STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In re: HOMOSASSA AND CHASSAHOWITZKA SPRINGS GROUPS BASIN MANAGEMENT ACTION PLAN
______________________________/

OGC CASE NO. 25-1038

FINAL ORDER ESTABLISHING THE HOMOSASSA AND CHASSAHOWITZKA SPRINGS GROUPS BASIN MANAGEMENT ACTION PLAN

Pursuant to Sections 403.067(7), Florida Statutes, this Final Order adopts the attached Basin Management Action Plan ("BMAP") for certain surface waterbodies within the Springs Coast basin. The adopted BMAP, entitled "Homosassa and Chassahowitzka Springs Groups Basin Management Action Plan" (hereafter referred to as the "Homosassa and Chassahowitzka Springs Groups BMAP") and dated June 2025, is attached hereto and incorporated herein as Exhibit 1. The 2025 BMAP builds upon the previous BMAP and adds new management strategies and analyses that continue the restoration efforts to date. This updated BMAP (Exhibit 1) supersedes and replaces the previous BMAP in its entirety.

Surface waters in the Homosassa and Chassahowitzka Springs Groups BMAP are designated as Class III waters in accordance with Chapter 62-302, Florida Administrative Code ("F.A.C."). Water quality for Class III waters is meant to be suitable for recreational use and for the propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

The Homosassa and Chassahowitzka Springs Groups basin is located in Citrus County. The Florida Department of Environmental Protection ("department") established TMDLs for certain waters addressed in this BMAP within Rule 62-304.645, F.A.C. Excessive nitrate is the primary pollutant contributing to the impairments. Table 1 in the attached Exhibit 1 identifies the applicable TMDLs addressed in this BMAP.

The department worked closely with the affected stakeholders, including local and state agencies, in updating the Homosassa and Chassahowitzka Springs Groups BMAP to achieve the associated TMDLs. Beyond direct work with the affected stakeholders, the department encouraged public participation to the greatest practicable extent by providing routine updates in technical meetings and requests for comment at technical meetings on the Homosassa and Chassahowitzka Springs Groups BMAP. The department held a noticed public meeting on April 16, 2025, to discuss the BMAP and receive comments.

The Homosassa and Chassahowitzka Springs Groups BMAP represents the collaborative effort of stakeholders to identify current and planned management actions to achieve the required pollutant load reductions. The adopted BMAP documents the projects and management actions that have been, or will be, undertaken by stakeholders to reduce discharge of pollutants in the watershed. The projects and management actions (completed, ongoing, and planned) identified in the BMAP address known sources of pollutants, facilitate investigation of unknown sources, prevent new sources, and address future loads associated with growth and land use changes in the basin.

The specific pollutant reduction allocations, projects and management actions required of individual entities are set forth in Section 2 and Appendices B, C, E, G, I and J of the BMAP. Unless otherwise noted in the BMAP, all requirements of this BMAP are enforceable upon the effective date of this Order.

This Final Order and incorporated BMAP are enforceable pursuant to Sections 403.067, 403.121, 403.131, 403.141, 403.161, 373.119 and 373.129, Florida Statutes.

THEREFORE, IT IS ORDERED that the attached Exhibit 1 is hereby adopted as the Homosassa and Chassahowitzka Springs Groups Basin Management Action Plan.

NOTICE OF RIGHTS

The Homosassa and Chassahowitzka Springs Groups Basin Management Action Plan shall become final unless a timely petition for an administrative proceeding is filed pursuant to the provisions of Sections 120.569 and 120.57 of the Florida Statutes, before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the department's proposed agency action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the department's Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Petitions must be filed within 21 days of publication of the public notice or within 21 days of receipt of this order, whichever occurs first. Under Section 120.60(3), Florida Statutes, however, any person who asked the department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 of the Florida

Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the department's action is based must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency’s proposed action;

(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency’s proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the agency to take with respect to the agency’s proposed action.

A petition that does not dispute the material facts on which the department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the department's final action may be different from the position taken by it in this order. Persons whose substantial interests will be affected by any such final decision of the department on the petition have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available for this proceeding.

A party who is adversely affected by this order has the right to seek judicial review under Section 120.68 of the Florida Statutes, by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the department in the Office of the General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the department.

DONE AND ORDERED this 27 day of June 2025, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

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Alexis Lambert
Secretary

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

FILED ON THIS DATE PURSUANT TO § 120.52, FLORIDA STATUTES, WITH THE DESIGNATED DEPARTMENT CLERK, RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED.

	06/27/2025
CLERK	DATE

Final

Homosassa and Chassahowitzka Springs Groups Basin Management Action Plan

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

with participation from the
Homosassa and Chassahowitzka Springs Groups Springs Stakeholders

June 2025

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

Exhibit 1

Acknowledgments

The Florida Department of Environmental Protection (DEP) adopted the *Homosassa and Chassahowitzka Springs Groups 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 residents.

Florida Department of Environmental Protection
Alexis A. Lambert, Secretary

Table ES-1. Homosassa and Chassahowitzka stakeholders

Type of Organization or Entity	Name
Responsible Entities	Agriculture Citrus County City of Brooksville City of Inverness Hernando County
Responsible Agencies	County Health Departments Florida Department of Agriculture and Consumer Services (FDACS) (DEP) Florida Department of Transportation - District 7 (FDOT) Southwest Florida Water Management District (SWFWMD)
Other Interested Stakeholders	Florida Farm Bureau Florida Native Plant Society Florida Onsite Wastewater Association (FOWA) Homeowners/Residents Homosassa River Alliance Howard T. Odum Florida Springs Institute Save the Manatee Club Septic Contractors Sierra Club Adventure Coast Group U.S. Fish and Wildlife Service - Chassahowitzka National Wildlife Refuge

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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List of Acronyms and Abbreviations

AC	Autocorrelation
ACE	Agricultural Cooperative Regional Water Quality Elements
ALG	Agricultural Land Acreage
AWT	Advanced Waste Treatment
BEBR	Bureau of Economic and Business Research
BMAP	Basin Management Action Plan
BMPs	Best Management Practices
CAFO	Concentrated Animal Feeding Operation
CASTNET	Clean Air Status and Trends Network
cfs	Cubic Feet Per Second
CMAQ	Community Multiscale Air Quality
DEP	Florida Department of Environmental Protection
DMR	Discharge Monitoring Reports
DO	Dissolved Oxygen
EPA	Environmental Protection Agency (U.S.)
F.A.C.	Florida Administrative Code
F.A.R.	Florida Administrative Register
FDACS	Florida Department of Agriculture and Consumer Services
FDOH	Florida Department of Health
FDOT	Florida Department of Transportation
FF	Farm Fertilizer
FFS	Florida Forest Service
FGS	Florida Geologic Survey
FLWMI	Florida Water Management Inventory
FOWA	Florida Onsite Wastewater Association
F.S.	Florida Statutes
FSAID	Florida Statewide Agricultural Irrigation Demand
FWC	Florida Fish and Wildlife Conservation Commission
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
gpd	Gallons Per Day
HB	House Bill
IV	Implementation Verification
in/yr	Inch Per Year
lbs	Pounds
lbs/yr	Pounds Per Year
lbs-N/yr	Pounds of Nitrogen Per Year
LVS	Linear Vegetation Survey
LW	Livestock Waste
MFLs	Minimum Flows and Levels
mgd	Million Gallons Per Day
mg/L	Milligrams Per Liter

MS4	Municipal Separate Storm Sewer System
N	Nitrogen
NA	Not Applicable
NADP	National Atmospheric Deposition Program
NELAC	National Laboratory Environmental Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NHD	National Hydrography Database
NMP	Nutrient Management Plan
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
PFA	Priority Focus Area
PSA	Public Service Announcement
QA/QC	Quality Assurance/Quality Control
RAP	Reasonable Assurance Plan
RIB	Rapid Infiltration Basin
RPS	Rapid Periphyton Survey
RRLA	Rapid Rate Land Application
RSF	Regional Stormwater Facility
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
SSURGO	National Cooperative Soil Survey Geographic Database
STF	Sports Turf Fertilizer
STORET	Florida Storage and Retrieval Database
SWIM	Surface Water Improvement and Management
SWMP	Stormwater Management Program
TBD	To Be Determined
TDEP	Total Atmospheric Deposition Model
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UFA	Upper Floridan aquifer
UF-IFAS	University of Florida-Institute of Food and Agricultural Sciences

USGS	U.S. Geological Survey
UTF	Urban Turfgrass Fertilizer
WBID	Waterbody Identification (Number)
WIN	Florida Watershed Information Network Database
WMD	Water Management District
WWTF	Wastewater Treatment Facility

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. 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. The Homosassa and Chassahowitzka Springs Groups are two of the impaired first magnitude OFS.

This Homosassa and Chassahowitzka basin management action plan (BMAP) comprises 340,609 acres located in southern Citrus County, including the City of Inverness, and northern Hernando County, including a portion of the City of Brooksville. The BMAP area (**Figure ES-1**) contains both the Homosassa Spring Group, comprised of numerous springs that are the source waters for the Homosassa River, and the Chassahowitzka Spring Group, comprised of six springs that make up the headwaters of the Chassahowitzka River (an impaired Outstanding Florida Water [OFW]), that discharges into the coast.

Homosassa and Chassahowitzka Springs Groups Priority Focus Area (PFA)

The PFA (**see Appendix D**) comprises 77,732 acres and includes a region in the western part of the Homosassa Springshed (36,961 acres) and Chassahowitzka Springshed (40,771 acres) that are subareas within the BMAP boundary. The PFA represents the area in the basin where the aquifer is most vulnerable to inputs and where there are the most connections between groundwater and the springs.

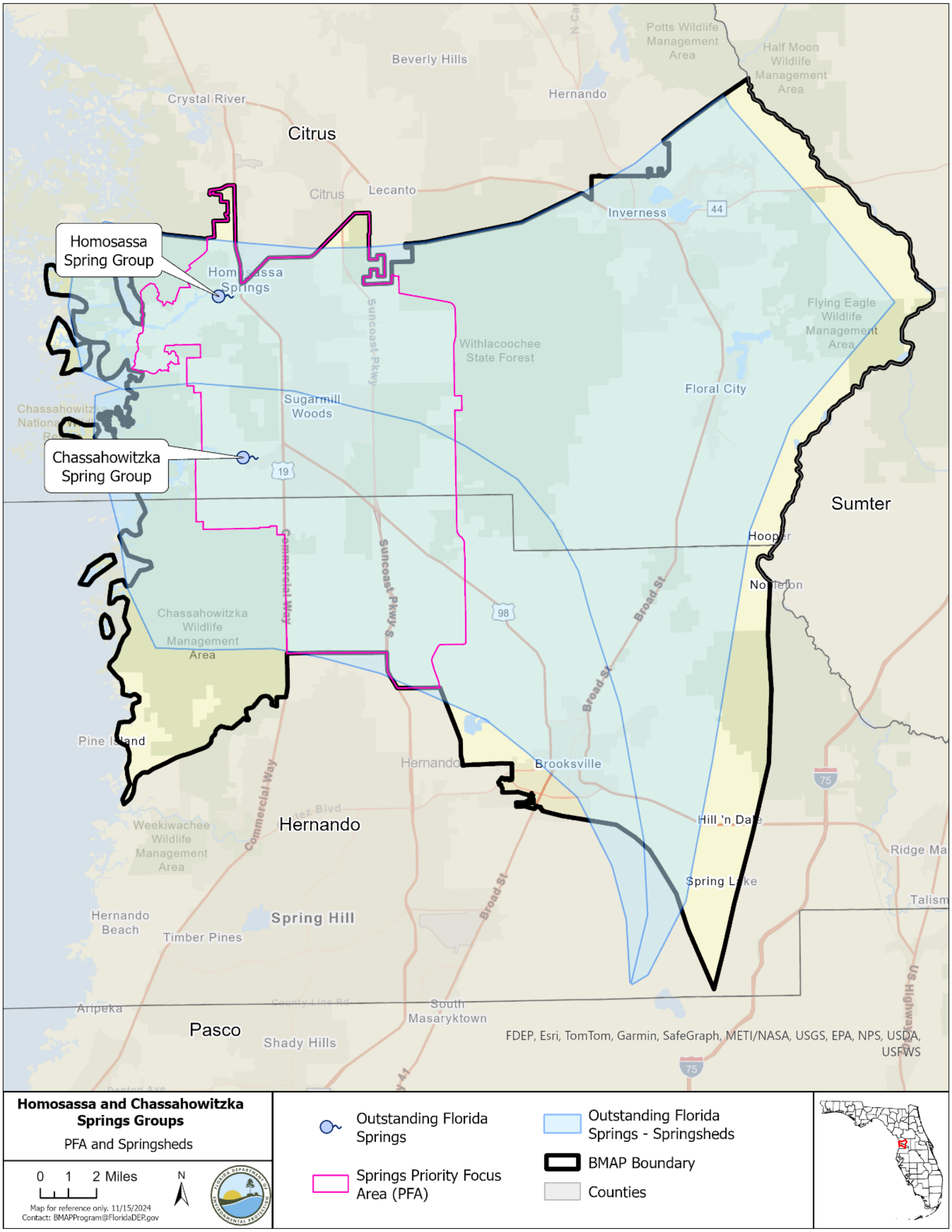

Figure ES-1. Homosassa and Chassahowitzka Springs Groups BMAP and PFA boundaries

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

Homosassa and Chassahowitzka Springs Groups was identified as impaired because of a biological imbalance caused by excessive concentrations of nitrate in the water. DEP adopted nutrient total maximum daily loads (TMDLs) for the Homosassa Spring Group, Chassahowitzka Spring Group, and Chassahowitzka River-Baird Creek in 2014. The TMDLs established a monthly average nitrate target of 0.23 milligrams per liter (mg/L) for Homosassa Spring Group and Chassahowitzka Spring Group and a total nitrogen (TN) water quality target of 0.25 mg/L for Chassahowitzka River-Baird Creek.

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 14% of the nitrogen loading to groundwater within the BMAP boundary, onsite sewage treatment and disposal systems (OSTDS or septic systems) 32%, and agricultural sources (including farm fertilizer and livestock waste) 34% of the total loading to groundwater based on the DEP analysis conducted using the NSILT.

To achieve the TMDL target at the spring vents, the total load reduction required is 587,090 pounds of nitrogen per year (lbs-N/yr) – 379,746 lbs-N/yr in Homosassa and 207,344 lbs-N/yr in Chassahowitzka. The following milestones are being established to measure progress towards achieving the total necessary load reduction of 587,090 pounds (lbs):

- 2028 - Reduction of 176,127 lbs-N/yr (30%).
- 2033 - Additional reduction of 293,545 lbs-N/yr (50%).
- 2038 - Additional reduction of 117,418 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 vent 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 or expanding the area to which the existing OSTDS remediation policies apply and any such change would be incorporated into a future updated BMAP through a formal adoption process.

Cost estimates were provided by stakeholders for more than 50% of the projects and management actions listed in the BMAP. For the projects where estimates were provided, the total estimated cost exceeds $149 million. Of the total estimated cost, approximately $37 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 Homosassa and Chassahowitzka Basin, including 12,372 pounds of total nitrogen (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 vent. To ensure that load reductions are achieved at the spring vent, 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 vent and ultimately achieve the TMDL target. Monitoring at the spring vent 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 PFAs 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**), within the PFA, any OSTDS on lots of all sizes that requires a permit to modify or replace an existing system pursuant to Chapter 62-6, Florida Administrative Code (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 better 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, 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 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. The Homosassa and Chassahowitzka Springs Groups are two of the impaired first magnitude OFS. Development of the BMAP to meet the requirements of the Florida Springs and Aquifer Protection Act for the Homosassa and Chassahowitzka Springs Groups 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. The waters of the Homosassa and Chassahowitzka Springs Groups that are addressed in this BMAP are Class III waterbodies with a designated use of recreation, propagation, and the maintenance of a healthy, well-balanced population of fish and wildlife. 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 the Homosassa and Chassahowitzka Springs Groups and Chassahowitzka River in 2014. The TMDLs (**Table 1)** established a target of an annual average of 0.23 milligrams per liter (mg/L) of nitrate for the Homosassa and Chassahowitzka Springs Groups; a target of an annual average of 0.25 mg/L of TN for Chassahowitzka River-Baird Creek. The period of record for water quality data evaluated for the TMDLs was January 2004 through December 2013.

Table 1. Restoration targets for Homosassa and Chassahowitzka Springs Groups and Chassahowitzka River

Waterbody or Spring Name	Waterbody Identification (WBID) Number	Parameter	TMDL (mg/L)
Homosassa #1 Spring	1345G	Nitrate, annual average	0.23
Homosassa #2 Spring	1345G	Nitrate, annual average	0.23
Homosassa #3 Spring	1345G	Nitrate, annual average	0.23
Pumphouse Springs	1345G	Nitrate, annual average	0.23

Waterbody or Spring Name	Waterbody Identification (WBID) Number	Parameter	TMDL (mg/L)
Trotter Springs	1345G	Nitrate, annual average	0.23
Bluebird Springs	1348A	Nitrate, annual average	0.23
Hidden River Main Spring	1348E	Nitrate, annual average	0.23
Hidden River #2 Spring	1348E	Nitrate, annual average	0.23
Chassahowitzka Main Spring	1348Z	Nitrate, annual average	0.23
Chassahowitzka #1 Spring	1348Z	Nitrate, annual average	0.23
Crab Creek Spring	1348Z	Nitrate, annual average	0.23
Baird #1 Spring	1348D	Nitrate, annual average	0.23
Ruth Spring	1348D	Nitrate, annual average	0.23
Beteejay Spring	1361B	Nitrate, annual average	0.23
Chassahowitzka River-Baird Creek	1348D	TN, annual average	0.25

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 BMAP area (see **Figure 1)** comprises 340,609 acres located in southern Citrus County, including the City of Inverness, and northern Hernando County, including a portion of the City of Brooksville. The BMAP area contains both the Homosassa Spring Group, comprised of numerous springs that are the source waters for the Homosassa River, and the Chassahowitzka Spring Group, comprised of six springs that make up the headwaters of the Chassahowitzka River (an impaired Outstanding Florida Water), that discharges into the coast.

This area includes the surface water basin as well as the groundwater contributing areas for the springs (or springsheds). Springsheds for the OFS were delineated or reviewed by Southwest Florida Water Management District (SWFWMD) with input from the Florida Geological Survey

(FGS). A springshed is the area of land that contributes water to a spring or group of springs, mainly via groundwater flow.

1.5 Priority Focus Area (PFA)

In compliance with the Florida Springs and Aquifer Protection Act, the 2018 BMAP delineated a PFA, defined as the area 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 PFA provides a guide for focusing restoration strategies where science suggests these efforts will most benefit the springs. The document describing the delineation process for the PFA is on the DEP website (link is provided in **Appendix D)**.

1.5.1 Description

Nitrogen sources are more likely to influence groundwater quality under certain conditions. For example, where soils are sandy and well drained, less nitrogen is converted to gas and released into the atmosphere or taken up by plants, compared with other soil types. Therefore, local soil types play a role in how much nitrogen travels from the land surface to groundwater in a specific springshed. Also, the underlying geologic material influences the vulnerability of the underlying aquifers and the rate of lateral movement within the Floridan aquifer toward the springs. These conditions, and others, were considered in the delineation of the PFA (see **Appendix D**). The geographic information system (GIS) files associated with the PFA boundary are available to the public on the DEP Map Direct webpage.

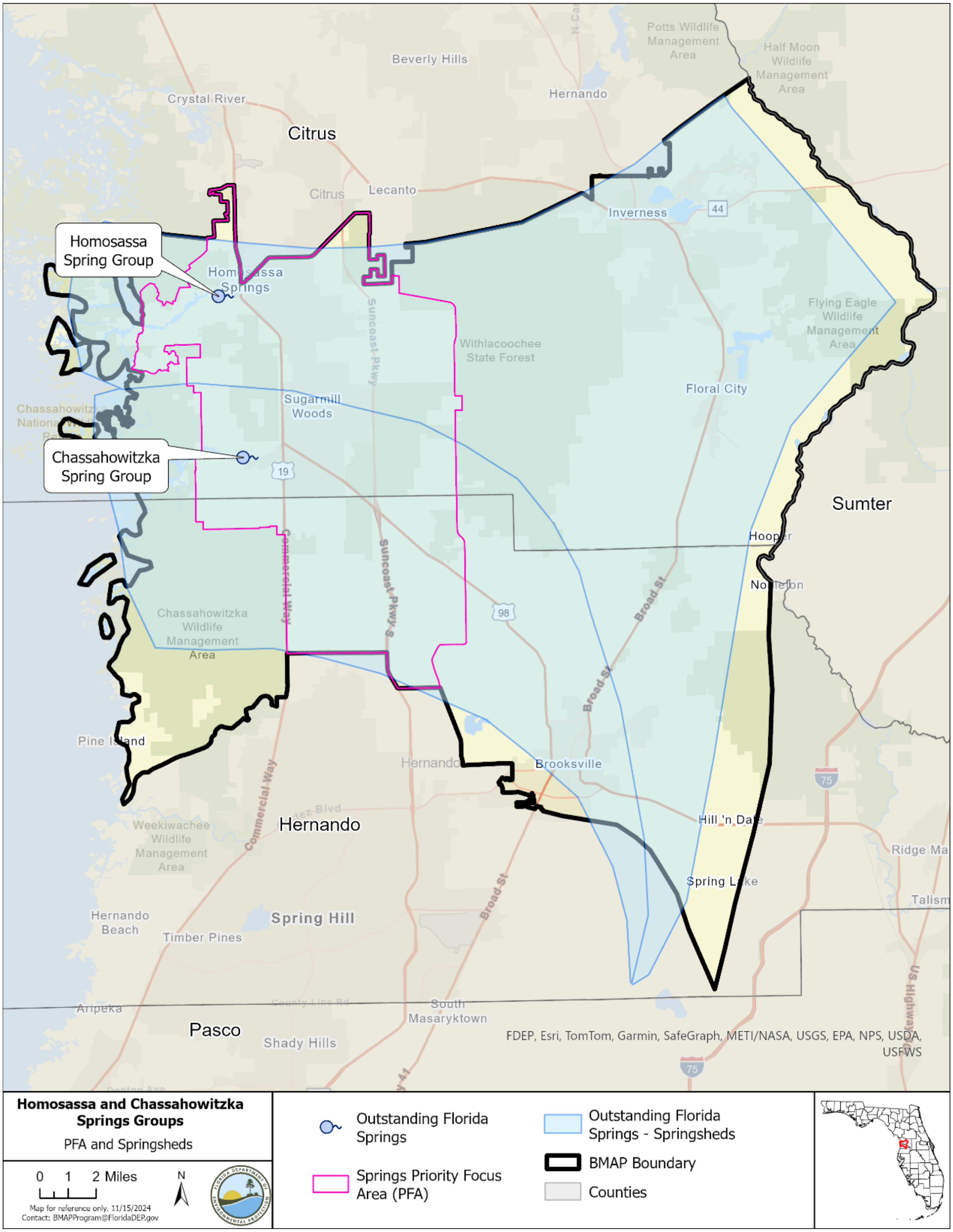

Figure 1. Homosassa and Chassahowitzka Springs Groups BMAP and PFA boundaries

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 gallons per day (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 contamination by 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 Homosassa and Chassahowitzka 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 Homosassa and Chassahowitzka 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 November 7, 2024, in Brooksville, 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 17, 2025, that was noticed in the F.A.R. and in local newspapers.

In addition to public meetings, DEP held several 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 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 TMDL

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:

- Low recharge (Less than 4 inches per year [in/yr]
- Medium recharge (4 to 10 in/yr).
- High recharge (greater than 10 in/yr).

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 TMDL is implemented.

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

Nitrogen Source	Homosassa Total Nitrogen Load to Groundwater in Pounds of Total Nitrogen Per Year (lbs/yr)	% Contribution	Chassahowitzka Total Nitrogen Load to Groundwater in Pounds of Total Nitrogen Per Year (lbs/yr)	% Contribution
OSTDS	215,178	37%	81,452	24%
UTF	90,284	15%	44,183	13%
Atmospheric Deposition	70,808	12%	43,944	13%
FF	108,876	19%	56,274	16%
STF	1,514	<1%	878	<1%
STF – Golf	12,135	2%	24,300	7%
LW	81,994	14%	66,674	19%
Biosolids	0	0%	9,043	3%
WWTFs	3,382	1%	17,972	5%
Total	**584,121**	**100%**	**344,719**	**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 (2.25 for Citrus County and 2.46 for Hernando 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 PFA provides a guide for focusing strategies where science suggests efforts will best benefit the springs. The PFA boundary 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, 2014.

    - 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.

        - Citrus County: 2023

        - Hernando 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 TMDL 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 TMDL.

- **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 2**, **Figure 3** and **Figure 4** depict the estimated percentage of nitrogen loading to groundwater by source in each springshed and the BMAP area combined. For example, urban turfgrass fertilizer (UTF) represents 14% of the nitrogen loading to groundwater, onsite sewage treatment and disposal systems (OSTDS or septic systems) 32%, and agricultural sources (including farm fertilizer and livestock waste) 34% of the total loading to groundwater in the BMAP area (combined springsheds). Stormwater loading to groundwater is incorporated into the various source categories.

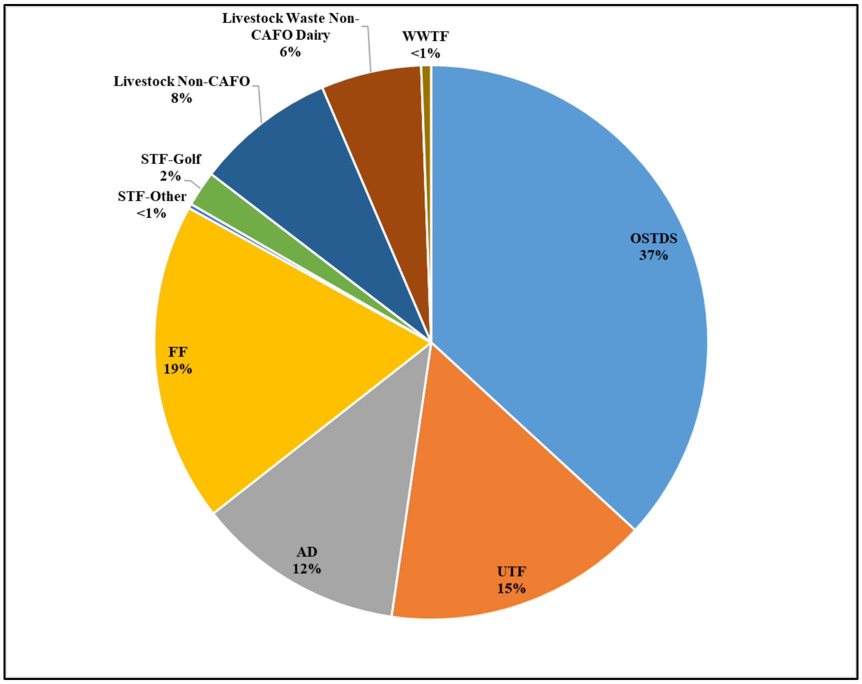

Figure 2. Loading to groundwater by source in the Homosassa Springshed BMAP area

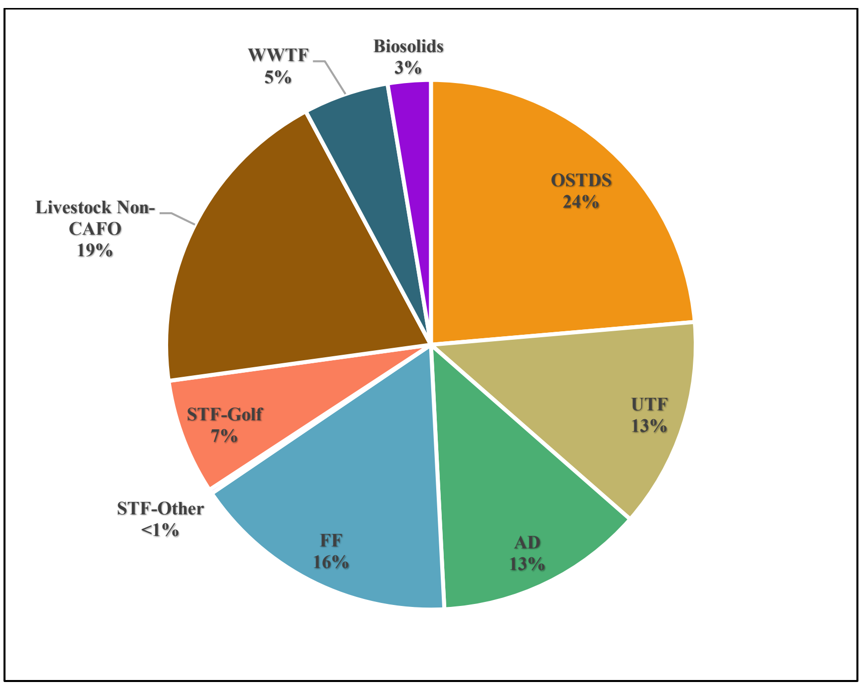

Figure 3. Loading to groundwater by source in the Chassahowitzka Springshed BMAP area

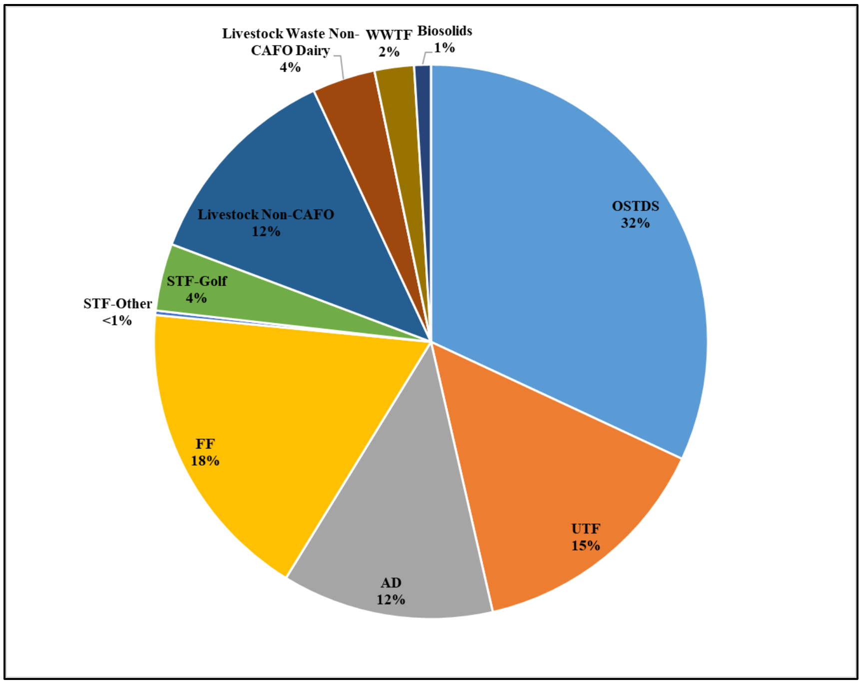

Figure 4. Loading to groundwater by source in the Homosassa and Chassahowitzka BMAP area (combined springsheds)

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 vent, 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 concentration of 0.23 mg/L. The difference between the spring vent loading and the TMDL loading target is the required percent reduction to meet the TMDL. The total required load reduction is allocated to sources and to entities based on existing loads.

Table 4. Total reduction required to meet the TMDLs

Description	Homosassa Nitrogen Loads (lbs/yr)	Chassahowitzka Nitrogen Loads (lbs/yr)	Source
Total Load at Spring Vents	271,301	207,128	Upper 95% confidence interval – nitrate and flow data 2012 to 2022
TMDL Load	94,924	82,543	TMDL targets of 0.23 mg/L and using the same flow data and proportions
Percent Reduction	65%	60%	Calculated reduction needed based on the total load at the spring vent and the TMDL load
NSILT Load	584,121	344,719	Total load to groundwater from the updated NSILT
Required Reductions	**379,746**	**207,344**	**Percent Reduction Multiplied by the NSILT Load**

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 TMDL 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 vent 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)

Basin	2028 Milestone (30% of Total)	2033 Milestone (+50% of Total)	2038 Milestone (+20% of Total)	Total Nitrogen Reduction (100%)
Homosassa	113,924	189,873	75,949	379,746
Chassahowitzka	62,203	103,672	41,469	207,344
BMAP Area	176,127	293,545	117,418	587,090

2.2 Load Reduction Strategy

A precise total load reduction to groundwater needed to meet the TMDL 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 total reduction of at least 587,090 lbs/yr TN in the BMAP area (combined springsheds) by 2038 to achieve the TMDL. However, due to the distance of some reductions in relation to the spring vent 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 vent is reduced to achieve the TMDL target within the timeline of the BMAP.

To increase our understanding of the relationship between project reductions and changes in concentrations at the spring vent, as well as the time lag of water movement within the springshed to the spring, water quality monitoring of existing groundwater within the BMAP and at the spring vent 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** and **Table 7** summarize the total required reductions assigned to each entity by spring group. Note that some entities may have assigned reductions in more than one springshed. Regional projects are state-sponsored management actions that treat nutrient loading from one or many urban sources. Agriculture in **Table 6** through **Table 11** 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 privately owned WWTFs can be found in **Appendix J**.

Table 6. Total required reductions by entity in the Chassahowitzka Spring Group

*Total excludes reductions of atmospheric deposition.

Entity	Total Assigned Reductions by Entity (lbs/yr)
Citrus County	17,678
City of Brooksville	6,244
Hernando County	62,531
Agriculture	79,829
Private WWTFs	880
Private Golf Courses	14,579
Total, All Reductions	**181,741***

Table 7. Total required reductions by entity in the Homosassa Spring Group

*Total excludes reductions of atmospheric deposition.

Entity	Total Assigned Reductions by Entity (lbs/yr)
Citrus County	171,775
City of Inverness	11,320
Hernando County	16,745
Agriculture	124,055
Private WWTFs	1,057
Private Golf Courses	7,888
Regional Projects	874
Total, All Reductions	**333,713***

Table 8 and **Table 9** include the 5-year milestone required reductions for each entity by spring group. **Table 10** and **Table 11** compare the current list of planned, underway, and completed

projects to the first 5-year milestone by spring group. 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 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 8. 5-year milestone required reductions by entity in the Chassahowitzka Spring Group

Entity	2028 Milestone Assigned Reductions (30%) (lbs/yr)	2033 Milestone Assigned Reductions (80%) (lbs/yr)	2038 Milestone Assigned Reductions (100%) (lbs/yr)
Citrus County	5,303	14,142	17,678
City of Brooksville	1,873	4,995	6,244
Hernando County	18,759	50,024	62,531
Agriculture	23,949	63,864	79,829
Private WWTFs	264	704	880
Private Golf Courses	4,374	11,663	14,579
Total, All Reductions	**54,522**	**145,392**	**181,741**

Table 9. 5-year milestone required reductions by entity in the Homosassa Spring Group

Entity	2028 Milestone Assigned Reductions (30%) (lbs/yr)	2033 Milestone Assigned Reductions (80%) (lbs/yr)	2038 Milestone Assigned Reductions (100%) (lbs/yr)
Citrus County	51,532	137,420	171,775

Entity	2028 Milestone Assigned Reductions (30%) (lbs/yr)	2033 Milestone Assigned Reductions (80%) (lbs/yr)	2038 Milestone Assigned Reductions (100%) (lbs/yr)
City of Inverness	3,396	9,056	11,320
Hernando County	5,023	13,396	16,745
Agriculture	37,217	99,244	124,055
Private WWTFs	317	845	1,057
Private Golf Courses	2,366	6,310	7,888
Regional Projects	262	699	874
Total, All Reductions	**100,114**	**266,970**	**333,713**

Table 10. Progress towards next 5-year milestone by entity in the Chassahowitzka Spring Group

** 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)
Citrus County	5,303	434	0	434	4,869
City of Brooksville	1,873	486	0	486	1,387
Hernando County	18,759	1,641	0	1,641	17,118
Agriculture+	23,949	4,031	0	4,031	19,918
Private WWTFs	264	0	0	0	264
Private Golf Courses	4,374	0	0	0	4,374
Total, All Reductions	**54,522**	**6,592**	**0**	**6,592**	

Table 11. Progress towards next 5-year milestone by entity in the Homosassa Spring Group

** 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)
Citrus County	51,532	3,167	4,198	7,365	44,167
City of Inverness	3,396	618	8,174	8,792	0
Hernando County	5,023	380	0	380	4,643
Agriculture+	37,217	25,434	0	25,434	11,783
Private WWTFs	317	0	0	0	317

Private Golf Courses	2,366	0	0	0	2,366
Regional Projects	262	9	0	9	253
Total, All Reductions	**100,114**	**29,608**	**12,372**	**41,980**	

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 any 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 within the PFA or on lots of one acre or less outside the PFA, 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 F) was updated in this BMAP iteration to include this additional requirement for new systems.

2.5.2 Existing OSTDS Remediation

Existing OSTDS in the PFA 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 Homosassa and Chassahowitzka NSILT update, OSTDS contribute 37% (215,178 lbs/yr) pollutant loading in the Homosassa springshed, 24% (81,452 lbs/yr) in the Chassahowitzka springshed and 32% (296,631 lbs/yr) in the BMAP area (combined springsheds). Cumulatively, nitrogen loading from OSTDS within this springshed results in degradation of groundwater that impacts the Homosassa and Chassahowitzka 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 TMDL and to minimize nitrogen loads from future growth. Existing OSTDS in the PFA 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 8,681 known and likely OSTDS in the PFA and approximately 21,610 known and likely OSTDS in the BMAP area (combined springsheds) (**Figure 5**). **Table E-1** in **Appendix E** summarizes the estimated count of OSTDS on all lots within the PFA. **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 PFA, 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 TMDL; 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 TMDL. 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 23-0130. 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 spring 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.

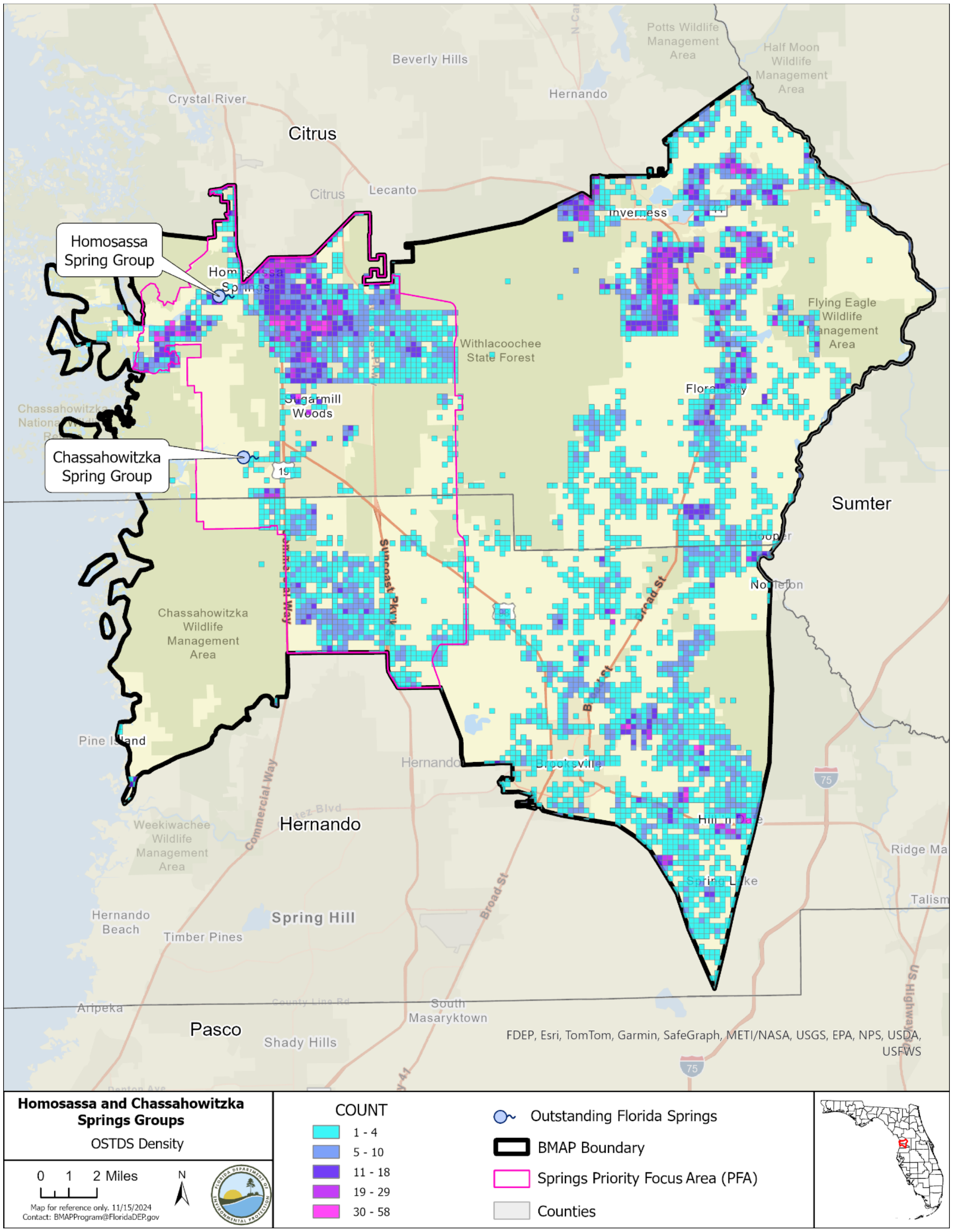

Figure 5. Estimated OSTDS location density in the Homosassa and Chassahowitzka BMAP area and PFA

2.6 WWTF Management Strategies

2.6.1 Facility Improvements and Effluent Limits

There are several WWTFs located in the Homosassa and Chassahowitzka BMAP area, including two domestic WWTFs permitted to discharge more than 100,000 gallons of treated effluent per day (or 0.1 million gallons per day [mgd]). **Figure 6** shows the locations of domestic WWTFs in the Homosassa and Chassahowitzka BMAP.

In the Homosassa and Chassahowitzka BMAP area, treated effluent containing nitrogen is discharged to sprayfields and RIBs, or is reused for irrigation water. The total nitrogen load from WWTFs is 21,353 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 wastes 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 12** 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. DEP will evaluate the need for more stringent nutrient effluent limits as appropriate.

Table 12. 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) (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

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 12**. 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 23-0130 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.

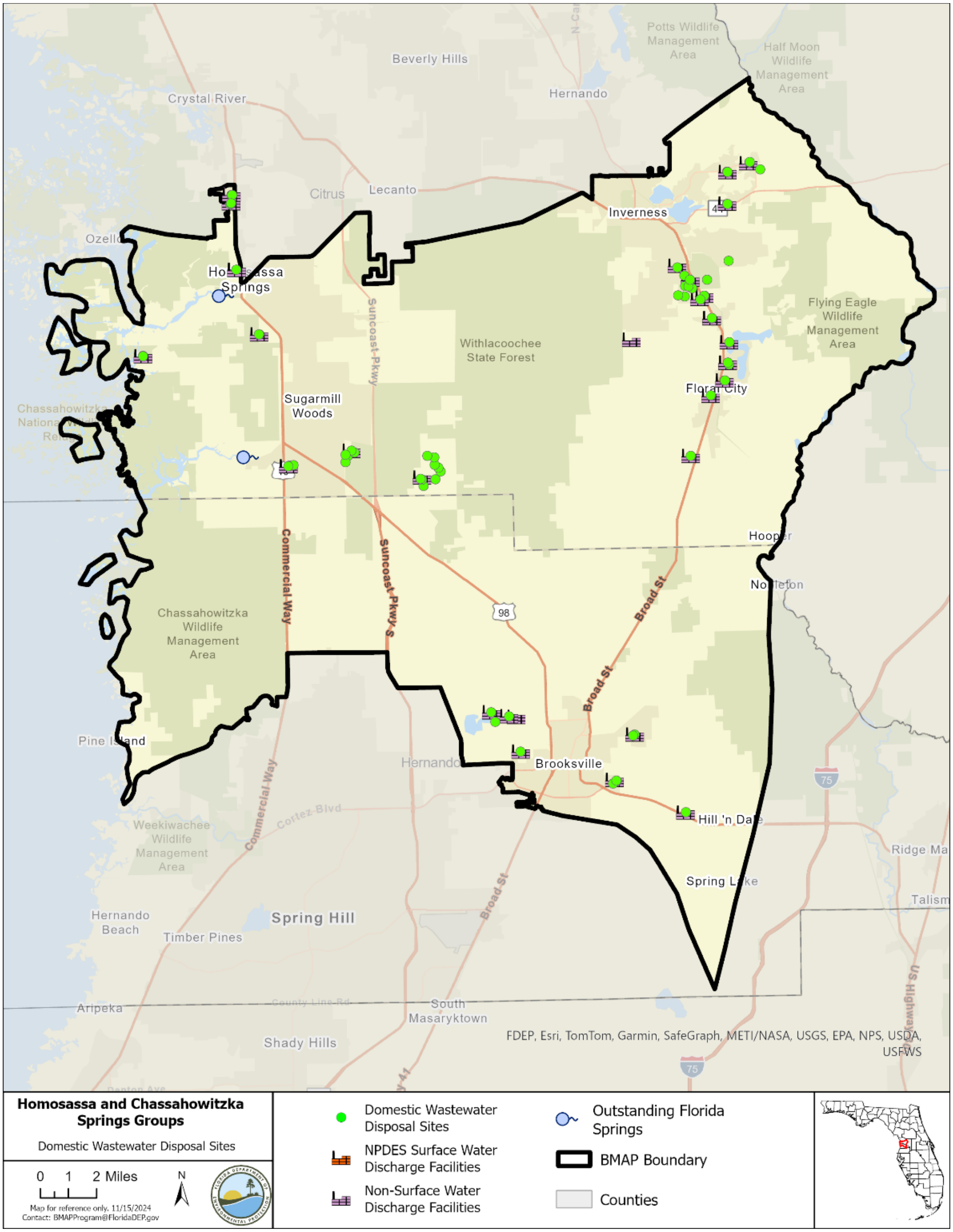

Figure 6. Locations of domestic WWTFs in the Homosassa and Chassahowitzka BMAP area

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 TMDL 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 Storm 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 Homosassa and Chassahowitzka BMAP area 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 four golf courses covering 471 acres in the Homosassa springshed area. The golf course acreage is primarily located in high recharge areas. There are three sports fields covering 48 acres in the Homosassa springshed area. The sports field acreage is primarily located in high recharge areas. There are four golf courses covering 1,011 acres in the Chassahowitzka springshed area. The golf course acreage is primarily located in high recharge areas. There are five sports fields covering 99 acres in the Chassahowitzka springshed area. The sports field acreage is primarily located in high recharge areas. 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 a certification for golf course BMPs (UF-IFAS Florida Golf Course 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.

2.9 Agricultural Sources Management Strategies

As presented in **Appendix H**, based on data including Florida Statewide Agricultural Irrigation Demand (FSAID) IX geodatabase land use, FDACS identified agricultural acreage within the BMAP. An estimated 39,047 acres of land in the BMAP are considered agricultural based on FDACS' assessment.

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 165,150 lbs/yr TN, or 18% 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 148,618 lbs/yr TN, or 16% 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, the 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, NOIs covered 13,153 acres in the Homosassa and Chassahowitzka BMAP area (13,153 of 28,202 adjusted 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.

Currently, agricultural nonpoint sources contribute 34% of the TN nutrient sources in the Homosassa and Chassahowitzka 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 13** shows the three dominant crop types within the Homosassa and Chassahowitzka BMAP.

Table 13. Dominant crop types in Homosassa and Chassahowitzka BMAP

Crop Type	Acres
Grazing Land	28,714
Cropland and/or Pastureland	2,792
Row Crops	1,239

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

FDACS will continue to work with key stakeholders in the Homosassa and Chassahowitzka 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 7**). 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.

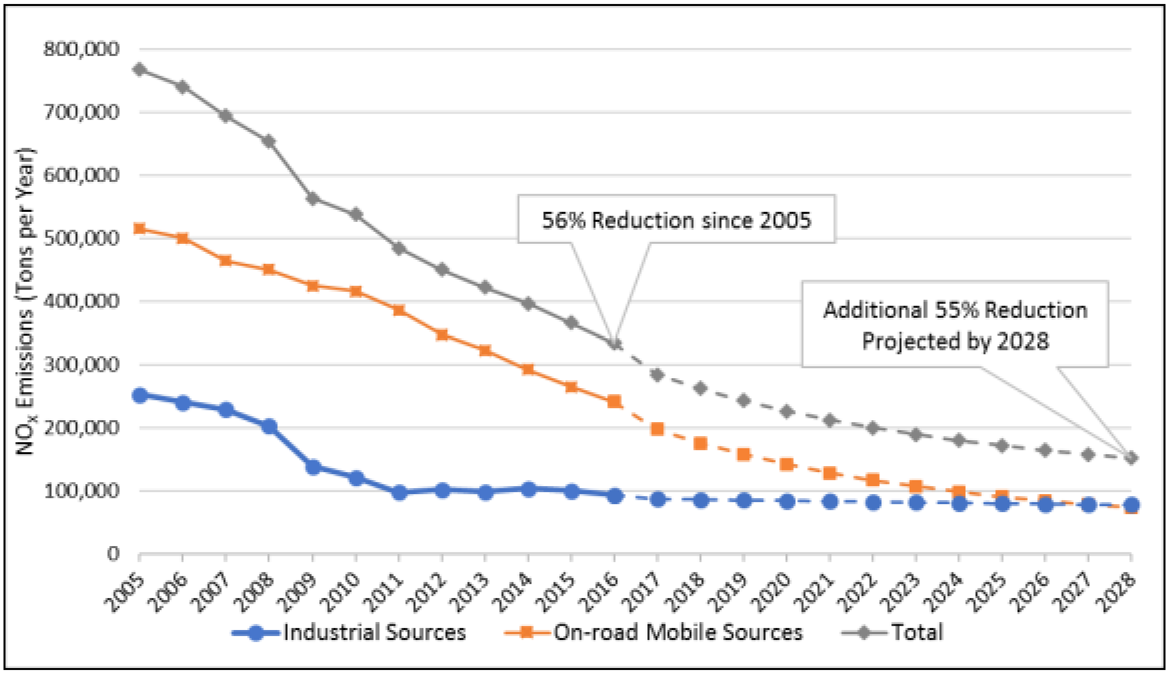

Figure 7. Florida NOx emissions for 2005 to 2016 and projected emission decreases for 2017 to 2028 from industrial and on-road mobile sources

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 addressed 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 an entity may receive new reduction requirements that will require additional restoration actions by the responsible entity to remediate impact.

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 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 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 14** 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 target is achieved and maintained.

Table 14. 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)
Inverness	469	260	628	7,257
Citrus County	9,522	5,409	20,640	163,069
Brooksville	829	333	729	7,913
Hernando County	13,540	9,510	36,303	178,007
Total	**24,360**	**15,513**	**58,300**	**356,245**

Scenario 1 resulted in an additional basin load of 15,513 lbs/yr TN. Scenario 3 resulted in an additional basin load of 356,245 lbs/yr TN. When compared to the results of the Homosassa and Chassahowitzka BMAP NSILT (928,840 lbs/yr TN), it is estimated that growth in the basin could result in a 2% to 38% 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 and the SWFWMD are available to agricultural producers within the Homosassa and Chassahowitzka 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 SWFWMD cost share program also provides outreach and funding for projects that provide nutrient and irrigation management benefits. FDACS and the SWFWMD 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, TMDL, and BMAP.
- Obtain reports from other basins where tools or other information may be applicable to the TMDL.

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

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.

Primary objectives:

- Measure the water quality and biological response in the impaired springs and groundwater at the beginning of the BMAP period and during implementation.
- Document nutrient trends in the Homosassa and Chassahowitzka Springs Groups Basin.

Secondary objectives:

- Identify areas where groundwater data and modeling might help in understanding the hydrodynamics of the system.
- Evaluate groundwater quality trends and nutrient loading to the aquifer across the basin.
- Confirm and refine nutrient removal efficiencies of agricultural and/or urban BMPs, projects and other management efforts.

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 vent and in the groundwater: core and supplemental (**Table 15** and **Table 16,** 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 vent. The other parameters are considered supplementary parameters for the BMAP, as they build information about groundwater and the spring 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 TMDL 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 15. Core water quality indicators and field parameters for spring vent and groundwater

Core Parameters
TN
Total Kjeldahl Nitrogen
Nitrate as Nitrogen
Orthophosphate as Phosphorus
Total Phosphorus (TP)

Table 16. Supplemental water quality indicators and field parameters for spring vent and groundwater

Supplemental Parameters
Specific Conductance
Dissolved Oxygen (DO)
pH
Temperature
Total Suspended Solids (TSS)
Total Dissolved Solids (TDS)
Turbidity
Chloride
Color
Ammonia (as N)
Total Organic Carbon
Calcium

Supplemental Parameters
Magnesium
Sodium
Potassium
Sulfate
Fluoride
Alkalinity

Surface water and groundwater monitoring network locations were selected to track changes in water quality and allow the annual evaluation of progress toward achieving the TMDL. **Figure 8** shows the locations of the river and spring stations currently being sampled that will be used for the BMAP monitoring in the Homosassa and Chassahowitzka BMAP. Station locations for the monitoring networks will be reviewed and modified as needed.

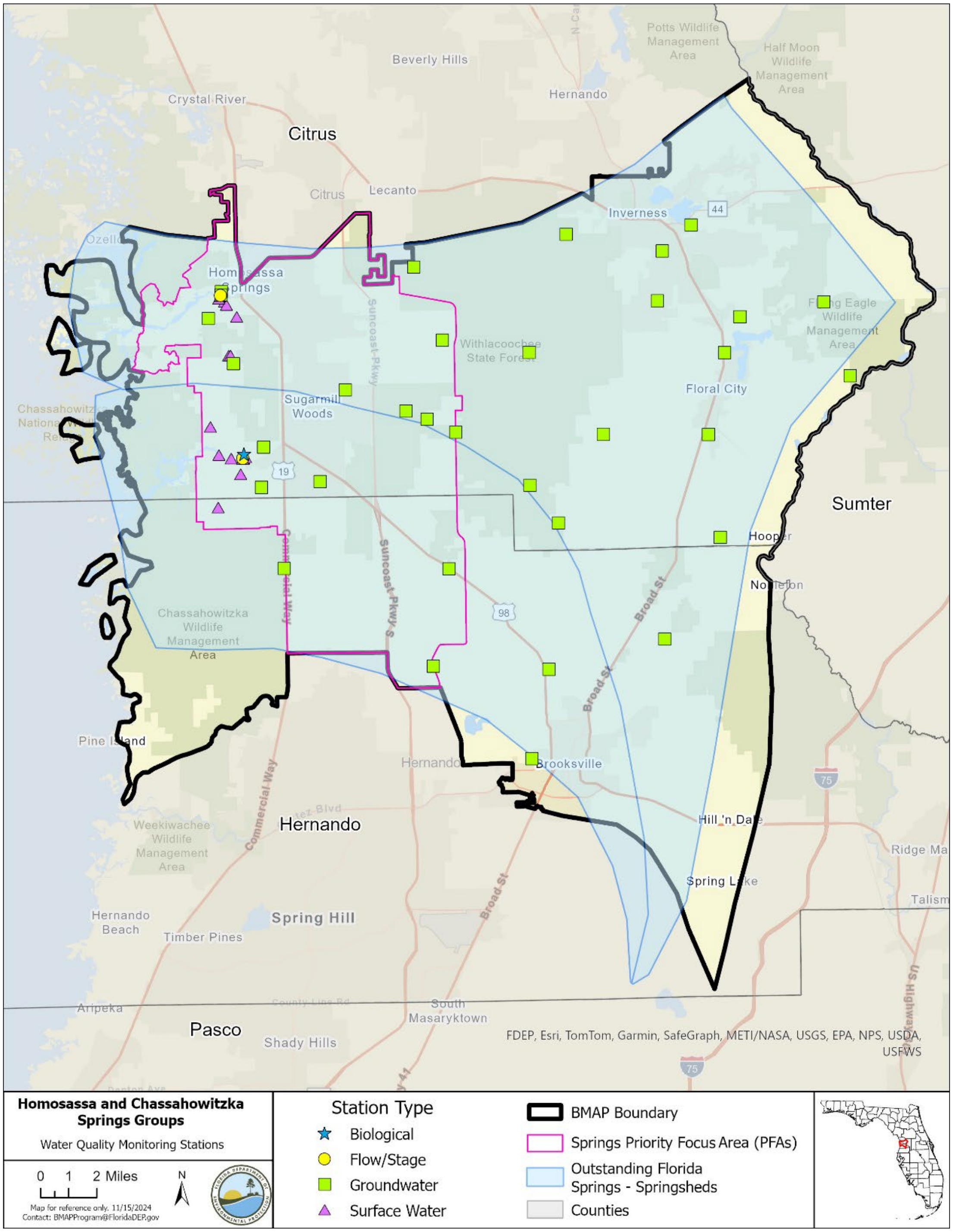

Figure 8. Water quality monitoring stations in the Homosassa and Chassahowitzka BMAP

3.3.3 Nutrient Monitoring

Water quality is monitored to evaluate progress towards achieving the TMDL target of 0.23 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 vent 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 and 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 vent due to transport time to the spring vent.

3.3.3.1 Spring Sampling

Eight springs within the Homosassa Spring Group were evaluated for water quality. Trotter Spring is sampled monthly, Homosassa Springs 1, 2 and 3 are sampled bi-monthly, Pumphouse Spring, Hidden River Head Spring, Hidden River Spring 2, and Halls River Head Spring are sampled quarterly by the SWFWMD. Discharge is evaluated at four locations continuously by USGS monitors. **Figure 9** displays the nitrate plus nitrite concentrations at the spring vent stations for the Homosassa Springs Group.

Six springs within the Chassahowitzka Spring Group were evaluated for water quality. Chassahowitzka Head Spring, Chassahowitzka Spring 1, Ruth Spring, Beteejay Spring, Baird Spring, and Crab Creek Spring are sampled quarterly by the SWFWMD. Discharge is evaluated continuously by a USGS monitor. **Figure 10** displays the nitrate plus nitrite concentrations at the spring vent stations for the Chassahowitzka Springs Group.

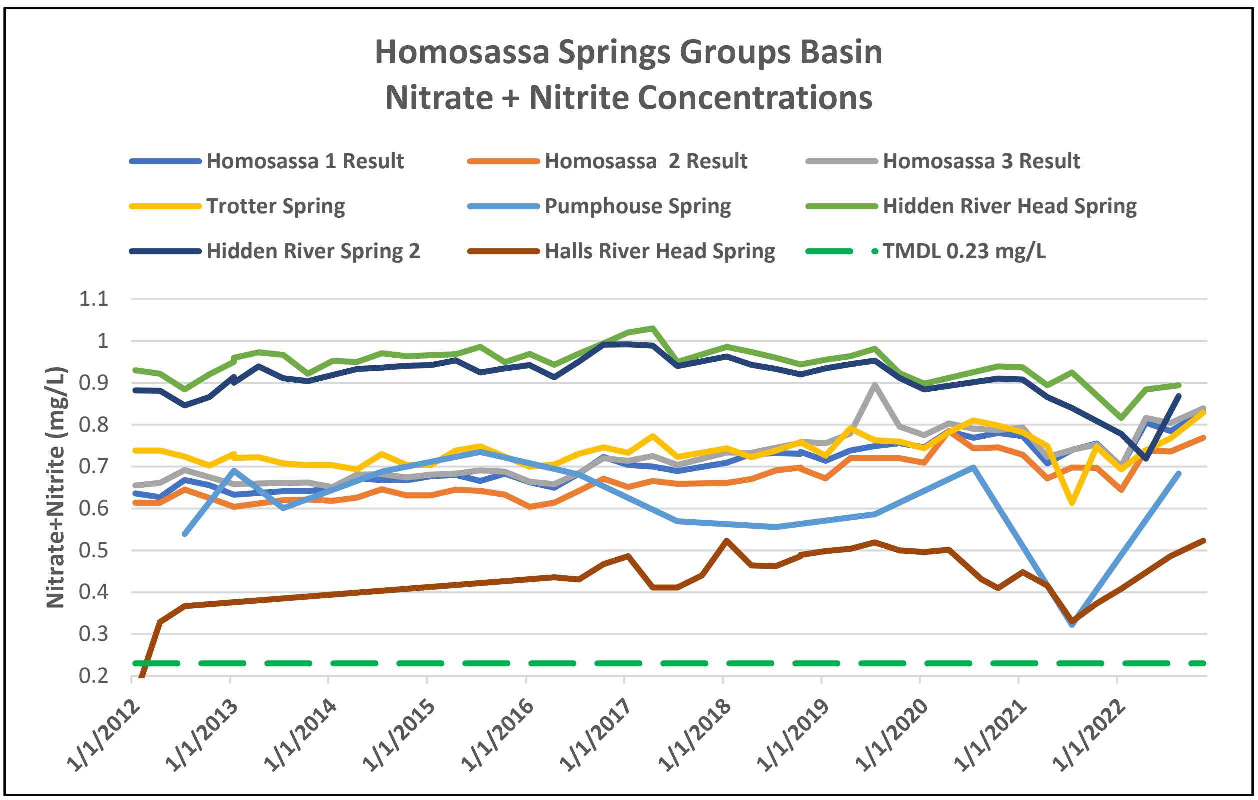

Figure 9. Nitrate plus nitrite concentration over time in the Homosassa Springshed

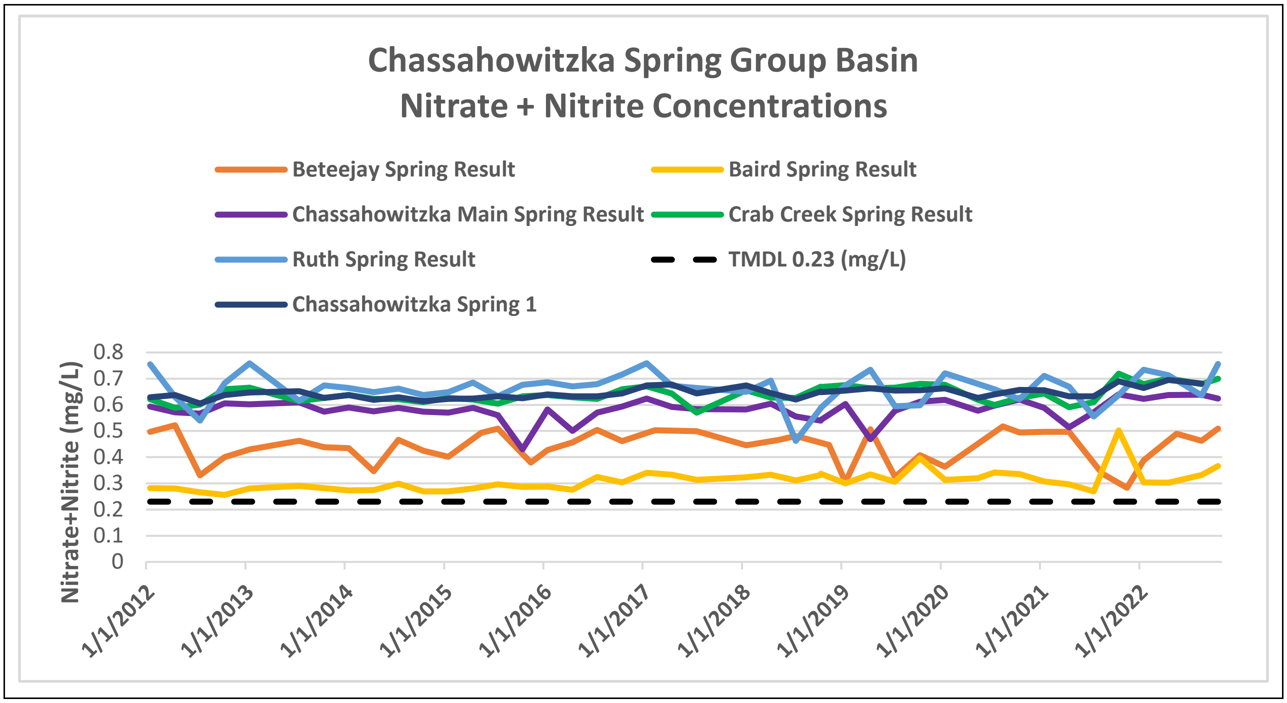

Figure 10. Nitrate plus nitrite concentration over time in the Chassahowitzka Springshed

3.3.3.2 Groundwater Results and Discussion

Data from groundwater monitoring wells were obtained from DEP's Water Information Network (WIN) database 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. Available data was evaluated in order 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 analyses because comparisons between time periods represent changes in the same set of wells. In the Homosassa and Chassahowitzka Basin, there were 36 fixed well stations and 12 sporadic well stations sampled within the period of record.

Groundwater data are 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, a grand median of the annual median nitrate concentrations from each well was used for the visual analysis for each time period evaluated.

A box plot was generated for the Homosassa and Chassahowitzka Basin as seen in **Figure 11** below. To create the box plot, the period of record was divided into early (2017 to 2020) and late (2021 to 2024) subperiods. For the 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 Homosassa and Chassahowitzka Basin, the 36 fixed sampling stations were evaluated to develop 118 median sample results for the early period and 87 median sample results for the late period. The overall grand median value for the early period is 0.34 mg/L and the overall grand median value for the late period is 0.33 mg/L.

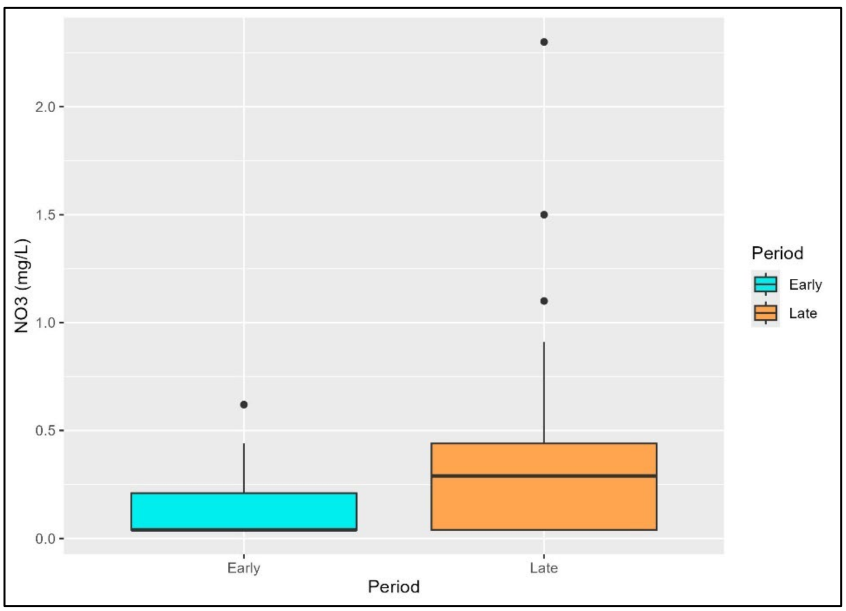

Figure 11. Homosassa and Chassahowitzka Basin groundwater nitrate concentrations of early and late periods with outliers

DEP is working to evaluate monitoring network for the Homosassa and Chassahowitzka Basin 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

Homosassa and Chassahowitzka BMAP area (see **Table 17**). DEP recommends that several types of biological monitoring be conducted to assess the health of the Homosassa and Chassahowitzka Springs Groups.

Table 17. 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 (RPS) score	Attached Algae (Periphyton)	DEP SOP FS 7230

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 spring.

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. 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 Homosassa and Chassahowitzka 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. DACS 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

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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: http://www.floridadep.gov
- DEP Map Direct Webpage: https://ca.dep.state.fl.us/mapdirect/
- DEP Watershed Assessment Section WBID boundaries: https://floridadep.gov/dear/watershed-assessment-section/content/basin-411-0
- PFA information: https://floridadep.gov/dear/water-quality-restoration/content/bmap-public-meetings
- 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
- 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/
- SWFWMD 2024 Surface Water Improvement and Management (SWIM) Plans https://www.swfwmd.state.fl.us/projects/swim
- SWFWMD Springs: https://www.swfwmd.state.fl.us/projects/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, 2014, and wastewater projects completed since January 1, 2022, and OSTDS projects completed since January 1, 2023, 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

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
4963	Citrus County	NA	CC-01	Public Education Activities	Fertilizer ordinance; implementation of FYN Program; and website, public service announcements, brochures, etc.	Education Efforts	Ongoing	NA	3,145	Homosassa Springshed-Inside PFA	$0	County	County - $0.00
7675	Citrus County	NA	CC-01a	Public Education Activities	Fertilizer ordinance; implementation of FYN Program; and website, public service announcements, brochures, etc.	Education Efforts	Ongoing	NA	434	Chassahowitzka Springshed-Inside PFA	$0	County	County - $0.00
4964	Citrus County	DEP	CC-02	Southwest Regional Water Reclamation Facility (SWRWRF)	1.5 MGD advanced wastewater treatment facility that will reduce nutrients in effluent and create disposal capacity for flow coming from septic system elimination.	WWTF Upgrade	Completed	2021	TBD	Chassahowitzka Springshed-Inside PFA	$23,000,000	County; DEP	County - $6,600,000.00; DEP - $16,400,000.00
4965	Citrus County	DEP	CC-03	Garcia Point Septic to Sewer Project	Connection of 68 residents to centralized sewer and elimination of septic tanks along the Homosassa River. Original credit of 2,174 lbs-TN/yr. Project was captured in the updated loading estimates.	OSTDS Phase Out	Completed	2020	0	Homosassa Springshed-Inside PFA	$1,250,000	County; DEP	County - $300,000.00; DEP - $950,000.00
4966	Citrus County	TBD	CC-04	Chassahowitzka to SWRWRF Force Main	New force main interconnection that will collect wastewater flows from the south side of the Homosassa River by redirecting flow from the Meadowcrest WWTP to the SWRWRF.	WWTF Upgrade	Completed	2021	TBD	Homosassa Springshed-Inside PFA	$1,200,000	TBD	TBD - $1,200,000.00
4967	Citrus County	SWFWMD; DEP	CC-05	Sugarmill Woods Residential Reclaimed Water	Distribute reclaimed water to the residential area of Oak Village in the Sugarmill Woods development.	WWTF Diversion to Reuse	Underway	2035	TBD	Chassahowitzka Springshed-Inside PFA	$12,000,000	DEP; SWFWMD; County	DEP - $4,000,000.00; SWFWMD - $2,000,000.00; County - $6,000,000.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
4968	Citrus County	TBD	CC-06	Sugarmill Woods Golf and Country Club Reclaimed Water Project	Reclaimed water line from the SWRWRF to the golf course for irrigation.	WWTF Diversion to Reuse	Completed	2021	TBD	Chassahowitzka Springshed-Inside PFA	$4,000,000	County; TBD	County - $2,000,000.00; TBD - $2,000,000.00
4969	Citrus County	TBD	CC-07	Septic to Sewer Conversion Study	Perform a study to identify the best options for converting existing lots with OSTDS and any non-municipal WWTFs within the study area to central collection.	Study	Completed	2021	NA	Basinwide	$200,000	County; TBD	County - $100,000.00; TBD - $100,000.00
4970	Citrus County	DEP; SWFWMD	CC-08	Homosassa South Fork Water Quality Improvement Phase I - Pond 2	Water quality treatment of stormwater runoff prior to entering Pepper Creek and the South Fork of the Homosassa River from the directly connected areas north of CR 490A.	BMP Treatment Train	Completed	2019	22	Homosassa Springshed-Inside PFA	$1,903,000	SWFWMD; County; DEP	SWFWMD - $1,000,000.00; County - $703,000.00; DEP - $200,000.00
4971	Citrus County	SWFWMD	CC-09	Cardinal Lane Watershed Management Plan	Complete alternative analysis tasks including a stormwater level of service analysis, surface water resource assessment, and BMP alternative analysis.	Study	Completed	2019	NA	Homosassa Springshed-Inside PFA	$200,000	County; SWFWMD	County - $100,000.00; SWFWMD - $100,000.00
4972	Citrus County	NA	CC-10	Floral City Collection System	Construct a sanitary gravity collector system along east Orange Ave and Old Floral City Road to connect facilities to central sewer.	Wastewater Service Area Expansion	Underway	2035	NA	Homosassa Springshed-Outside PFA	$1,200,000	County	County - $1,200,000.00
4973	Citrus County	NA	CC-11	Mason Creek Private Package Plant	Connect the private package plant to the county's central sewer.	Decommission/ Abandonment	Underway	2034	TBD	Homosassa Springshed-Inside PFA	$925,000	DEP	DEP - $925,000.00
4974	Citrus County	DEP; SWFWMD	CC-12	Homosassa Downtown West Septic to Sewer	Gravity sewer and force main to connect 122 residents and businesses to the SWRWRF; including septic system abandonment.	OSTDS Phase Out	Underway	2027	913	Homosassa Springshed-Inside PFA	$9,763,200	County; DEP; SWFWMD	County - $1,027,053.00; DEP - $2,054,105.00; SWFWMD - $1,027,053.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
4975	Citrus County	TBD	CC-13	Homosassa Downtown East Septic to Sewer	Gravity sewer and force main to connect 232 residents and businesses to the SWRWRF; including septic system abandonment. Entity has estimated reductions of 1,785.00 lbs TN/year.	OSTDS Phase Out	Underway	2028	1,736	Homosassa Springshed-Inside PFA	$16,191,000	County; DEP; SWFWMD	County - $0.00; DEP - $0.00; SWFWMD - $0.00
4976	Citrus County	TBD	CC-14	Homosassa Downtown North Septic to Sewer	Gravity sewer and force main to connect 129 residents and businesses to the SWRWRF; including septic system abandonment.	OSTDS Phase Out	Planned	2029	965	Homosassa Springshed-Inside PFA	$7,424,625	TBD	TBD - $7,424,625.00
4977	Citrus County	TBD	CC-15	Homosassa Park Septic to Sewer	Gravity sewer and force main to connect 89 residents and businesses to the SWRWRF; including septic system abandonment.	OSTDS Phase Out	Planned	2030	1,198	Homosassa Springshed-Inside PFA	$3,561,705	TBD	TBD - $3,561,705.00
4978	Citrus County	TBD	CC-16	Homosassa Rooks Septic to Sewer	Gravity sewer and force main to connect 163 residents and businesses to the SWRWRF; including septic system abandonment. Entity estimated reductions of 1,255.00 lb TN/yr.	OSTDS Phase Out	Planned	2031	1,219	Homosassa Springshed-Inside PFA	$5,607,305	TBD	TBD - $5,607,305.00
4979	Citrus County	TBD	CC-17	SWRWRF Dewatering Facility	Construct a sludge dewatering facility at the SWRWRF.	WWTF Upgrade	Planned	2035	TBD	Chassahowitzka Springshed-Inside PFA	$2,500,000	TBD	TBD - $2,500,000.00
4980	Citrus County	TBD	CC-18	Homosassa Retreats Septic to Sewer	Gravity sewer and force main to connect 104 residents and businesses to the SWRWRF; including septic system abandonment.	OSTDS Phase Out	Planned	2032	778	Homosassa Springshed-Inside PFA	$4,591,845	TBD	TBD - $4,591,845.00
4981	Citrus County	TBD	CC-19	Homosassa Cedars Septic to Sewer	Gravity sewer and force main to connect 23 residents and businesses to the SWRWRF; including decommissioning and abandonment of the existing	OSTDS Phase Out	Planned	2030	34	Homosassa Springshed-Inside PFA	$2,177,090	TBD	TBD - $2,177,090.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
					Cedar Lake MHP packaged WWTP and septic system abandonment.								
4982	Citrus County	TBD	CC-20	Mason Creek Septic to Sewer	Gravity sewer and force main to connect 160 residents and businesses to the SWRWRF; including septic system abandonment.	OSTDS Phase Out	Planned	2034	239	Homosassa Springshed-Inside PFA	$6,008,235	TBD	TBD - $6,008,235.00
4983	Citrus County	TBD	CC-21	Homosassa Phase 5 Septic to Sewer	Gravity sewer and force main to connect 115 residents and businesses to the SWRWRF; including septic system abandonment. Estimated reductions of 885.00 lbs TN/yr.	OSTDS Phase Out	Underway	2028	1,549	Homosassa Springshed-Inside PFA	$4,421,525	TBD	TBD - $4,421,525.00
5260	Citrus County	SWFWMD	CC-22	Homosassa River Watershed Management Plan	Complete water quality analysis and BMP alternative analysis.	Study	Completed	2022	NA	Homosassa Springshed-Inside PFA	$175,000	County; SWFWMD	County - $87,500.00; SWFWMD - $87,500.00
5261	Citrus County	SWFWMD	CC-23	Chassahowitzka River Watershed Management Plan	Complete study including new LiDAR acquisition, watershed evaluation, floodplain analysis and BMP alternative analysis.	Study	Underway	2024	NA	Chassahowitzka Springshed-Inside PFA	$925,000	SWFWMD; County	SWFWMD - $462,500.00; County - $462,500.00
5767	Citrus County	SWFWMD	CC-24	Lizzie Hart Sink Watershed Management Plan	Complete study including new LiDAR acquisition, watershed evaluation, floodplain analysis and BMP alternative analysis. Project updated to canceled in STAR year 2022.	Study	Canceled	NA	NA	Homosassa Springshed-Outside PFA	$0	County; SWFWMD	County - $237,500.00; SWFWMD - $237,500.00
4961	City of Brooksville	NA	COB-01	Public Education Activities	Adopt fertilizer ordinance in 2017; website, public service announcements, billing inserts, brochures, etc.	Education Efforts	Ongoing	NA	486	Chassahowitzka Springshed-Outside PFA	$0	City	City - $0.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
5258	City of Brooksville	NA	COB-02	Sewer Rehabilitation Phase IV	Sewer Rehabilitation Phase IV to correct structural defects and eliminate sanitary sewer overflows and backups caused by inflow and infiltration.	WWTF Upgrade	Underway	2024	NA	Chassahowitzka Springshed-Outside PFA	$3,600,000	DEP SRF	DEP SRF - $2,880,000.00
5259	City of Brooksville	NA	COB-03	Reclaimed Water to Cascades	Reclaimed water to Cascades residential development for irrigation.	WWTF Disposal Site	Completed	2023	NA	Basinwide	$240,000	DEP LF	DEP LF - $150,000.00
6460	City of Brooksville	NA	COB-04	Oxidation Ditch #2	To modify existing WWTF to process increased influent received. Includes construction of an Anoxic Basin and an additional Oxidation Ditch to existing.	WWTF Upgrade	Underway	2027	NA	Basinwide	$6,000,000	City	City - $0.00
4962	City of Inverness	NA	COI-01	Public Education Activities	Implementation of Florida Yards & Neighborhood (FYN) Program; and website, public service announcements, brochures, etc.	Education Efforts	Ongoing	NA	562	Homosassa Springshed-Outside PFA	$0	City of Inverness	City of Inverness - $0.00
5262	City of Inverness	NA	COI-02	Swale Stormwater Improvements	Swale reclamation.	Bioswales	Underway	2030	TBD	Homosassa Springshed-Outside PFA	$0	City of Inverness	City of Inverness - $0.00
5263	City of Inverness	NA	COI-03	Inverness Street Sweeping	Street cleaning gutters of debris before making it into the storm water system.	Street Sweeping	Ongoing	NA	56	Homosassa Springshed-Outside PFA	$0	City of Inverness	City of Inverness - $0.00
6753	City of Inverness	NA	COI-04	41 N Sewer Extension Project	The 41 North Sewer Expansion Project is located in the northern portion of the City of Inverness. This project will remove 67 OSTDS and is predicted to remove up to 576 lbs of TN.	OSTDS Phase Out	Underway	2025	902	Homosassa Springshed-Outside PFA	$4,804,800	DEP Springs; City of Inverness	DEP Springs - $3,264,800.00; City of Inverness - $1,540,000.00
6785	City of Inverness	NA	COI-05	South Highlands Septic Sewer Project	The total project area consists of 751 parcels of which 540 contain septic tanks. This is a residential area comprised of single family lots.	OSTDS Phase Out	Underway	2027	7,272	Homosassa Springshed-Outside PFA	$26,037,720	City of Inverness; DEP Springs	City of Inverness - $15,057,990.00; DEP Springs - $11,148,750.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
6791	City of Inverness	NA	COI-06	Cherry Avenue	Cherry Avenue, between West Main Street and Zephyr Street, predominantly consists of single-family homes, except for the north end which consists of commercial properties and the south end which includes modular homes. Flooding conditions.	Stormwater System Upgrade	Underway	2024	TBD	Homosassa Springshed-Outside PFA	$0	TBD	TBD - $0.00
7115	City of Inverness	NA	COI-07	DEP Swale Stormwater Improvements	Waiting on Stormwater report from VHB to identify specific project to utilize grant funding. The city will design and construct the selected stormwater BMP at the site that will provide the highest potential improvement to water quality.	Stormwater System Upgrade	Underway	2026	TBD	Homosassa Springshed-Outside PFA	$0	DEP	DEP - $450,000.00
5768	FDACS	Agricultural Producers	FDACS-01a	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	1,358	Chassahowitzka Springshed-Inside PFA	$0	FDACS	FDACS - $0.00
	FDACS	Agricultural Producers	FDACS-01b	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	3,746	Homosassa Springshed-Inside PFA	$0	FDACS	FDACS - $0.00
5769	FDACS	Agricultural Producers	FDACS-02a	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	Agricultural BMPs	Ongoing	NA	950	Chassahowitzka Springshed-Inside PFA	$0	FDACS	FDACS - $0.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
					Loading tool (based on FSAID IX) developed by FDACS.								
	FDACS	Agricultural Producers	FDACS-02b	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	1,991	Homosassa Springshed-Inside PFA	$0	FDACS	FDACS - $0.00
	FDACS	Agricultural Producers	FDACS-03a	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 FSAID IX) developed by FDACS.	Agricultural BMPs	Ongoing	NA	1,723	Chassahowitzka Springshed-Inside PFA	$0	FDACS	FDACS - $0.00
	FDACS	Agricultural Producers	FDACS-03b	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 FSAID IX) developed by FDACS.	Agricultural BMPs	Ongoing	NA	19,697	Homosassa Springshed-Inside PFA	$0	FDACS	FDACS - $0.00
4984	Hernando County	FDOT District 7	HC-01	Public Education Activities	Hernando County partnered with FDOT District 7 to provide public education on adopted fertilizer ordinance; pet waste ordinance; website, brochures, public service announcements, Adopt-A- Road, etc. The 5-year agreement allows $5-10,000/year for expenses.	Education Efforts	Ongoing	NA	380	Homosassa Springshed-Outside PFA	$50,000	FDOT District 7; County	FDOT District 7 - $25,000.00; County - $25,000.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
7676	Hernando County	FDOT District 7	HC-01a	Public Education Activities	Hernando County partnered with FDOT District 7 to provide public education on adopted fertilizer ordinance; pet waste ordinance; website, brochures, public service announcements, Adopt-A- Road, etc. The 5-year agreement allows $5-10,000/year for expenses.	Education Efforts	Ongoing	NA	1,489	Chassahowitzka Springshed-Outside PFA	$50,000	FDOT District 7; County	FDOT District 7 - $25,000.00; County - $25,000.00
4985	Hernando County	TBD	HC-02	BMAP Manager	Proposed position to be filled by a high level staff person to lead all aspects of BMAP implementation for Hernando County. This position will be responsible for intergovernmental coordination with agencies to fulfill BMAP requirements.	Study	Canceled	2031	NA	Basinwide	$150,000	TBD	TBD - $150,000.00
4986	Hernando County	SWFWMD	HC-03	Eastern Hernando Withlacoochee Watershed Resource Assessment and BMP Development Plan	Comprehensive engineering analysis, water quality assessment, watershed model development and conceptual BMP designs.	Study	Completed	2016	NA	Basinwide	$200,000	County; SWFWMD	County - $100,000.00; SWFWMD - $100,000.00
4987	Hernando County	SWFWMD	HC-04	Bystre Lake Resource Assessment and BMP Development Plan	Comprehensive engineering analysis, water quality assessment, watershed model development and conceptual BMP designs.	Study	Completed	2017	NA	Chassahowitzka Springshed-Outside PFA	$200,000	County; SWFWMD	County - $100,000.00; SWFWMD - $100,000.00
4988	Hernando County	SWFWMD	HC-05	Blue Sink Watershed Resource Assessment and BMP	Comprehensive engineering analysis, water quality assessment, watershed model development and conceptual BMP designs.	Study	Completed	2015	NA	Chassahowitzka Springshed-Outside PFA	$200,000	County; SWFWMD	County - $100,000.00; SWFWMD - $100,000.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
				Development Plan									
4989	Hernando County	SWFWMD	HC-06	Little Withlacoochee River Watershed Resource Assessment and BMP Development Plan	Comprehensive engineering analysis, water quality assessment, watershed model development and conceptual BMP designs.	Study	Completed	2015	NA	TBD	$100,000	County; SWFWMD	County - $50,000.00; SWFWMD - $50,000.00
4990	Hernando County	TBD	HC-07	Blue Sink Stormwater Quality Improvement Project	Construction of stormwater BMP treatment train providing water quality pre-treatment of surface discharges to Blue Sink using enhanced nitrogen removal technology.	BMP Treatment Train	Planned	2028	TBD	Homosassa Springshed-Outside PFA	$750,000	TBD	TBD - $0.00
4991	Hernando County	SWFWMD	HC-08	Reclaimed Water Master Plan Revision	Revision to current reclaimed water plan to identify future growth and needed interconnections. The increased use of reclaimed water will reduce fertilizer application.	Study	Completed	2018	NA	Basinwide	$150,000	SWFWMD; County	SWFWMD - $75,000.00; County - $75,000.00
4992	Hernando County	NA	HC-09	Countryside Estates	Package Plant Connection Project. Connect package plant at existing mobile home community to county sewer system via new force main and lift station.	WWTF Upgrade	Underway	2025	0	Homosassa Springshed-Outside PFA	$693,000	County	County - $1,001,300.00
5257	Hernando County	DEP	HC-10	Package Plant Connection Project	Connect two private wastewater package plants (Weeki Wachee N and Frontier Campground) to Glen Water Reclamation Facility (Hernando Co.) in Weeki.	WWTF Upgrade	Canceled	NA	NA	Chassahowitzka Springshed-Outside PFA	$0	NA	NA - $0.00
5771	Hernando County	NA	HC-12	Lemesa St. Stormwater Improvement	Construction of a stormwater pond providing water quality treatment and flood storage for	Dry Detention Pond	Completed	2021	1	Chassahowitzka Springshed-Outside PFA	$49,717	County	County - $50,000.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
					runoff from untreated existing residential area.								
6315	Hernando County	SWFWMD	HC-13	South Brooksville BMP 5 Dauson Stormwater Project	Construction of a stormwater pond providing water quality treatment and flood storage for runoff from untreated existing urban area. Previously listed in WEEK as HC-15 ProjID 5029.	Wet Detention Pond	Completed	2014	48	Chassahowitzka Springshed- Outside PFA	$498,625	SWFWMD; Hernando County	SWFWMD - $175,000.00; Hernando County - $323,625.00
6316	Hernando County	SWFWMD	HC-14	South Brooksville BMP 6 Josephine Street Stormwater Project	Construction of a stormwater pond providing water quality treatment and flood storage for runoff from untreated existing urban area. Project previously listed as WEEK HC-16 ProjID 5030.	Wet Detention Pond	Completed	2018	53	Chassahowitzka Springshed- Outside PFA	$612,000	Hernando County; SWFWMD	Hernando County - $360,497.23; SWFWMD - $175,000.00
6317	Hernando County	SWFWMD	HC-15	South Brooksville BMP 7 Russell Street Stormwater Project	Construction of a stormwater pond providing water quality treatment and flood storage for runoff from untreated existing urban area. Previously listed as WEEK HC-17 ProjID 5031.	Wet Detention Pond	Completed	2017	49	Chassahowitzka Springshed- Outside PFA	$1,115,612	SWFWMD; Hernando County	SWFWMD - $475,000.00; Hernando County - $640,612.00
5008	Management Strategies	TBD	WU-01	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	NA	Basinwide	$0	TBD	TBD - $0.00
4995	SWFWMD	Stakeholders	SWF-01	Homosassa River Surface Water Improvement and Management (SWIM) Plan	Implementation and periodic review and update of the Homosassa SWIM Plan.	Study	Completed	2017	NA	Basinwide	$51,500	SWFWMD	SWFWMD - $51,500.00
4996	SWFWMD	Stakeholders	SWF-02	Chassahowitzka River SWIM Plan	Implementation and periodic review and update of the Chassahowitzka SWIM Plan.	Study	Completed	2017	NA	Basinwide	$51,500	SWFWMD	SWFWMD - $51,500.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
4997	SWFWMD	Agricultural Producers	SWF-03	Facilitating Agricultural Resource Management Systems (FARMS) Program	The FARMS Program is an agricultural BMP cost-share program to promote improved water quality in spring systems through approved precision nutrient application technologies.	Agricultural BMPs	Ongoing	NA	TBD	Basinwide	$0	SWFWMD	SWFWMD - $0.00
4998	SWFWMD	NA	SWF-04	Evaluation of Nitrogen Leaching from Reclaimed Water	Study of nitrogen leaching rates from reclaimed water application to lawns, spray fields, and rapid infiltration basins to refine estimates of nitrogen loading to groundwater and identify the best disposal methods to minimize nitrogen loading.	Study	Completed	2020	NA	Basinwide	$294,000	SWFWMD	SWFWMD - $294,000.00
4999	SWFWMD	NA	SWF-05	Springs Coast Wastewater Disposal Treatment Wetlands	This project will assess areas to determine sites appropriate for construction of wetlands to treat WWTF effluent.	Study	Completed	2015	NA	Basinwide	$400,000	SWFWMD	SWFWMD - $400,000.00
5000	SWFWMD	DEP- FPS	SWF-08	Homosassa Habitat Enhancement	Install, monitor, and maintain a floating wetland system in the Homosassa River within the Ellie Schiller Homosassa Wildlife State Park to evaluate the water quality and aquatic habitat benefits.	Floating Islands/ Managed Aquatic Plant Systems (MAPS)	Completed	2017	TBD	Homosassa Springshed- Inside PFA	$128,471	SWFWMD	SWFWMD - $128,471.00
5001	SWFWMD	NA	SWF-09	Chassahowitzka Spring Sediment Removal	Removal and disposal of 3,800 cubic yards of organic sediments and sand from the Chassahowitzka Headspring. This will increase water column visibility, reduce nutrient resuspension, and improve recreation.	Muck Removal/ Restoration Dredging	Completed	2014	NA	Chassahowitzka Springshed- Inside PFA	$875,000	SWFWMD	SWFWMD - $875,000.00

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
5002	SWFWMD	NA	SWF-10	Update FDOH Drinking Water Source and Wastewater Source Inventory	Update FDOH GIS map of drinking water service and wastewater disposal areas of concern to determine impacts from onsite wastewater.	Study	Canceled	NA	NA	Basinwide	$0	SWFWMD	SWFWMD - $245,000.00
5003	SWFWMD	NA	SWF-11	Model Springs Fertilizer Ordinance	New model ordinance language was created by DEP and this project is no longer needed.	Regulations, Ordinances, and Guidelines	Canceled	NA	NA	Basinwide	$0	SWFWMD	SWFWMD - $0.00
5772	SWFWMD	Stakeholders	SWF-12	FARMS - M & B Products, Inc.	M&B Dairy was a pilot project with a project termination date of 6/30/2022.	Agricultural BMPs	Completed	2017	NA	Homosassa Springshed-Inside PFA	$330,128	SWFWMD	SWFWMD - $247,596.00
6259	SWFWMD	None	SWF-13	Submerged Aquatic Vegetation Mapping	Submerged aquatic vegetation mapping at designated locations within the Chassahowitzka River.	Monitoring/ Data Collection	Ongoing	NA	NA	Chassahowitzka Springshed-Inside PFA	$0	SWFWMD	SWFWMD - $0.00
6257	SWFWMD	Citrus County; Citrus County Sheriff's Office; Discover Crystal River Florida; DEP; FFWCC	SWF-14	Chassahowitzka Education Campaign	To educate targeted audiences about the recreational best management practices that will help protect the Chassahowitzka River and reduce ecological impacts.	Enhanced Public Education	Ongoing	NA	NA	Basinwide	$0	SWFWMD	SWFWMD - $0.00
6260	SWFWMD	None	SWF-15	Submerged Aquatic Vegetation Mapping	Submerged aquatic vegetation mapping at designated locations within the Homosassa River.	Monitoring/ Data Collection	Ongoing	NA	NA	Homosassa Springshed-Inside PFA	$0	SWFWMD	SWFWMD - $0.00
6949	SWFWMD	NA	SWF-16	Investigation of Iron Stimulation of Filamentous Algal Growth in Chassahowitzka River	The objective of this study is to investigate whether there is a correlation between iron concentrations and filamentous algae growth in Chassahowitzka River.	Study	Completed	2024	NA	Chassahowitzka Springshed-Inside PFA	$49,952	SWFWMD	SWFWMD - $49,951.85

Proj ID	Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	Crediting Location	Cost Estimate	Funding Source	Funding Amount
7001	Turnpike Enterprise	NA	TP-01	SR 589 Mile Post 49.5 - 61	Street Sweeping and Shoulder litter pick up along Suncoast Parkway between mile post 49.5 and 61 both North and South bound.	Street Sweeping	Ongoing	NA	9	Homosassa Springshed-Inside PFA	$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. Homosassa and Chassahowitzka Springs Groups PFA Report

During the development of the 2018 Homosassa and Chassahowitzka BMAP, the PFA was 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 defined a PFA which is incorporated by reference into this BMAP. Information on this and other springshed PFAs are available at the following link: https://floridadep.gov/dear/water-quality-restoration/content/bmap-documents-meeting-materials-and-recordings.

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 Homosassa and Chassahowitzka BMAP NSILT estimates and GIS coverages, OSTDS contribute approximately 32% of the total pollutant loading in the BMAP area. 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

Beginning July 1, 2023, sections 373.811 and 403.067, F.S., prohibit any 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 within the PFA or on lots of one acre or less outside the PFA, 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 Homosassa and Chassahowitzka BMAP applies to existing OSTDS in the PFA on all lot sizes 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 65%t 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 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 Homosassa and Chassahowitzka BMAP 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:

- Improve understanding of the ecological responses to nutrient enrichment and reductions.
- Maintain and expand water quality monitoring programs.
- Report annual status and trends.
- Evaluate new and emerging technologies.
- Research and develop advanced septic systems.
- Monthly water sampling at the spring.

Completed projects:

- Florida Onsite Sewage Nitrogen Reduction Strategies Study.
- 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:

- Quarterly springs water quality monitoring.
- Stream water quality monitoring.
- UFA nutrient modeling.
- Springs initiative modeling.
- Monitoring of in-ground nitrogen reducing biofilters.

Proposed projects:

- Groundwater quality monitoring for BMAP assessment.
- Performance monitoring on advanced OSTDS in Florida.

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 37% (215,178 lbs/yr) pollutant loading in the Homosassa springshed, 24% (81,452 lbs/yr) in the Chassahowitzka springshed and 32% (296,631 lbs/yr) in the BMAP area (combined springsheds). **Table E-1** lists the number of existing OSTDS in the PFA 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 in the BMAP

Recharge Area	All OSTDS in BMAP	Credit for Enhancement (lbs/yr)	Credit for Sewer (lbs/yr)
High	19,225	140,328	266,622
Medium	1,687	6,704	12,737
Low	447	352	670
Total	**21,359**	**147,384**	**280,029**

Estimated reductions are for either enhancement <u>or</u> sewer per parcel classification. Reductions cannot be combined for the same parcel classification but can be combined between the different classifications.

Nitrogen impacts from new development could also be reduced through prohibiting new conventional OSTDS on all lot sizes throughout the BMAP area. 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.

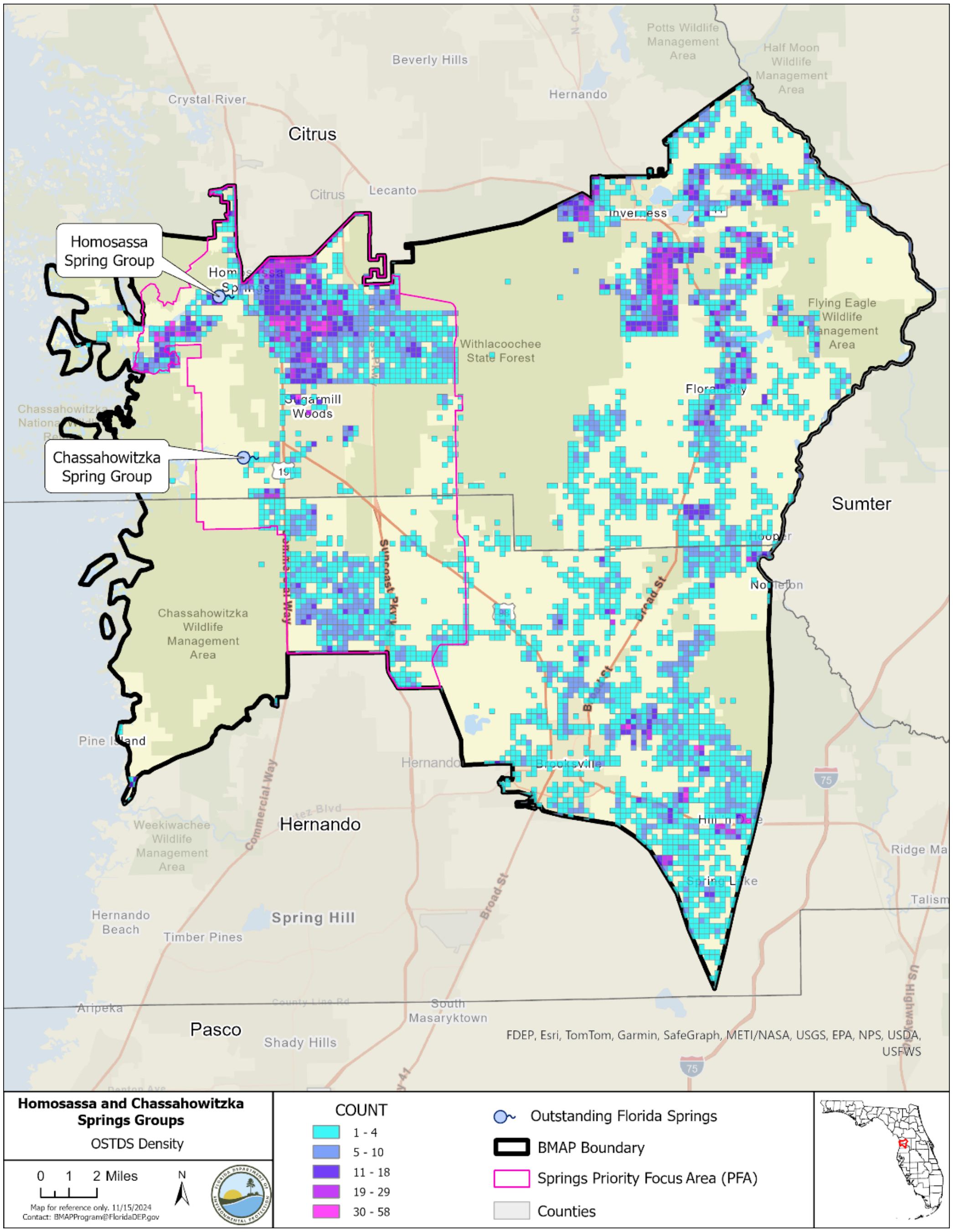

Figure E-1. Locations of OSTDS in the PFA in the Homosassa and Chassahowitzka BMAP

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

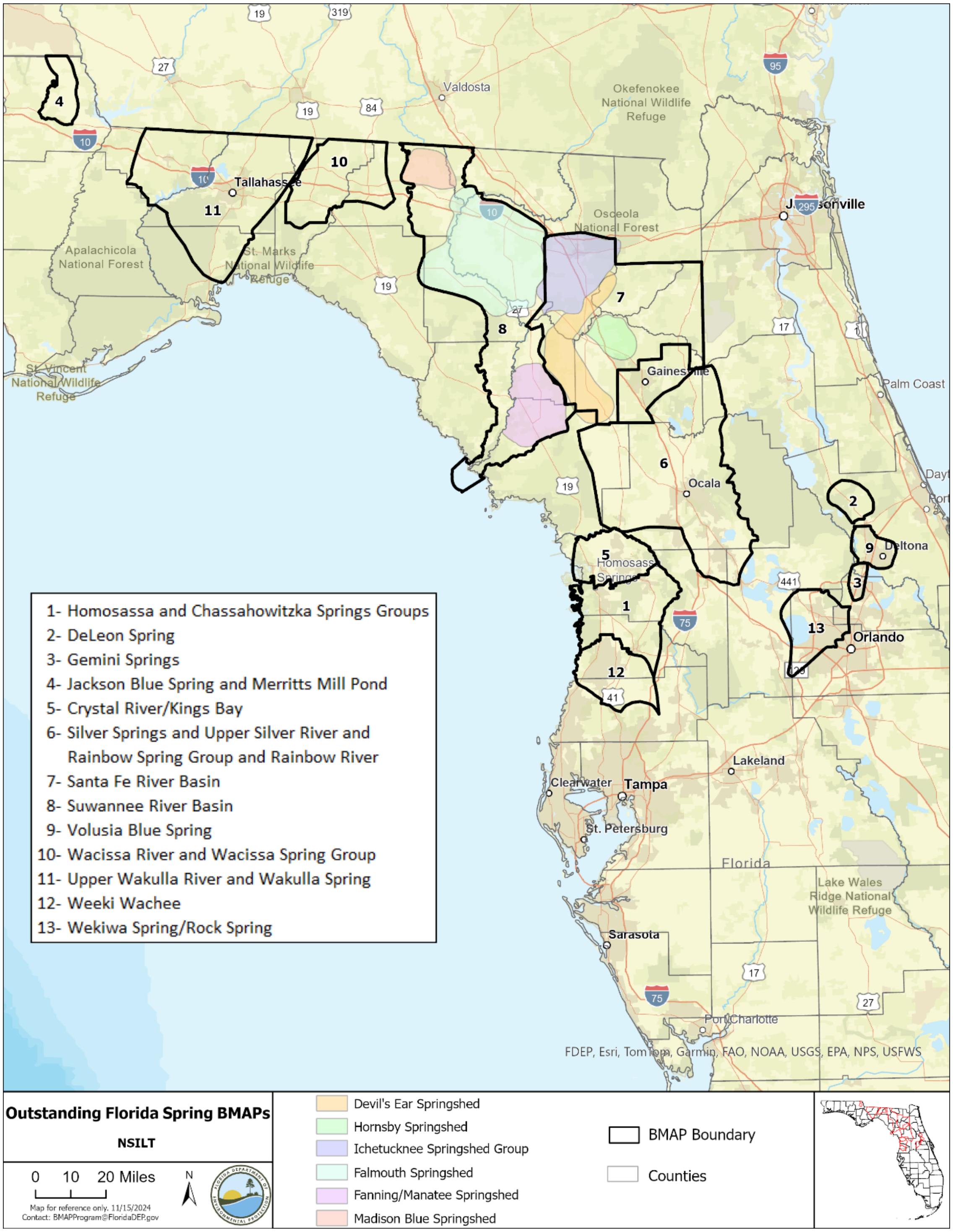

Figure 1. Map of the spring BMAPs and springsheds with updated NSILTs

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.

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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 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					

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)
	Fairways					
	Roughs					
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 an 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 Chassahowitzka-Homosassa Springs BMAP, there are seven 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 shows the percentage of agricultural land use within the Chassahowitzka-Homosassa Springs 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 Chassahowitzka-Homosassa Springs BMAP

Non-agricultural acres	286,947
Agricultural acres	28,202

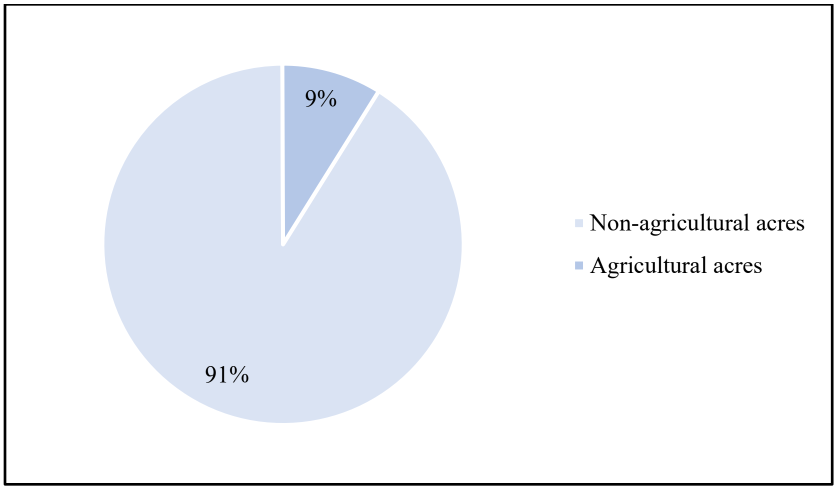

Figure H-1. Relative agricultural land use in Chassahowitzka-Homosassa Springs BMAP

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 Chassahowitzka-Homosassa Springs BMAP by BMP program commodity

Commodity	Agricultural Acres Enrolled
Citrus	82
Cow/Calf	8,417
Dairy	261
Equine	10
Fruit/Nut	180
Multiple Commodities	2,809
Nursery	959
Row/Field Crop	433
Total	**13,151 (47%)**

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

Commodity	Chassahowitzka	Homosassa
Citrus	0	82
Cow/Calf	2,183	6,234
Dairy	0	261
Equine	0	10
Fruit/Nut	30	150
Multiple Commodities	345	2,464
Nursery	912	47
Row/Field Crop	207	226
Total	**3,677 (38%)**	**9,474 (51%)**

As of July 2024, 47% of the agricultural acres in the Chassahowitzka-Homosassa Springs BMAP area are enrolled in FDACS' BMP program. **Table H-3** shows the acreages enrolled in the BMP Program by commodity. 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

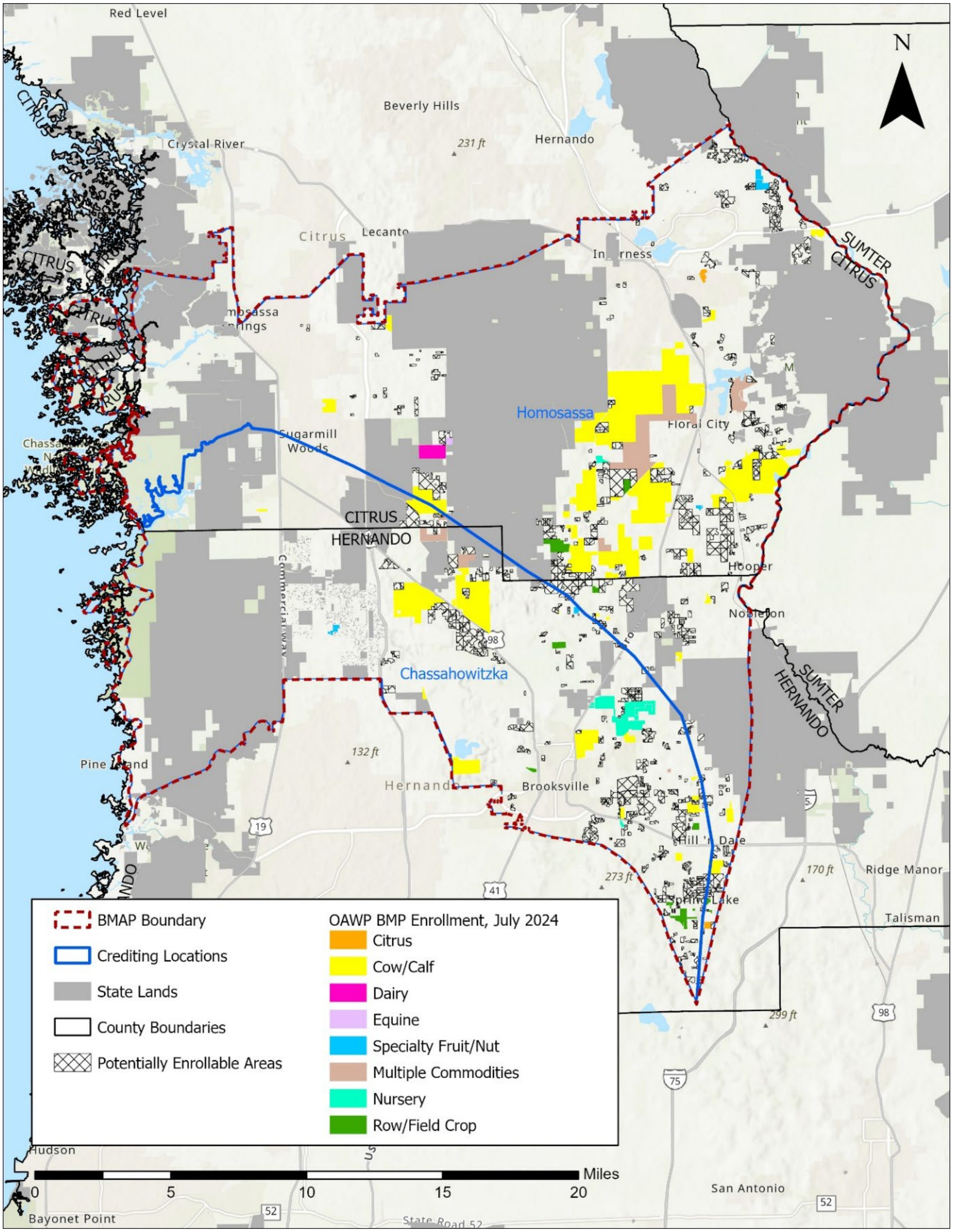

Figure H-2. Lands enrolled in BMPs in the BMAP area

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 Chassahowitzka-Homosassa Springs BMAP by springshed based on the FSAID 11 and the results of the FDACS unenrolled agricultural lands characterization.

Table H-4. Agricultural Lands in Chassahowitzka-Homosassa Springs BMAP by springshed

* Enrollment information current as of July 2024.

Springshed	Agricultural Acres	Unenrolled - Unlikely Enrollable Acres	Agricultural Acres - Adjusted	Agricultural Acres Enrolled*
Chassahowitzka	14,206	4,471	9,735	3,678
Homosassa	24,841	6,374	18,467	9,475

Potentially Enrollable Lands

There are 15,052 acres of potentially enrollable lands within the Chassahowitzka-Homosassa Springs 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	20
Cropland and/or Pastureland	1,281
Crops	240
Fallow	349

Crop Type	Acres
Fruit (Non-citrus)	31
Grazing Land	11,558
Hay	456
Livestock	379
Nursery	169
Open Lands	569
Total	**15,052**

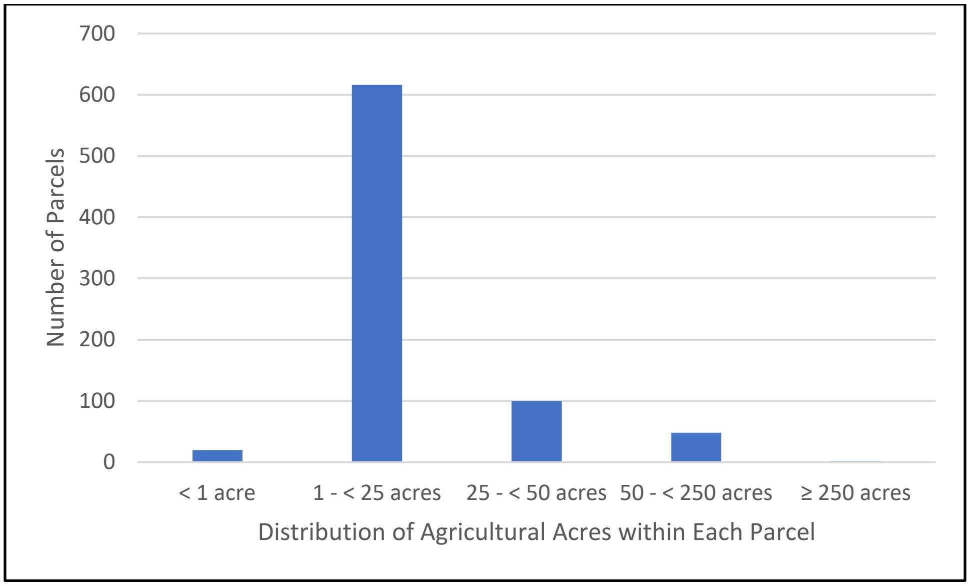

Figure H-3. Count of potentially enrollable parcels by size class

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.

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 Chassahowitzka-Homosassa Springs BMAP are shown in **Table H-7**.

Table H-6. Cost share project types and total 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%
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%

[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
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

Chassahowitzka BMP Category	TN Reductions to Groundwater
Livestock BMPs	1,605
Tillage, Cover Crops and Soil Health BMPs	118
Homosassa BMP Category	**TN Reductions to Groundwater**
Irrigation BMPs	9,547
Livestock BMPs	8,350
Precision Nitrogen Management	545
Storage	137
Tillage, Cover Crops and Soil Health BMPs	1,118
Total	**21,420**

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[3]

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
Suwannee	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

[3] Florida Department of Agriculture and Consumer Services. (2015). Water Quality/Quantity Best Management Practices for Florida Dairy Operations. https://ccmedia.fdacs.gov/content/download/64582/file/Dairy-Operations-Manual.pdf

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 Homosassa and Chassahowitzka 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 in the Homosassa and Chassahowitzka BMAP

County	Golf Course Name	2028 Milestone/ 30% Reduction TN (lbs/yr)	2033 Milestone/ 80% Reduction TN (lbs/yr)	2038 Milestone/ 100% Reduction TN (lbs/yr)
Citrus County	Sugarmill Woods Country Club	715	1,906	2,383
Citrus County	Inverness Golf and Country Club	634	1,692	2,115
Citrus County	Point O'Woods Golf Club	99	264	330
Citrus County	Cypress/Oak/Pine Courses At Sugarmill Woods Country Club	555	1,480	1,850
Citrus County	Southern Woods Golf Club (Now Citrus National Golf Club)	713	1,900	2,375
Citrus County	Sweet Swing Driving Range	21	55	69
Hernando County	Cabot Farms Golf Club	3,085	8,228	10,285
Hernando County	Brooksville Country Club	918	2,449	3,061

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 Homosassa and Chassahowitzka 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** of this document. All facilities listed below must meet the applicable effluent limit (**Table 12**) 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 the Homosassa and Chassahowitzka BMAP

Basin	Facility ID	Facility Name
Chassahowitzka	FLA011916	Walden Woods MHP WWTF
Chassahowitzka	FLA012071	Wesleyan Village
Chassahowitzka	FLA012071	Wesleyan Village
Chassahowitzka	FLA012062	Countryside Estates WWTF
Chassahowitzka	FLA012046	Brooksville Golf & Country Club WWTF
Homosassa	FLA011853	Aunt Vera's Antique Store
Homosassa	FLA011864	Moonrise Resort
Homosassa	FLA011879	Oak Pond Mobile Home Estates
Homosassa	FLA011880	Stoneridge Landing
Homosassa	FLA011884	Floral Oaks Apartments WWTF
Homosassa	FLA011891	Bedrock Singing Forest MHP WWTF
Homosassa	FLA011898	Harbor Lights Mobil Home Resort WWTP
Homosassa	FLA011899	Cedar Lakes MHP WWTF
Homosassa	FLA011900	Royal Oaks Manor
Homosassa	FLA011901	Bell Villa MHP
Homosassa	FLA011901	Bell Villa MHP
Homosassa	FLA011904	Oasis Mobile Home and RV Park WWTF
Homosassa	FLA011907	Evanridge MHP
Homosassa	FLA011915	Forest View MHP WWTF
Homosassa	FLA011927	Tarawood Adult Community
Homosassa	FLA011902	Palm Terrace Village WWTF