

Appendix G: Minimum Flows and Minimum Water Levels Recovery and Prevention Strategies

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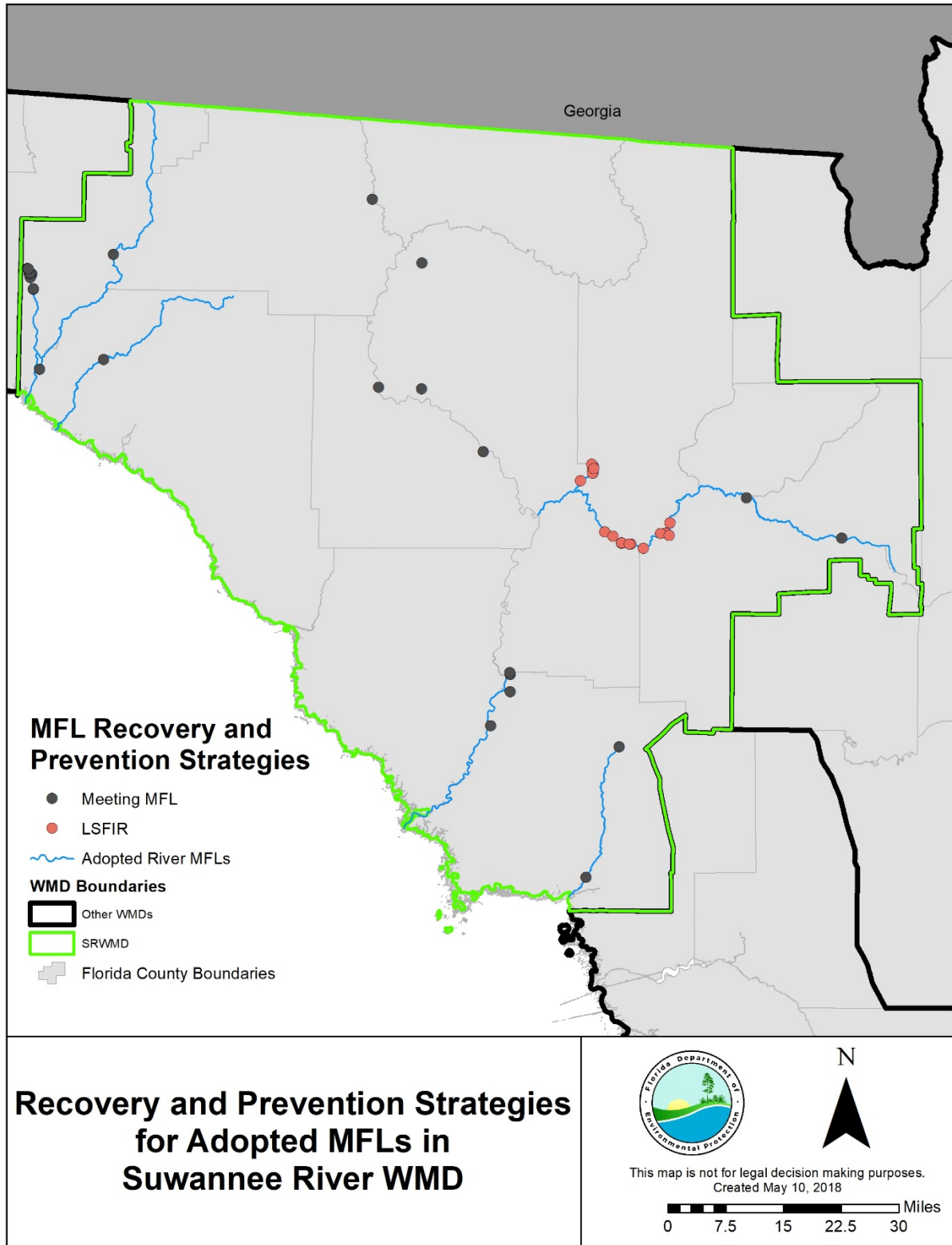
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Suwannee River Water Management District

The SRWMD, in coordination with the SJRWMD and DEP, identified 18 waterbodies as being in recovery and has approved the Lower Santa Fe and Ichetucknee River and Priority Springs (LSFI) Recovery Strategy as the means to recover these waterbodies.

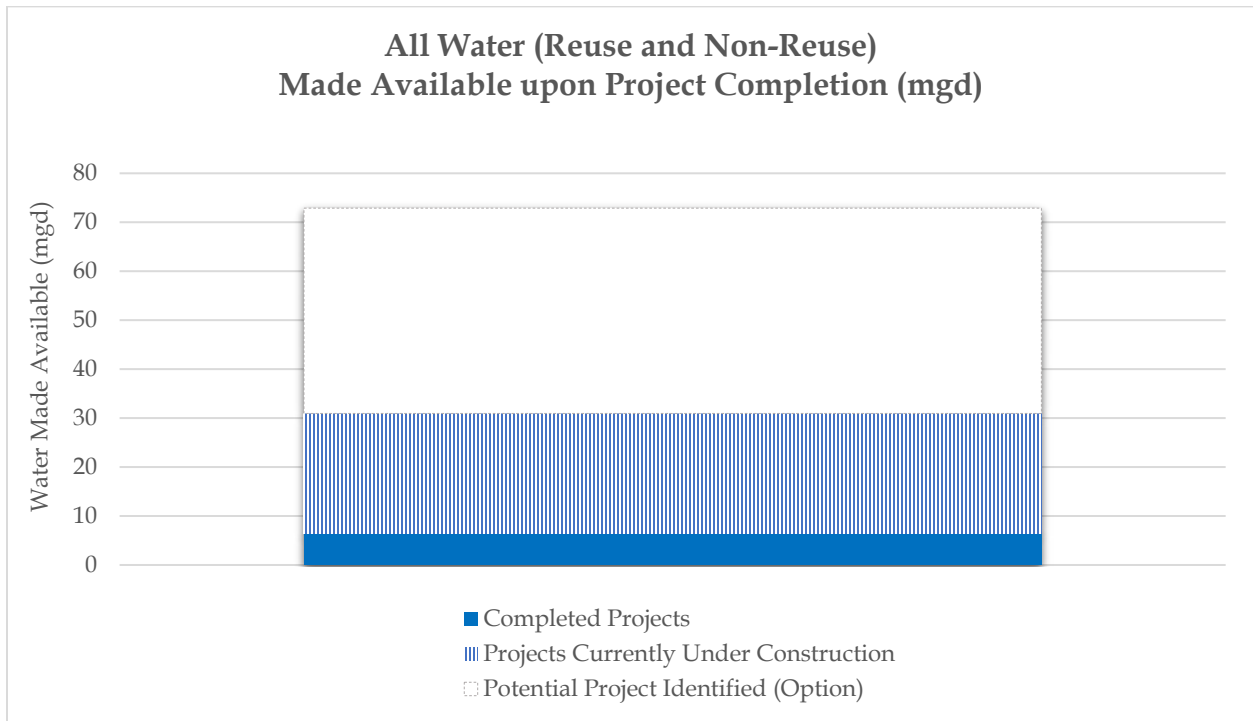
Background

In recognition that effective management in Northeast Florida requires close coordination, DEP, SJRWMD, and SRWMD entered in to an interagency agreement to ensure resource protection and equitable treatment of water users in the two districts. The LSFI MFLs were adopted by DEP based on the conclusion that groundwater use in both the SRWMD and SJRWMD contribute to the current status of priority water bodies in the Lower Santa Fe River Basin, and thus cross boundary MFLs and Recovery Strategies are appropriate to achieve long-term recovery and maintenance of minimum flows in the Lower Santa Fe Basin. DEP additionally adopted the regulatory components of the recovery strategy while the non-regulatory components were approved by the Governing Boards of both the SRWMD and the SJRWMD. The purpose of the recovery strategy is to develop near-term managerial practices to address these streamflow impacts, and provide a framework to implement long-term water management strategies, water resource development projects, and conservation measures, in order to recover and maintain flows in these water bodies at the proposed minimum flow criteria.



Status of Projects

The status of each individual project benefitting these MFLs can be found in Appendix F and, for the LSFIs strategy, include projects in both the SJRWMD and the SRWMD. The below graph represents the progress of making water available for the LSFIs strategy for both districts, listing those completed or under construction as well as those that are potential projects identified as project options.



St. Johns River Water Management District

The SJRWMD has identified 25 waterbodies as being in recovery or prevention within its district. Seven of these waterbodies are included in a regional strategy known as the Prevention/Recovery Strategy of Minimum Flows and Levels for Volusia Blue Spring and Big, Daugharty, Helen, Hires, Indian, and Three Island Lakes (Volusia Strategy). An MFL associated with Silver Springs is included in the Silver Springs Prevention Strategy. Each is summarized below. Recovery of these waterbodies is accomplished utilizing regulatory and non-regulatory measures. This appendix includes the status of projects associated with these two strategies.

Background

Volusia Recovery and Prevention Strategy

In November 2013, the District's Governing Board approved a comprehensive strategy to protect Blue Spring and six Volusia County lakes from current and potential impacts of groundwater withdrawals. They help recover the MFL for Indian Lake. These MFLs were all adopted between 1994 and 2004, and three have had re-evaluations as late as 2013. The Volusia Strategy calls for groundwater withdrawals to be maintained at or below sustainable limits, or for impacts from groundwater withdrawals to be offset through reuse of reclaimed water, aquifer recharge and water supply projects, as well as through conservation and regulatory measures. Projects and measures proposed in the strategy are designed to ensure MFLs in Blue Spring and the affected lakes (other than Indian Lake) continue to be achieved and to meet future water demands for public water supply utilities and other water users throughout Volusia County.

Silver Springs Prevention Strategy

An MFL for Silver Springs, an Outstanding Florida Spring, was adopted based on criteria developed from vegetation, soils and topography data. The MFL will protect the structure and function of wetlands and aquatic habitats, as well as other ecological functions and values. Currently, the MFL for Silver Springs is being achieved. However, the Silver Springs MFL is projected to not be met by 2025 and so a prevention strategy was adopted in 2017.

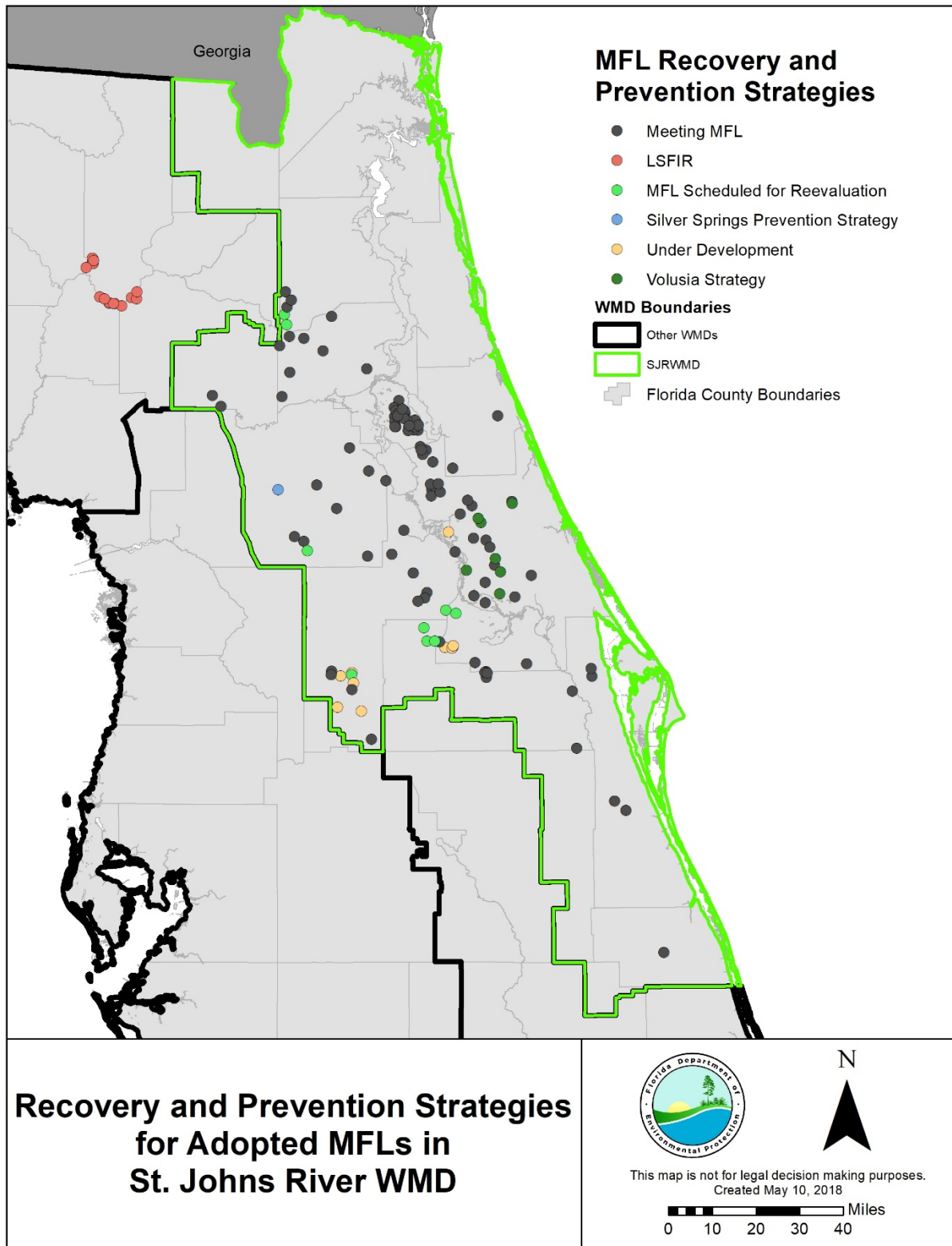
Under Development or Re-evaluation

A total of 17 waterbodies within the SJRWMD are currently identified as being in recovery or prevention but do not currently have a recovery or prevention strategy. While not currently covered by a strategy, the SJRWMD nevertheless has assisted in implementing projects to benefit these waterbodies.

Lower Santa Fe and Ichetucknee River and Priority Springs Recovery Strategy

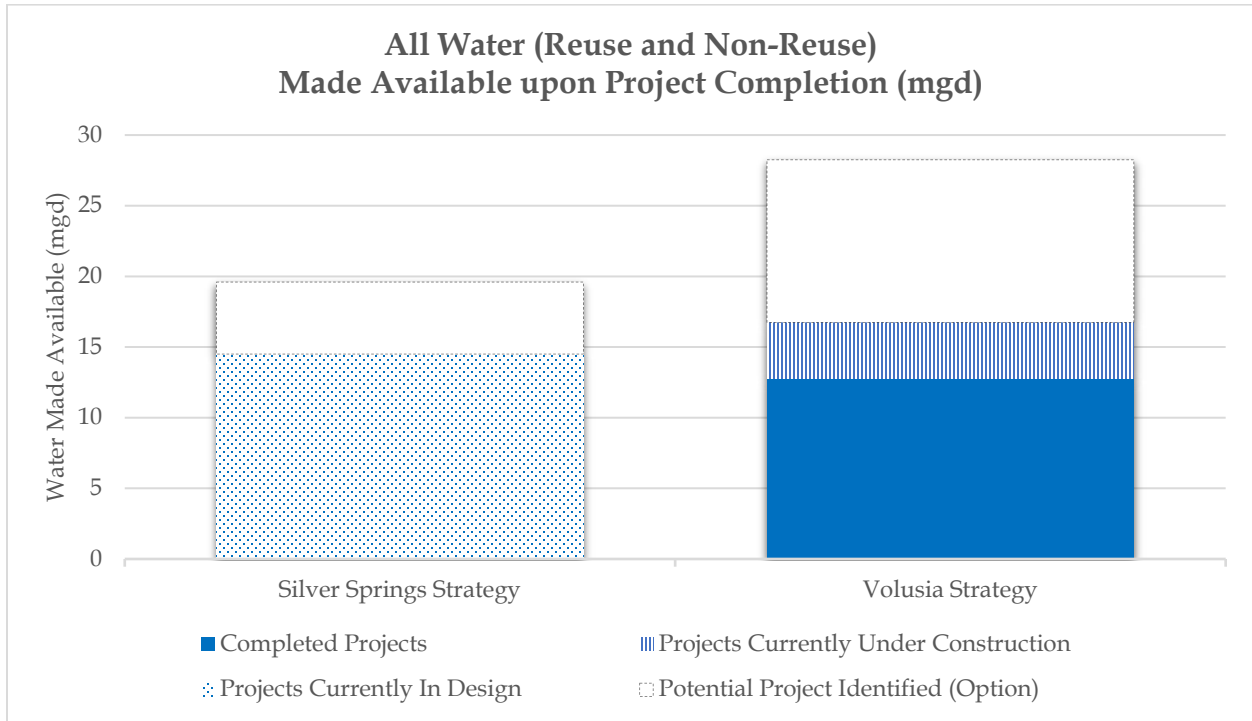
The SRWMD, in coordination with the SJRWMD and DEP, identified 18 waterbodies associated with the Lower Santa Fe and Ichetucknee River and Priority Springs (LSFIR) as being in recovery. The SJRWMD and SRWMD both approved the LSFIR Recovery Strategy as the means to recover these waterbodies. In order to avoid duplication, the status of projects and

project list for this strategy is presented in under the Suwannee River Water Management District Recovery and Prevention Strategies.



Status of Projects

The status of each individual project can be found in Appendix F. The below graph represents the progress of making water available for the Silver Springs Prevention Strategy (approved in 2017) and the Volusia Strategy, listing those completed, under construction, or in design as well as those that are potential projects identified as project options.



Southwest Florida Water Management District

Through fiscal year 2016-17, the SWFWMD has established 202 MFLs on waterbodies and identified 67 of those as being in need of recovery. These waterbodies are all included in three regional and two water-body-specific recovery strategies. The strategies address recovery through regulatory and non-regulatory measures. This appendix includes summaries of the five recovery strategies and the status of their associated projects.

Background

Southern Water Use Caution Area Recovery Strategy

The Southern Water Use Caution Area (SWUCA) was designated in 1992 to address declines in Upper Floridan aquifer levels due primarily to groundwater withdrawals. Drawdowns in aquifer levels in some areas exceeded 50 feet, causing saltwater intrusion along the coast, and unacceptable impacts to some lakes and river systems. The area encompasses approximately 5,100 square miles, including all of DeSoto, Hardee, Manatee and Sarasota counties, and parts of Charlotte, Highlands, Hillsborough and Polk counties. SWFWMD has identified 20 recovery waterbodies in the SWUCA, all initially adopted between 2006 and 2017, with 9 re-evaluations conducted in 2017. The MFL established for the aquifer system in the area includes 10 wells monitoring that system.

The District adopted the SWUCA Recovery Strategy in 2006 and is implementing the strategy over a 20-year period. The four principal goals of the Recovery Strategy to achieve by 2025 include: restore minimum flows in the upper Peace River; restore priority minimum lake levels in lakes along the Lake Wales Ridge; reduce the rate of saltwater intrusion in coastal Hillsborough, Manatee, and Sarasota counties by achieving the saltwater intrusion minimum aquifer level; and ensure there are sufficient water supplies for existing and projected reasonable and beneficial uses.

The District has been successful in multiple efforts associated with its SWUCA Recovery Strategy. Partnering with the Peace River Manasota Regional Water Supply Authority, the District has assisted in developing a sustainable water supply to meet the needs of a four-county region in the southern portion of the SWUCA. The District's cooperatively-funded Facilitating Agricultural Resource Management Systems (FARMS) program has helped the agricultural community reduce its use of groundwater from the Upper Floridan aquifer. The FARMS program combined with other conservation efforts have helped reduce Upper Floridan groundwater withdrawals by more than 50 mgd, one of the targets established by the SWUCA Recovery Strategy. The District's Lake Hancock Lake Level Modification Project became fully operational in 2014 to help meet the minimum flows for the upper Peace River. Other successes to date include completion of the Tampa Electric Company (TECO) Southwest Polk Power Station Reclaimed Water Interconnect project. This project is anticipated to provide a near-term resource benefit of 10 mgd and long-term benefit of 17 mgd. In addition, the formation of the Polk Regional Water Cooperative and the selection of project options will assist in meeting MFL's and developing a sustainable long-term water supply in the northern portion of the SWUCA and in the CFWI.

Northern Tampa Bay Water Use Caution Area Recovery Strategy

In 1989, the District established the Northern Tampa Bay Water Use Caution Area (NTBWUCA), an area encompassing all of Pinellas County and parts of Hillsborough and Pasco counties. In 2007, the NTBWUCA was expanded to include an additional portion of northeastern Hillsborough County and the remainder of Pasco County. The District took these actions based on concerns about hydrologic impacts to wetlands, lakes and rivers resulting from groundwater withdrawals and concerns regarding rapid growth and development pressures in the region. Because the majority of groundwater use in the NTBWUCA is for public supply, most of the water resource impacts were in areas surrounding the major public supply wellfields. As of Calendar Year 2016, SWFWMD has identified 45¹ recovery waterbodies in the NTBWUCA, all initially adopted between 2000 and 2013, with 13¹ re-evaluations conducted between 2007-2018.

The first phase of the District's NTBWUCA Recovery Strategy was adopted in 2000 and called for a phased reduction in pumping from Tampa Bay Water's regional wellfields and providing financial incentives for construction of alternative water supply projects. A second phase of the Recovery Strategy, adopted in 2010 for implementation through 2020, includes a comprehensive plan that addresses continued monitoring and evaluation of environmental mitigation for withdrawal impacts and continued water conservation activities by Tampa Bay Water's member governments.

Implementation of the NTBWUCA Recovery Strategy has led to construction of alternative water supply projects that have produced 140 mgd of new alternative water sources and allowed for groundwater withdrawals from Tampa Bay Water's regional wellfields to be reduced by more than 60 mgd. Successes associated with implementation of the ongoing second phase of the Recovery Strategy are currently being summarized as part of the review associated with renewal of the consolidated permit issued to Tampa Bay Water for regional water withdrawals.

Lower Hillsborough River Strategy

Flows in the Lower Hillsborough River have been reduced by a variety of factors including increased public supply use of the Hillsborough River Reservoir, surface water drainage alterations, reduction in surface storage, and induced recharge due to groundwater withdrawals. The District set a minimum flow for the Lower Hillsborough River in 2000, and in 2007 adopted revised minimum flows for the lower river as well as minimum flows for Sulphur Springs, and the Tampa Bypass Canal. Because the minimum flow was not being achieved in the lower river in 2000 and the revised minimum flows adopted in 2007 were similarly not being met, the Lower Hillsborough River Strategy was included in both the first and second phases of the NTBWUCA Recovery Strategy that were respectively adopted by the District in 2000 and 2007.

The Recovery Strategy outlines six projects and a timeline for their implementation. Four projects are being jointly funded by the District and the City of Tampa, and two are being

¹ Excludes Lower Hillsborough River, which, though located within the NTBWUCA, is more specifically covered by the Hillsborough River Strategy.

implemented by the District. Implementation of specific projects is subject to applicable diagnostic/feasibility studies and contingent on any required permits. These projects include Tampa Bypass Canal diversions, a transmission pipeline evaluation/project, modifications to the Sulphur Springs weir and pump station, projects at Blue Sink and Morris Bridge Sink, and the investigation of storage options.

Beginning in late 2007, the District, and more recently the City of Tampa, have, when necessary, transferred water from the Tampa Bypass Canal to the Hillsborough River Reservoir and over the City of Tampa dam to help achieve minimum flows in the lower river. A peer-review completed in 2008 supported the determination that a transmission pipeline project for these diversions was not necessary, and the project is no longer considered viable for recovery of the lower river. By 2012, the City, with funding from the District, completed the Sulphur Springs weir and pump station projects and has been supplying flow from springs to the base of the City of Tampa dam. The Blue Sink project, completed by the City with District funding in 2017 provides additional quantities of flow the lower river. Project facility design and permitting for use of water from Morris Bridge Sink for lower river recovery have been completed. Future project activities are contingent upon feasibility investigations regarding the City's proposed Tampa Augmentation Project. The District is helping fund the Tampa Augmentation Project to evaluate the storage and recovery of reclaimed water in the Floridan Aquifer System for subsequent delivery to the Hillsborough River Reservoir.

Dover/Plant City Water Use Caution Area Recovery Strategy

During an unprecedented nine nights of freezing temperatures over eleven consecutive days in January 2010, withdrawals totaling nearly 619,000 gpm occurred for approximately 65 hours in the Dover/Plant City area and were followed by withdrawals at a rate of approximately 433,000 gpm for an additional 19 hours. In 2011, based on impacts associated with these withdrawals, the District established the Dover/Plant City WUCA (DPCWUCA); a 256 square mile area located in northeast Hillsborough County and eastern Polk County within portions of the NTBWUCA as well as the SWUCA. Concurrent with the establishment of the DPCWUCA, the District adopted a Minimum Aquifer Level (MAL), Minimum Aquifer Level Protection Zone (MALPZ) and recovery strategy for the DPCWUCA. The recovery strategy has the objective to reduce groundwater withdrawals used for frost/freeze cold protection by 20 percent by January 2020 (from January 2010 withdrawal quantities).

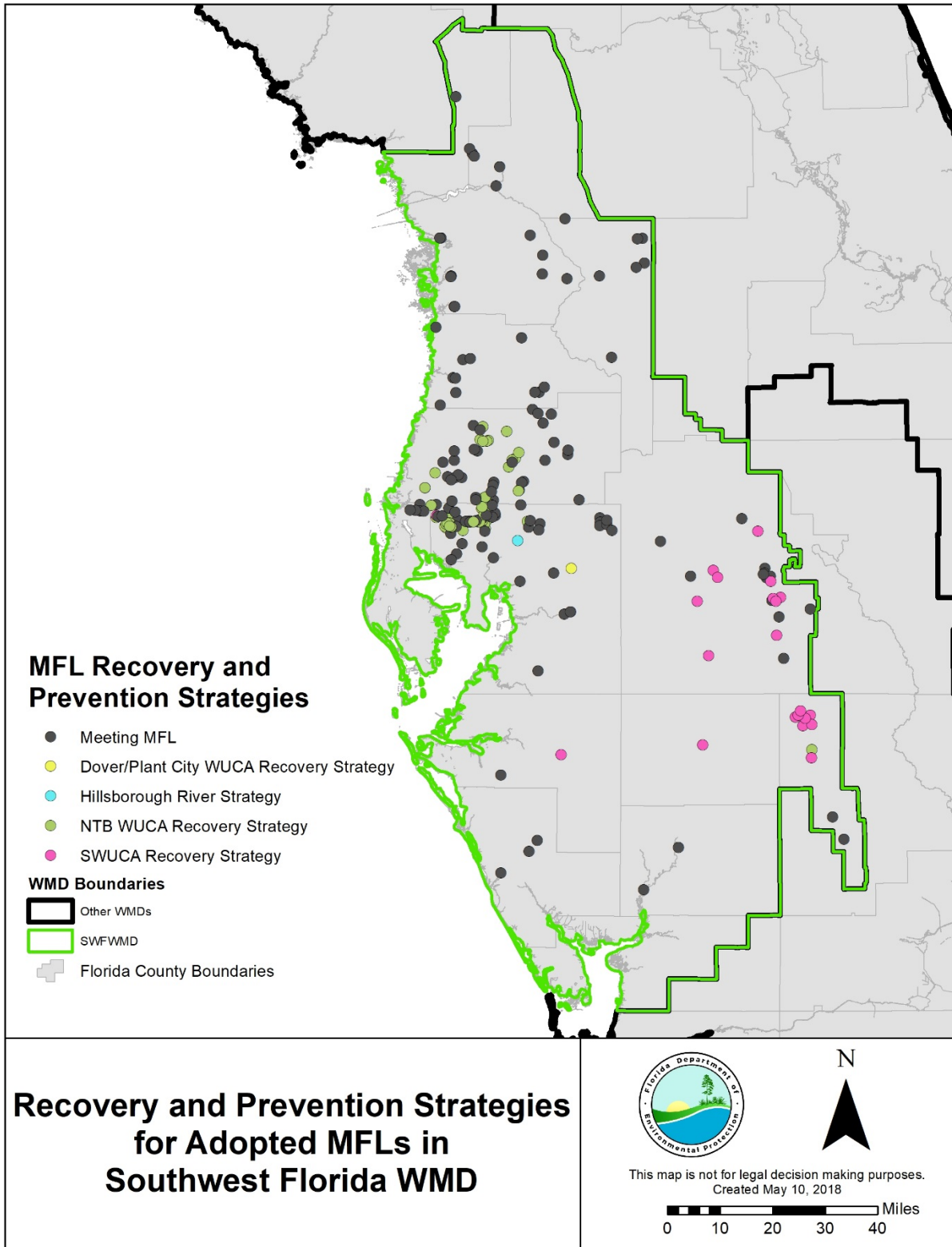
Recovery mechanisms identified in the strategy include non-regulatory and regulatory approaches. The non-regulatory mechanisms include assistance in offsetting groundwater withdrawals for cold protection through the District's cooperatively-funded FARMS program, providing enhanced data for irrigation system management, and other means. Projects are co-funded by the District and private enterprise to develop and enhance water conservation projects for the direct benefit of reducing cold protection groundwater withdrawals. In the regulatory approach, water use permitting rules address groundwater withdrawal impacts, alternative water supplies, frost/freeze cold protection methods and resource recovery. New groundwater withdrawals for cold protection are not authorized within the MALPZ and any new permitted groundwater withdrawals outside the MALPZ cannot cause new drawdown impact at the

MALPZ boundary. Alternative methods to groundwater withdrawals used for cold protection are to be investigated and implemented where practicable.

Evaluation of progress toward achieving the minimum aquifer level is ongoing. The evaluation includes or will include assessment of reductions in groundwater withdrawals used for frost/freeze protection in the DPCWUCA and the resulting reduced impacts on the minimum aquifer level. FARMS projects have resulted in a projected 41 MGD of reduced groundwater use for freeze protection in the DPCWUCA. If by January 2020 a 20 percent reduction in groundwater withdrawals used for frost/freeze protection or the minimum aquifer level has not been achieved, the recovery strategy will be reassessed.

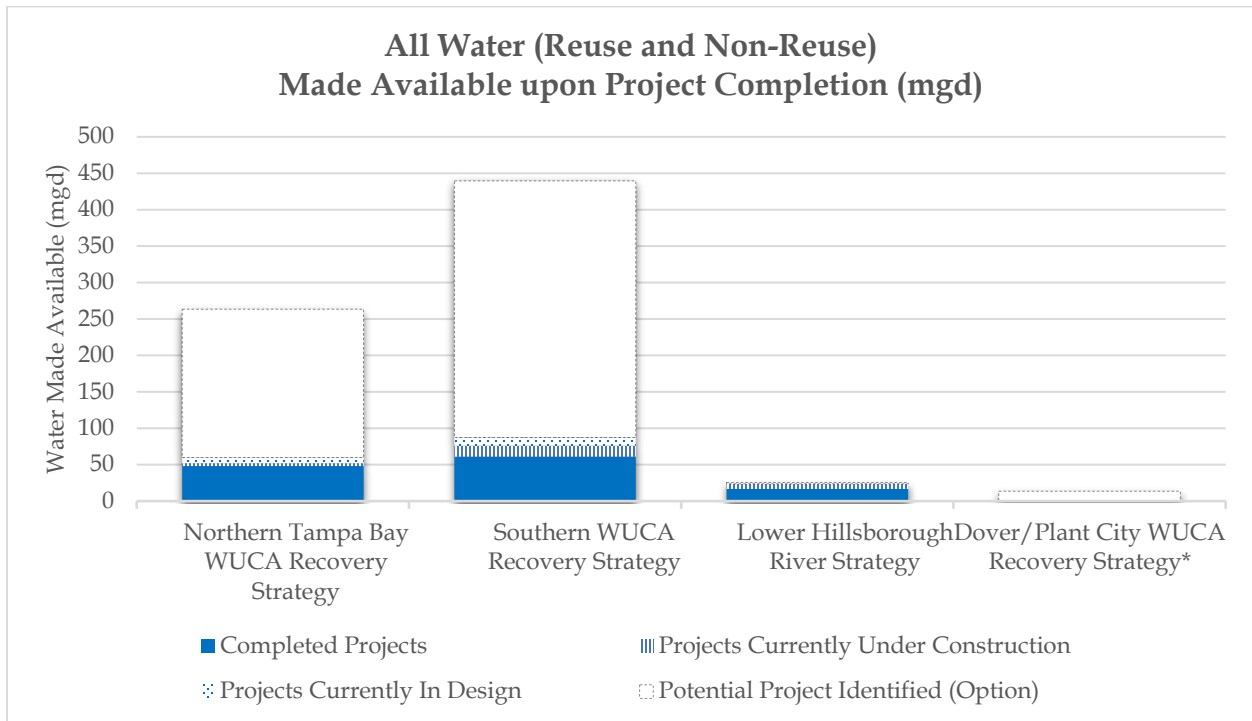
Lower Alafia River Recovery Strategy

In establishing minimum flows for the Lower Alafia River system in 2010, the District determined that flow rates under certain conditions were below the proposed minimum flows due to withdrawals from Lithia and Buckhorn springs by Mosaic Fertilizer, LLC. The District subsequently incorporated conditions associated with a phased recovery strategy into a water use permit issued to Mosaic. Compliance with conditions included in a water use permit issued to Mosaic Fertilizer, LLC has supported achievement of minimum flows established for the Lower Alafia River system.



Status of Projects

The status of each individual project can be found in Appendix F. The below graph represents the progress of the above identified recovery and prevention strategies, listing those completed, under construction, or in design as well as those that are potential projects identified as project options.²



*As previously described, the Dover/Plant City WUCA Recovery Strategy includes non-regulatory and regulatory approaches. The non-regulatory mechanisms include assistance in offsetting groundwater withdrawals for cold protection through the SWFWMD's cooperatively-funded FARMS program, providing enhanced data for irrigation system management, and other means. To date, 29 FARMS projects are operational offsetting approximately 1 mgd annual average daily use and offsetting 41 mgd freeze protection quantities.

² Graph does not include the Lower Alafia River Recovery Strategy due to its limited scope as described in this appendix.

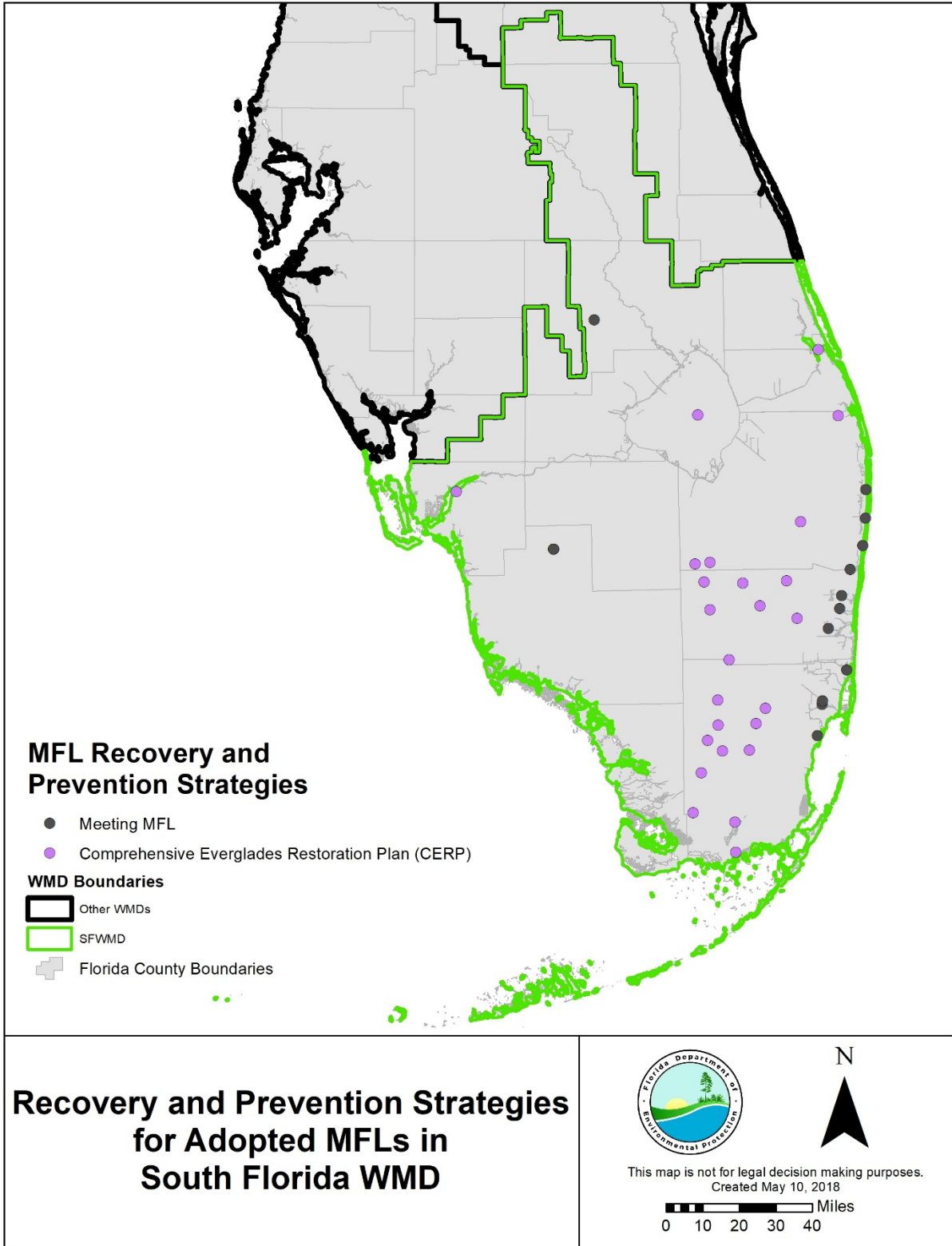
South Florida Water Management District

The SFWMD has identified four waterbodies as being in recovery and has identified **Comprehensive Everglades Restoration Plan (CERP)** as the means to recovery and protect these waterbodies, which include the Everglades, Lake Okeechobee, Loxahatchee River, and the Caloosahatchee River.

Background

CERP is a framework for modifications and operational changes to the Central and Southern Florida Project. The overarching objective of CERP is the restoration, preservation, and protection of the South Florida ecosystem while providing for other water-related needs of the region, including water supply and flood protection. There are a multitude of different projects identified in CERP. Together, these projects are expected to deliver benefits to improve the ecological function of over 2.4 million acres of the South Florida ecosystem, improve urban and agricultural water supply, improve deliveries to coastal estuaries, and improve regional water quality conditions, while maintaining the existing levels of flood protection.

CERP is identified as the recovery strategy for 25 MFLs sites. Twenty of these MFLs are for wetland sites within the Everglades and were adopted in 2001. MFLs have also been adopted for Lake Okeechobee, Loxahatchee River, and the Caloosahatchee River between 2001 and 2003.



Status of Projects

Due to the unique nature of CERP, a summary of the projects, funding, and status of CERP projects designed to produce new water to meet the MFL is provided below and included in the second tab of Appendix F. CERP projects outlined in this table are part of an existing recovery strategy designed to provide new water to natural areas that will help meet the minimum flow or minimum water level. CERP projects associated with an MFL waterbody that has a prevention strategy are not included in **Table 1** below. For more information on CERP, visit the Water Management District’s website at <https://www.sfwmd.gov/our-work/cerp-project-planning>.

Table 1. MFL waterbodies with recovery strategies that include CERP projects.

MFL Waterbody	Project Name ^a	State Funding	Federal Funding	Total Funding	Project Phase (Status)	Water Storage Created (Acre-Feet) ^b
Lake Okeechobee	Lake Okeechobee Watershed Restoration Project (Includes aboveground storage and ASR)	TBD	TBD	TBD	Planning	TBD
Caloosahatchee River	Caloosahatchee River (C-43) West Basin Storage Reservoir (Includes testing completed for ASR)	\$127,038,873	\$36,845,616	\$163,893,489 ^c	Construction	170,000
Loxahatchee River	Loxahatchee River Watershed Restoration Project	TBD	TBD	TBD	Planning	TBD
Everglades	Central Everglades Planning Project (CEPP) (Includes ENP Seepage Management)	\$7,018,468	\$12,201,369	\$19,219,837	Design	120,000
Everglades	Post Authorization Change Report for CEPP – Everglades Agricultural Area Storage Reservoir Project	TBD	TBD	TBD	Planning	300,000

Florida Statewide Annual Report on Total Maximum Daily Loads, Basin Management Action Plans, Minimum Flows or Minimum Water Levels, and Recovery or Prevention Strategies, June 2018

Everglades	Broward County Water Preserve Areas	\$263,247,325	\$63,633,518	\$326,880,843	Design	20,000
Everglades	C-111 Spreader Canal Projects ^d	\$49,913,227	\$12,693,854	\$62,607,081	Operations	1,500

- a. Only those CERP projects that produce new water and are associated with an MFL recovery strategy (e.g., aboveground storage, ASR, etc.) are listed in the table.
- b. TBD = To Be Determined means the federal and state funding along with the quantity of new water produced with this project has not yet been determined. This information will be revised once the final plan for the project has been formulated through the planning process.
- c. Reflects the total state and federal funding reported to the United States Army Corps of Engineers as of September 30, 2017. The expenditures required to complete the project in 2022 are expected to be approximately \$600 million.
- d. Project with storage feature creates hydraulic ridge adjacent to natural areas reducing seepage losses keeping more of the natural rainfall and water flows within natural areas.