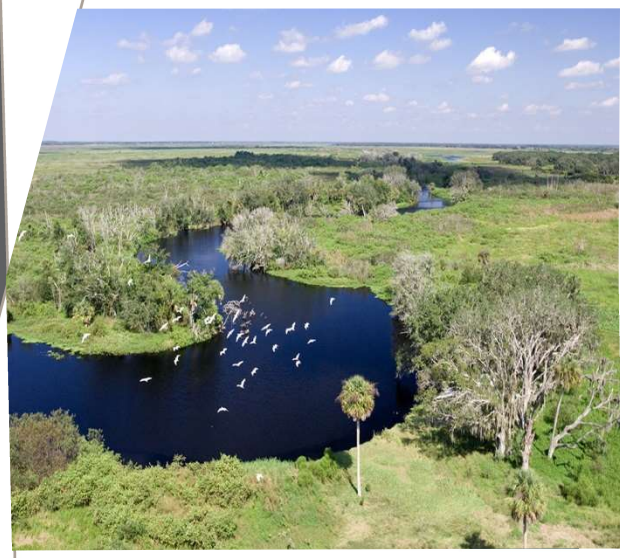
Statement of Estimated Regulatory Costs

Kissimmee River and Chain of Lakes Water Reservations



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Document Information

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Acronyms

C&SF	Central and Southern Florida Project
CFWI	Central Florida Water Initiative
CUP	Consumptive Use Permit
ELU	Existing Legal Users
E. Toho	East Lake Tohopekaliga
F.A.C.	Florida Administrative Code
FAS	Florida Aquifer System
FDEP	Florida Department of Environmental Protection
FS	Florida Statute
Form No. 1392	Daily Stage and Withdrawal Data Form
Form No. 1393	Temporary Request and Authorization of Withdrawal Facility Operation
HRS	Kissimmee River Headwaters Revitalization Schedule
KCH	Lake County's Kissimmee-Cypress-Hatchineha
KCOL	Kissimmee Chain of Lakes
kgal	Kilogallons (thousand gallons)
KRRP	Kissimmee River Restoration Project
LFAS	Lower Floridan aquifer system
LKB	Lower Kissimmee Basin
MGD	Million Gallons per Day
MGY	Million Gallons per Year
NAICS	North American Industry Classification System
OUA	Okeechobee Utility Authority
RIB	Rapid Infiltration Basins
Rules	Kissimmee River and Chain of Lakes Water Reservations
SAS	Surficial aquifer system
SERC	Statement of Estimated Regulatory Costs
SFWMD	South Florida Water Management District
SJRWMD	St. Johns River Water Management District
STA	Stormwater Treatment Area
SWFWMD	Southwest Florida Water Management District
Toho	Tohopekaliga
TWA	Toho Water Authority
UCOL	Upper Chain of Lakes
UFAS	Upper Floridan aquifer system

UKB	Upper Kissimmee Basin
UK-OPS	Upper Kissimmee - Operations Simulation Model
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WRDA 1992	1992 Water Resources Development Act
WRL	Water reservation lines
WUP	Water Use Program

Executive Summary

The South Florida Water Management District is proposing water reservation Rules for the Kissimmee River and Chain of Lakes to reserve water from consumptive uses in eight reservation waterbodies, which include: 1) Lakes Hart-Mary Jane Reservation Waterbodies, 2) Lakes Myrtle – Preston – Joel Reservation Waterbodies, 3) East Lake Tohopekaliga Reservation Waterbodies, 4) Lake Tohopekaliga Reservation Waterbodies, 5) Alligator Chain of Lakes Reservation Waterbodies, 6) Lake Gentry Reservation Waterbodies, 7) Headwaters Revitalization Lakes Reservation Waterbodies and 8) Kissimmee River Reservation Waterbodies (Figure 1), and their contributing waterbodies.

The proposed Rules: (a) identify the amount of water required to protect fish and wildlife given the existing lake regulation schedules and in consideration of existing water use permits, and (b) prevent that water from being allocated for consumptive uses. The Rules would apply to any of the 111 existing permit holders who seek new permits or to make certain changes to their permits such as increasing the water allocation as well as applicants seeking permits for new withdrawals from the reservation area. Across both existing permit holders and entities who may seek new permits in the future, the South Florida Water Management District expects that there would be up to 151 entities affected by the Rules through 2040.

This Statement of Estimated Regulatory Costs (SERC) is required by Florida statute. If the anticipated regulatory costs of the proposed Rules exceed specified thresholds, then the Rules must be reviewed and ratified by the state legislature before taking effect. Although not required, this SERC also considers the potential benefits of the proposed Rules for comparison to costs. The direct and/or indirect economic impacts likely to result in the first five years following implementation of the Rules were estimated as follows.

- ***Economic benefits to Florida residents*** were estimated to total $10.5 million which includes $7.0 million in benefits among recreational participants and $3.5 million in nonuse benefits.
- ***Economic costs on government entities*** were estimated to be $40,000 related to administrative costs imposed on the South Florida Water Management District. Implementation of the Rules is not expected to reduce, and may in fact increase, property values, property tax collections, and sales tax collections.
- ***Economic costs on future water users*** were estimated to be no more than $575,000. These costs would be incurred by new applicants or existing legal users (i.e. businesses or public entities) seeking an increased water allocation who, because of the Rules, needed to develop an alternative water source. No other transaction costs or adverse economic impacts are anticipated among water users.
- ***Total estimated regulatory costs*** in the first five years following implementation of the Rules is anticipated to be no more than $615,000.[1]

There are small businesses, small cities, and small counties within the five-county area containing the reservation and contributing waterbodies. These entities would not be affected by implementation of the Rules unless: (a) they are current water users and seek to change their use permits; or (b) they are not current users but want to withdraw water directly or indirectly from reserved water bodies in the future.

[1] $40,000 + $575,000 = $615,000.

1 Proposed Rules and Potential Economic Impacts

1.1 Background

The Kissimmee Basin, comprised of the Kissimmee River and Chain of Lakes, is the northernmost basin within the sixteen county boundary of the South Florida Water Management District (SFWMD or District). The boundary of the Kissimmee Basin overlaps those of six counties—Orange, Osceola, Polk, Highlands, Okeechobee, and Glades. It is bounded on the north and east by the St. Johns River Water Management District (SJRWMD), on the west by the Southwest Florida Water Management District (SWFWMD) and on the south by Lake Okeechobee. In terms of water resources, the Kissimmee Basin is divided into a northern and southern portion named the Upper Kissimmee Basin (UKB) and Lower Kissimmee Basin (LKB) water supply planning areas, respectively.

Within the Kissimmee Basin, the UKB and LKB serve as water supply planning areas. The boundary of the UKB and LKB meets along the Kissimmee River and at the county boundaries of Polk, Osceola, Highlands, and Okeechobee. The UKB is approximately 1,581 square miles with an average yearly rainfall of 48 inches and is 115 square miles smaller than the LKB. It includes hundreds of lakes and wetlands primarily located near the eastern and southern borders of the basin (Figure 1-1). The largest lake, Lake Kissimmee, is the third largest lake in Florida. A network of creeks, wetlands, sloughs, and tributary streams transport water throughout the UKB to the Kissimmee Chain of Lakes (KCOL), which includes the Headwaters Revitalization Lakes (Lakes Kissimmee, Hatchineha, Cypress and Tiger) and the Upper Chain of Lakes (UCOL), just north of the Kissimmee River (Figure 1-2). Ultimately, all the surface water that drains the UKB passes through the KCOL and into the Kissimmee River. The UKB lies within the boundaries of the Central Florida Water Initiative (CFWI). The CFWI was initiated among the three water management districts: SFWMD, SJRWMD, and SWFWMD, in part, to address short and long-term development of water supplies in the Central Florida Area. The CFWI boundary includes Orange, Osceola, Seminole, Polk, and portions of southern Lake Counties. The UKB is incorporated within the CFWI planning area and includes portions of Orange, Polk, and Osceola Counties.

The LKB is approximately 1,805 square miles and has an average yearly rainfall of 45 to 50 inches. The LKB is located directly north and west of Lake Okeechobee. Its main hydrological feature is the Kissimmee River, which flows from Lake Kissimmee to Lake Okeechobee. The LKB planning area (Figure 1.1), consists of the Kissimmee River and portions of four other watersheds namely the Taylor Creek/Nubbin Slough, Lake Istokpoga, Indian Prairie and Fisheating Creek, including an extensive network of canals, tributaries and significant floodplain habitat (SFWMD 2019).

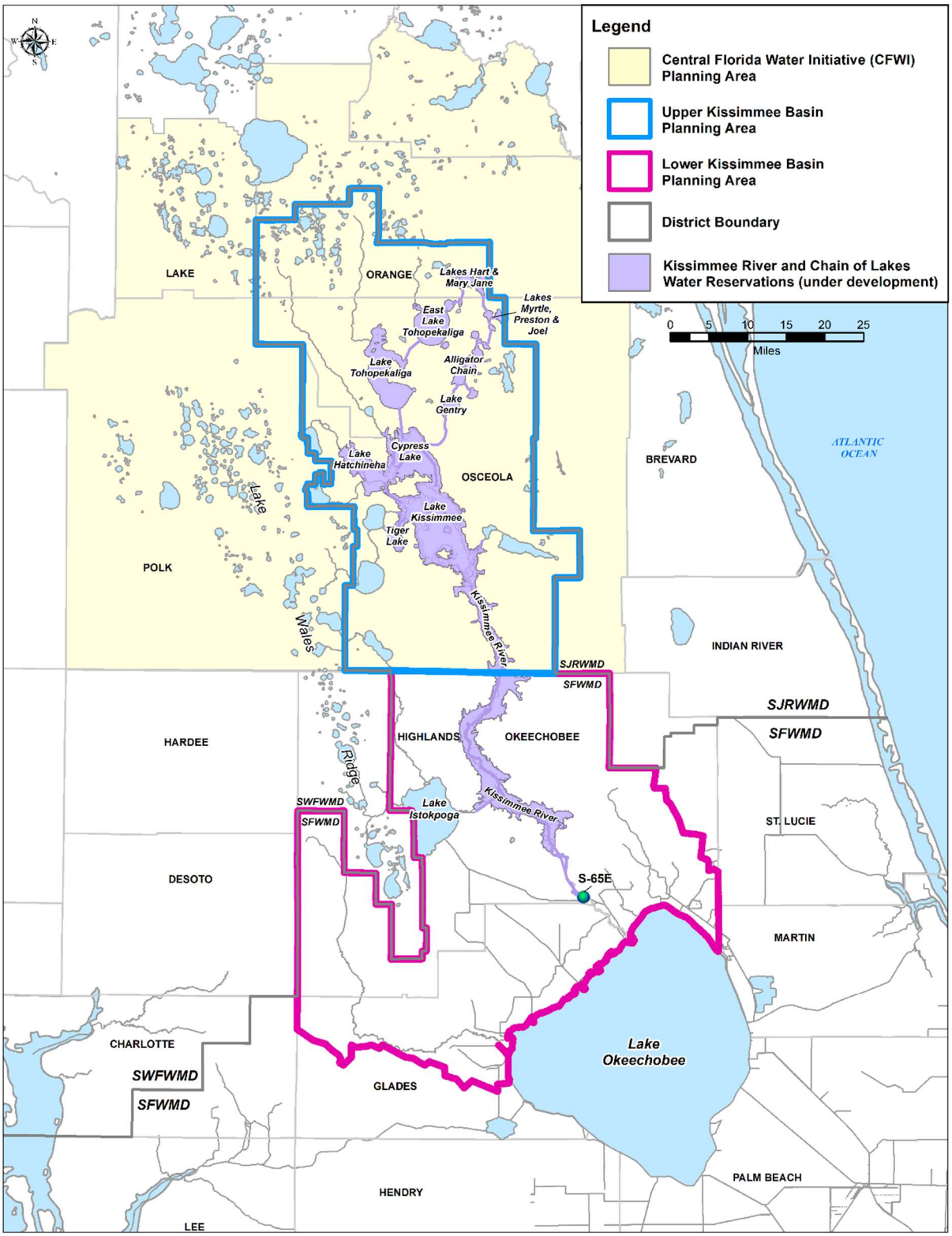

Figure 1-1. Map of the Kissimmee Basin.

The SFWMD developed the Kissimmee River and Chain of Lakes Water Reservations (hereafter the Rules) to reserve water needed to protect fish and wildlife (Figure 1.2). Within this region, there are multiple water users, including existing legal users (ELU) that withdraw water for the following purposes such as, but not limited to agriculture, livestock, industrial and public water supply as is discussed further in Chapter 2. Increased growth resulting in increased demand has resulted in additional requests for water withdrawals from both existing and new users. The water reservations will reserve from allocation 1) all surface water and surficial aquifer system (SAS) groundwater in the Kissimmee River, floodplain, the Headwaters Revitalization Lakes; 2) quantities of surface water and SAS groundwater up to established water reservation stages in the UCOL; and 3) surface water and SAS groundwater in all contributing waterbodies that is required for the protection of fish and wildlife (SFWMD 2020a).

Once the water reservations are adopted by rule, the SFWMD will continue to regulate existing and future water withdrawals and use additional regulatory criteria to ensure applicants provide reasonable assurance that proposed water withdrawals will not withdraw water reserved for the protection of fish and wildlife in the Kissimmee River and Chain of Lakes. A permittee will provide reasonable assurances by performing daily downstream water elevation stage checks of specified water reservation waterbodies and the Lake Okeechobee regulatory releases prior to withdrawing surface water or groundwater from a reservation or contributing waterbody.

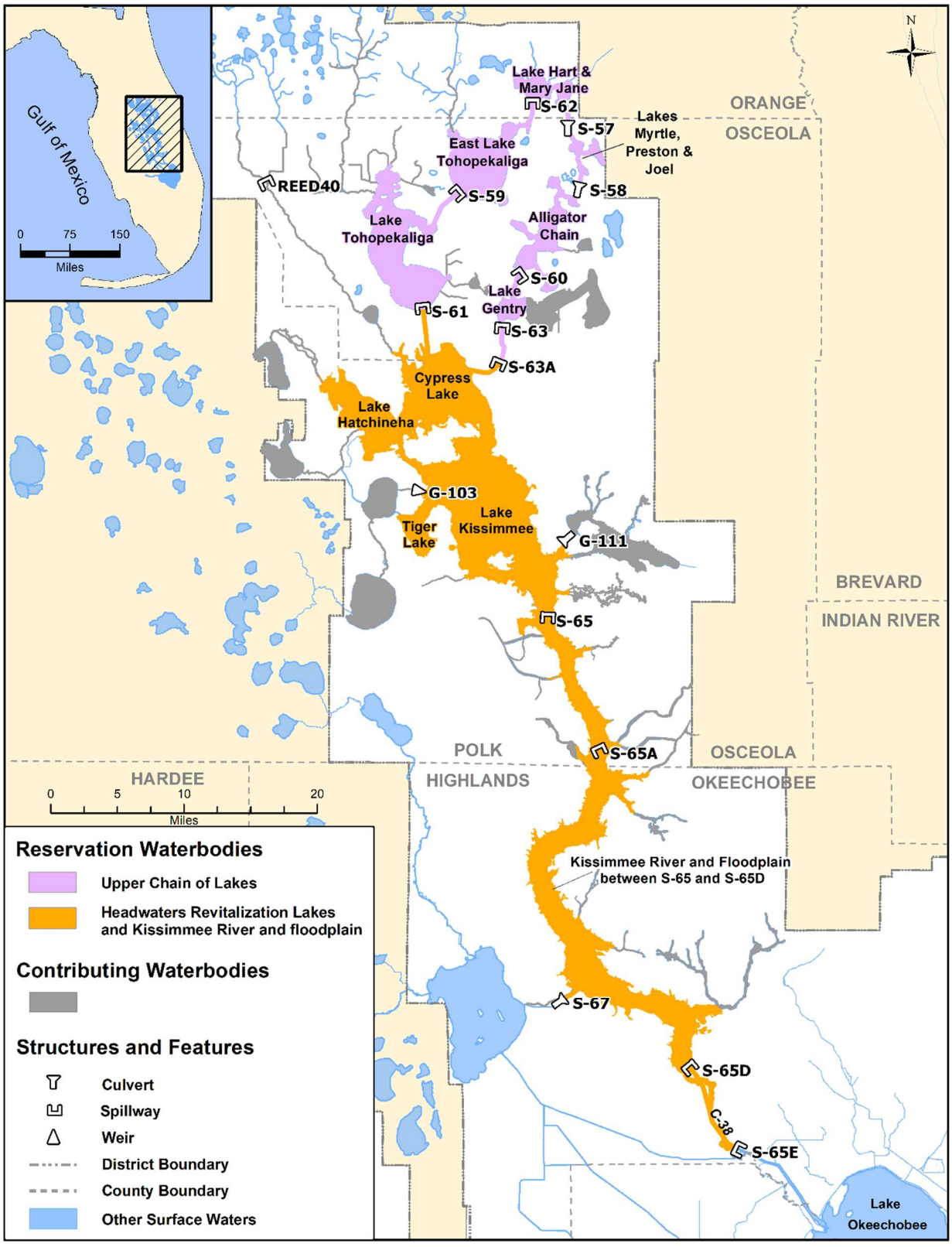

Figure 1-2. Map of the Kissimmee River and Chain of Lakes Water Reservations.

1.2 Historic and Current Conditions

Before human modifications in the late 1800s, the connectivity of the surface waterbodies was much less direct than it is today. Before the Kissimmee River was channelized, it meandered for 103 miles between Lake Kissimmee and Lake Okeechobee and contained diverse fish and wildlife resources and habitats associated with sand bars, vegetation beds, and variable flow conditions. In 1842, it was possible to travel by boat up the Kissimmee River, and Lakes Kissimmee, Hatchineha and Cypress to Lake Tohopekaliga (Preble 1945). However, in the 1880s, canals were dredged between lakes in the KCOL by Hamilton Disston as part of a drainage project to reclaim land. Another part of this project dredged a connection between Lake Okeechobee and the Caloosahatchee River. By 1882, it was possible to travel by steamboat from the town of Kissimmee on Lake Tohopekaliga through Lake Kissimmee and then down the Kissimmee River, across Lake Okeechobee and down the Caloosahatchee River to Fort Myers on the Gulf of Mexico (SFWMD 2020a).

In the Rivers and Harbors Act of 1902, the United States Congress authorized a federal navigation project with “a channel width of 30 feet and depth of 3 feet at the ordinary stage of the river” from the town of Kissimmee at the northern end of Lake Tohopekaliga through Lakes Cypress, Hatchineha, and Kissimmee and down the Kissimmee River to Fort Basinger. This navigation project involved the removal of large woody snags and the dredging of channels as necessary and was completed between 1902 and 1909 by the United States Army Corps of Engineers (USACE). In 1927, the USACE conducted the last federal maintenance dredging for this project (SFWMD 2020a).

Following two major hurricanes in the 1940s, most of South Florida, including the Kissimmee Basin, was affected by massive flooding and property damage. The ensuing request for Federal assistance from the State of Florida prompted Congress to authorize the Central and Southern Florida Flood Control (C&SF) Project to mitigate the risk of flood damage in the region in 1949. Construction on features affecting the Kissimmee Basin began in 1962 and 1972. In the UKB, constructed features included the enlargement of existing canals originally built by Disston, dredging a new canal connecting Lake Gentry to Lake Cypress, and installing nine water control structures to regulate water levels and flows among the Upper Chain of Lakes. Operation of the structures narrowed the range of water level fluctuation in the lakes, reducing the amount and quality of habitat for fish and wildlife (SFWMD 2020a).

In the LKB, the C&SF Project reconfigured the Kissimmee River into a 56-mile-long canal regulated by a series of water control features. In addition to the S-65 structure at the outlet from Lake Kissimmee, five water control structures (S-65A to S-65E) were installed along the C-38 canal to step-down water levels and control the flow of water in the river. The installation of the structures and channelization modified the natural flow regime and caused habitat alterations and immediate declines in fish and wildlife populations. Four of the structures remain today; S-65, S-65A, S-65D and S-65E.

The conditions imposed by the C&SF Project remained until concerns about habitat loss and damage to the ecosystem from the C&SF Project ultimately led to the development of the Kissimmee River Restoration Project (KRRP), which was authorized under the 1992 Water Resources Development Act (WRDA 1992). Under the Act, Congress authorized a joint federal-state project to re-establish the historical hydrological characteristics of 40 miles of the Kissimmee River to restore its ecological integrity. The KRRP is unarguably one of the largest river restoration projects in the world. The primary goal of the KRRP is to ensure that the river-floodplain system has “the capability of supporting and maintaining a balanced, integrated, adaptive community having species composition, diversity, and functional organization comparable to that of natural habitat of the region” (2014). The KRRP is to protect fish and wildlife and help re-establish historic populations. To support the water needs of the KRRP, WRDA 1992 also authorized the Kissimmee River Headwaters Revitalization Schedule (HRS) to change (raise) the regulation schedule for the Headwaters Revitalization Lakes. The HRS intended to provide more water storage to provide sufficient inflows to restore the Kissimmee River by allowing water levels to rise higher than the previous schedule. After extensive planning, construction for the KRRP began in 1999 with backfilling of the C-38 canal in the Phase I construction area and removal of the S-65B and S-65C water control structures. Currently, construction work is nearly complete. When the project is completed in 2021, more

than 40 square miles of river-floodplain ecosystem will be restored, including nearly 20,000 acres of wetlands and 44 miles of historic river channel (USACE 2020). The final phase is currently projected to be complete in Spring 2021.

The KRRP has an estimated cost of $800 million. Its success depends largely on re-establishing historic hydrologic conditions, which will lead to recovery of wetlands and associated fish and wildlife populations similar to what existed during pre-channelization. This commitment requires not only long-term management and evaluation of restoration progress, but implementation of water resource management strategies to protect the water needed for restoration of the ecosystem. Therefore, the District is proposing the Rules to reserve water for the protection of fish and wildlife in the Kissimmee River and Chain of Lakes. Once implemented, the reserved water will not be available for consumptive use, thus ensuring the ecosystem has the necessary hydrologic conditions to support a healthy and sustainable community of native fish and wildlife.

1.3 Summary of Proposed Rules

The District is proposing the water reservation Rules for the Kissimmee River and Chain of Lakes to reserve water from consumptive uses in 8 reservation waterbodies identified as: 1) Lakes Hart-Mary Jane Reservation Waterbodies, 2) Lakes Myrtle – Preston – Joel Reservation Waterbodies, 3) East Lake Tohopekaliga Reservation Waterbodies, 4) Lake Tohopekaliga Reservation Waterbodies, 5) Alligator Chain of Lakes Reservation Waterbodies, 6) Lake Gentry Reservation Waterbodies, 7) Headwaters Revitalization Lakes Reservation Waterbodies and 8) Kissimmee River Reservation Waterbodies (Figure 1-3), and their contributing waterbodies (Table 1-1). The southern extent of this water reservation terminates at the S-65E structure near Lake Okeechobee. The waterbodies were selected for water reservation development because they are closely linked hydrologically, represent water resources of regional significance, and have valued fish and wildlife resources. The purpose of the Rules is to reserve from allocation the water needed to protect fish and wildlife in the Kissimmee River and Chain of Lakes and to protect the public's investment in the ecological restoration of the Kissimmee River and its floodplain. Considerable fish and wildlife resources are associated with the reservation waterbodies, including a world-class sport fishery and several threatened and endangered species. The Kissimmee Basin historically and currently provides diverse habitat for fish and wildlife including wading bird colonies; snail kite, sandhill crane and other avian species nesting; foraging habitat for bald eagles; and large-mouth bass fisheries. Fluctuating water levels are one of the most important factors that determine the type, abundance, and distribution of vegetation in lake littoral zones. In the KCOL, habitat use by fish and wildlife is linked to seasonal and annual patterns of water level fluctuation. This is due, in part, to how hydrology determines zonation of wetland plant communities, which in turn provide food, shelter, and breeding habitat for various faunal communities.

The proposed Rules protect reserved water from future consumptive water use allocations, thereby protecting the ecosystem while maintaining existing permitted consumptive use allocations. The water reservations will reserve from allocation 1) all surface water and SAS groundwater in the Kissimmee River, floodplain, the Headwaters Revitalization Lakes; 2) quantities of surface water and SAS groundwater up to established water reservation stages in the UCOL; and 3) surface water and SAS groundwater in all contributing waterbodies that is required for the protection of fish and wildlife (SFWMD 2020a). The proposed Rules would establish water reservation lines (WRL) (defined daily stage elevations within each lake in the UCOL) which would allow permit holders to withdraw water from the system when there is sufficient water available (above and beyond the WRL) to meet the needs of fish and wildlife. Surface waters and SAS groundwater that contribute to the reservation waterbodies are also reserved from allocation based on the same WRL criteria described above. The proposed reservation water levels are based on the hydrologic conditions expected under a fully restored Kissimmee River and floodplain (between S-65 and S-65D), a fully implemented headwater revitalization schedule and based on historic and existing operation for the remaining lakes in the UCOL.

Certain additional constraints would limit the withdrawal of water such as the Lake Okeechobee constraint. The Lake Okeechobee constraint would limit withdrawals to occur only when Lake Okeechobee regulatory

releases are being made to tide through the Caloosahatchee River or St. Lucie Estuary. Additional constraints are proposed within specific reservation waterbodies where water withdrawals may occur in those waterbodies only when water reservation stages would warrant. A key threshold for the Water Reservation rule criteria is that the reduction in annual average discharges at the S-65 structure for the 41-year simulation period conducted in the District's Upper Kissimmee - Operations Simulation (UK-OPS) Model by more than 4.18 percent. The District has determined that up to a 5 percent reduction in the annual average discharges at the S-65 structure would be acceptable in terms of protecting the water needed for fish and wildlife, based on an analysis of historic flows. All applicants will be required to demonstrate reasonable assurances that a withdrawal in combination with other permitted withdrawals will not reduce annual average discharges at the S-65 structure by more than 4.18 percent. An applicant would satisfy this criterion by utilizing the District's UK-OPS hydrologic model to determine the reduction in flow that would be caused by their proposed withdrawals. One water use permit recently was authorized, consuming 0.82 percent of the threshold and leaving 4.18 percent of future reductions in the annual average discharges at the S-65 structure. Once the threshold is reached, no further withdrawals will be permitted. A detailed explanation of how to utilize UK-OPS to determine the potential for downstream impacts on the KCOL is provided in Chapter 4.

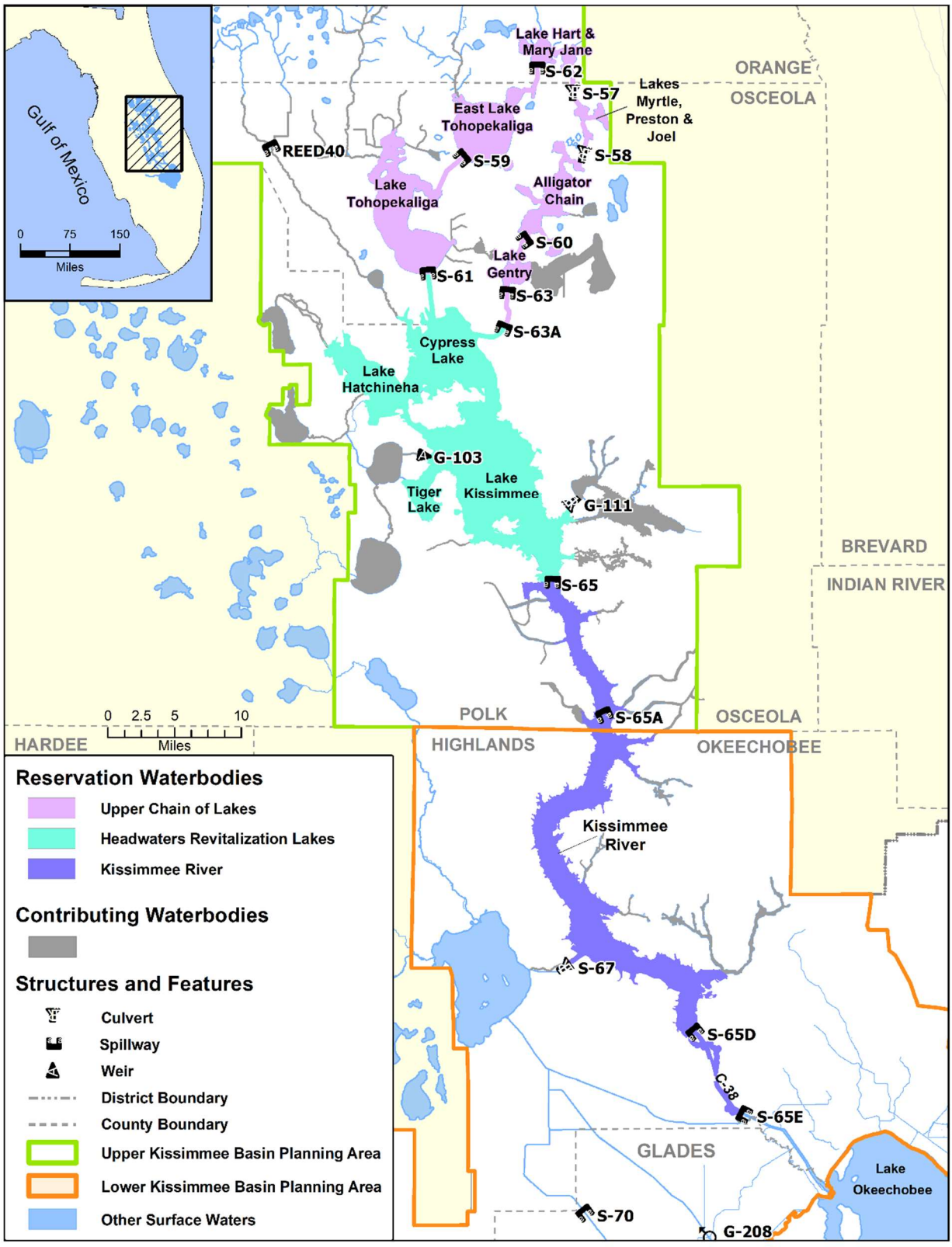

Figure 1-3. Map of Reservation Waterbodies.

Table 1-1. Reservation and Contributing Waterbodies in the Kissimmee River and Chain of Lakes.

Reservation Water Body	Reservation Waterbodies	Contributing Waterbodies
Lakes Myrtle-Preston-Joel	C-30 Canal south of S-57, Lake Myrtle, Myrtle-Preston Canal, Lake Preston, C-32B Canal, Lake Joel, C-32C Canal north of S-58	NA
Lakes Hart-Mary Jane	Lake Whippoorwill, Whippoorwill Canal, Lake Hart, C-29 Canal, Lake Mary Jane, C-29A Canal north of S-62, C-30 Canal north of S-57	NA
East Lake Tohopekaliga	C-29A Canal south of S-62, Ajay Lake, C-29B Canal, Fells Cove, East Lake Tohopekaliga, Runnymede Canal, Lake Runnymede and C-31 Canal northeast of S-59	Boggy Creek
Lake Tohopekaliga	C-31 Canal southwest of S-59, Lake Tohopekaliga	Fish Lake, Bass Slough, Partin Canal, Mill Slough, East City Ditch, West City Ditch, Shingle Creek including Western Branch (West Shingle Creek), WPA Canal, Gator Bay Branch, Fanny Bass Ditch, Fanny Bass Pond, Drawdy Bay Ditch
Alligator Chain Of Lakes	C-33 Canal north of S-60, Alligator Lake, Brick Canal, Brick Lake, Live Oak Lake, Live Oak Canal, Sardine Lake, Sardine Canal, C-32G Canal, Lake Lizzie, C-32F Canal, Lake Center, Center/Coon Canal, Coon Lake, C-32D Canal, Trout Lake, C-32C Canal south of S-58	Buck Slough, Buck Lake
Lake Gentry	C-34 Canal north of S-63, Lake Gentry, C-33 Canal south of S-60	Big Bend Swamp, Big Bend Swamp Canal/Gentry Ditch
Headwaters Revitalization Lakes	C-35 Canal south of S-61, Cypress Lake, C-34 Canal south of S-63A, C-34 Canal north of S-63A, C-36 Canal, Lake Hatchineha, C-37 Canal, Lake Kissimmee, Zipprer Canal east of G-103, Tiger Lake, Tiger Creek, Jackson Canal south of G-111	Lake Russell, Lower Reedy Creek south of REED40, Upper Reedy Creek north of REED40, Bonnet Creek, Lake Marion, Lake Marion Creek, Catfish Creek , Lake Pierce, Zipprer Canal west of G-103, Lake Rosalie, Weohyakapka Creek, Lake Weohyakapka, Otter Slough, Jackson Canal north of G-111, Lake Jackson, Parker Hammock Slough, Lake Marian, Fodderstack Slough, No Name Slough
Kissimmee River Pool A		Buttermilk Slough, Packingham Slough, Ice Cream Slough, Blanket Bay Slough, Armstrong Slough
Kissimmee River Pool B/C/D	Istokpoga Canal and floodplain east of S-67	Tick Island Slough, Pine Island Slough, Sevenmile Slough, Starvation Slough, Oak Creek, Ash Slough, Gore Slough, Fish Slough, Cypress Slough, Istokpoga Creek west of S-67
Kissimmee River Pool E	C-38 Canal and remnant river channels from S-65 to S-65E	NA
Kissimmee River Pools A-E	Kissimmee River and floodplain between S-65 and S-65D	NA

The Rules set-aside (i.e. reserve) water for the protection of fish and wildlife. The amount of water to be reserved was determined as part of the Rule development process. To make this determination the rule-makers considered: (a) the amount of water already allocated to existing water use permits; (b) the Lake Okeechobee regulation schedule and (c) the water levels required to protect of fish and wildlife. In the end, the Rules will preserve the rights of existing legal users and protect fish and wildlife in a manner consistent with the public interest.

The proposed Rules identify when water will be reserved in throughout the year in the UCOL using a water reservation line for each reservation waterbody. The stage within a reservation waterbody must be above the identified WRL prior to making a withdrawal. For water that is not reserved, applicants must meet the conditions for permit issuance under Section 373.223, F.S. and provide reasonable assurance that the proposed use will not impact or withdraw water reserved for the protection of fish and wildlife in the Kissimmee River and KCOL under Rule 40E-10.071, Florida Administrative Code (F.A.C.) This is done by demonstrating how the proposed withdrawal would potentially impact the system and other ELU.

A new section of the Applicant's Handbook for Water Use Permit Applications within the South Florida Water Management District (SFWMD, 2020; hereafter "Applicant's Handbook") provides specific criteria defining those water uses which do not withdraw reserved water in terms of direct (reservation waterbodies and connecting canals) and indirect (significant contributing source to reservation waterbodies, i.e. groundwater) withdrawals. The new Section 3.11.5 includes:

- Direct withdrawals of surface water from UCOL reservation or contributing waterbodies that occur when the reservation waterbody stage exceeds the stage reserved from allocation;
- For Indirect Withdrawals of groundwater from the SAS, demonstration that the well(s) impose less than 0.1-foot of drawdown from a reservation or contributing waterbody, as determined pursuant to Subsection 3.1.2.A of the Applicant's Handbook;
- A permit modification or renewal that does not change the source, increase the allocation or change the withdrawal location. This includes crop changes that do not affect the allocation or that results in a decrease in allocation;
- Re-allocation or transfer of water use permit that satisfied the conditions of issuance prior to the adoption of the Rules, or if after adoption of the Rules, complied with additional criteria required for permit issuance according to the Rules;
- A proposed new use or water use permit modification that does not include Direct Withdrawal of Surface Water or Indirect Withdrawal of Groundwater from a reservation of contributing waterbody;
- Withdrawals from Floridan Aquifer System (FAS) well(s);
- District-authorized Direct Withdrawal of Surface Water when the District is making discharges from reservation waterbodies for flood protection, maintenance, or environmental releases;
- Dispersed water management or other water quality improvement projects have been authorized by the District and are consistent with the Northern Everglades and Estuaries Protection Program;
- Withdrawals authorized by Subsection 40E-2.061(2), F.A.C. (General Permit by Rule for Short-Term Dewatering).

The District developed additional criteria for issuance of permits from UCOL and contributing waterbodies for Direct Withdrawals of Surface Water or Indirect Withdrawals from Groundwater that would be in accordance with criteria in Subsection 5.2.2 K.9 of the Applicant's Handbook. These criteria include:

- Demonstrating that the withdrawals comply with the environmental criteria of the Applicant's Handbook in Subsection 3.3 and 3.11.5.C;
- Demonstration that the withdrawal request is reasonable—beneficial for the use class is compatible with the source and has available withdrawal capacity;

- Demonstration of reasonable assurance that the proposed use will not have downstream impacts to the Kissimmee River and will not impact the KRRP objectives. These analyses shall demonstrate that the individual and cumulative withdrawals do not reduce average discharges at the S-65 structure by more than 4.18 percent, compared to a no-withdrawal condition over the range of hydrologic variability that occurred between 1965 and 2005;
- Demonstration of reasonable assurance that the proposed use will not have downstream impacts on ELU in the Lake Okeechobee Service Area.

1.4 Potential Benefits of the Rules

Statement of estimated regulatory costs (SERC) regulations do not require consideration of the potential benefits of the Rules; however, potential benefits are significant and are therefore summarized below for context. In addition to benefits in the reservation and contributing waterbodies, the success and benefits the public will receive from the KRRP are based largely on re-establishing more natural hydrological characteristics within the river and so supporting healthy vegetation, fish and wildlife populations.

The SERC considers the *incremental benefits* of the Rules using "with" and "without" scenarios. The "with Rules" scenario is the benefits that would be achieved *with* the water reservations as proposed in the Rules. The "without Rules" scenario is the benefits that would be achieved *without* the water reservations as proposed in the Rules. The incremental benefits attributable to the Rules are therefore the differences in benefits with and without the Rules:

Incremental Benefits of Rules = Benefits with the Rules – Benefits without the Rules.

The following sections discuss ecosystem services, economic valuation of ecosystem services, and the potential benefits of implementing the water reservation Rules.

1.4.1 Ecosystem Services

Healthy ecosystems perform numerous functions that support and benefit humans and other species. These functions or "ecosystem services" are *benefits that are provided by nature* and *valued by people*, directly or indirectly. The Millennium Ecosystem assessment (2003) classifies ecosystem services into four broad categories:

- Provisioning services, such as food and water;
- Regulating services, such as flood and disease control;
- Supporting services, such as nutrient cycling; and
- Cultural services, the contribution of ecosystems to human recreational, cultural, and spiritual values.

Examples of services that directly benefit people include the provision of food, timber, water, scenic beauty, and opportunities for outdoor recreation such as fishing, kayaking, hunting, and hiking. Contributions to cultural and spiritual values are also examples of services that directly benefit humans. Other services, such as nutrient cycling and the provision of wildlife habitat, indirectly benefit humans. These services support vegetation and wildlife which then contribute services directly to humans. For example, wetlands provide nursery habitat for young life stages of some types of fish and provide nesting and feeding habitat for some types of birds. The resulting fish and bird populations provide direct benefits to anglers, birders, and hunters, among others.

Figure 1-4 illustrates the ecosystem services provided by wetlands, including habitat for fish and wildlife, improved water quality, nutrient cycling, and support for recreational, cultural, and spiritual values. These services in turn are valued by people who benefit from them (i.e. beneficiaries). Beneficiaries may be specific groups of individuals as well as the public.

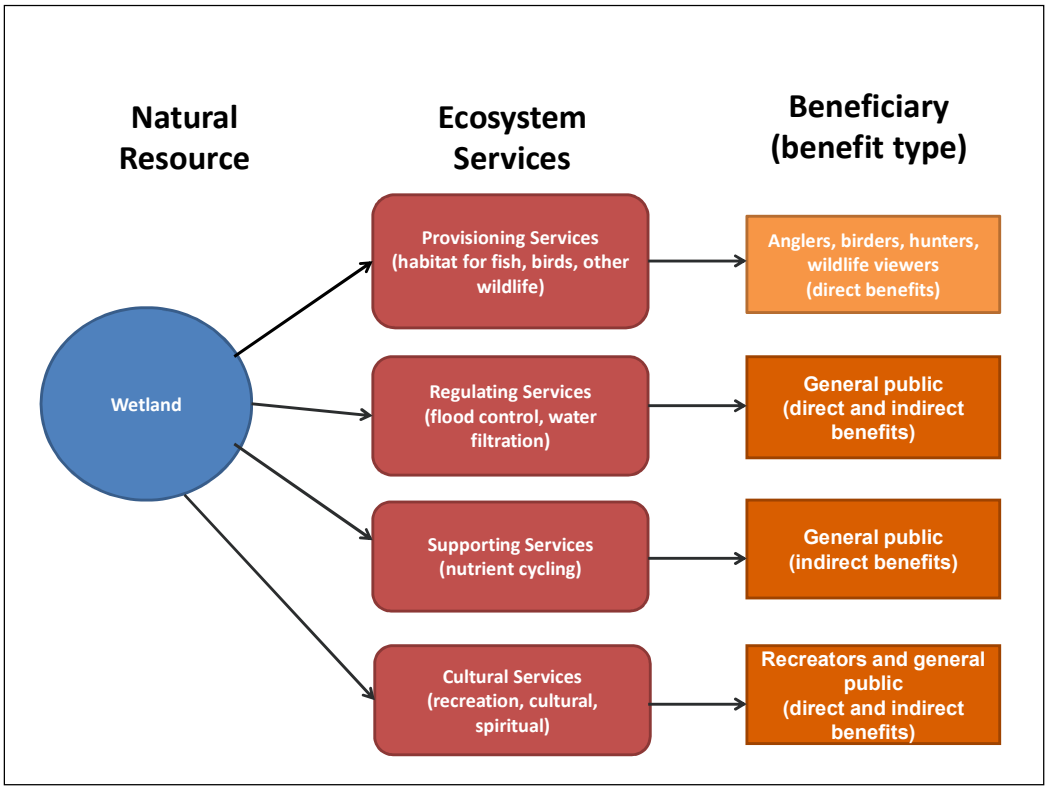

Figure 1-4. Connection between Natural Resources and People.

Economists have developed techniques to quantify the economic value of ecosystem services. Economic value reflects that amount of one thing that someone is willing to trade for another; it is typically measured in dollars for convenience. For example, if someone is willing to pay up to $10 for a good that costs them only $6, the economic value of the good to that person is $4 because they give up $6 to gain something worth $10 to them. Because economic value reflects the net or surplus value gained above the cost of the good, it is called *consumer surplus*.

Estimating consumer surplus is straightforward for goods and services traded in a market where economists can use data on the quantities of goods and services purchased at different prices to estimate economic values. Valuation is more difficult for goods and services that are not traded in markets, such as cultural services, because similar data (i.e. market transactions) are not available.

Non-market valuation techniques were developed to quantify the consumer surplus for ecosystem goods and services that are not traded in markets. Economic values from ecosystem services can be classified into two main categories of values: *use values* and *non-use values*.[2] Use values arise from direct and indirect uses of ecosystem goods and services such as timber and other forest products, outdoor recreation, and drinking water. In contrast, non-use values capture values that people may hold for ecosystems and natural resources for reasons other than their direct and indirect uses. Examples include preserving ecosystem health for future generations and protecting endangered species because of their intrinsic value.

Non-use values are estimated using survey-based techniques that create hypothetical markets for the services, for example by asking an individual if they would be willing to contribute to a fund, or have their taxes increased in order to preserve or improve an ecosystem good or service. Due to the hypothetical nature of these techniques, the measurement of non-use values is difficult and remains a controversial topic in economics.

[2] Non-use values are also called passive use values.

The Rules, by protecting water to support healthy fish and wildlife populations, will provide both use and non-use benefits to Florida residents and visitors. In the following sections, we discuss the potential economic benefits of the Rules for two categories of benefits: recreational use value and non-use value. Because benefit estimation is not a requirement of the SERC, we present a partial estimate of benefits based on categories of benefits that can be estimated using readily available information. The actual benefits are expected to be larger. However, as discussed further in Section 1.6, even these partial benefits substantially outweigh the expected costs of the Rules to Florida residents over the first five years of Rule implementation.

1.4.2 Recreational Use Benefits

Three inputs were integrated into a Monte Carlo analysis to estimate the annual recreational use benefits likely to arise from implementation of the Rules.[3] The three inputs were: (1) the number of annual visits potentially affected by implementation of the Rules; (2) the baseline value per visit; and (3) the change in value per visit associated with implementation of the Rules. The methods used to estimate distributions for each input are described in the following text. Table 1-2 presents the inputs and results.

Number of Visits Affected

The number of visits affected by implementation of the Rules was characterized as a PERT distribution defined by the minimum, most likely, and maximum number of visits that might be affected.

- The minimum number of visits potentially affected was based on visitation to the three state parks located in counties intersected by the proposed water reservations. In the 2018/2019 fiscal year, FDEP (2019a) reports these parks hosted a total of 263,014 visits.[4] Assuming 25 percent of these trips would be affected by implementation of the Rules, the minimum value in the distribution was 65,754 (calculated as 25 percent of 263,014 visits).
- The maximum number of visits potentially affected was based on the assumption that 5 percent of all 8,270,365 visits to public recreational areas located in counties intersected by the proposed water reservations would be affected each year.[5] Thus, the maximum value in the distribution was 413,518.
- The most likely number of visits was defined as the midpoint between 65,754 and 413,518, which is 239,636.

Baseline Value per Visit

The baseline value per visit among affected trips was quantified using an economic measure known as consumer surplus. The economics literature includes estimates of consumer-surplus-per-visit associated with freshwater recreation in Florida (Bi et al 2019; Shrestha et al 2007; Ehrlich et al 2016). These studies suggested that, at baseline, consumer surplus per visit likely ranges from $23.52 to $40.40.

The baseline value per visit was characterized as a PERT distribution defined by:

- A minimum value of $23.52;
- A maximum value of $40.40; and
- A most likely value of $32.00 (the average of $23.52 and $40.40).

[3] Monte Carlo analysis is used to estimate distributions of outputs, taking into account uncertainty in the inputs.

[4] The 53,732 acre Kissimmee Prairie Preserve hosted 33,107 visits. The 5,893 acre Lake Kissimmee hosed 73,495 visits. The 9,251 acre Highlands Hammock State Park 156,412.

[5] The total number of visits to recreational areas located in counties intersected by the proposed water reservations is unknown. The total was estimated to be 8,270,365 based on (a) the total acreage of public recreational sites in the affected counties (779,012) and an assumed annual visitation rate of 10.62 visits per acre.

Rule-Related Change in Value per Visit

The rule-related change in values per visit represents the reduction in consumer surplus if fish and wildlife are not protected. Shrestha et al. (2007) characterized the value of enhancements at recreational facilities in Florida. Based on their work, we characterize the rule-related change in value per visit as a PERT distribution defined by: a minimum of 10 percent of the baseline value per visit, a maximum of 30 percent and a most likely of 20 percent.

The Range of Use Benefits

Monte Carlo methods were used to estimate the range of annual use benefits. Under the assumption that the number of visits affected, the baseline value per visit, and the rule-related change in value per visit are independent inputs, annual use benefits ranged from $0.2 million to $5.0 million with an expected value of $1.5 million.

Benefits over 5 and 50 years were converted to a present value using a 3 percent annual discount rate.[6] Five years is the timeframe over which this SERC considers costs, and the 50-year timeframe represents a reasonable measure of total benefits resulting from the project.

Table 1-2. Recreation Use Benefits: Monte Carlo Inputs and Results.

Factor	Low	High
Trips Benefitting from Implementation	65,754	413,518
Consumer surplus per visit	$23.52	$40.40
Percent Enhancement in Consumer Surplus per Visit	10%	30%
Range of Annual Benefits	$0.2 million	$5.0 million
Expected Annual Benefits	$1.5 million	
Expected Annual Benefits: Present Value over 5 Years	$7.0 million	
Expected Annual Benefits: Present Value over 50 Years	$39.4 million	

1.4.3 Nonuse Benefits

Estimating the non-use value associated with changes in ecosystem service provision is difficult and controversial. Economic theory suggests that non-use values are most likely to be important for irreversible changes to unique or special resources. The KRRP would result in the preservation and restoration of a unique ecosystem containing multiple rare, threatened, or endangered species. Coordination with state and federal agencies and stakeholders occurred through public comment periods for the protection of fish and wildlife once the Rules are adopted. Without the Rules, there is a reasonable chance that some fish and wildlife species' populations would decline. The protection of these fish and wildlife is likely to generate non-use values of a material magnitude.

Published papers in the peer reviewed economics literature have calculated the ratio of non-use benefits to use benefits. This ratio allows a site-specific estimate of non-use values to be estimated relatively easily.

The United States Environmental Protection Agency (USEPA) previously identified as a 'credible rule of thumb' the assumption that the ratio of nonuse to use values associated with natural resource changes

[6] $Present\ Value = \sum_{year} \frac{Annual\ Benefits}{1.03^{year}}$

might be about 0.5. This ratio, which was based on Fisher and Raucher (1984), was used in the estimation of potential nonuse values associated with protection of fish and wildlife. While a meta-analyses describing potential nonuse to use ratios for similar types of natural resources (Table 1-3), indicates the ratio of nonuse to use values might be as high as 1.92, the 0.5 ratio is relied on in this analysis in order to make a conservative comparison of benefits and costs.

Applying 0.5 to the annual range in recreational use benefits of $0.2 million to $5.0 million yields an estimated non-use value of $0.1 million to $2.5 million. The expected non-use value is 0.5 times the expected recreational use benefits value of $1.5 million, which equals $0.8 million.

Table 1-3. Nonuse to Use Ratios.

Study	Scope	Nonuse to Use Ratio	Was Ratio Reported or Derived?	Number of Studies	Study Years
Fisher and Raucher (1984)	Water Quality Improvements	0.70	Derived	9	1974-1983
Brown (1993)	Impact to Environmental Resources	1.92	Reported	31	1981-1993
Loomis and White (1996)	Impacts to T&E Species	0.82	Derived	20	1983-1994
Brouwer et al. (1999)	Impacts to Wetland Ecosystems	0.52	Derived	30	1981-1998
Johnston et al. (2003)	Water Quality Improvements	0.51	Reported	20	1978-2000
Johnston et al. (2005)	Aquatic Resource Improvements	1.38	Derived	34	1981-2001
Van Houtven et al. (2007)	Water Quality Improvements	0.50	Reported	21	1977-2003
Richardson and Loomis (2009)	Impacts to T&E Species	0.42	Reported	31	1983-2003
Johnston and Thomassin (2010)	Water Quality Improvements	1.19	Derived	36	1981-2003

1.4.4 Total Benefits

Total benefits are calculated as the sum of use and nonuse benefits and reported in Table 1-4.

Table 1-4. Summary of Estimated Consumer Surplus Benefits of the Draft Rules.

Expected Values	Recreation Use Benefits	Nonuse Benefits	Total Benefits
Annual	$1.5 million	$0.8 million	$2.3 million
Present Value over 5 Years	$7.0 million	$3.5 million	$10.5 million
Present Value over 50 Years	$39.4 million	$13.5 million	$52.9 million

1.5 Potential Economic Costs of the Draft Rules

Requirements associated with the new Rules may impose some costs beyond what current and potential applicants, government entities, and small businesses pay under the current rules. Chapters 3, 4, and 5 of the SERC describe these costs. This section summarizes the potential costs incurred over a 5-year period after the implementation of the Rule, for comparison to SERC criteria and the potential benefits above.

1.5.1 Potential costs to Government Entities of Rule Implementation

Chapter 3 presents the potential incremental costs to the District and other government entities resulting from implementation of the Rules. Incremental costs represent the increase in costs with the Rules compared to costs without the Rules.

Incremental costs to the district are expected to be minor. The per-transaction costs associated with review of permit applications, review of compliance forms, and monitoring and enforcement are expected to be similar to current processes. The UK-OPS model developed by the District will be used by permit applicants. The development of the model is not an incremental cost of Rule implementation, as it was developed primarily for Rule development, specifically to implement hydrological modeling required to evaluate various withdrawal scenarios with the proposed water reservation lines in the Upper Chain of Lakes. The WRLs were set using historical stage data within the UCOLs.

Costs to the District over five years is expected to be no more than $40,000.

No other government entities would incur costs associated with implementation of the Rules.

1.5.2 Transactional costs associated with the draft Rules

Chapter 4 discusses incremental transactional costs, which are new or additional costs that would be imposed on permit applicants and permit holders. Incremental costs are costs to permit applicants and permit holders above costs under current rules. Potential incremental costs include:

- Incremental costs of $250 to $2,500 to run the UK-OPS model as part of the permit application process;
- Negligible incremental costs to permit holders of recording water withdrawals and submitting forms more frequently than under the current rules; and
- Incremental costs, in the form of accessing alternative water supplies, would arise among applicants that would have been approved without the Rules but who are not approved with the Rules. These incremental costs likely range from $1 to $4 per 1,000 gallons. As discussed in Chapter 2, water use has been projected to increase between 2017 and 2040. Increases range from 3 percent for agricultural water use in the UKB and 36 percent for total water use in the CFWI, which includes the UKB. This SERC assumes a 5 percent increase from now until 2040 in water demand within the reservation and contributing waterbodies, as most of the existing water permits are agricultural. Applying this to the current permitted withdrawals of 48.3 million gallons per day (mgd) (see Chapter 2), an additional 220 million gallons would be demanded over the next five years.[7] The SERC assumes that 50 percent of this demand would be satisfied through accessing alternative water supplies under the proposed Rules, but would have been permitted under the current Rules, thereby resulting in incremental transactional costs. Assuming a midpoint cost of accessing alternative water supplies of $2.50 per thousand gallons (kilogallons or kgal) and applying a five percent annual discount rate, the estimated present value of these transactional costs is about $575,000 (Table 1-5).[8] Based on the current information the District believes that this value is more likely to be overstated than understated.

[7] 48.3 mgd x 365 days/year x 0.05 ÷20 years x 5 years = 220.3 million gallons.

[8] Appropriate discount rates may range from three percent for public projects to seven percent for private firms. We use a midpoint value. Higher discount rates reduce the present value of future costs.

Table 1-5. Calculation of Potential Transactional Costs.

Year	Additional Demand (kgal)	Cost per kgal	Discount Factor [a]	Present Value Cost [b]
2021	4,259	$2.50	0.952	$10,141
2022	21,296	$2.50	0.907	$48,289
2023	53,239	$2.50	0.864	$114,974
2024	88,732	$2.50	0.823	$182,499
2025	110,914	$2.50	0.784	$217,261
Total				$573,164

[a] The discount factor equals $1/(1+d)^{(Year-2020)}$, where d is the annual discount rate of 5 percent.
[b] The present value cost equals additional demand in kgal x cost per kgal x discount factor.

1.5.3 Summary of costs over a 5-year period

Table 1-6 summarizes the costs discussed in the preceding sections.

Table 1-6. Summary of Costs over Five Years.

	Costs in the First Five Years of Rule Implementation
Costs to District	No more than $40,000
Costs to Applicants	Not likely to exceed $575,000
Costs to Permitted Individuals	Negligible
Total	Not likely to exceed $615,000

1.6 Comparison of Costs and Benefits of the Draft Rules

The SERC analysis focuses on the potential costs of the proposed Rules during its first five years of implementation. The Rules must be reviewed by the Florida legislature if the Rules are likely to result in any of the following:

- Have an adverse impact on economic growth, private-sector job creation or employment, or private-sector investment in excess of $1 million in the aggregate within 5 years after the implementation of the Rules;
- Have an adverse impact on business competitiveness, including the ability of persons doing business in the state to compete with persons doing business in other states or domestic markets, productivity, or innovation in excess of $1 million in the aggregate within 5 years after the implementation of the Rules; or
- Increase regulatory costs, including any transactional costs, in excess of $1 million in the aggregate within 5 years after the implementation of the Rules.

This SERC has found that total incremental costs during the first five years of Rule implementation are not likely to exceed $615,000. None of the adverse regulatory conditions above is likely to be met. In addition, as discussed in Chapter 5, there are expected to be negligible negative impacts and some positive impacts on small businesses, small counties, or small cities resulting from the Rules.

This SERC has found that benefits of the Rules are expected to be significant. As reported in Table 1-4, partial consumer surplus benefits are estimated to be more than $10 million over the first five years of Rule

implementation and more than $50 million over 50 years (both are present values reflecting a 3 percent discount rate).[9] These values are more likely to be understated than overstated.

[9] A 3 percent discount rate is appropriate for public value.

2 Number of Individuals and Entities Required to Comply

2.1 Information Provided in this Section

This section includes a general description of the types of individuals and entities likely to be affected by the water reservation Rules and estimates of the number of individuals and entities likely required to comply with the Rules.

2.2 Summary of Individuals and Entities Likely Required to Comply

Those who will be affected by the Rules include future applicants for permits to withdraw non-reserved water from the water reservation area and existing permit holders if they request a permit modification that changes the location of the withdrawal, the source of the withdrawal, or increases the amount of withdrawal. Those impacted may include businesses, small government entities, or individuals who seek to withdraw water from the water reservation area to use as a supplemental water source for various uses. These may include irrigation for agriculture, landscaping, or nursery operations, various industrial uses, livestock operations, or as a public water source.

2.2.1 Existing Permit Holders

There are 111 existing permit holders within the reservation area. These include 97 permits for groundwater withdrawals from the SAS and 14 permits for surface water withdrawals (Figure 2-1 and Figure 2-2). Withdrawals from the SAS account for the majority of permits within the water reservation area, but most of the allocation is derived from surface water. The total daily allocation for withdrawals of groundwater is about 5.8 mgd while the total daily allocation for all surface water sources is about 42.7 mgd. Table 2-1 summarizes the number of permits and allocation for groundwater withdrawals from SAS and surface water withdrawals.

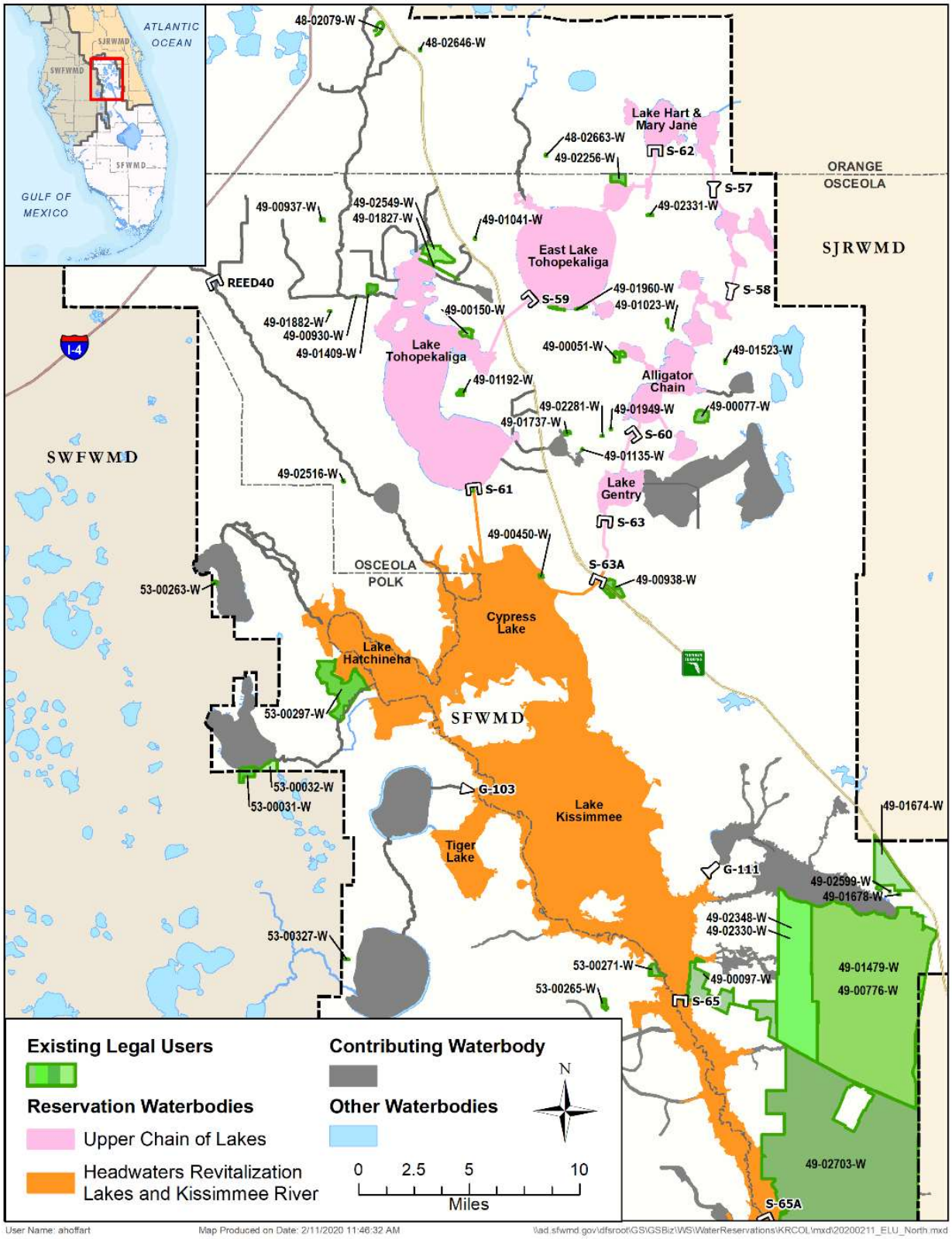

Figure 2-1. Existing Legal Users (Upper Kissimmee Basin)

Tables 2-2 and 2-3 show the number of permits and amount of permitted withdrawals by water source and permitted use. The majority of the permitted allocation amount, sixty-two percent, is for withdrawals for agricultural uses. Fifty-four percent of the current allocation is for agricultural uses provided by surface water withdrawals. The additional permitted use types for SAS withdrawals include agriculture, landscaping, livestock, plant nurseries, industrial activities, and as a public water supply. Some permits include multiple uses and are grouped together in the table under a separate heading. Not including permits for multiple uses, there are 23 permits for livestock and 12 for public water sources. Of the 14 existing permits for surface water withdrawals, 11 are for agricultural uses and three are for use as a public water source.

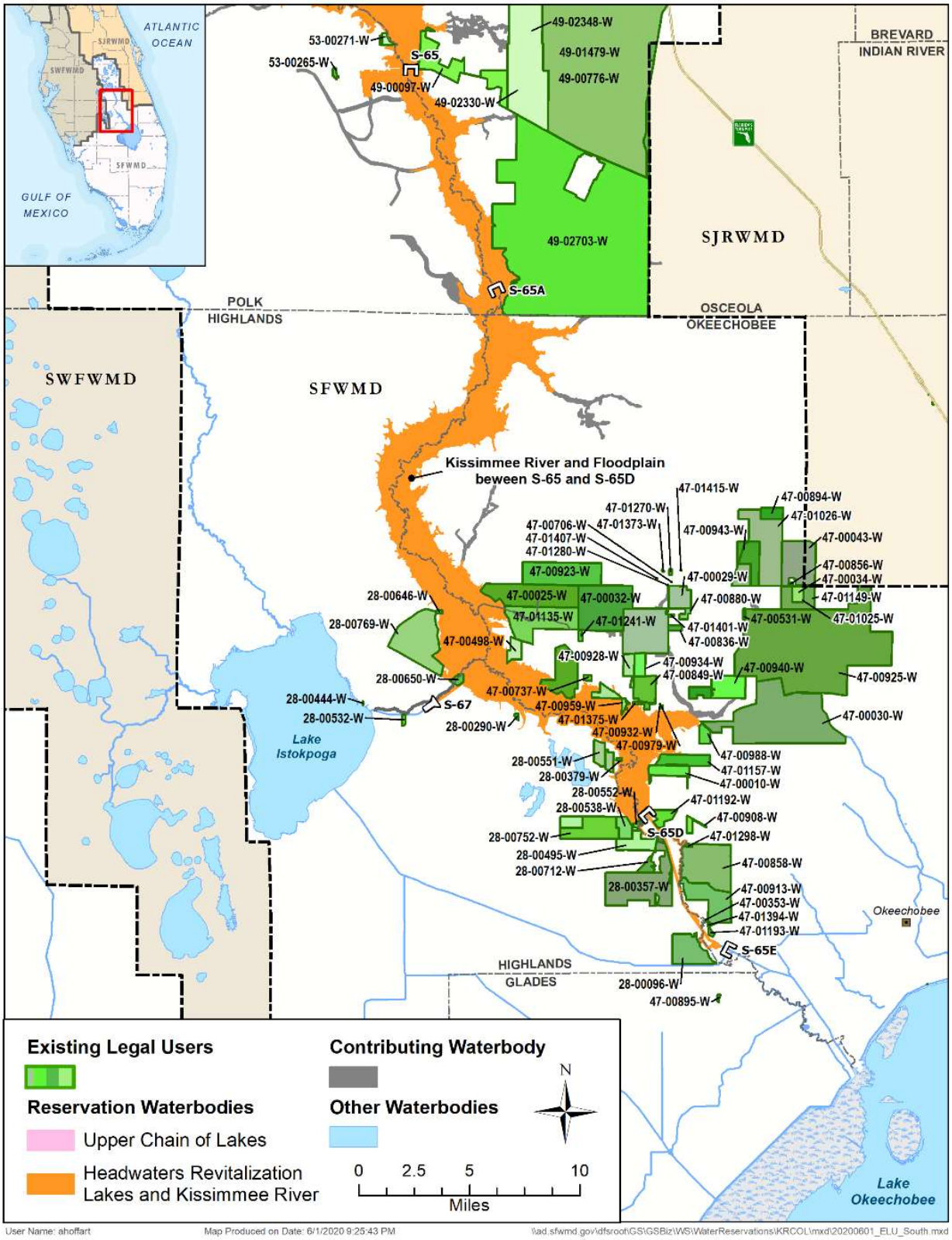

Figure 2-2. Existing Legal Users (Lower Kissimmee Basin)

Table 2-1. Permits and Allocation by Water Source Type.

Source	Number of Permits	Average Daily Allocation (mgd)	Total Average Daily Allocation (mgd)	Total Annual Allocation (mgy)
SAS	97	0.06	5.876	2,144.74
Surface Water	14	3.053	42.74	15,600.1

Table 2-2. Number of Permits by Water Source and Permitted Use.

	Surficial Aquifer System (SAS)	C-38 Canal	Lake Kissimmee	Lake Marian	Lake Pierce	Lake Tohopekaliga	Lake Live Oak	On-Site Canal (drain to C-34)	Pearl Lake	Shingle Creek	East City Ditch/Mill Slough	C-41A Canal	Total	% by Use Type
Agriculture	14	1	1	2	2	1	1	1	1			1	25	23%
Livestock	43												43	39%
Public Water Supply	16					1				1	1		19	17%
Landscape	11												11	10%
Nursery	6												6	5%
Aquaculture	0												0	0%
Industrial	1												1	1%
Multiple Uses	6												6	5%
Grand Total	97	1	1	2	2	2	1	1	1	1	1	1	111	100%
% by Water Source	87%	1%	1%	2%	2%	2%	1%	1%	1%	1%	1%	1%	100%	

Table 2-3. Amount of Total Annual Allocation (MGD) by Water Source and Permitted Use Type.

	Surficial Aquifer System (SAS)	C-38 Canal	Lake Kissimmee	Lake Marian	Lake Pierce	Lake Tohopekaliga	Lake Live Oak	On-Site Canal (drain to C-34)	Pearl Lake	Shingle Creek	East City Ditch/Mill Slough	C-41A Canal	Total	% by Use Type
Agriculture	0.55	5.71	3.23	15.03	0.60	0.15	0.23	0.78	0.50			0.29	30.36	62%
Livestock	0.77												0.77	2%
Public Water Supply	0.09					2.00				6.00	8.22		16.31	34%
Landscape	0.09												0.09	0%
Nursery	0.26												0.26	1%
Aquaculture	0.00												0.00	0%
Industrial	0.01												0.01	0%
Multiple Uses	0.82												0.82	2%
Grand Total	5.88	5.71	3.23	15.03	0.60	2.15	0.23	0.78	0.50	6.00	8.22	0.29	48.62	100%
% by Water Source	12%	12%	7%	31%	1%	4%	0%	2%	1%	12%	17%	1%	100%	

The proposed reservation Rules will not impact existing permit holders unless they request a modification to their existing permit that changes 1) the location of the withdrawal, 2) the source of the withdrawal, or 3) increases the amount of withdrawal. The proposed Rules will not affect existing permit holders, now or in the future, as along as the location and source do not change and the allocation amount does not increase. Figure 2-3 shows the number of expiring permits by year under current conditions.

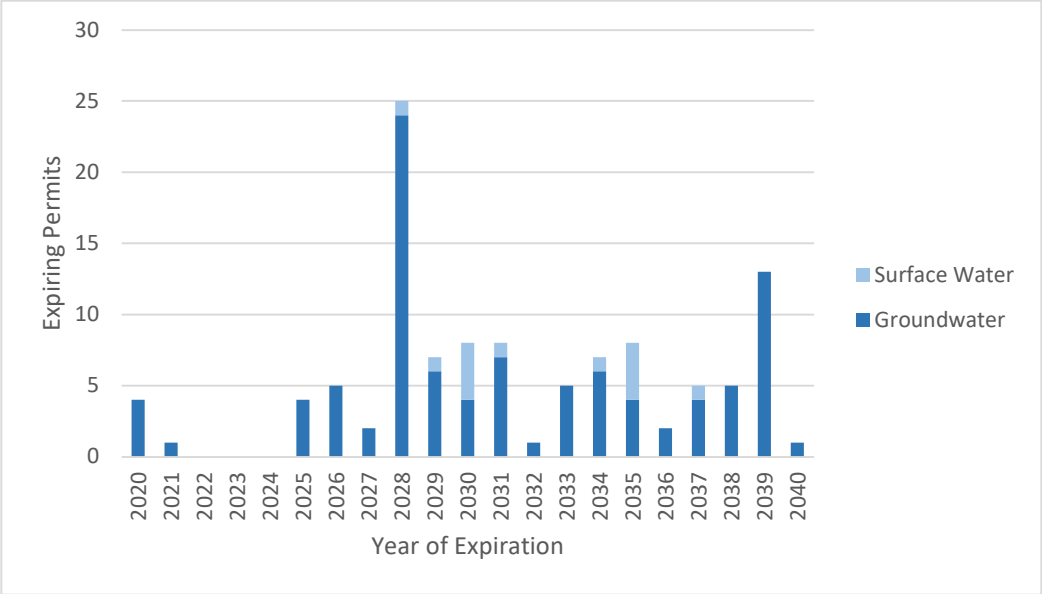

Figure 2-3. Number of Expiring Permits by Year

2.2.2 Potential Future Permit Applications

The number of future applicants for new withdrawals from the reservation area is unknown. We estimate the potential number of future applicants by applying regional forecasts in water consumption to the number of existing permit holders.

The UKB is included in the CFWI planning area, which includes areas managed by the SFWMD, the SJRWMD, and the SWFWMD. Both the water supply planning and consumptive use permit (CUP) and water use program (WUP) are tools that the Florida Legislature has provided to the Districts to protect water resources. In 2016, the legislature supported regulatory consistency in the CFWI Planning Area and set forth rulemaking requirements for the Florida Department of Environmental Protection (FDEP) (Section 373.0465(2)(d), F.S.). The FDEP published a notice of rule development on December 30, 2016. The FDEP held numerous workshops, in coordination with the Districts, FDACS, and other stakeholders, to adopt uniform rules for application within the CFWI planning Area. That effort is currently underway. (CFWI, 2020).

Total water demand in the CFWI is expected to increase by 36 percent between 2015 and 2040 (CFWI, 2020, Table 1). The largest increases in water demands are expected from public supply and commercial / industrial / institutional categories, with increases of 54 Percent and 29 percent, respectively. Agriculture is expected to increase by 3 percent and landscape / recreational is expected to increase by 23 percent.

In the LKB, total water demand is projected to increase by 5 percent between 2017 and 2040 (SFWMD, 2019, Table 1). Agricultural water use, which is the majority of water use in the LKB (representing 96.4 percent of total demand increases), is projected to increase by 4.7 percent from 2017 – 2040. The second category that is expected to increase demand the most over the projected period (2017 – 2020) is water used as public water supply at 11.5 percent (representing 1.3 percent of total demand increases).

As stated previously, most of the existing permitted allocations within the Kissimmee Basin Water Reservation are for agricultural uses. In both the UKB and LKB, agricultural water demand is expected to increase by about 3.5 percent (3 percent in the UKB and 4.7 percent in the LKB). As agricultural demands rise slightly, growth of the agriculture industry remains relatively flat, and therefore the District expects to receive few, if any, new or "de novo" applicants for agriculture uses.

By 2020, water demand in the UKB and LKB for public water supply is projected to surpass agricultural demand. This is mostly due to the expectation of high population growth, especially in urban areas. Currently, water permitted from the reservation area makes up a considerable proportion of this demand. Nineteen existing permit holders for public water supply are currently allocated about 16 mgd from the reservation area. This is approximately 34 percent of total water demanded in 2020 for public use in the region. Public water supply has the largest projected increase in absolute water use and is the highest percentage increase overall (between both planning areas).

The number of permits during the first five years after implementation of the Rules was estimated as follows:

- As noted above, total annual water use between 2017 and 2040 is projected to increase 3 percent among agricultural users in the UKB, which is less than 0.2 percent annually. Total annual water use in the area managed under the Central Florida Water Initiative, which includes the UKB, is expected to have increased 36 percent between 2017 and 2040; this is approximately 1.35 percent annually.
- While most of the current water withdrawal in the area at issue is for livestock and agriculture, the SERC assumes total annual water use would increase from its current 48.6 mgd by approximately 1.25 percent annually during the first 5 years after the Rules are implemented.
- The SERC assumes that 50 percent of the new demand would be satisfied by new permits.
- Under these assumptions, additional permitted water demand at the end of five years would be 1.5 mgd.[19]
- The current average allocation per permit is 0.44 mgd per permit.[20]
- The estimated number of new permits is 3.5.[21]

[19] 48.6 mgd x 5 years x 1.25%/yr x 50% = 1.5 mgd.

[20] 48.6 mgd ÷ 111 permits = 0.44 mgd/permit.

[21] 1.5 mgd ÷ 0.44 mgd/permit = 3.5 permits.

3 Costs to the District and to Any Other State and Local Government Entities

3.1 Information Provided in this Section

This section provides an estimate of the costs to the District and other state and local government entities of implementing and enforcing the proposed Rules and any anticipated effect on state or local revenues. Potential effects are based on *incremental costs*, which measure the potential increase in costs required with the Rules compared to those without the Rules. We assume that the status quo represents future conditions without the Rules.

3.2 Costs to the District

The SERC considers three types of costs potentially incurred by the District if the proposed Rules are adopted.

1. *Startup costs* are fixed costs (meaning they do not depend on the number of permit applications) that are incurred if the Rule is adopted. Startup costs are incurred once and are reasonably foreseeable.
2. *Recurring costs* are fixed costs that occur at regular intervals and are reasonably foreseeable.
3. *Variable costs* are incurred when a permit application is received or if enforcement actions related to an approved permit are required. Therefore, this type of expense is dependent on choices made by residents and businesses near the reservation and contributing waterbodies and cannot be estimated with certainty.

3.2.1 Startup Costs

As minimal startup tasks would be required, there would be negligible startup costs if the proposed Rules are adopted. As summarized below, costs associated with developing the UK-OPS model, a spreadsheet model, that will be used by permit applicants were incurred during the rulemaking process. However, these costs would have occurred whether the proposed Rules are adopted and are therefore not considered incremental costs.

As part of the rulemaking process, the District created the UK-OPS Model (see rulemaking documents available at SFWMD 2020b). The model estimates potential downstream impacts of water withdrawals from reservation waterbodies. The UK-OPS model will be available on the District website for free. Permit applicants are required to use the model as part of the permit application process to demonstrate that the individual and collective (cumulative) withdrawals do not reduce annual average discharges at the S-65 structure by more than 4.18 percent as of [rule effective date], compared to a no-withdrawal condition over the range of hydrologic variability that occurred between 1965 and 2005. (SFWMD 2020b, §3.11.5(B)(2)(b)). The cost to the District of model development was approximately $85,000 and the cost of peer review was approximately $20,000. Since the UK-OPS model was completed as part of the rulemaking process, these are not considered incremental costs for the SERC.

3.2.2 Recurring Costs

The only identified incremental recurring cost is updating the online UK-OPS model as permits are approved. Specifically, the model will be updated to reflect the percentage reduction of average discharges at S-65 remaining after approval of any permit applications. The new percentage will be lower than the current available reduction of 4.18 percent. The cost to the District to update the software and post online

is expected to be no more than a few hours. For the purposes of this SERC, we estimate that the cost is no more than $1,000 per year.

3.2.3 Variable Costs

In general, costs to the District of reviewing applications and for monitoring and enforcement would be similar as with the current Rules. Applications would have similar information and applicants would have to meet special conditions already required in the current Rules.

The only identified incremental costs are related to review of forms associated with permit compliance (Form No. 1392: Daily Stage and Withdrawal Data Form) and requests to withdraw water during environmental or flood control releases and temporary request of withdrawals (Form No. 1393: Temporary Request and Authorization of Withdrawal Facility Operation). The incremental time associated with review of Form No. 1392 is expected to be no more than 10 minutes per week for one staff person. The number of these requests is unknown. For the purposes of the SERC, this cost is estimated as no more than $2,000 per year.

Temporary requests for withdrawal would generally only occur between March 30 and May 1. Review of Form No. 1393 and coordination with operations staff is expected to take about 30 minutes per request. The number of requests is unknown. For the purposes of the SERC, these costs are estimated as no more than $5,000 per year.

3.2.4 Summary of Estimated Costs to the District

Activities under the proposed Rules will be conducted within the existing staff and resources of the District. The incremental costs of the proposed Rules would be small, and implementation will not require any additional employment at the District. Most of the estimated costs to the District would be variable costs (Table 3-1). Other costs to the District are expected to be negligible.

Table 3-1. Summary of Estimated Incremental Costs to the District.

Type of Cost	Description	Incremental Cost
Startup	None identified	$0 [a]
Recurring	Update UK-OPS Model after Approved Permit Applications	$ No more than 1,000 per year
Variable	Permit Review	$ 0 per permit application [b]
Variable	Monitoring and Enforcement	$ 0 per approved permit [b]
Variable	Review of requests to withdraw water during environmental releases	No more than $2,000 per year
Variable	Review of special withdrawal requests	No more than $5,000 per year

[a] Startup costs are expected to be negligible.

[b] The expected increase in costs with the proposed Rules are negligible.

3.3 Costs to other State and Local Government Entities

The proposed Rules do not place any new requirements or responsibilities on other state or local government entities. Therefore, other state and local government entities are not expected to incur additional costs associated with implementation of the proposed water reservation Rules.

State or local government entities that are existing permit holders or would become a permit applicant from a reservation or contributing waterbody would incur transactional costs like other existing or potential water users. Chapter 4 discusses the potential costs that government entities may face as a permit applicant.

There are seven government entities that are currently withdrawing water from within the water reservation area (Table 3-2).

Table 3-2. Government Entities currently withdrawing water from within the Water Reservation.

Entity Name	County	Purpose
Alton Chandler Civic Center	Okeechobee	Public Water Supply
Coquina Water Management	Okeechobee	Public Water Supply
Kissimmee Field Station	Osceola	Landscape
Lake Toho Restoration/Alternative Water Supply Project	Osceola	Public Water Supply
Shingle Creek Regional Park	Osceola	Public Water Supply
Okeechobee Field Station	Okeechobee	Landscape
United States Army Corp of Engineers	Okeechobee	Public Water Supply

3.4 Impact on State or Local Revenues

The proposed Rules are not expected to reduce property values, local government property tax collections, or state sales tax revenues. There are at least two ways in which the proposed Rules might prevent future decreases in property values, tax collections, or sales tax revenues compared to the current Rules.

1. Under the current Rules, new water withdrawals might negatively impact the amount or frequency of water available for downstream ELU, which could reduce property values and associated tax collections. In contrast, the proposed Rules protect ELU and would therefore prevent these reductions.
2. The proposed Rule could prevent a loss in sales tax revenues associated with outdoor recreation and tourism spending. The current Rules do not adequately allocate water for the protection of fish and wildlife populations, which could result in a reduction in nature-based recreation and tourism spending, leading to a reduction in sales tax revenue. In contrast, the proposed Rules would protect water allocation and water levels that are supportive of healthy fish and wildlife populations, which will support continued recreation and tourism and associated sales taxes.

Therefore, a net positive impact of the proposed Rules on state and local revenues is expected.

3.5 Conclusion

The District is expected to incur only minor costs resulting from implementation of the proposed Rules. There are negligible incremental startup costs. The cost is mainly variable costs associated with review of water during environmental or flood control releases and temporary withdrawal requests. In total, annual costs are estimated to be no more than $8,000 per year.

Costs to other government entities are generally expected to be similar to those under the current Rules. The proposed Rules are not expected to reduce property values, property tax collections, or sales tax collections, and may increase these categories compared to the current Rules.

4 Transactional Costs and Economic Impacts of Proposed Rules

4.1 Introduction

This section describes a "good faith estimate of the transactional costs likely to be incurred by individuals and entities, including local government entities required to comply with the requirements of the rule" (*Section 120.541 Florida Statutes*). As discussed in Chapters 1 and 2, individuals or entities requesting new or additional permitted water quantities from waters reserved in the Rules will incur potential transactional costs. Transactional costs are defined as "direct costs readily ascertainable based upon standard business practices" and include:

- Fees associated with obtaining a permit;
- UK-OPS Model for hydrologic simulation, if the applicant seeks to demonstrate that the requested new or additional withdrawal will not result in the withdrawal of water reserved for fish and wildlife; and
- If an application cannot be modified to meet the requirements of the Rules, the potential costs of accessing additional alternative water supplies from water sources not affected by the proposed Rules.

Without the Rules, individuals and entities applying for new consumptive water use permits or modifications to existing permits would have incurred transactional costs. In this SERC, the District considers the *incremental* transactional costs resulting from the Rules. Incremental transactions costs are the difference between the "with Rules" transactional costs and the "without Rules" transactional costs. For example, if a fee would increase from $10 to $25 because of the Rules, then the incremental transactional costs would be $15. The potential incremental transactional costs resulting from the Rules are described in the following sections.

Under current requirements (without the Rules), applicants must demonstrate that a proposed water use:

- Is reasonable-beneficial, (*i.e.* there is a need for the water in the requested amount);
- Does not interfere with any existing legal use of water; and
- Is consistent with the public interest (SFWMD 2015).

Potential transactional costs associated with demonstrating the above include, but are not limited to, monitoring and associated equipment, analysis of measured hydrologic data, or hydrologic modeling. The Rules reduce uncertainty in the potential amount of water available and streamline and standardize the process of directly or indirectly withdrawing water from the reserved waterbodies. Applicants will be better able to evaluate the likelihood that their permit would be approved and to reduce the potential that they would have to modify the application or otherwise incur additional transactional costs to be approved. For some applicants, the Rules will likely result in a decrease in transactional costs. For others, costs may stay about the same or may increase. Consider four groups of applicants that, without the Rules, would have applied for waters reserved by the Rules:

1. Applicants whose permit application would have been approved with or without the Rules;
2. Applicants whose permit application would have been denied with or without the Rules;
3. Applicants whose permit application would have been approved without the Rules, but would be denied with the Rules; and

4. Applicants who would have applied without the Rules but would not apply with the Rules.

The first group of applicants would have their permit approved with or without the Rules. Not only will this group not likely incur additional costs because of the Rules, they might have reduced hydrologic modeling or other costs of demonstrating the three criteria above.

The second group of applicants would have been denied with or without the Rules. This group will also likely have fewer transactional costs with the Rules, as they will be better able to discern that their application would not be approved and therefore could avoid expending some of the transactional costs. These applicants may seek alternative sources of water supply, but they would have had to do so without the Rules, so this would not be an incremental cost for this group.

The third group will likely incur additional transactional costs because of the Rules. The additional costs will likely come in the form of additional use of the UK-OPS simulation model or the costs of accessing an alternative water supply. These potential costs are discussed further below.

The fourth group will face some reduced costs and some additional transactional costs because of the Rules. This group would save the costs associated with applying for waters that are reserved by the Rules but may expend costs developing an alternative supply of water.

4.2 Filing Fees or Fees Associated with Obtaining a Permit

Current, without Rules, water use permitting fees range from $100 to over $11,500, depending on the use class and requested allocation of the permit (SFWMD 2014). There would be no additional filing or other fees associated with the Rules. No special permit forms have been identified for reservation waters. Therefore, there would be no incremental costs associated with the Rules.

4.3 Cost of Monitoring and Equipment to be Installed

The District requires monitoring plans to be included in permit applications and monitoring plans are a condition of the permit. The Applicant's Handbook (SFWMD 2020b) note three general types of monitoring that may be required:

- Withdrawal quantity monitoring;
- Water quality monitoring; and
- Hydrologic and Ecological monitoring.

The without Rules requirements and any changes anticipated because of the Rules are discussed for each type of monitoring below.

4.3.1 Water Withdrawal Monitoring

Current requirements for water withdrawal monitoring are that water withdrawals are to be recorded monthly and provided to the District semi-annually unless otherwise specified in the permit (SFWMD 2015). In addition, potential water losses are required to be monitored for public water supply use class permits. These requirements would not be changed by the Rules with the exceptions below.

With the Rules, individuals or entities that are issued permits would be required to check daily stage elevation measurements from the reservation waterbodies or the nearest reservation waterbody downstream of contributing waterbodies affected by the permittee's withdrawal, in addition to a daily stage check at Lake Okeechobee.

If a permittee is withdrawing water from a waterbody within the UCOL; daily stage elevations would need to be checked from the waterbody the withdrawal is directly affecting if that waterbody has a reservation associated with it or if the waterbody is a contributing waterbody, then a daily stage elevation check of the nearest downstream waterbody reservation would need to occur. In addition, a daily check on discharges

being made from Lake Okeechobee would also be required. The purpose of these daily stage and flow checks is to determine if the withdrawals could be made pursuant to the Rule to ensure that fish and wildlife are protected.

Water may be withdrawn on a particular day, only if stage elevations are above the water reservation line for each reservation waterbody station associated with the withdrawal and water from Lake Okeechobee is being discharged to tide. The verification of daily stage and flow would require the permittee to check the official District monitoring stations as identified in their permit. The daily stage elevation measurements at permit identified monitoring stations will need to be recorded daily at 10:00 a.m. onto SFWMD Form No. 1392, and submitted to the District weekly. The permittee would be required to record water withdrawals on a daily basis, and provide these data to the District weekly using Form No. 1392. Therefore, the Rules would generally require more frequent monitoring and reporting. The District does not expect that the more frequent monitoring would require additional or different equipment to be installed, as the lake stage elevations are already being monitored and recorded by the SFWMD without the Rules. Therefore, the only incremental cost resulting for the Rules would be the value of time required to monitor and report more frequently. The District expects this cost to be negligible for most individuals and entities.

4.3.2 Water Quality Monitoring

Water quality monitoring, including saline water monitoring and pollution source monitoring, may be required under current rules. The proposed Rules would not change these requirements and are not expected to change the conditions under which water quality monitoring would be required. Therefore, individuals and entities would not incur any incremental costs associated with water quality monitoring because of the Rules.

4.3.3 Hydrologic and Ecological Monitoring

Hydrologic and ecological monitoring may be required under current rules to ensure that wetlands and other surface waters, offsite land uses, existing legal users, and the water resources of the District are not harmed by the water withdrawal. Such monitoring includes:

- Water quality monitoring;
- A wetland hydrobiological monitoring program; or
- Additional monitoring, if there is uncertainty in the computer modeling or data which define the drawdown resulting from withdrawals from ground water or surface water sources.

The Rules do not change the requirements listed in the bullets above. Therefore, there would be no incremental costs associated with hydrologic and ecological monitoring. For individuals or entities that are issued a new water use permit, compliance with maximum daily stages that prescribe when withdrawals are allowed based on official District monitoring station gauge readings is considered sufficient to ensure that the withdrawal does not have negative impacts on the environment, fish and wildlife, or other ELU. The District expects cost associated with monitoring station gauge readings to be negligible for most individuals and entities.

4.4 Cost of Hydrologic Modeling

Under current rules, hydrologic modeling may be required by an applicant to demonstrate that the proposed withdrawal will not negatively impact the environment, fish and wildlife, or other existing legal users. There are two additional circumstances associated with the Rules that would require an applicant to perform hydrologic monitoring:

- To demonstrate that a proposed direct or indirect withdrawal of water from a reservation waterbody would not result in downstream impacts to the Upper Chain of Lakes (UCOL), Headwaters Revitalization Lakes, Kissimmee River and Contributing Waterbodies; or

- To demonstrate that a proposed withdrawal of groundwater would not cause an indirect withdrawal of reserved water in the UCOL, Headwaters Revitalization Lakes, Kissimmee River and Contributing Waterbodies.

The proposed Rules would not change the requirements under which hydrologic modeling would be required to indicate the withdrawal will not negatively impact the environment, fish and wildlife, or other ELU.

4.4.1 Potential Downstream Impacts on the Kissimmee River

Under the new Rules, additional hydrologic modeling using the District's UK-OPS hydrologic simulation model is required for the determination of potential downstream impacts on the Kissimmee River. The costs associated with this modeling is described in Section 4.4.1.1

The availability of water for direct and indirect surface water withdrawals from the Kissimmee River and Chain of Lakes reservation waterbodies is ephemeral. Allocations from these waterbodies do not have the 1-in-10 level of certainty afforded to other consumptive use permit allocations. Availability of water is determined daily. Demonstration of reasonable assurance requires the applicant to demonstrate that the withdrawal, in combination with other permitted withdrawals, will not reduce annual average discharges at the S-65 structure by more than 4.18 percent, as compared to a "no withdrawal" condition over a range of hydrologic variability that occurred between 1965 and 2005. The UK-OPS Model was used to determine the reduction in the annual average discharges because of withdrawals from a water use permit issued to Toho Water Authority (49-02549-W). This permit resulted in a 0.82 percent reduction in annual average discharges at the S-65 structure, thereby reducing the 5 percent threshold to 4.18 percent, which is reflected in the draft water reservation Rules.

The UK-OPS hydrologic simulation model is available for hydrologic assessments to provide reasonable assurance that the annual average discharges at the S-65 structure is not reduced by more than 4.18 percent to ensure protection of fish and wildlife. The following section describes the cost associated with this new approach.

4.4.1.1 UK-OPS Hydrologic Simulation Model Analysis

The UK-OPS Model (3.12) was developed in 2014 as a screening-level tool for seasonal operations, planning, and regulation schedule testing for Lakes Kissimmee-Cypress-Hatchineha (KCH), Tohopekaliga (Toho), and East Lake Tohopekaliga (E. Toho). This model uses a daily time step to determine lake level impacts using modeled inflows (from a more complex regional model) or historical hydrology. The historical hydrology option is required for permit evaluations.

The SFWMD Water Use Bureau identified the UK-OPS Model as a tool for future evaluation of proposed direct surface water withdrawals from the Upper Chain of Lakes; lakes per the proposed water reservation criteria. The UK-OPS Model has been simplified, to a degree, to create a simple and transparent permit evaluation tool that can be used by SFWMD water use review staff and consultants to evaluate potential impacts of proposed direct or indirect surface water withdrawals on Kissimmee River and Chain of Lakes reservation waterbodies and S-65 discharges.

The costs incurred by the user for using this model are determined based on the number of man-hours required to:

1. Download and become familiar with the spreadsheet tool;
2. Input applicant specific data as it relates to the reservation waterbody the proposed withdrawal will occur, proposed withdrawal specifications and capacity requested;
3. Simulation run time to process the user specified data; and
4. Document and report the spreadsheets findings to SFWMD.

The spreadsheet tool has been developed and peer reviewed. Its functionality and modularity for an individual applicant may range from complex and time consuming to a simple "plug in" tool depending on the applicant's familiarity with model usage. The functionality of the final spreadsheet tool and the degree of difficulty of use by the applicant will define the costs associated with its use; the individual user may incur costs from $250 to $2,500. This is a significant reduction in cost compared to other types of hydrologic modeling. Thus, transactional costs will be reduced for applicants that choose to utilize this tool but would have had to perform hydrologic modeling without the Rules.

4.4.2 Demonstration that a Groundwater Withdrawal does not Withdraw Reserved Water

The Rules would require that applicants seeking to withdraw water from the SAS near any of the reserved waterbodies would need to demonstrate that such withdrawal would not result in more than 0.1-foot of drawdown from a reservation water body or contributing waterbody. The potential modeling approaches acceptable for this task are in the current rules and include basic analytic impact assessments or calibrated numeric system simulation methods (SFWMD 2015). The District expects that any permit applications for withdrawals from the SAS near the reserved waterbodies would have required such modeling without the implementation of the Kissimmee River and Chain of Lakes Water Reservation Rules. Therefore, there are no incremental costs associated with hydrologic modeling of ground water withdrawals.

4.5 Cost of Accessing Alternative Water Supplies

As noted above, some individuals or entities will not be able to meet their water needs because of the Rules, and will have to access alternative water supplies. This section discusses the potential costs associated with gaining access to alternative water supplies. The Central Florida Water Initiative 2020 Regional Water Supply Plan (CFWI 2020), Draft March 2020, identifies the following as sources of alternative water supplies: brackish groundwater, surface water, stormwater, seawater, reclaimed water and water stored in aquifer storage and recovery wells and reservoirs. A list of numerous alternative water supply projects is provided in Appendix E (Water Supply and Water Resource Development Project Options) of the CFWI 2020 Plan.

Under the Rules, surface water from the KCOL will be reserved from consumptive use during certain times of the year, and surface water from the Kissimmee River will be reserved indefinitely. The District expects that future water users will primarily rely on the following sources: 1) groundwater from the lower Floridan aquifer (brackish groundwater), 2) runoff collection and storage, and 3) reclaimed water. Brackish Groundwater from the Upper and Lower Floridan Aquifer

A review of past and current Water Supply Plans that encompass the UKB and LKB have identified two brackish groundwater alternative water supply projects within the area of that encompasses the new rule that use the upper and lower Floridan Aquifer as a source of water.

In the 2005 – 2006 Kissimmee Basin Water Supply Plan Update, a potential brackish upper Floridan aquifer system (UFAS) wellfield project was identified by SFWMD in eastern Osceola County. The estimated production cost of the project ranged from $0.95/kgal to $1.57/kgal (based on 10, 20, and 40 mgd capacities) and had an estimated construction cost of $91 million. Included in the total cost of this project is a membrane treatment plant, storage, an injection well for brine disposal and 25 miles of transmission lines. Note that this project would be classified as an inter-district transfer if water was to be used in the SFWMD, since the wellfield is in the SJRWMD.

The CFWI 2020 Plan indicates that the Cypress Lake Wellfield Project in central Osceola County is being considered as a potential alternative water supply source. The lower Floridan aquifer system (LFAS) brackish groundwater well field is being considered by the Water Cooperative of Central Florida, which consists of the Toho Water Authority (TWA), Orange County Utilities, Polk County Utilities, and the City of St. Cloud. The 37.5 mgd project has been permitted, and wetlands monitoring is required to determine if impacts occur in minimum flow and level lakes and wetlands closer to the ridge area. The estimated cost to provide 30 mgd of finished water is $3.88/kgal. This would be accomplished utilizing a two-phased

reverse osmosis water treatment plant where each phase will have the capability of producing 15 mgd of finished water at system build-out capacity.

If a farming operation decided to utilize water from the Floridan aquifer, it is likely that the withdrawal rate would be lower. The unit costs of utilizing this water would likely be higher. Small-scale treatment technologies to reduce the salt content of brackish water are anticipated to be the major component of the cost. The 2005 – 2006 KB Plan Update states that brackish water may be used, untreated, for some agricultural purposes, so for some users the costs associated with use of the brackish water supply may be less as the treatment process can be eliminated.

4.5.1 Off-line Storage

Surface water reservoirs serve to store excess surface water runoff that occurs during rainfall events in the wet season and provide that to individual users and/or entities during the dry season when water availability is low. Under the Rules, the construction of any new surface reservoirs would be "off-line" such that no rivers are dammed, existing flood protection or surface water bodies are impacted.

The CFWI 2020 Plan provides descriptions of several potential solutions to address water supply needs in Appendix E (Water Supply and Water Resource Development Project Options). Appendix E provides solutions utilizing groundwater, reclaimed water, surface water, and stormwater. Several "off-line" reservoirs are included in Appendix C that can be used to store wet season flows for subsequent use in the dry season, and are summarized below:

- St. Johns River/Taylor Creek Reservoir. This proposed project is located in the St. Johns River basin and will have the ability to provide an average annual daily flow of 54 mgd, and the projected construction, operation, and maintenance cost is $3.14/kgal. This cost does not include land acquisition or wetland mitigation.
- Grove Land Reservoir & Stormwater Treatment Area (STA). This proposed project is located in Okeechobee and Indian River County. The proposed project consists of a 5,000-acre reservoir and a 2,000-acre STA. The project would have an average annual daily flow of 100 mgd, and the projected construction, operation and maintenance cost is $0.82/kgal. Treatment and transmission costs are not included in this cost.
- Lake Toho Restoration/Alternative Water Supply Project (Judge Farms Reservoir and Impoundment Project). This proposed 200-acre reservoir project located in Osceola County north of Lake Toho, is permitted by SFWMD as Water Use Permit 49-02549-W. The annual average daily allocation is permitted at 8.22 mgd. The construction, operation, and maintenance cost is $0.99/kgal. This cost does not include treatment, pumping, and distribution. This example is typical of the type of off-line storage that a large farm operation might construct and utilize.
- Pennywash/Wolf Creek Reservoir. This proposed project is located in Osceola County (SJRWMD) and is in the conceptual stage consisting of the development of a 20 mgd surface water reservoir that would be constructed at the junction of the Pennywash Creek and Wolf Creek. Due to this project existing in the initial conceptual stages, the costs associated for its construction and unit cost per thousand gallons of water is not available.

4.5.2 Reclaimed Water

The CFWI 2020 Plan states the reclaimed water is highly utilized and estimates that by the year 2040, 98 percent will be reused for beneficial purposes. The CFWI 2040 Plan states overall supply of reclaimed water services will need to be expanded to accommodate the higher proportion of public supply customers that will account for future population growth within the planning area. This can be accomplished by augmenting reclaimed water flows with treatment of surface water and stormwater.

The CFWI 2020 Plan described a stormwater reuse project for the TWA that uses stormwater from the West Ditch, a tributary of Shingle Creek, which flows into Lake Toho. This project will route stormwater through a series of ponds to provide stormwater as a reuse supplement to the South Bermuda Water Reclamation Facility. The project will provide approximately 1.5 mgd with a reliability of 60 percent. The treated stormwater can either be mixed with treated wastewater for reuse or can be routed to Rapid Infiltration Basins. The estimated construction costs are $30.63 million and the unit production cost is $3.51/kgal.

The Indirect Potable Reuse project is a TWA proposed project that will construct 160 acres of Rapid Infiltration Basins (RIB) on the Lake Wales Ridge. Five 1 mgd water supply withdrawal wells and appurtenances along the 160-acre RIB will pump the recharged and filtered water to the TWA Southwest Water Treatment Plant for potable use. The projected construction cost is $16.19 million dollars and the unit production cost is $3.52/kgal.

Table 4-1 summarizes the key information regarding the alternative water supplies discussed in this section.

Table 4-1. Examples of Alternative Water Supplies, Capacities, and Projected Costs.

Type of Supply	Location	Flow (MGD)	Cost, $/kgal
Brackish Wellfield (UFAS)	Eastern Osceola County	40	$1.57
Brackish Wellfield (LFAS)	Cypress Lake Wellfield	7.5	$3.88
Off-line Storage	St. Johns River/Taylor Creek Reservoir	54.0	$3.14 (not including land acquisition)
Off-line Storage	Groveland Reservoir, SE UK COL	122.0	$0.82 (treatment and transmission costs not included)
Off-line Storage	Judge Farms Reservoir, North of Lake Toho	8.22 (100% reliability)	$0.99
Off-line Storage	Pennywash/Wolf Creek	20	Not Available
Stormwater Reuse	West Ditch of Shingle Creek	1.5 (60% reliability)	$3.51
Indirect Reuse	Lake Wales Ridge RIB	5.0	$3.52

4.6 Conclusion

Individuals and entities will incur transactional costs as part of obtaining a water use permit within District boundaries. Depending on the circumstances of the specific applicant, the Rules may result in an increase or decrease in transactional costs compared to current requirements. An increase in transactional costs is expected for individuals or entities that would have been able to withdraw water from the reservation water bodies without the Rules. These applicants will likely seek alternative water supplies at an increased cost. In addition, some individuals or entities would incur incremental transactional costs due to additional monitoring or modeling requirements. Table 4-2 summarizes the potential incremental increases in transactional costs.

Table 4-2. Summary of Potential Incremental Transactional Costs.

Category of Transactional Cost	Sub-Category	Without Rule	With Rule	Potential Incremental Costs
Filing or other Fees	n/a	$100 to $11,500	No change	None
Monitoring or Equipment	Water quantity	Minimum of monthly data reported semi-annually	Daily recording of official District gauge data reported weekly	Negligible
	Water quality	Required under some circumstances	No change	None
	Hydrologic and ecological	Required under some circumstances	No change	None
Hydrologic Modeling	Downstream Impacts from Surface Water Withdrawals	Required under some circumstances	Required use of UK-OPS for all new applicants	$250 to $2,500 per applicant, depending on applicant familiarity with modeling applications
	Ground water modeling	Likely required for all SAS applicants	No change	None
Accessing Alternative Water Supplies	Brackish groundwater	Some applicants would have pursued	Likely increase in number of applicants	Potentially $1/kgal to $4/kgal
	Off-line storage	Some applicants would have pursued	Likely increase in number of applicants	Potentially $0.8/kgal to $3/kgal
	Reclaimed water	Some applicants would have pursued	Likely increase in number of applicants	Potentially $3/kgal

5 Impact on Small Businesses, Small Cities, and Small Counties

According to Section 120.541, Florida Statutes (F.S.), the Statement of Estimated Regulatory Costs shall include "An analysis of the impact on small businesses as defined by Chapter 288.703, F.S., and an analysis of the impact on small counties and small cities as defined by Chapter 120.52, F.S."

5.1 Small Businesses near the Water Reservation Area

A small business is defined in Chapter 288.703, F.S., as "an independently owned and operated business concern that employs 200 or fewer permanent full-time employees and that, together with its affiliates, has a net worth of not more than $5 million or any firm based in this state which has a Small Business Administration 8(a) certification. As applicable to sole proprietorships, the $5 million net worth requirement shall include both personal and business investments."

Nearly all (i.e., 99 percent) of the privately owned businesses in the water reservation area employ 250 or fewer people.[22] The categories in the County Business Patterns data include businesses with 100 to 250 employees. The District does not expect that the inclusion of business with employees over 200, and up to 250, will affect the results. The five largest sectors include Retail Trade; Accommodation and Food Services; Health Care and Social Assistance; Professional, Scientific, and Technical Services; and Construction (Table 5-1). About 55 percent of small businesses in the area are in one of these five sectors. As discussed in Chapter 2, most current water consumptive use permit holders in the water reservation area are agricultural operations. Therefore, we expect that even though less than one percent of small businesses are in the agricultural sector, these businesses may be more likely to be affected by the Rule than other sectors. The potential impacts of the Rules on small businesses are discussed in Section 5.4.

[22] Based on US Census Bureau (2018), the most recent data available at the zip code level.

Table 5-1. Small Businesses near the Water Reservation Area.

Sector [a]	Percent of Small Businesses [b]
Retail Trade	17.5%
Accommodation and Food Services	10.2%
Health Care and Social Assistance	9.7%
Professional, Scientific, and Technical Services	8.9%
Construction	8.4%
Other Services (except Public Administration)	8.2%
Real Estate and Rental and Leasing	8.2%
Administrative and Support and Waste Management and Remediation Services	7.0%
Transportation and Warehousing	4.9%
Wholesale Trade	4.8%
Finance and Insurance	4.4%
Manufacturing	2.2%
Arts, Entertainment, and Recreation	1.8%
Information	1.4%
Educational Services	1.2%
Management of Companies and Enterprises	0.6%
Agriculture, Forestry, Fishing and Hunting	0.2%
Utilities	0.2%
Non-classifiable establishments	0.1%
Mining, Quarrying, and Oil and Gas Extraction	<0.1%

[a] Based on North American Industry Classification System (NAICS) economic sector.
[b] Data are from US Census Bureau (2018) and include businesses with 250 employees or less in zip codes within ¼ mile of reservation waterbodies.

5.2 Small Cities in the Water Reservation Area

A small city is defined in Chapter 120.52, F.S. as "any municipality that has an unincarcerated population of 10,000 or less according to the most recent decennial census." Twenty-one municipalities that meet the definition of a small city were identified within the five-county area containing the reservation and contributing waterbodies (Table 5-2). Four of these municipalities overlap the proposed water reservation or contributing waterbodies. The potential impacts of the Rules on small cities are discussed in Section 5.4.

Table 5-2. Small Cities in the Water Reservation Area.

County	Municipality	2010 Population [a]	Overlaps Water Reservation or Contributing Waterbody
Highlands	Avon Park	8,836	No
Highlands	Lake Placid	2,223	No
Okeechobee	Okeechobee	5,621	No
Orange	Bay Lake	47	Yes
Orange	Belle Isle	5,988	No
Orange	Eatonville	2,159	No
Orange	Edgewood	2,503	No
Orange	Lake Buena Vista	10	Yes
Orange	Oakland	2,538	No
Orange	Windermere	2,462	No
Polk	Davenport	2,888	Yes
Polk	Dundee	3,717	Yes
Polk	Eagle Lake	2,255	No
Polk	Fort Meade	5,626	No
Polk	Frostproof	2,992	No
Polk	Highland Park	230	No
Polk	Hillcrest Heights	254	No
Polk	Lake Alfred	5,015	No
Polk	Lake Hamilton	1,231	No
Polk	Mulberry	3,817	No
Polk	Polk	1,562	No

[a] Source: U.S. Census Bureau, 2010 Census. Available at https://www2.census.gov/programs-surveys/popest/datasets/2010-2019/cities/totals/sub-est2019_12.csv. Accessed June 14, 2020.

5.3 Small Counties in the Water Reservation Area

A small county is defined in Chapter 120.52, F.S. as "any county that has an unincarcerated population of 75,000 or less according to the most recent decennial census. The Rules would overlap five counties: Highlands, Okeechobee, Orange, Osceola, and Polk (Table 5-3). Only Okeechobee County meets the definition of a small county.

Table 5-3. Counties in the Water Reservation Area.

County	Population [a]	Meets Small County Definition
Highlands	98,786	No
Okeechobee	39,996	Yes
Orange	1,145,956	No
Osceola	268,685	No
Polk	602,095	No

[a] Source: U.S. Census Bureau, 2010 Census. Available at https://www2.census.gov/programs-surveys/popest/datasets/2010-2019/counties/totals/co-est2019-alldata.csv. Accessed June 14, 2020.

The Okeechobee Utility Authority (OUA) is a public water supplier in Okeechobee County, the only county that meets the definition of a small county. The OUA withdraws surface and ground water. The surface water intake is located near the northern end of Lake Okeechobee northeast of the Kissimmee River inlet, and the ground water wells are located northeast of the Kissimmee River inlet near the City of Okeechobee (SFWMD, 2007). The OUA does not currently withdraw water from within the proposed boundaries of the Kissimmee River and Chain of Lakes water reservation.

5.4 Potential Impacts on Small Businesses, Cities, and Counties

Small businesses that receive water from public water suppliers would not be affected by the Rules. As with all water users, any small businesses, cities, or counties that currently withdraw water from the reservation area would be protected by the Rules. As discussed in Section 1.3, if existing users sought new permits or to make certain changes to their permits such as increasing the water allocation, then they would be subject to the Rules. Small businesses, cities, or counties that are not current users but want to withdraw water directly or indirectly from reserved water bodies in the future would be subject to the Rules.

Chapter 4 discusses the potential costs to applicants. They face minor additional requirements associated with the application, monitoring, and reporting compared to what they would have faced without the Rules. In general, however, the Rules are expected to streamline the process. The incremental costs, meaning the increase in costs over current requirements, are expected to be negligible. If sufficient water is not available to meet the applicant's need with the reservation, then the applicant may need to develop an alternative supply of water. Chapter 4 discusses the potential costs of developing an alternate supply of water for different types of water users.

We note that some of these applicants would have had to develop an alternative supply of water even without the Rule if enough water would not have been available. Therefore, some future users would not face additional costs because of the Rule and may even face reduced costs associated with the reduction in required hydrological modeling and the clarification and streamlining of the process resulting from the Rules.

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