listed in Rule Chapter 5L-3.004, F.A.C. Facilities with certain production and discharge rates also require an NPDES permit from DEP. The Aquaculture BMPs were last updated by rule in November 2023.

FDACS Division of Aquaculture conducts annual site visits at certified facilities to confirm compliance with BMPs. These include management practices in areas of construction, containment,

shrimp culture, sturgeon culture, shellfish culture, live rock culture, aquatic plants, including fertilizer application, and health management. For more information about FDACSs Division of Aquaculture and Aquaculture BMPs go to https://www.fdacs.gov/Divisions-Offices/Aquaculture.

Within the Silver and Rainbow BMAP, there are 7 aquaculture facilities under certification with the FDACS Division of Aquaculture as of November 2024. As with agricultural land use in Florida, aquaculture facilities are frequently in and out of production. The facilities being provided may no longer be in operation and/or there may be new companies in different parts of the basin by the next BMAP iteration.

Forestry

The FDACS Florida Forest Service (FFS) develops, implements (through education and training), and monitors Silviculture BMPs in Florida. Silviculture BMPs are applicable to *bona-fide* ongoing silviculture operations and are not intended for use during tree removal or land clearing operations that are associated with a land-use change to a non-forestry objective. The FFS Silviculture BMP Manual is adopted under Chapter 5I-6.002 F.A.C. and was last updated in 2008. FFS is currently in the process of updating the manual with guidance from the FDACS Silviculture BMP Technical Advisory Council. The current manual is composed of fourteen BMP categories covering many aspects of silviculture operations including timber harvesting, site preparation, forest roads, stream and wetland crossings, and forest fertilization. The primary objectives of Silviculture BMPs are to minimize the risks to Florida's water resources from silviculture-related sources of nonpoint source pollution and maintain overall ecosystem integrity. Section 403.067, F.S., provides silviculture practitioners implementing Silviculture BMPs a presumption of compliance with state water quality standards for the pollutants addressed by the BMPs.

The FFS Silviculture BMP implementation monitoring program was initiated in 1981 and follows the criteria which have been established for state forest agencies in the southeastern United States by the Southern Group of State Foresters. Monitoring surveys are conducted biennially on a random sample of recently conducted silviculture operations throughout Florida with the goal of determining the level of implementation and compliance with Silviculture BMPs. For the period of record (1981 to 2023), Florida's statewide Silviculture BMP compliance rates range from 84% (1985) to 99.7% (2019) and have shown an overall average compliance rate above 98% since 2005. For more information about Silviculture BMPs and to download a copy of the latest FFS Silviculture BMP Implementation Survey Report go to https://www.fdacs.gov/bmps.

Agricultural Land Use

Agricultural Land Use in BMAPs

Land use data are helpful as a starting point for estimating agricultural acreage, determining agricultural nonpoint source loads, and developing strategies to reduce those loads in a BMAP area, but there are inherent limitations in the available data. Agriculture acreages fluctuate when volatile economic markets for certain agricultural commodities provide incentive for crops to change at a

fast pace, properties are sold, leases are terminated, production areas decrease, or production ceases, among other reasons. Florida's recent population growth has also resulted in accelerated land use changes statewide, some of which include transitioning agricultural or fallow agricultural lands to developed land uses. The dynamic nature of Florida's agricultural industry creates challenges with comparing agricultural acres from year to year.

When developing a BMAP, agricultural nonpoint source loading is estimated using a broad methodology based on statewide land use data. Oftentimes, this results in properties being designated as agricultural nonpoint pollution sources and creates an obligation for these properties to enroll in the FDACS BMP Program when they may be better addressed under other programs more applicable to the practices occurring on those properties. Examples of these properties include: rural residential/homesteads, ranchettes, or single-family homes with accessory structures for livestock or groves that serve the needs of those living on the property. Continued identification of these properties as agricultural nonpoint sources limits the ability to reliably direct programmatic resources to meet water quality restoration goals.

FDACS uses the parcel-level polygon agricultural lands (ALG) data that is part of the Florida Statewide Agricultural Irrigation Demand (FSAID) Geodatabase to estimate agricultural acreages statewide. FSAID provides acreages and specific crop types of irrigated and non-irrigated agricultural lands statewide. FSAID is updated annually based on water management district land use data, county property appraiser data, OAWP BMP enrollment data, U.S. Department of Agriculture data for agriculture, such as the Cropland Data Layer and Census of Agriculture, FDACS Division of Plant Industry citrus data, as well as field verification performed by the U.S. Geological Survey, water management districts, and OAWP. As the FSAID is detailed and updated on an annual basis, it provides a reliable characterization of agricultural land uses that accounts for the fast-growing population and resultant land use changes taking place statewide. The FSAID also provides FDACS a clearer picture of agriculture's impact on the landscape and consistent method to better track, direct, and assess BMP implementation, cost share projects, and regional projects.

Table H-1 and **Figure H-1** show the percentage of agricultural land use within the Silver and Rainbow BMAP, determined by comparing the FSAID 11 ALG and total acreage of the BMAP boundary. Understanding what proportion of a BMAP is comprised of agriculture provides insight as to the potential contribution of agricultural nonpoint sources.

Table H-1. Agricultural Land Use in Silver and Rainbow BMAP

Non-agricultural acres	731,674
Agricultural acres	275,544

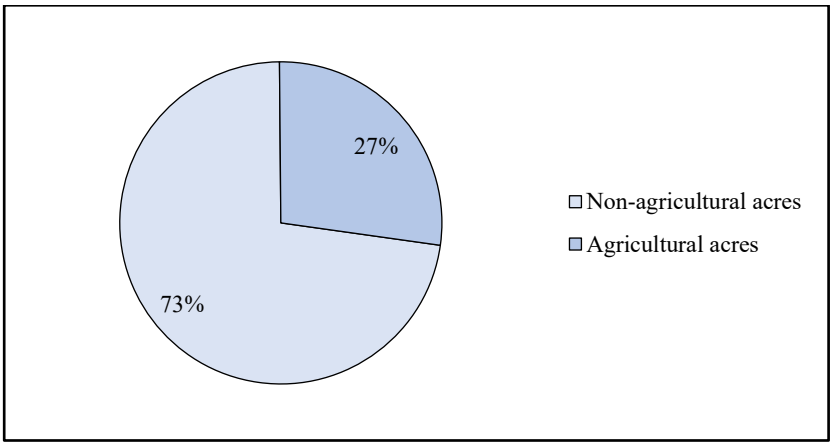

Figure H-1. Agricultural acres compared to non-agricultural acres in the BMAP area

FDACS BMP Program Metrics

Enrollment Delineation and BMAP Metrics

BMP enrollments are delineated in GIS using county property appraiser parcels. In terms of NOIs, enrolled acreage fluctuates when parcels are sold, when leases end or change hands, or when production areas downsize or production ceases, among other reasons. Nonproduction areas such as forest, roads, urban structures, and water features are often included within the parcel boundaries. Conversely, agricultural lands in the FSAID ALG only include areas identified as agriculture. To estimate the agricultural acres enrolled in the BMP program, OAWP overlays the FSAID ALG and BMP enrollment data within GIS to calculate the acres of agricultural land in an enrolled parcel.

Summary Tables

Table H-2. Agricultural lands enrolled in the Silver and Rainbow BMAP by BMP Program commodity

Commodity	Agricultural Acres Enrolled
Citrus	454
Cow/Calf	42,865
Dairy	225
Equine	15,926
Fruit/Nut	657
Multiple Commodities	52,964
Nursery	1,028
Row/Field Crop	9,262
Sod	39
Total	**123,420 (45%)**

Table H-3. Agricultural acres enrolled by commodity and springshed

Commodity	Rainbow	Silver
Citrus	0	454
Cow/Calf	22,231	20,633
Dairy	0	225
Equine	12,168	3,759
Fruit/Nut	0	657
Multiple Commodities	43,979	8,985
Nursery	756	272
Row/Field Crop	5,382	3,880
Sod	0	39
Total	84,516	38,904
Percent of Agricultural Lands Enrolled in BMPs	53%	34%

As of July 2024, 43% of the agricultural acres in the Silver and Rainbow BMAP area are enrolled in FDACS' BMP program. **Table H-2** shows the acreages enrolled in the BMP Program by commodity. **Table H-3** shows the acreages enrolled in the BMP Program by commodity and springshed. It is important to note that producers often undertake the production of multiple commodities on their operations, resulting in the requirement to implement the applicable BMPs from more than one BMP manual. When this occurs, the acres enrolled under more than one BMP manual are classified as “multiple commodity” and not included in the individual commodity totals to prevent duplication.

Enrollment Map

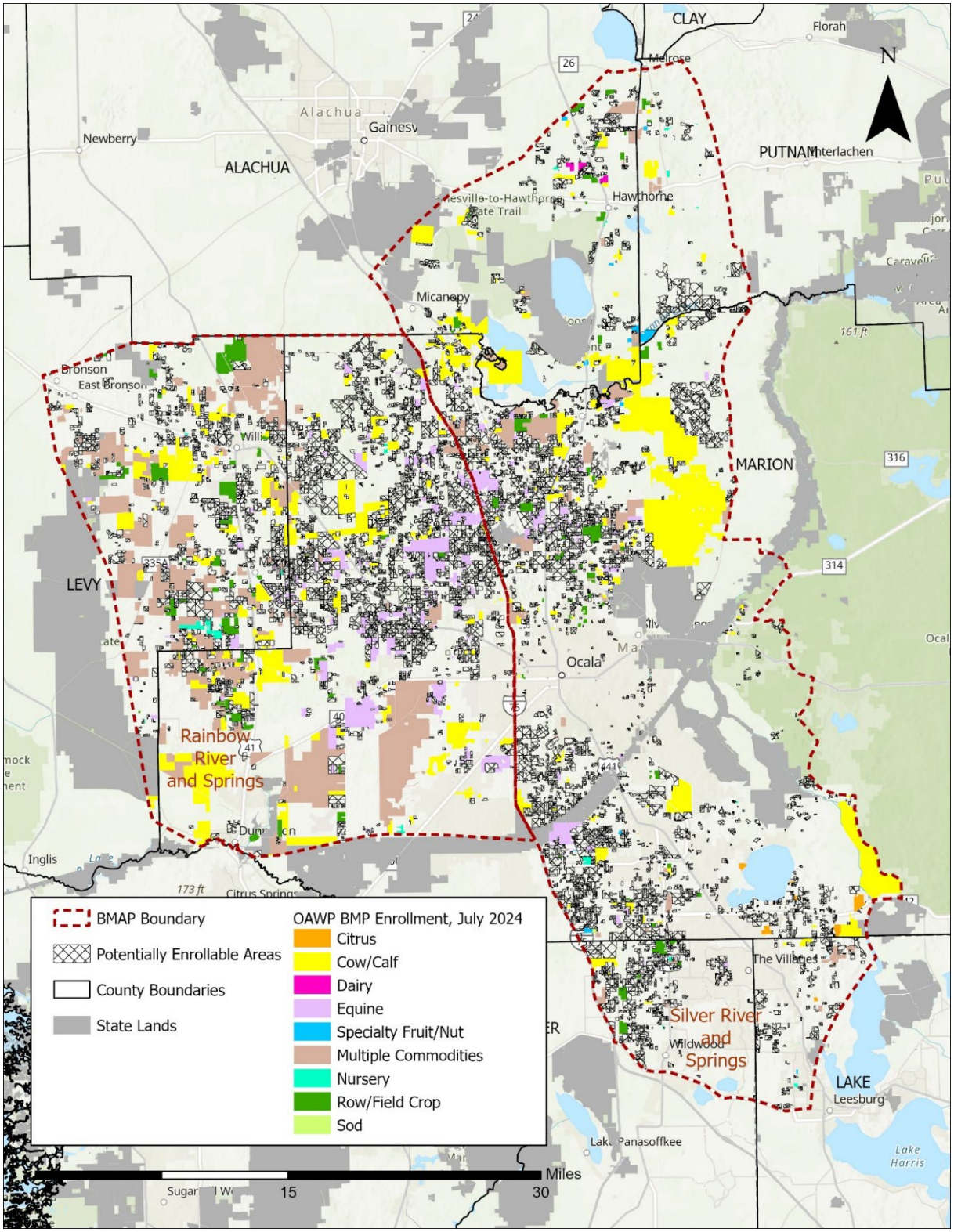

Figure H-2. Agricultural enrollment in the Silver and Rainbow BMAP

Unenrolled Agricultural Lands

Oftentimes, there are lands initially identified as agriculture which, upon closer evaluation, raise questions as to whether there is agricultural activity and whether it is enrollable within the purview of OAWP. FDACS characterizes lands classified as agriculture in the FSAID ALG, but not currently enrolled in the FDACS BMP Program using property appraiser data such as parcel owner information, agricultural tax valuation for exemption purposes, other parcel land use details to determine whether the remaining lands are potentially enrollable. More information about the "Unenrolled agricultural lands" characterization analyses is available in ***FDACS Annual Status of Implementation of BMPs Report***.

The assessment of unenrolled agricultural lands at a more granular scale provides an indication of which areas are more likely (or unlikely) to have enrollable agricultural activities occurring on them. It also provides an estimate of the number of parcels and the associated agricultural acres deemed to be enrollable. The number of parcels is a useful proxy for the level of resource dedication needed to enroll the associated agricultural acres and where best to focus finite resources and staffing needs. It is often the case that much of the potentially enrollable acreage is encompassed within many smaller parcels which may require additional resources to enroll and require further evaluation, such as those that have agricultural activity intended solely for personal use ancillary to a residence, those that do not have an agricultural land use per the property appraiser, as well as parcels where there is no current activity to enroll.

Table H-4 shows the breakdown of agricultural lands within the Silver and Rainbow BMAP based on the FSAID 11 and the results of the FDACS unenrolled agricultural lands characterization.

Table H-4. Agricultural lands in Silver and Rainbow BMAP by springshed

** Enrollment information current as of July 2024.*

Springshed	Agricultural Acres	Unenrolled - Unlikely Enrollable Acres	Agricultural Acres - Adjusted	Agricultural Acres Enrolled*
Rainbow	179,183	19,521	159,662	84,515
Silver	155,429	39,547	115,882	38,905

Potentially Enrollable Lands

There are 152,212 acres of potentially enrollable lands within the Silver and Rainbow BMAP based on the assessment of unenrolled agricultural lands performed by FDACS. **Table H-5** shows the potentially enrollable acreages by crop type. **Figure H-3** shows the count of potentially enrollable parcels based on size classifications used by FDACS.

Table H-5. Potentially enrollable acres by crop type

Crop Type	Acres
Citrus	178

Crop Type	Acres
Cropland and/or Pastureland	717
Crops	8,005
Fallow	6,192
Fruit (Non-citrus)	391
Grazing Land	87,030
Hay	3,747
Livestock	41,637
Sod	389
Nursery	385
Open Lands	3,539
Total	**152,211**

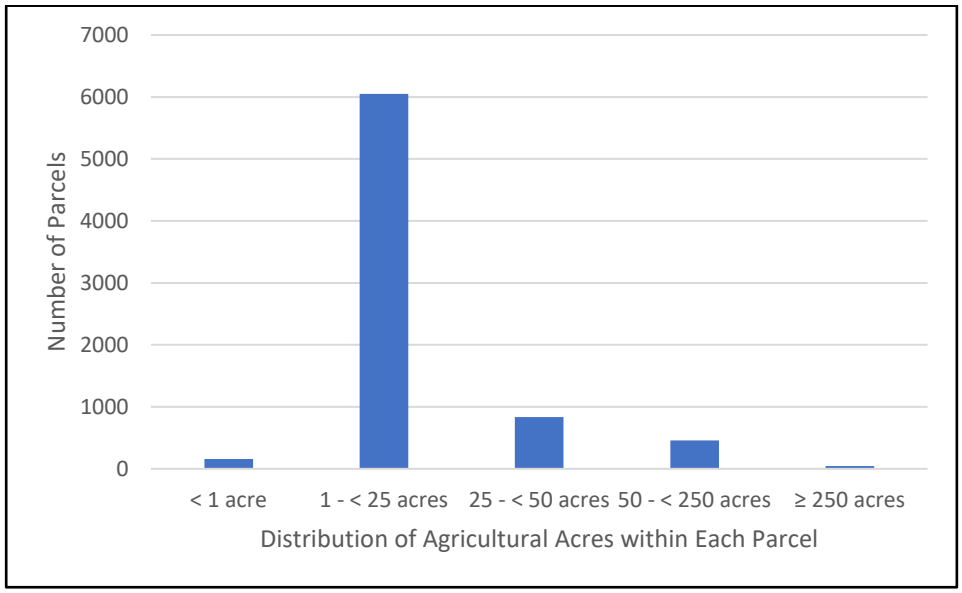

Figure H-3. Count of potentially enrollable parcels by size class

FDACS Cost Share

Enrollment in and proper implementation of BMPs makes a producer eligible for cost share for certain BMPs, other practices, and projects. The availability of cost share funds depends on annual appropriations by the Florida Legislature, and therefore, the amount available can vary each year. Cost share applications may be submitted once a producer has enrolled in the BMP Program and has been assigned an NOI number. Cost share practices are categorized as nutrient management, irrigation management, or water resource protection. BMPs, other practices, and projects eligible for cost share funding may include precision agriculture technologies, variable rate irrigation methods, water control structures, and tailwater recovery systems. OAWP seeks to leverage its cost share funding with other cost share programs offered by FDACS and other state and federal agencies. The United States Department of Agriculture NRCS offers funding through its Environmental Quality

Incentives Program, and certain WMDs have agricultural cost share programs. Applicants are encouraged to use OAWP cost share in conjunction with other available conservation programs although funding cannot be duplicative.

Cost share project types and estimated nutrient reduction efficiencies

Table H-6 identifies agricultural technologies eligible for funding through cost-share assistance and the associated nutrient reductions[1]. The nutrient reductions were used to develop a methodology to estimate nutrient reductions for NOIs that have received cost-share funding[2]. The NOI boundary, based on property appraiser parcel data, was considered the area treated by the cost-shared agricultural technology or project. For parcels with more than one cost-share project, OAWP identified the order of treatment to determine the reductions for the multiple projects based on each cost-shared agricultural technology. Estimated nutrient reductions from FDACS cost share in the Silver and Rainbow BMAP are shown in **Table H-7**.

Table H-6. Cost share project types and estimated nutrient reduction efficiencies

Project Types	BMP Category	Mechanism	N Impact
Nutrient Management Plan	Precision Nitrogen Management	N application reduction	15%
Plastic Mulch Layer - Drip Tape	Precision Nitrogen Management	N leaching reduction	18%
Controlled Release Fertilizer	Precision Nitrogen Management	N leaching reduction	20%
Applicator (Hoop Sprayer)	Precision Nitrogen Management	N application reduction	20%
Applicator (Liquid)	Precision Nitrogen Management	N application reduction	15%
Spreader (Dry Variable)	Precision Nitrogen Management	N application reduction	15%
Applicator (Dry Banding)	Precision Nitrogen Management	N application reduction	25%
Cover Crops	Tillage, Cover Crops and Soil Health BMPs	N leaching reduction	30%
Vertical Till	Tillage, Cover Crops and Soil Health BMPs	N leaching reduction	6%
Flail Mower	Tillage, Cover Crops and Soil Health BMPs	N application reduction	8%
Integrated Crop-Livestock Rotations	Livestock BMPS	N leaching reduction	50%
Rhizoma Peanut Mix Pasture System	Livestock BMPS	N application reduction	31%
Fencing	Livestock BMPS	N leaching reduction	20%
Livestock Water Exclusion	Livestock BMPS	N runoff reduction	33%

[1] FDACS, 2024. Nitrogen Benefits of Agricultural Best Management Practices for Florida: Summary of Findings. Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural Water Policy. In collaboration with The Balmoral Group.

[2] FDACS, 2024. Nitrogen Reductions BMP Analysis: Results and Process Description. Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural Water Policy. In collaboration with The Balmoral Group.

Project Types	BMP Category	Mechanism	N Impact
Alternative Water Supply - Livestock	Livestock BMPS	N runoff reduction	33%
Free Stall Barn	Livestock BMPS	N leaching reduction	30%
Culvert/Riser	Drainage and Erosion Reduction BMPs	N runoff reduction	16%
Water Control Structures or Stormwater Improvement	Drainage and Erosion Reduction BMPs	N runoff reduction	17%
Tailwater Recovery Ponds	Drainage and Erosion Reduction BMPs	N runoff reduction	42%
Storage – Compost	Storage	N leaching reduction	26%
Storage – Potting Soil	Storage	N leaching reduction	23%
Rotation – mobile corral	Livestock BMPS	N leaching reduction	20%
Rotation – portable feeder/wagon	Livestock BMPS	N leaching reduction	20%

Table H-7. Nutrient reductions from FDACS cost share

Rainbow BMP Category	Rainbow - TN Reductions to Groundwater
Drainage and Erosion Reduction BMPs	603
Irrigation	12,845
Livestock BMPs	6,322
Precision Nitrogen Management	4,712
Storage	1,148
Tillage, Cover Crops, and Soil Health BMPs	1,350
Silver BMP Category	**Silver - TN Reductions to Groundwater**
Drainage and Erosion Reduction BMPs	54
Irrigation	928
Livestock BMPs	5,957
Precision Nitrogen Management	3,196
Tillage, Cover Crops, and Soil Health BMPs	4,705
Total	**41,821**

Future Efforts

Outreach

To address resource concerns, FDACS continues enhancing coordination with producers, agencies, and stakeholders to increase enrollment in the BMP program. OAWP is sending correspondence to agricultural landowners within BMAPs that are not currently enrolled in the BMP program to increase enrollment rates and verify land uses where additional focus may be required to achieve resource protection. This effort is utilizing a phased approach and targeting priority land uses, and then evaluating the amount of agricultural acreage for the remaining unenrolled lands, while ensuring that all entities identified as

agriculture will be notified. Additionally, OAWP continues to coordinate with industry groups and outreach partners to educate and inform agricultural producers about the BMP program.

Dairy Loading Estimations

Dairy operations represent a diverse agricultural industry within Florida, varying widely from pasture-based operations to confinement facilities where the cows spend the entire day under roof. Dairies must balance nutrient use and management based on the amounts of manure and wastewater generated onsite. Nutrient management requirements vary based on herd sizes and are implemented either through the permitting process under Chapter 62-670, F.A.C. or through enrollment in the FDACS BMP program.

Manure is typically stored onsite as solids or in the operation's waste storage pond (WSP). Manure solids can be land-applied, composted, or hauled off-site. Waste stored in the waste storage pond can be land-applied as liquid organic fertilizer, such as through a center pivot irrigation system. Use of nutrients from solids or the WSP allows dairy operations to produce forage or silage crops for their herds and maintain a nutrient balance.

Manure is an organic source of Nitrogen (N) subject to volatilization based on many factors including temperature, rainfall, soil type, and storage method. Volatilization provides for less available N to be lost through leaching, but also less available N for crop uptake.

Concentrated Animal Feeding Operation (CAFO) Dairies

Dairies with a herd size over 700 are Concentrated Animal Feeding Operations (CAFOs) and are permitted by FDEP under Chapter 62-670, F.A.C. CAFO dairies are required to implement a Nutrient Management Plan (NMP) as part of their permit. The NMP outlines the nutrient inputs and outputs of a particular dairy operation, including any reuse and off-site disposal of manure and any commercial fertilizers used to grow forage or silage crops. CAFO dairies must perform water quality monitoring onsite and submit quarterly and annual reports demonstrating compliance with water quality standards and their NMP.

While CAFO dairies can meet most of their crop nutrient requirements using waste generated onsite, in some instances the amount of N lost due to volatilization may require the use of supplemental commercial fertilizers. However, when commercial fertilizers are utilized, they are typically applied at rates below the standard application rates for agronomic crops based on the NMPs and annual reports submitted by permitted dairies.

Non-CAFO Dairies

Dairies with herd sizes smaller than 700 are non-CAFO and are subject to the same requirements as other agricultural operations within BMAPs. They must enroll in and implement BMPs applicable to their operation or perform water quality monitoring per Chapter 62-307, F.A.C. While not duplicative of permit requirements, the FDACS Dairy BMP Program has some similarities including lining of WSPs and maintenance of a nutrient balance through record review and collection. Further,

enrolled dairy operations are subject to the Implementation Verification (IV) site visit requirement every 2 years as required by s. 403.067(7)(d)3., F.S.

NSILT Estimation of Dairy Loading

The NSILT provides estimates of loading to groundwater based on land use and other factors in a springshed, where it may be harder to capture nuances happening on the ground such as methods of agricultural production.

Attenuation Factors

All dairies must demonstrate a balance between their nutrient inputs and outputs based on the nutrient of concern in a basin, e.g., nitrogen. Nutrient balance considers a variety of factors including waste treatment systems, volatilization losses, and crop uptake. **Table H-8** shows the overall nitrogen (N) remaining for crop uptake for typical dairy waste treatment systems.

Table H-8. Overall nitrogen remaining for crop uptake with the described systems

Type of System	N Remaining
Cows on pasture	40%
Cows on concrete floor to storage pond with less than 7 days hold time then sprayed through sprinkler or thinly surface applied	35%
Cows on concrete floor to storage pond with less than 7 days hold time then incorporated or seepage ditch	40%
Cows on concrete floor to storage pond with 7 to 30 days hold time then sprayed through sprinkler or thinly surface applied	30%
Cows on concrete floor to storage pond with 7 to 30 days hold time then incorporated or seepage ditch	35%
Cows on concrete floor to storage pond with greater than 30 days hold time then sprayed through sprinkler or thinly surface applied	10%
Cows on concrete floor to storage pond with greater than 30 days hold time then incorporated or seepage ditch	15%
From WSP samples to crop uptake if applied via sprinkler or thinly surface applied	50%
From WSP sample to incorporated or seepage ditch	80%
Solids thinly applied	75%
Solids incorporated	95%

Dairies produce waste daily, and many produce crops year-round, therefore the nutrients in manure that is land applied through spreading or through an irrigation system are either lost to the atmosphere or taken up by a crop. Manure is stored prior to land application and may be treated in some way, e.g., separating solids from process wastewater or held in a WSP, allowing additional time for volatilization to occur. It is reasonable to expect dairy waste to have the same of attenuation at both CAFO and non-CAFO dairies. The NSILT assumes non-CAFO dairy waste has an attenuation rate of 50%, whereas CAFO dairy waste is assumed to attenuate at 85%. A comparison of the loading estimates using the different attenuation rates based on the NSILT is shown in **Table H-9**.

Table H-9. Estimated dairy loading at different attenuation rates

BMAP	Springshed	Recharge	Dairy Load to Groundwater - 50% Attenuation	Dairy Load to Groundwater - 85% Attenuation
Suwannee	Middle	High	93,051	27,915
	Middle	Medium	20,310	6,093
Santa Fe	Hornsby	Low	2,313	694
Silver	Silver	High	26,535	7,960
Chassahowitzka/Homosassa	Homosassa	High	34,209	10,263

Future Steps to Refine and Address Dairy Loading

While variability in production systems is not unique to dairy operations, it is important to assess the various management systems at both CAFO and non-CAFO dairies to estimate an operation's impact in a springshed. Loading from dairy operations is expected to be reevaluated regularly as part of the adaptive management inherent in BMAP implementation.

The dairy industry is actively working on sustainability projects focused on nutrient mitigation and water conservation. Additionally, CAFO and non-CAFO dairy operations enrolled in FDACS BMPs are eligible for regular cost share funding from FDACS and SRWMD.

Legacy Loads

Legacy loading can present an additional challenge to measuring progress in many areas of Florida with adopted BMAPs. Based on research, initial verification by DEP, and long-term trends in water quality in the BMAP area, it is expected that current efforts, such as BMP implementation, will continue to provide improvements in overall water quality despite the impacts from legacy loads.

While the implementation of BMPs will improve the water quality in the basin, it is not reasonable to assume that BMP implementation alone can overcome the issues of legacy loads, conversion to more urban environments, and the effects of intense weather events. BMP implementation is one of several complex and integrated components in managing the water resources of a watershed.

Collaboration between DEP, FDACS, the water management districts, and other state agencies, as well as local governments, federal partners, and agricultural producers, is critical in identifying projects and programs, as well as locating funding opportunities to achieve allocations provided for under this BMAP. To improve water quality while retaining the benefits that agricultural production provides to local communities, wildlife enhancement, and the preservation of natural areas requires a commitment from all stakeholders to implementing protective measures in a way that maintains the viability of agricultural operations.

Appendix I. Private Golf Courses with BMAP Responsibilities

The tables below list privately owned and operated golf courses that have been identified as contributing sources of nitrogen loading to the groundwater in the Silver and Rainbow BMAP. Publicly-owned facilities have been assigned as a part of the responsible entities allocation. The golf courses in **Table I-1** are subject to nutrient management strategies identified in **Section 2.8.**1 and **Appendix G** of this document. All facilities listed below have been assigned required TN reductions to meet the TMDLs. DEP encourages coordination between public and private entities as necessary to address loading in the basin.

Table I-1. Privately owned or operated golf courses within the Silver and Rainbow Springs BMAP

County	Facility Name	2028 Milestone/ 30% Reduction TN (lbs/yr)	2033 Milestone/ 80% Reduction TN (lbs/yr)	2038 Milestone/ 100% Reduction TN (lbs/yr)
Marion	Baseline Golf Course	552	1,472	1,841
Marion	Country Club Silver Springs Shores	396	1,057	1,321
Marion	Creek/Links/Spruce Courses at The Links Spruce Creek	174	464	580
Marion	Del Webb`s Spruce Creek	516	1,377	1,721
Marion	Heritage/Master/Memorial/Champion at Spruce Creek Country Club	1,975	5,267	6,584
Marion	Lake Diamond Golf Course	884	2,358	2,947
Marion	Rolling Greens Executive Golf Community	1,338	3,569	4,461
Marion	Stonecrest Golf Course	650	1,734	2,167
Marion	Grand Lake RV and Golf	709	1,891	2,363
Marion	Country Club Ocala	770	2,053	2,567
Lake	Harbor Hills Country Club	603	1,609	2,011
Lake	Lakes Lady Lake Golf Course	84	225	282
Lake	Meadow/Oaks/Sanctuary Courses and Club at Pennbrooke Fairways	187	498	622
Lake	Water Oak Country Club Estates	459	1,223	1,529
Sumter	Continental Country Club	0	1	1
Marion	Golden Hills Country Club	1,236	3,297	4,121
Marion	Oak Run Golf & Country Club	280	746	933
Marion	Ocala Palms Golf Course	833	2,221	2,776
Marion	Royal Oaks Golf Club	969	2,584	3,230
Marion	Stone Creek Golf Club	195	519	648
Marion	Golden Ocala Golf and Equestrian Club	838	2,235	2,793
Marion	Julliette Falls Golf Course	502	1,337	1,672
Marion	Links/Tortoise/Hare Courses	3,026	8,068	10,085
Marion	Candler Hills Golf Course	1,344	3,583	4,479

County	Facility Name	2028 Milestone/ 30% Reduction TN (lbs/yr)	2033 Milestone/ 80% Reduction TN (lbs/yr)	2038 Milestone/ 100% Reduction TN (lbs/yr)
Marion	Rainbow's End Golf Course	211	563	704
Sumter	Sumter Landing CDD (The Villages)	2,344	6,250	7,813
Lake, Marion, Sumter	The Villages Operating Company (The Villages)	11,030	29,414	36,768
Total	**N/A**	**32,105**	**85,613**	**107,016**

Appendix J. Private Wastewater Treatment Facilities with BMAP Responsibilities

The table below lists privately owned and operated facilities that have been identified as contributing sources of nitrogen loading to the groundwater in the Silver and Rainbow BMAP. Publicly-owned facilities have been assigned as a part of the responsible entities allocation. The WWTFs in **Table J-1** are subject to relevant nutrient management strategies identified in **Section 2.6**. All facilities listed below must meet the applicable effluent limit (**Table 9**) to meet the TMDLs. DEP encourages coordination between public and private entities as necessary to address loading in the basin.

Table J-1. Privately owned or operated WWTFs in or disposing within the Silver and Rainbow Springs BMAP

**This facility was operating during the period of record for wastewater for this update but is in the process of being replaced with Bay Laurel North WRF (FLAB07309).*

Facility ID	Facility Name
FLA010595	ACA Camp Geneva WWTF
FLA010735	Associated Grocers Of Florida
FLA010750	Big Lake Village WWTF
FLA010623	Blue Parrot Camping Park
FLA010689	Camp Sonlight
FLA010771	Cedar Hills WWTF
FLA499951	Central Sumter Utility Company WWTF
FLA010745	Cliftwood MHP WWTF
FLA010763	Days Inn - Ocala West WWTF
FLA010643	Fruitland Acres WWTF
FLA010770	Grand Lake RV Resort WWTF
FLA010608	Harbor Hills
FLA010703	Hilltop Estates
FLA012716	I-75 FDOT Rest Area WWTF
FLA010575	Lady Lake Village MHP WWTF
FLA013517	Lake Deaton RV Park WWTF
FLA010530	Lake Griffin Isles Mobile Home Park WWTF
FLA010549	Lake North Apartments
FLA010709	Lake View Woods WWTF
FLA010688	Lake Waldena Resort WWTF
FLA010722	Landfair WWTF
FLA010592	Leisure Meadows Mobile Home Park WWTF

Facility ID	Facility Name
FLA017133	Little Sumter Utility Company WWTF
FLA010764	Marie's Mobile Home Park WWTF
FLA010789	Marion Correctional Institute WWTF
FLA010741	MCUD Stonecrest WWTF
FLA011697	Melrose Community School WWTF
FLA010571	Mirror Lake Manor Apartments WWTF
FLA010708	Nautilus Mobile Home & RV Park WWTF
FLA281581	North Sumter Utilities WWTF
FLA516708	North Sumter Utility Company Master Reuse System (NSUMRS)
FLA010693	Oak Bend Manufactured Home Community
FLA010725	Ocala East Villas WWTF
FLA010737	Ocala Jai Alai - WWTF
FLA010773	Ocala Springs Shopping Center (Winn-Dixie Store #2437)
FLA010685	On Golden Pond Mobile Home Park WWTF
FLA358134	Orange Blossom Utilities
FLA010705	Paddock Park South WWTF
FLA010570	Pennbrooke WWTP
FLA016154	Petro PSC Truck Stop WWTF
FLA010698	Phoenix Houses Of Florida
FLA017026	Plantation Landing WWTF
FLA010731	Queen's Garden Resort WWTF
FLA013519	Rails End RV & MHP WWTF
FLA010593	Recreation Plantation RV Park
FLA010696	Robins Nest RV Park WWTF
FLA010757	Rolling Greens MHP WWTF
FLA011739	Sandhill Forest Two WWTF
FLA010704	Shady Rd Villas WWTF
FLA010729	Sharpes Ferry MHC WWTF
FLA010701	Smith Lake Shores WWTF
FLA010744	Spanish Oaks MHP WWTF
FLA010740	Spanish Palm Estates WWTF
FLA010690	Sportsman Cove WWTF
FLA010700	Springs RV Resort WWTF
FLA010784	Sunny Oaks MHP WWTF
FLA010611	Sunshine Mobile Home Park WWTF

Facility ID	Facility Name
FLA010699	Tradewinds WWTF
FLA010599	Valencia Terrace
FLA010692	Victory MHP LLC
FLA010555	Villages WWTF
FLA010756	Wandering Oaks RV Resort WWTF
FLA010706	Whispering Oaks MHP WWTF
FLA107077	Wilderness RV Park Estates, Inc.
FLA012660	Reddick RV WWTF
FLA012662	Crystal Springs MHP WWTF
FLA012663	Dogwood Acres MHP
FLA012664	Foxwood Farms MHP WWTF
FLA012665	Classic Oaks Village MHP LLC
FLA012667	Ocala RV Camp Resort WWTF
FLA012670	Howard Johnson Inn WWTF
FLA012676	Oak Tree Village and Campground WWTF
FLA012680	Crownwood WWTF
FLA012682	Sateke Village WWTF
FLA012683	On Top of the World South WWTF*
FLA012685	Westwood MHP WWTF
FLA012686	Ocala Jockey Club WWTF
FLA012687	103rd Street Square Center WWTF
FLA012693	Rainbow Springs Fifth Replat WWTF
FLA012694	Saddle Oak Club MHC WWTF
FLA012696	Golden Hills MHP WWTF
FLA012698	Falls Of Ocala MHP WWTF
FLA012699	Marion Landing
FLA012705	Sweetwater Oaks MHP WWTF
FLA012706	Fairfield Village of Ocala WWTF
FLA012707	Circle Square Shopping Center WWTF
FLA012708	Centers, Inc. the