



Kissimmee River Management Area General Management Plan



2025 THROUGH 2035



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**Kissimmee River Management Area General
Management Plan
(2025 through 2035)**

Land Stewardship Section
South Florida Water Management District
3301 Gun Club Road
West Palm Beach, Florida 33406

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ABBREVIATIONS

CARL	Conservation and Recreation Lands
District	South Florida Water Management District
FDEP	Florida Department of Environmental Protection
FDHR	Florida Division of Historical Resources
FE	Federally-designated Endangered
FFS	Florida Forest Service
FISC	Florida Invasive Species Council
FNAI	Florida Natural Areas Inventory
Ft	Feet
FT	Federally-designated Threatened
FT(S/A)	Federally-designated Threatened because of similarity of appearance
FXN	Federally-designated Threatened Nonessential Experimental Population
FY	Fiscal Year
FWC	Florida Fish and Wildlife Conservation Commission
HRS	Headwaters Revitalization Schedule
KRREP	Kissimmee River Restoration Evaluation Program
NAVD	North American Vertical Datum
NGVD	National Geodetic Vertical Datum
mi	Miles
mi ²	Square Miles
PSGHA	Public Small Game Hunting Area
SE	State-designated Endangered
ST	State-designated Threatened
TIITF	Board of Trustees of the Internal Improvement Trust Fund
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

1. EXECUTIVE SUMMARY

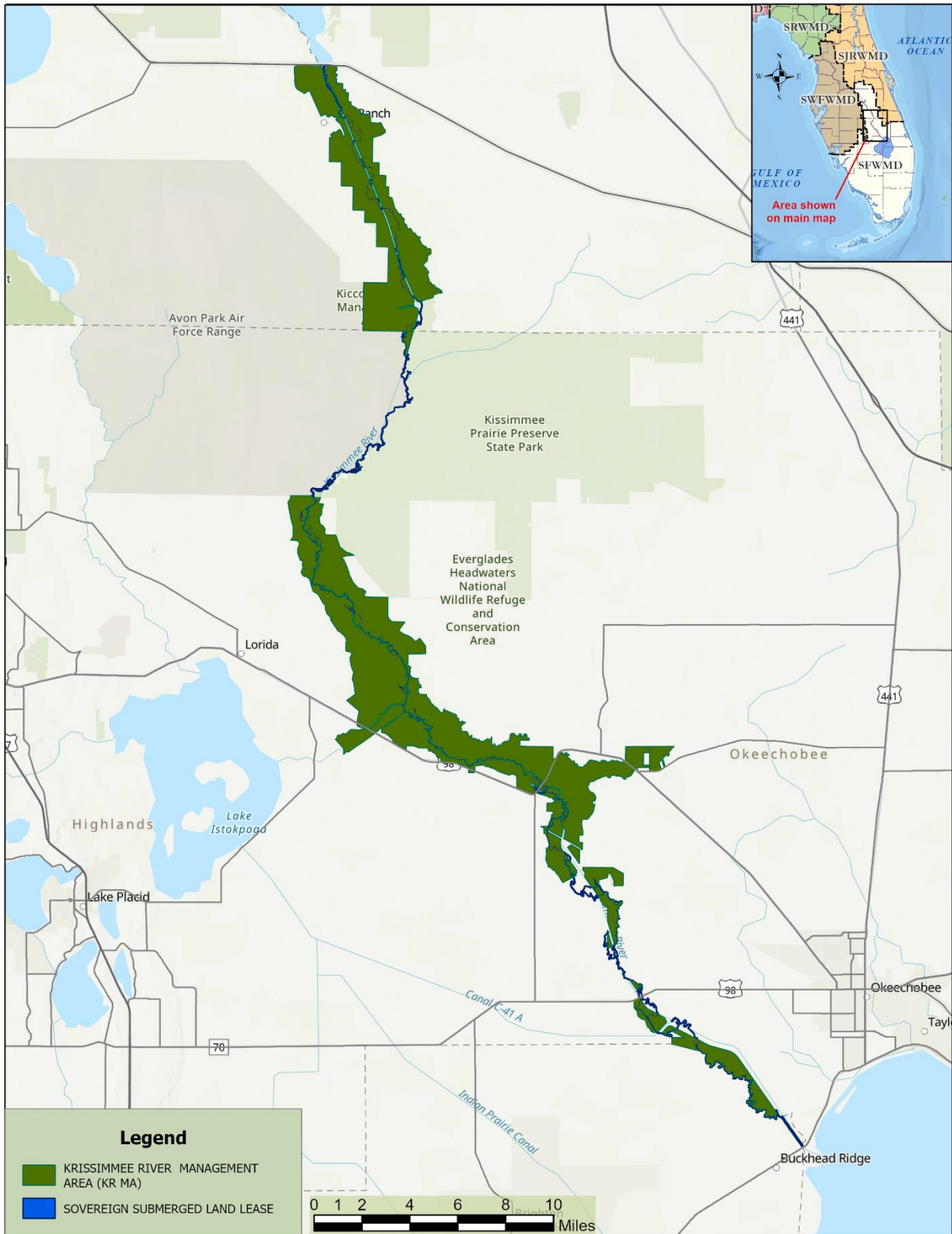
In 1981, the Florida Legislature established the Water Management Lands Trust Fund, which allowed water management districts to acquire environmentally sensitive land for the purposes of water management, water supply and conservation and protection of water resources through the Save Our Rivers (SOR) program. The South Florida Water Management District (District) used these funds to acquire properties for the Kissimmee River Restoration Project. The District has acquired a total of 86,914 acres in fee and shared-fee title interests to date, which it manages in collaboration with the Florida Department of Environmental Protection (FDEP) Division of State Lands. Of this land, the District directly manages 40,577 acres of fee-owned land and 2,173 acres owned by the Trustees of the Internal Improvement Trust Fund (TIITF), as the Kissimmee River Management Area (KR MA).

Pursuant to Section 373.1391, Florida Statutes, the District is responsible for managing lands acquired under the SOR program. This General Management Plan (GMP) guides the management of the KR MA through the 10-year period of 2025-2035 and was peer-reviewed by external professionals, as directed by section 373.591, Florida Statutes, and approved by the District's Governing Board. Goals identified for the next ten years include managing natural communities and modified habitats to protect and enhance water, floral, and faunal resources; providing resource-based public use opportunities; maintaining area infrastructure; and providing security and resource protection.

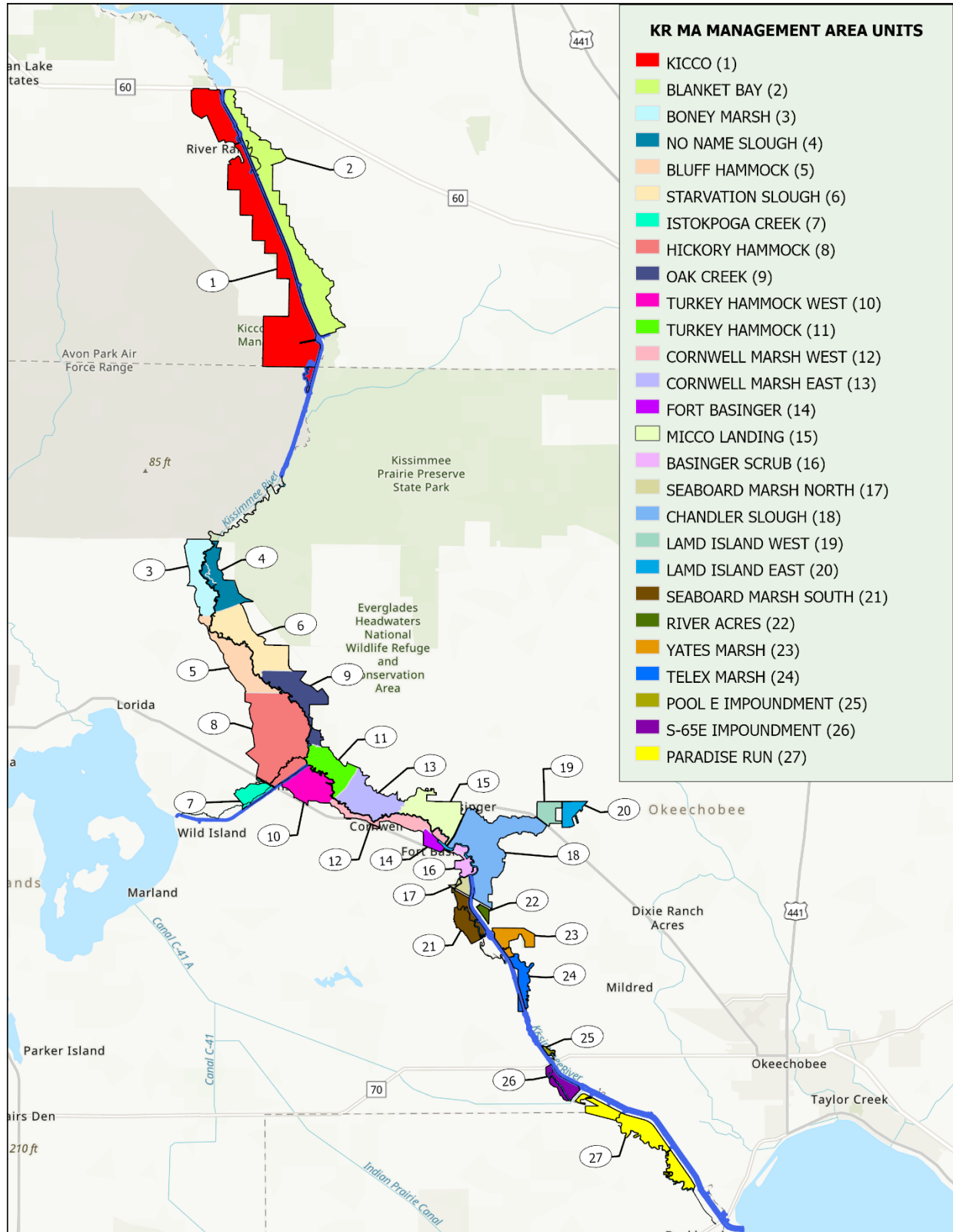
2. INTRODUCTION

The KR MA, located in central Florida, spans from State Road 60 to approximately 1.8 miles north of State Road 78 (**Map 1**). It covers portions of Polk, Osceola, Highlands, Glades, and Okeechobee counties. The Management Area encompasses lands within the Kissimmee River's 100-year floodplain, featuring a vast wetland ecosystem, interspersed with oxbows and upland communities. Historically, the Kissimmee River floodplain has been used for agriculture, and both conservation and agriculture continue to be the primary land uses in the KR Management Area and its surroundings. The KR MA is divided into twenty-seven separate management units (**Table 1, Map 2**).

Kissimmee River Management Area General Management Plan 2025 – 2035
South Florida Water Management District, Land Stewardship Section



Kissimmee River Management Area General Management Plan 2025 – 2035
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Map 2. KR MA management units.

Table 1. Positions of KR MA Management Units Relative to the River Channel.

100-Year Floodplain Pools	West Side of the Channel	East Side of the Channel
Upper River (FKA Pool A)	KICCO (1)	Blanket Bay (2)
Middle River (Kissimmee River Restoration FKA Pools B-D)	Boney Marsh (3) Bluff Hammock (5) Istokpoga Creek (7) Hickory Hammock (8) Turkey Hammock West (10) Cornwell Marsh West (12) Fort Basinger (14) Basinger Scrub (16) Seaboard Marsh North (17) Seaboard Marsh South (21)	No Name Slough (4) Starvation Slough (6) Oak Creek (9) Turkey Hammock (11) Cornwell Marsh East (13) Micco Landing (15) Chandler Slough (18) Lamb Island West (19) Lamb Island East (20) River Acres (22)
Lower River (FKA Pool E)	S-65E Impoundment (26) Paradise Run (27)	Yates Marsh (23) Telex Marsh (24) Pool E Impoundment (25)

KICCO Unit (7,669 acres) and Blanket Bay Unit (4,793 acres) are located in Polk and Osceola counties, respectively. The KICCO Unit derives its name from the Kissimmee Island Cattle Company, which previously operated a small company town on this site. The Blanket Bay Unit is partly owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) and managed by the District as part of the KR MA. These units were among the earliest acquisitions for the Kissimmee River Restoration Project. Although they were outside the backfilling project for the Kissimmee River Restoration, their acquisition was necessary due to the upstream effects resulting from the increased flows from the Kissimmee River Chain of Lakes just upstream of these units. These units were enhanced while the Kissimmee River Restoration Project was still in its initial testing stages. Improvements made in these areas included lowering levees to reestablish natural water flow and provide flood relief for the Kissimmee Chain of Lakes.

Boney Marsh (1,1415 acres), No Name Slough (1,284 acres), Bluff Hammock (1,626 acres), Starvation Slough (2,331 acres), Hickory Hammock (4,585 acres), Oak Creek (1,627 acres), Turkey Hammock West (1,273 acres), Turkey Hammock (1,250 acres), Cornwell Marsh West (980 acres), Cornwell Marsh East (1,696 acres), Fort Basinger (271 acres), Micco Landing (1,641 acres), Seaboard Marsh North (227 acres), Basinger Scrub (426), Chandler Slough (3,556 acres), Lamb Island West (456 acres), and Lamb Island East (422 acres), and Seaboard Marsh South (878 acres), make up most of the middle pools, which have been the primary focus of the Kissimmee River Restoration Project. These units are located in Highlands and Okeechobee counties and consist mostly of floodplain marshes that were drained for cattle operations. The ecological functions and hydrology of the units were improved alongside the restoration of the historic river

channel that historically fed them. The restoration project removed the middle pools of the C-38 Canal, eliminated spoil piles that had blocked sheet flow into these units, reestablished flow through oxbow lakes previously severed by the canal, and restored most of the original course of the Kissimmee River.

The benefits of restoration for the natural ecosystem are evident in the western portion of the No Name Slough Unit, where a prairie system has emerged along No Name Slough after the C-38 canal was backfilled. The western edges of the Oak Creek Unit feature hammock systems with a vast array of magnificent old-growth oaks. The Fort Basinger Unit extends outside the floodplain and the restoration project. Historically, it housed a one-room school where Edna Pearce-Lockett taught in her youth; the building was moved to the Pearce-Lockett estate in 2005. This unit has been restored to a mesic flatwood community and serves as a receptor site for relocated gopher tortoises. The Cornwell Marsh West Unit is located within the floodplain of the Kissimmee River and has been heavily disturbed. Previously, the upland areas in this unit were utilized for residential development, which included several houses that were demolished as part of the Kissimmee River Restoration Project. Some infrastructure, mainly roads, is still present in parts of the unit that remain disturbed. The Cornwell Marsh West Unit now hosts the Riverwoods Field Laboratory, which offers laboratory facilities for research and education while also supporting the monitoring program for the Kissimmee River. The Seaboard Marsh North Unit is mainly comprised of marshlands bordered by a cypress-dominated forested floodplain wetland. Within the Seaboard Marsh North unit is a hardwood community that lies outside the Kissimmee River floodplain. This area was acquired due to its archaeological significance. The Chandler Slough Unit lies within the Kissimmee River floodplain and primarily comprises restored floodplain marshes, forested wetlands, and cypress systems. As part of the Kissimmee River Restoration, a large ditch that bisected the Chandler Slough Unit was backfilled. The Lamb Island units, which are contiguous with the Chandler Slough Unit, lie outside the Kissimmee River floodplain but are part of the same interconnected slough system. Prior to acquisition by the District, the Lamb Island property was the site of a commercial dairy operation. Following the acquisition, the site was converted to a cattle operation to reduce nutrient loading into the Okeechobee Basin. The Seaboard Marsh South Unit stretches into Highlands and Okeechobee counties and comprises a mixture of marshes, cypress, and hardwood systems.

River Acres (118 acres), Yates Marsh (656 acres), Telex Marsh (545 acres), Pool E Impoundment (49 acres), S-65E Impoundment (525 acres), and Paradise Run (1,889 acres) units are located downstream of the Kissimmee River Restoration Project, south of the S-65D locks. In this segment, the C-38 Canal was not filled during restoration; however, remnants of the original river channel, which had been isolated by the canal, were reopened to restore connectivity to the historic flow path. Notably, the Telex Marsh Unit features some of the most scenic and undisturbed sections of the old river channel. The Telex Unit is located in Highlands County and consists of a hardwood system. The River Acres Unit is located within the River Acres platted subdivision in Okeechobee County. It was acquired as part of the Kissimmee River floodplain acquisition effort due to its position within the floodplain. It continues to function as a water quality detention area, helping to reduce nutrient loading by treating runoff from the surrounding subdivision. The site is densely vegetated with native and invasive shrub species. The Yates Unit is primarily improved pasture; however, the eastern portion supports a mix of natural communities. The land in Pool E is composed of wet prairie, while the S-65E Impoundment East and West, and Paradise Run units mainly consist of marshlands, which were necessary for flood control during the development of

the pool system. Paradise Run is partially located outside the Kissimmee River floodplain and is fairly drained. It is bordered by the remnant C-38 canal to the east and the old meandering river channel to the west.

2.1. Acquisition Purpose and Significance of the Area

Since its inception, the restoration of the Kissimmee River has been a central focus of the District's core mission. The restoration project began with the 1976 legislature (Chapter 76-113, Florida Statutes), which led to the Kissimmee River Restoration Project, authorized by Congress in the 1992 Water Resources Development Act to reclaim the over-drained wetlands along the river floodplain. This Act allowed the District and the U.S. Army Corps of Engineers (USACE) to enter into a cost-sharing cooperative agreement in 1994, launching one of the largest river restoration initiatives in the world: the Kissimmee River Restoration Project. As part of this project, the District acquired land within the river floodplain, which was essential to the ecological restoration goals of the Kissimmee River Restoration Project. To date, the District has acquired 86,914 acres in fee simple and shared title interest and 26,535 acres in flowage and conservation easements across Polk, Osceola, Highlands, Glades, and Okeechobee counties. The KR MA encompasses 40,577 acres of this fee-acquisition, while the remaining lands are managed by FDEP as part of Kissimmee River Prairie State Park. Additionally, the District leases sovereign submerged lands below the ordinary high-water mark and the 2,173-acre Blanket Bay Unit from TITF. Collectively, these leases advance the restoration effort and enhance public access.

Acquiring these lands has contributed to flood control, restoration of natural systems, improved water quality, and increased water supply in the Kissimmee River Basin. These properties made it possible to reconstruct the river's historic form in restored sections, reversing decades of biodiversity decline while maintaining existing levels of flood protection. Approximately 99 percent of the land in the Kissimmee River Restoration Project acquisition footprint was secured, resulting in over 100,000 acres of long-term conservation.

2.2. Legal Requirements of Management

The KR MA properties were purchased with funds from the SOR land acquisition program to protect lands that have important water resource values through acquisition, restoration, and management for environmental benefits. SOR was one of several programs funded through the 1981 Water Management Lands Trust Fund legislation (section 373.59, Florida Statutes (1981)) using documentary stamp tax revenue. The SOR program was eventually replaced by the 1999 Florida Forever Act, which consolidated the legislative directives of SOR and Preservation 2000, a program enacted in 1990 to provide additional funding for land acquisition. Lands acquired with funds from the trust are required to satisfy the requirements outlined in section 373.1391, Florida Statutes.

Section 373.1391, Florida Statutes, requires the District to balance resource conservation and public recreational use. This legislation reinforces the Water Management Lands Trust Fund requirements by directing the District to utilize lands titled to the District for public recreation purposes to the extent possible while considering the environmental sensitivity and suitability of those lands for recreation.

Public use on District lands is also governed by Chapter 40E-7, Florida Administrative Code (Rules 40E-7.511-539, Florida Administrative Code), which regulates public access to District land and use of said lands. As the steward, the Land Stewardship Section is responsible for protecting, enhancing, restoring, and preserving District lands for the beneficial use and enjoyment of existing and future generations.

To support the statutory directives in section 373.1391, the District has partnered with the Florida Fish and Wildlife Commission (FWC) to establish certain District properties as Wildlife Management Areas (WMA), Wildlife and Environmental Areas (WEA), Public Small Game Hunting Areas (PSGHA), or Miscellaneous Areas through their authority under Chapter 379, Florida Statutes. This partnership allows the FWC to promulgate rules under Chapter 68, Administrative Code, in coordination with the District, to regulate public use on these properties.

The determination of compatible public uses on District lands is based on the following criteria:

- Consistency with the acquisition purposes, including protecting natural ecosystems.
- Restrictions by easements, leases, reservations, adjacent land ownership, or conditions of the purchase agreement.
- Existing infrastructure and facilities, including fences, gates, signage, access, trails, campsites, etc.
- Available funding.
- Limitations on use resulting from endangered species and sensitive natural or archeological resources.
- Public health, safety, and welfare.

Management activities on lease areas are also subject to the requirements for State Lands as set forth in section 259.032, Florida Statutes.

2.3. General Management Plan Development

General Management Plans (GMPs) for the District are developed for selected areas established as management areas to guide management over a 10-year period. When the plans are updated, staff review the previous plan, identify accomplishments made on prior goals and objectives, and develop new goals and objectives for the coming ten years. These updated goals and objectives are based on District priorities, previous public input through meetings of the Recreation Forum and other venues, and current best management practices. This process is also designed to meet State requirements for management plans (section 259.032, Florida Statutes) on areas leased from the State of Florida. The draft plan is provided to the management review team specified in section 373.591, Florida Statutes, and comments from this multi-agency and stakeholder management review team on the draft and past management are included in the updated plan.

Common resource management and public use activities implemented by the District in management areas include:

- Prescribed fire to mimic the natural fire frequency in the fire-dependent habitats.
- Vegetation management, such as shredding and/or mowing to control invasive woody shrubs and eliminate hazardous fire fuels.
- Wildlife management, including surveys and habitat management.
- Nuisance and invasive vegetation control.
- Monitoring the health of the natural communities and the impact of management practices on them.
- Hydrologic restoration of wetlands to establish optimal flows and hydroperiods.
- Providing public use facilities that support hunting, boating, hiking, fishing, birding, canoeing, camping, nature appreciation, geocaching, and biking.
- Utilizing volunteers and user group organizations to support the public use program.
- Providing security and hunting opportunities through partnership with FWC.
- Providing educational programs through partnerships with external educational organizations.
- Leveraging staff time through contracts with the private sector when appropriate.

This GMP serves as the basic statement of management intent and consolidates relevant information about the KR MA to guide management actions for the 2025 to 2035 period. This includes land management goals and objectives, past and present land uses, resource data, restoration and management needs, public use programs, and administrative duties.

3. MANAGEMENT AREA GOALS AND OBJECTIVES

Management of Wildlife and Habitats

Goal 1: Manage natural communities and modified habitats to protect and enhance floral and faunal resources

Objectives:

- Continue to utilize prescribed fire to maintain all fire-dependent management units within their appropriate fire return intervals.
- Continue using mechanical vegetation treatment to control woody vegetation encroachment into wet prairies and seasonal wetlands, and to reduce dense pockets of vegetation.
- Enhance the mesic flatwoods community in the Fort Basinger Unit through mechanical and fire treatments.
- Continue to minimize hazardous fuel along firelines to reduce spot-over potential.

- Continue to utilize prescribed grazing as a management tool in areas compatible with acquisition purposes and management objectives.

Goal 2: Maintain, improve, or restore listed species populations and habitats.

Objectives:

- Enhance vegetation communities to increase habitat use by threatened and endangered species.
- Increase herbaceous cover in pine and prairie communities to improve foraging habitats.
- Manage the gopher tortoise recipient site in the Fort Basinger management unit according to the Long-term Gopher Tortoise Management Plan.
- Conduct periodic surveys of vegetation and tortoise burrows to monitor the gopher tortoise recipient site.
- Identify suitable habitats in other units to support potential gopher tortoise range expansion.
- Collaborate with state and federal partners to identify and manage black rail habitats, promoting their use by these federally threatened birds.
- Identify priority habitats and funding to conduct additional floral and faunal surveys.

Nuisance and Invasive Species Management

Goal 3: Manage invasive species to minimize their negative impacts on natural communities.

Objectives:

- Continue to control nuisance and invasive species to maintain the management units in maintenance condition (Condition Class 1) and systematically improve remaining areas.
- Continue to target invasive species infestations in identified areas as they become priorities to achieve maintenance levels.
- Collaborate with the Vegetation Management Section to develop strategies for reducing the spread of invasive grass and Carolina willow.
- Implement Early Detection Rapid Response (EDRR) treatments as needed.
- Seek additional funding through the FWC Upland Invasive Plant Management Program to expand invasive species treatment within the management area.
- Enhance wild hog population control measures.

Hydrological Management

Goal 4: Protect and enhance the hydrological and ecological functions of wetland communities

Objectives:

- Assess shifts in wetland hydrology and identify improvements to support optimal sheetflow in KR MA.
- Work with the Northern Everglades and Estuaries Protection Program to identify cooperative opportunities to make substantive improvements to degraded wetlands within the Kissimmee River Management Area.

Public access and Recreational opportunities

Goal 5: Provide nature-based public use opportunities

Objectives:

- Maintain compatible public use opportunities such as hunting, camping, airboating, canoeing, kayaking, fishing, hiking, biking, equestrian, and wildlife viewing.
- Continue to identify potential locations for new shelters and campsites in coordination with volunteers and user groups.
- Provide resource protection through partnerships with local and state law enforcement.
- Continue to implement the public use program through coordination with FWC, local partners, adjacent landowners, and recreation user groups.
- Continue to participate in the District's Public Recreational Forum to support stakeholder engagement.
- Continue to coordinate with the Florida Trail Association on the Florida National Scenic Trail throughout KR MA.
- Provide interpretive and educational information using brochures, signage, and kiosks at public use amenities such as airboat shelters.

Operation and Maintenance of Capital Facilities and Infrastructure

Goal 6: Maintain and improve facilities and infrastructure

Objectives:

- Continue to maintain the firelines and service roads within the management area.
- Maintain public-use facilities and infrastructure such as signs, primitive camping areas, boat ramps, and structures through a coordinated effort involving District staff, volunteers, and private contractors.
- Maintain and secure the Management Area boundary using signage, fences, and fireline maintenance.
- Ensure all facilities and infrastructure assets are accurately identified, mapped, and maintained within the geospatial data system.

- Develop comprehensive asset management and capital improvement plans for all infrastructure and facility assets to support proactive and strategic management.
- Secure needed funds to implement facilities and infrastructure maintenance and replacement plans.

Cultural Resource Management

Goal 7: Protect existing cultural resources

Objectives:

- Ensure all known sites are recorded in the Florida Division of Historical Resources Master Site file.
- Continue to monitor, protect, and preserve all known/identified sites.
- Coordinate with the Florida Division of Historical Resources (FDHR) to assess the need to conduct additional cultural resource surveys.
- Ensure at least one member of staff has attended the FDHR cultural resource training program.

4. AREA HISTORY

Historically, the Kissimmee River consisted of over 103 miles of meandering channels, oxbows, and natural, discontinuous sandbanks within a floodplain that varied from one to two miles in width (Figure 1). This floodplain, which is approximately 56 miles long, slopes gradually southward from Lake Kissimmee to Lake Okeechobee.

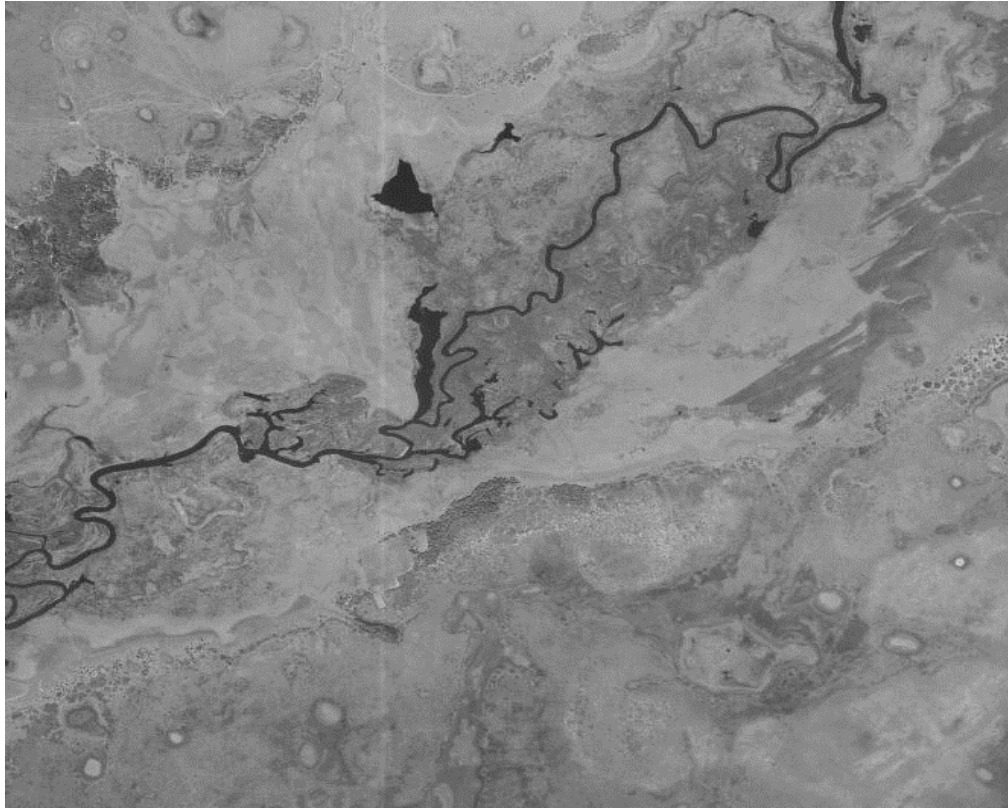


Figure 1. Aerial Image of the Kissimmee River Pre-Channelization.

Prior to channelization, the Kissimmee River seasonally overflowed its banks, flooding its broad floodplain (**Figure 2**) (SFWMD, 2006). Much of the floodplain would remain inundated throughout the year, except during drought conditions (Toth et al., 1998). During significant floods, like the hurricane of 1878, the Kissimmee River floodplain resembled a vast lake, extending several miles across the basin. The flooding conditions in the Kissimmee River basin resulted from the accumulation of runoff on the basin's wetlands and the subsequent rise in lake levels due to inadequate drainage capacity (Koebel, 1995). Hurricane-force winds over the Florida peninsula created problems with tide generation on the larger lakes, which added to the local flooding.

Dry Season



Wet Season



Figure 2. Seasonal water level trends in the Kissimmee River Basin.

Before the 1840s, settlement was sparse in the Kissimmee Basin. English-speaking settlers began to move to the area after the Seminoles were pushed south of Lake Okeechobee during the 1840s and 1850s. Land use in the basin primarily involved farming and cattle ranching. Steamboats served as the main mode of transportation for passengers and commerce. Kissimmee became a hub for steamboat travel along the Kissimmee River to South Florida and the Gulf Coast (Robinson, 2003). Initially, the steamboat route from Kissimmee to Fort Basinger was limited to steamers with a two-foot draft and was restricted by water levels. Periods of drought in the winter and spring would close the water route for several months, halting commerce and travel. Local politicians began lobbying Congress for improvements to the river system to accommodate larger steamers with a deeper draft year-round. As a result, Congress directed the USACE to study and open a steamer line from Kissimmee to Florida's southwest coast.

The Swamp and Overflowed Lands Act of 1850 encouraged development by transferring federal lands to the State to use as currency to finance drainage and levee projects. This led to the drainage of large tracts of land and opened the area to more homesteaders and development by the 1880s. Transportation and commerce also increased following the acquisition of four million acres of land by Hamilton Disston, a wealthy businessman from Pennsylvania, in 1881. Disston began a drainage project to connect the upper Kissimmee basin lakes and began dredging and clearing a navigable route from the Gulf of Mexico to Lake Okeechobee. Between 1881 and 1884, the Southport Canal was dredged to connect Lake Tohopekaliga and Lake Cypress. The St. Cloud Canal was also dredged to connect Lake Tohopekaliga and East Lake Tohopekaliga. By 1885, the Kissimmee River was navigable by 75-foot steamers from Fort Myers to Kissimmee (Bousquin et al., 2005). These excavations eliminated the meandering river channel, and the spoil deposited along the shorelines destroyed approximately 6,200 acres of floodplain wetland habitat. Newly drained and filled lands along the canals became suitable for ranching and farming. In 1902, Congress authorized additional alterations to complete the 3-foot deep and 30-foot-wide river channel between the city of Kissimmee and Fort Basinger, as well as between Lake Istokpoga and the Kissimmee River.

The establishment of the Everglades Drainage District by the State of Florida in 1907 and the enactment of the General Drainage Act in 1913 contributed to the rapid development in central and south Florida and set the stage for extensive flooding in the Kissimmee River basin. A series of hurricanes followed in 1926 and 1928, producing extensive rainfall and flooding that resulted in significant losses of life and property (USACE, 1991). As a result of the prolonged flooding within the basin, Congress authorized a modification to the Kissimmee navigation project to include a flood control component. More settlements rapidly followed World War II. Later, over half a million acres were flooded again by a series of hurricanes in 1947. The prolonged flooding prompted a public outcry for federal assistance to reduce flood damage to property in the basin.



Figure 3. *Historical photo of 1940s flooding that led to the C&SF Project.*



Figure 4. Historic 1948 Flood Event in Kissimmee, Florida.

Consequently, Congress authorized the USACE to initiate construction of the Central and Southern Florida Project in 1948, which led to engineering changes to deepen, straighten, and widen the waterway. The Kissimmee River portion of the project was then authorized in 1954, allowing the channelization and installation of control structures in the upper portion (Upper Basin) and lower portion (Lower Basin) of the Kissimmee River. Between 1962 and 1971, the 103-mile meandering river was channelized by cutting and dredging a 56-mile-long, 30-foot-deep, and 300-foot-wide canal (C-38 canal). Inflow from the Kissimmee Chain of Lakes became regulated by six water control structures, creating a series of impounded reservoirs, designated as Pools A-E, along the C-38 canal upstream of each structure.

While the project achieved flood protection, it also caused severe damage to the biological communities of the river and floodplain ecosystem. The floodplain at the lower end of each pool continued to be inundated, while the upper pools dried up. The fluctuations in water levels that occurred prior to channelization were eliminated. The channelization of the river destroyed much of the floodplain-dependent ecosystem that nurtured the wildlife community. While the channelization was ongoing, a drastic decline in bird, fish, and other wetland-dependent species was reported in a U.S. Geological Survey. These impacts on the river's natural resources elicited another public outcry, which led to the grassroots efforts to restore the Kissimmee River. The grassroots efforts prompted the 1971 Governor's Conference on Water Management in South Florida, which later resulted in the Florida legislature enacting the 1976 Kissimmee River Restoration Act. Following the passing of this Act, the U.S. Congress later authorized the Water Resources Development Act of 1992, which authorized the Kissimmee River Restoration Project to restore the river's ecosystem. After extensive planning, construction for the Kissimmee River Restoration Project began in 1999, with backfilling 8 miles of the C-38 canal.



Figure 5. Kissimmee River channelization, Circa 1962–1971.

The Kissimmee River Restoration Project is a joint partnership between the District and the USACE. The project was designed to restore over 40 square miles of river and floodplain ecosystem, including 43 miles of meandering river channel and 27,000 acres of wetlands. The restoration involved reestablishing inflows from the Kissimmee Chain of Lakes to achieve flow velocities and volumes similar to those that existed prior to channelization. Construction of the Kissimmee River Restoration Project involved backfilling approximately 22 miles of the C-38 Canal, reconnecting the original river channel across the backfilled sections, restoring portions of the river channel that were destroyed during the construction of the C-38 Canal, and removing the S-65B and S-65C water control structures along with their associated tieback levees.

In July 2021, the District and the USACE held a ribbon-cutting ceremony to celebrate the completion of the construction for the Kissimmee River Restoration Project.

A more in-depth historical overview of the region can be found in **Appendix A**.

5. RESOURCE DESCRIPTION AND ASSESSMENT

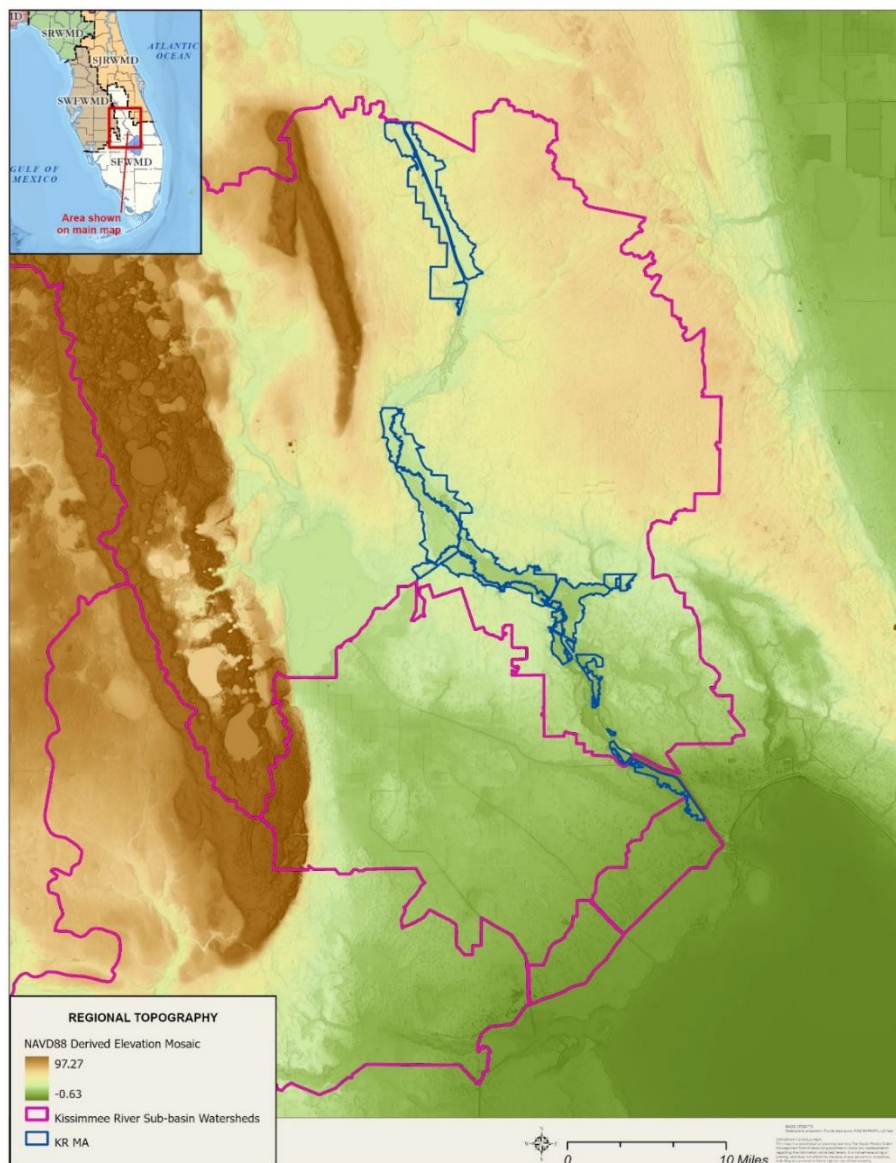
5.1 Infrastructure

The District maintains 118 miles of firelines and 20 miles of service roads through activities such as mowing, tilling, culvert replacement, and road improvements. The District also maintains the perimeter fences annually and conducts periodic repairs or replacements as needed. The District also maintains 23 primitive campsites, four being multi-use camping facilities, one of which is equipped with ADA-accessible features. In addition, there are five pavilions, five boat ramps for both motorized and non-motorized vessels, three airboat launches, two canoe and paddle launches, and 122 miles of recreational trails, all maintained with the assistance of dedicated volunteer groups.

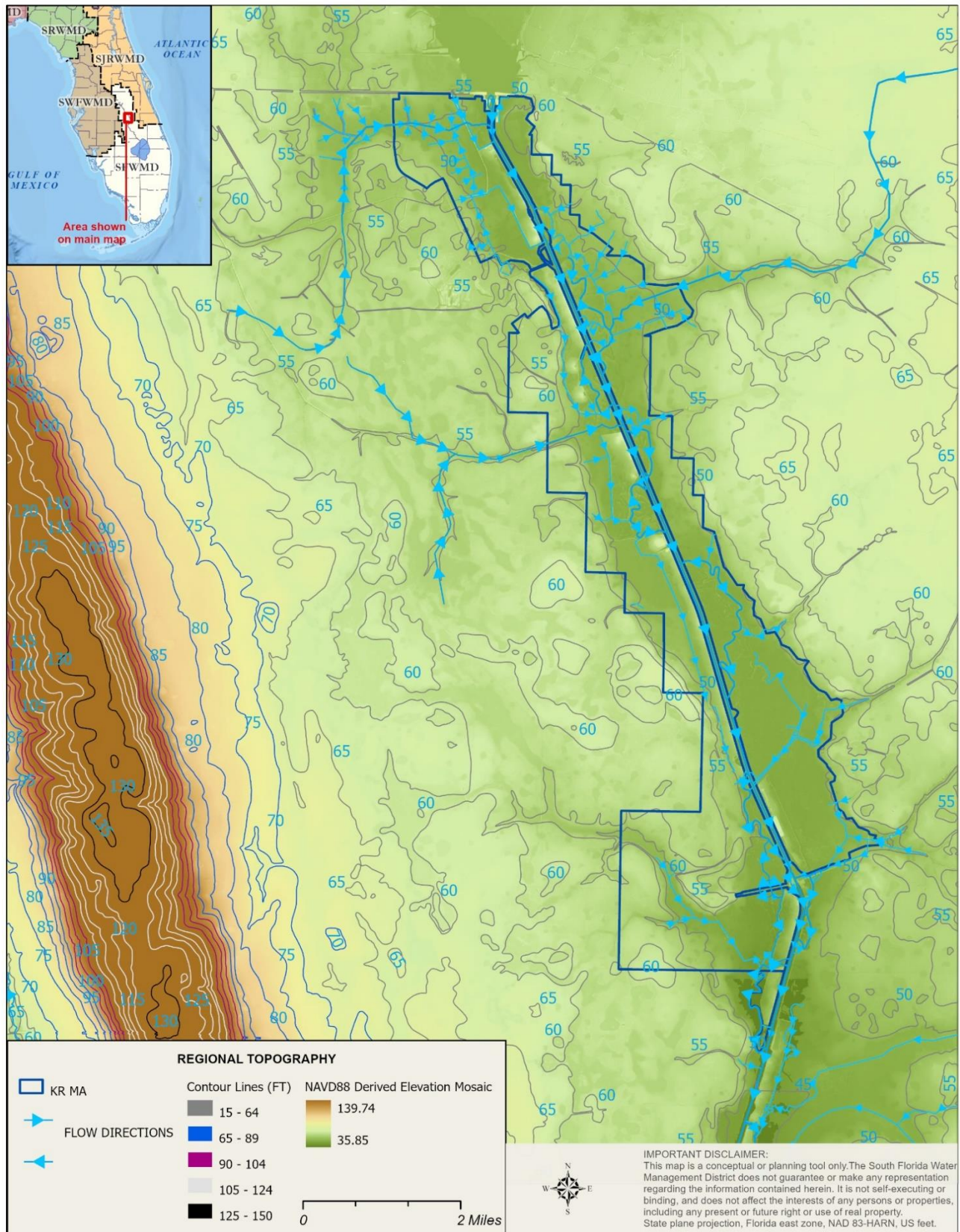
5.2 Physiograph

Topography

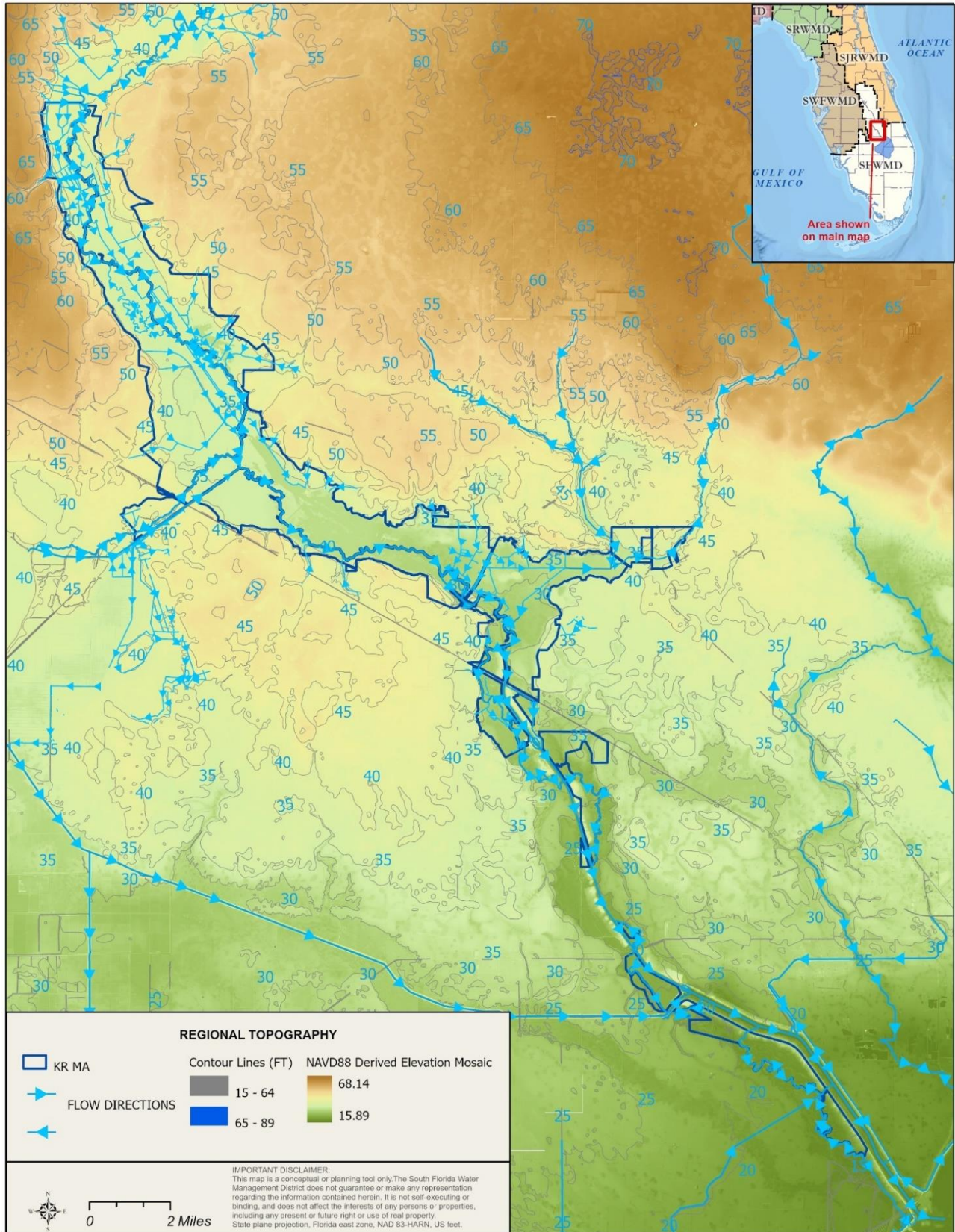
The natural topography in the Kissimmee River Basin (**Maps 3-5**) generally slopes southward toward the low-lying areas and eventually to the Kissimmee River, which originates at the southern end of Lake Kissimmee. Although it is relatively flat, the Kissimmee River basin exhibits greater topographic relief than areas south of Lake Okeechobee. Elevations within the Kissimmee River Basin range from 15 feet to 150 feet above mean sea level (MSL), with the higher elevations concentrated along the western ridges. In the KR MA, elevations range from 50 to 65 feet above MSL in the north, and gradually slope southwards, starting at an elevation of about 51 feet at Lake Kissimmee and reaching about 15 feet near Lake Okeechobee.



Map 3. Regional topography.



Map 4. KR MA (North) regional elevations.



Map 5. KR MA (South) regional elevations.

Geology

The Kissimmee River basin is situated within the Coastal Lowlands of the Coastal Plain physiographic province, extending into the eastern boundary of the Central Highlands physiographic province of the eastern United States. The Coastal Lowlands physiography includes several geomorphic features, including the Atlantic Coastal Ridge, Big Cypress Spur, Big Cypress Swamp, Caloosahatchee Valley, De Soto Plain, Eastern Valley, Everglades, Gulf Coastal Lowlands, Immokalee Rise, Mangrove and Coastal Glades, Osceola Plain, Sandy Flatlands, and the Southwestern Slope. The eastern boundary of the Central Highlands physiographic province encompasses Lake Wales Ridge and Intraridge Valley. The Kissimmee River basin falls within the Lake Wales Ridge, Osceola Plain, and Okeechobee Plain physiographic regions. The KR MA predominantly lies in the Okeechobee Plain (**Map 6**).

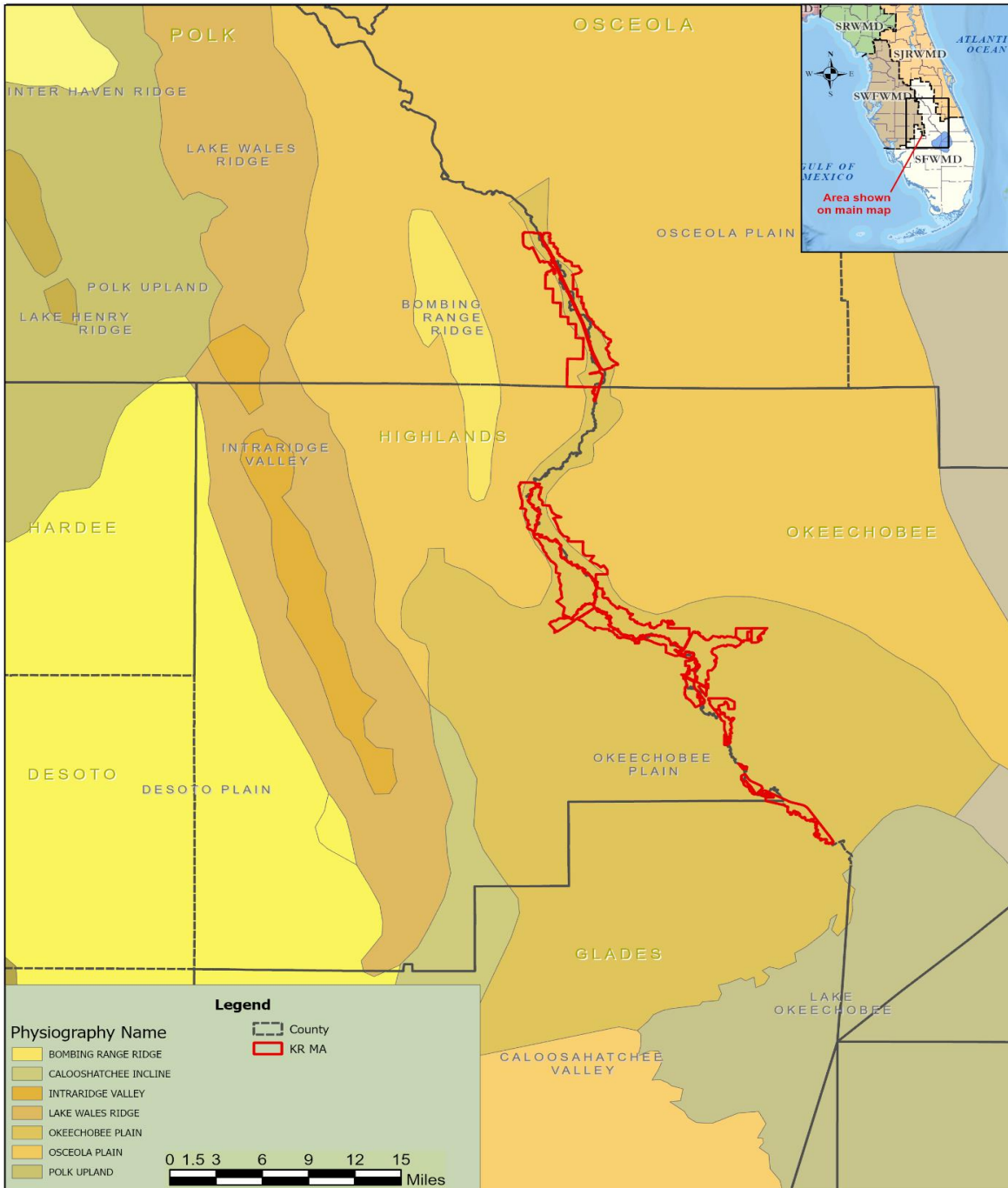
The Osceola Plain has little relief, with the average elevations ranging from about 50 to 75 feet above MSL and generally slopes southward to a low elevation of 40 feet in Okeechobee County. The highest elevation of the Osceola Plain occurs in the northwest corner, where it rises to 90 to 95 feet above MSL. The remainder of the Osceola Plain occurs between 60 and 70 feet above MSL. The Eastern Valley borders it to the east, and the Central Highlands physiography, which includes Lake Wales Ridge, Polk Uplands west, Mount Dora, and Orlando ridges, borders it to the north and the west. Drainage is mainly towards the Kissimmee River basin. A small ridge separates the Osceola Plain from the Okeechobee Plain.

The Lake Wales Ridge is a long, narrow ridge likely developed from a relict beach ridge during periods when the sea level was higher. It has the most prominent topographic feature of the Florida Peninsula, with elevations exceeding 100 feet above MSL. Surface waters east of the ridge flow into the Kissimmee River.

The Okeechobee Plain starts as a narrow, elongated stretch between the Osceola Plain physiographic region and expands southward. It is characterized by gently sloping, poorly drained sands and organic deposits. Elevations range from elevation 15 feet above MSL at Lake Okeechobee to 40 feet elevation in the north from the toe of the scarp that separates it from the Osceola Plain.

The Kissimmee River drainage basin has a complex groundwater system that includes three major hydrogeologic units: the surficial aquifer system, the intermediate confining unit, and the Floridan aquifer system. The surficial aquifer system is primarily recharged by rainfall. The thickness of the surficial aquifer varies considerably and ranges from about 10 to 150 feet below MSL within most of the Kissimmee River drainage basin. In Polk County along the Lake Wales Ridge, the thickness of the surficial aquifer system reaches almost 300 feet. It consists of fine to medium quartz sand, silt, and sandy clay. The intermediate confining unit is roughly 200 feet thick within the basin, but it ranges 50 to 600 feet below MSL in parts of Okeechobee and Highlands counties. It consists of an interbedded sequence of sands, calcareous silts and clays, shell, and phosphatic sand from the Peace River formation and the Arcadia formation, and dolomite. The Floridan aquifer system is subdivided into the Upper and the Lower Floridan aquifer, which are separated by a semi-confining unit. It consists of highly permeable carbonate rocks, primarily limestone and dolomite. The thickness of the Upper Floridan aquifer ranges from 100 to 1,000 feet

below MSL, and the Lower Floridan aquifer ranges from 1,000 to 1,600 feet below MSL. The Upper and Lower Floridan aquifers are composed of two production zones separated by low-permeability confining units. In the northern portion of the Kissimmee River drainage basin, the Upper Floridan aquifer is recharged primarily by direct downward leakance (e.g., through sinkholes) from the surficial aquifer system and, where present, through the intermediate confining unit. (SFWMD, 2020).



Map 6. KR Major geomorphic features.

Climate

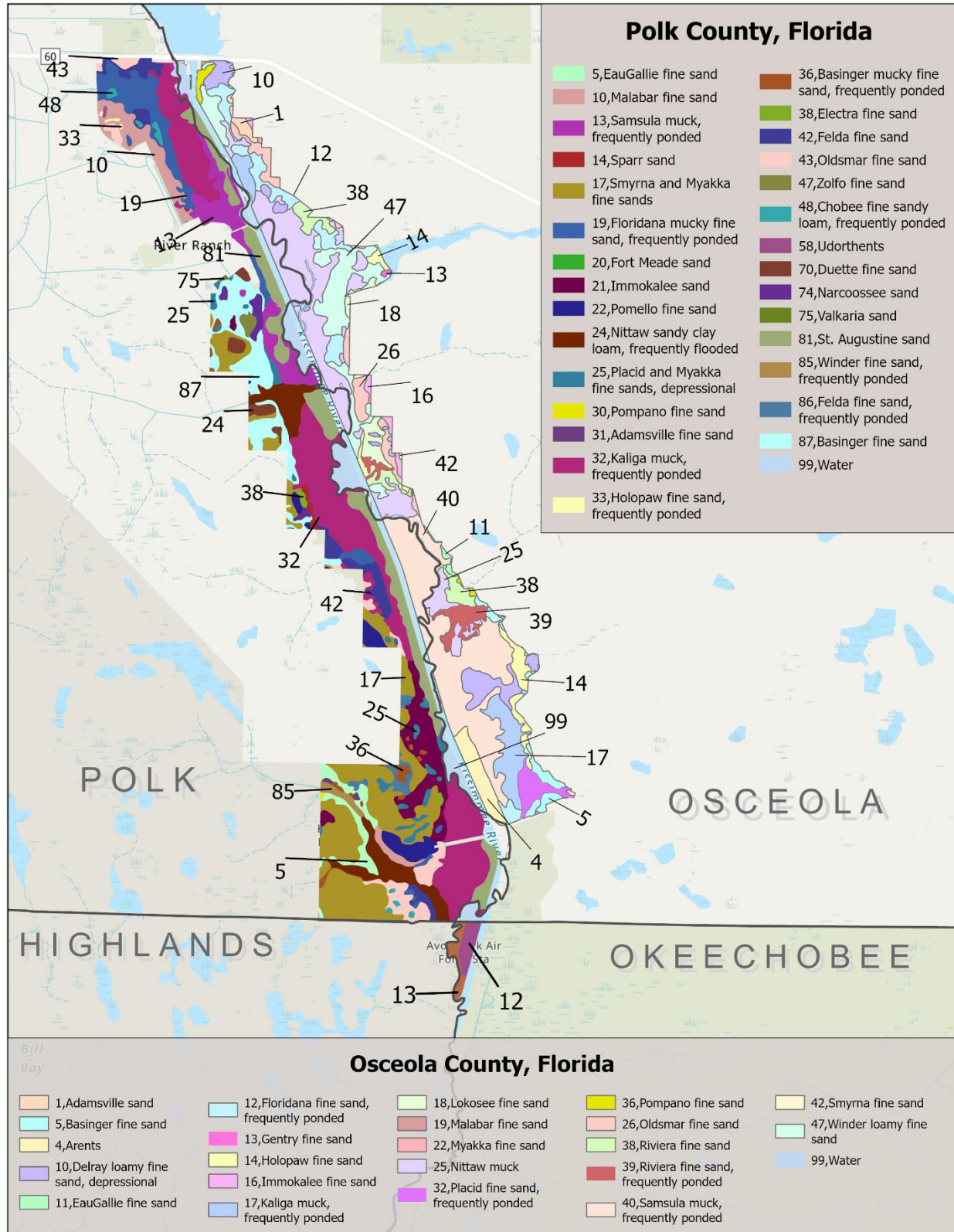
The Kissimmee River Basin experiences a humid subtropical climate characterized by wet and dry seasons of nearly equal length. The average yearly rainfall is 48 inches in the Upper Kissimmee Basin and 45 to 50 inches in the Lower Kissimmee River Basin. Most precipitation occurs during a distinct wet season, which lasts from June to October. El Niño effects during the dry season can lead to above-average precipitation from November to January.

Soils

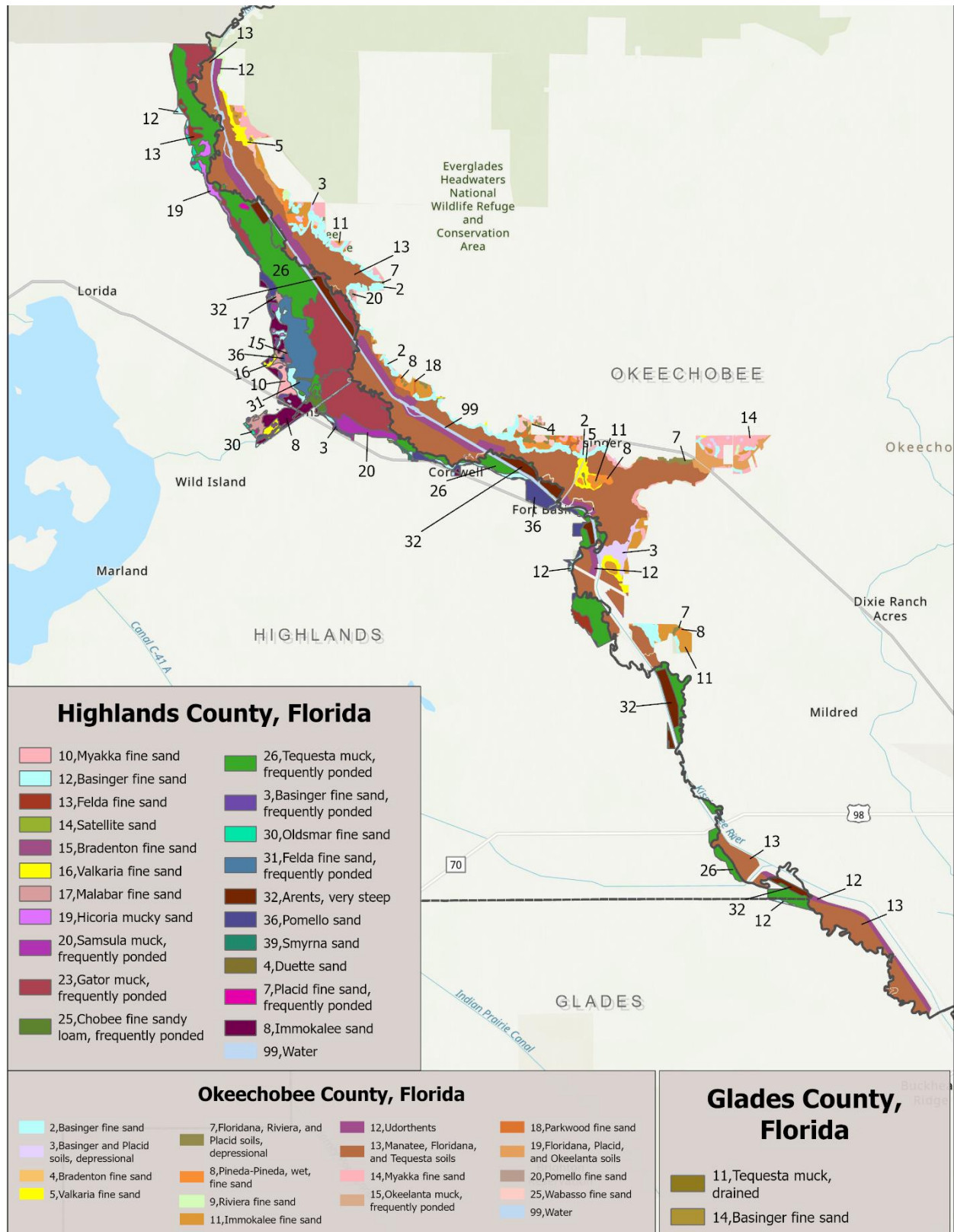
A soil map encompassing the KR MA (**Maps 7-8**) was compiled using Polk and Osceola County soil survey data from the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS).

The sandy soils in the Kissimmee drainage basin primarily originate from marine-deposited silica sands. In Okeechobee County, the main soil compositions in the KR MA are the Manatee Floridana Tequesta complex, and Udorthents soils and Myakka fine sand. In Highlands County, the predominant soil compositions are Tequesta muck, Gator muck, and Arents soils. In Polk County, the primary soil compositions are Kaliga muck, along with the Smyrna and Myakka fine sand complex. In Osceola County, the major soil compositions are Samsula muck and Nittaw muck. In Osceola County, the major soil compositions consist of Samsula muck and Nittaw muck. Other soil compositions throughout the KR MA include Basinger fine sand, Immokalee fine sand, Malabar fine sand, Felda fine sand, St. Augustine sand, Pineda-Pineda, Winder loamy fine sand, Chobee fine sandy loam, Pompano fine sand, Valkaria fine sand, Nittaw sandy clay loam, Floridana mucky fine sand, Delray loamy fine sand, Oldsmar fine sand, Hicoria mucky sand, Holopaw fine sand, Riviera fine sand, Pomello sand, EauGallie fine sand, Parkwood fine sand, Placid fine sand, Lokosee fine sand, Narcoossee sand, Zolfo fine sand, Sparr sand, Satellite sand, Electra fine, Okeelanta muck, Gentry fine sand, Duette fine sand, Bradenton fine sand, Wabasso fine sand, Adamsville fine sand, sand, and Fort Meade sand. In some areas, a hardpan layer lies one to two feet beneath the surface and is linked to perched wetlands. Information about soils is updated by NRCS periodically and available through the NRCS Web Soil Survey.

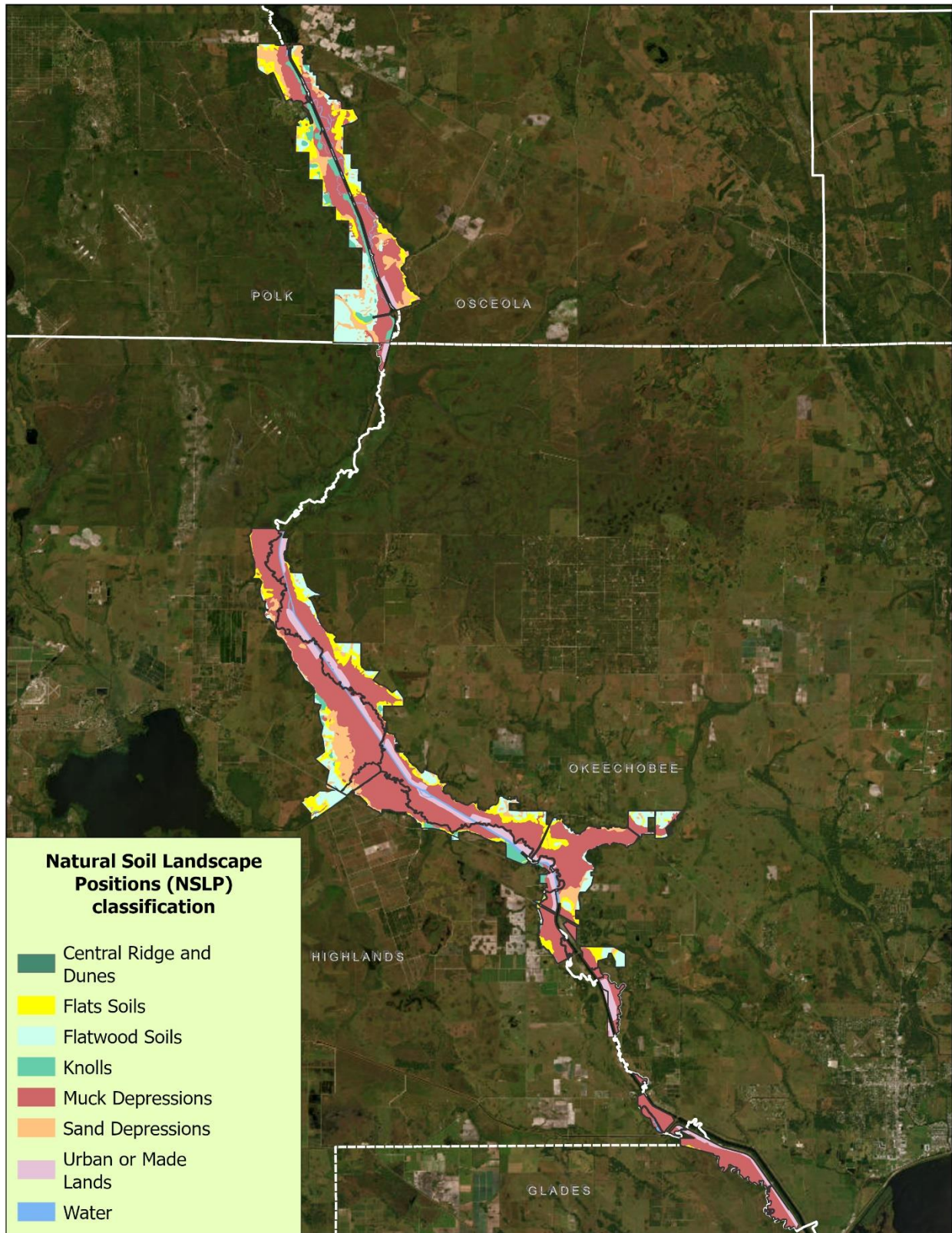
Weathering, erosion, climatic conditions, vegetation effects, and topographical locations of resident soils have resulted in numerous differences in soil characteristics. The Natural Soil Landscape Positions (NSLP) classification system groups South Florida soils into 12 categories based on hydrology and soil morphology that reflect the area's local relative topography, hydrology, and vegetation (Zahina et al. 2001). The soils within the KR MA are classified into seven distinct soil categories: flats soils, flatwood soils, knolls, muck depressions, sand depressions, Central Ridge and Dunes, and urban/made lands (**Map 9**). The soil classification database provides a complete description of soil classification, vegetation associations, and map and data files of NSLP (Zahina et al., 2001).



Map 7. KR MA (North) NRCS soil classifications.



Map 8. KR MA (South) NRCS soil classifications.



Map 9. KR MA NSLP soil classifications.

Soil Contamination and Excavation Sites

Water and soil samples were collected from the KR MA property as part of the environmental assessments for the Kissimmee River Restoration Project to identify potential contaminants. The assessments revealed several areas within the KR MA property with contaminated soil. These on-site contaminants, linked to previous cattle operations, were primarily associated with cattle dipping vats and cattle spray pens. Analysis of the samples indicated that the concentrations of contaminants of concern in the groundwater did not exceed the acceptable levels established by the Florida Groundwater Guidance, meaning that no corrective action or restrictions on the use of the site were necessary. However, elevated levels of contaminants were found in the soil, specifically arsenic contamination in Pool A (KICCO Unit) and Pool C. Additionally, Pool C showed contamination from dichlorodiphenyltrichloroethane (DDT) and related pollutants. As a result, the contaminated soils in these areas were excavated and replaced with clean soil. This remediation was essential for the Restricted I site use-level category designation, which allows for recreational use of the property. Furthermore, the installation of groundwater wells near the former sites of the dipping vats has been restricted. FDEP has confirmed that no further action is required following the cleanup. Given the property's agricultural history, there may be additional cattle dipping vats present. If any new vats are identified, the necessary cleanup will be coordinated with the FDEP.

Hydrology

The KR MA is located within the Lower Kissimmee Drainage Basin, which feeds the Kissimmee-Okeechobee-Everglades system. Its hydrology is closely linked to the Kissimmee River Restoration and the Headwaters Revitalization Schedule (HRS) that manages water discharge from Lake Kissimmee to the Kissimmee River.

The Kissimmee River Drainage Basin is the largest watershed discharging surface water into Lake Okeechobee. Hydrologically, the Kissimmee River Drainage Basin and Lake Okeechobee Drainage Basin downstream function as a single cohesive watershed. The Kissimmee Drainage Basin is divided into two parts: the Upper Basin, covering 1,633 square miles and including Lake Kissimmee, along with the east and west chain of lakes in Orange and Osceola Counties, and the Lower Basin, which covers 758 square miles and includes the tributary watersheds of the Kissimmee River between the outlet in Lake Kissimmee and Lake Okeechobee (USACE, 1991). Furthermore, the basin is subdivided into several sub-basin watersheds. The KR MA falls within five of the sub-basins of the Lower Basin: S-65A, Kissimmee River, S-68E, L-59E, and L-48 (**Map 10**).

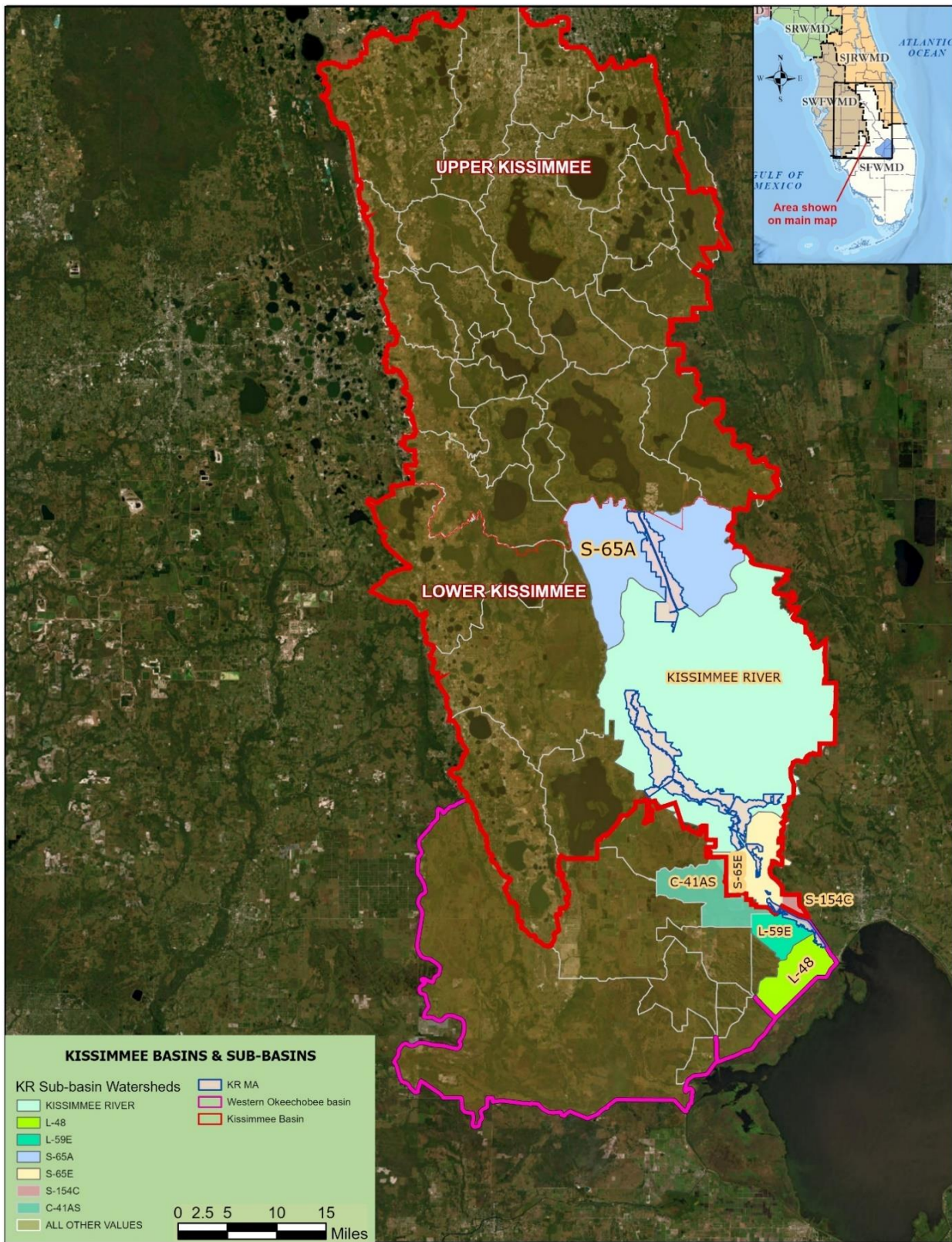
The Kissimmee River primarily drains agricultural lands, crops, and a natural slough system. Historically, the lakes within the Upper Basin were interconnected by streams and sloughs, and the hydrology was cyclical in response to periods of high and low rainfall. During wet seasons, the Chain of Lakes would overflow, creating expansive, marshy connections between the lakes. Flows through the Upper Basin originated near Alligator Lake, flowing northward through the East Chain of Lakes to Lake Hart, and then southward through East Lake Tohopekaliga, Lake Tohopekaliga (Lake Toho), Lake Cypress, Lake Hatchineha, and Lake Kissimmee. The Chain of Lakes had limited outfall capacity via the meandering natural Kissimmee River, functioning as natural

reservoirs that temporarily stored water during the wet season and released it throughout the rest of the year. The Kissimmee River basin was characterized by upland and floodplain retention with slow runoff. Under these conditions, the river flowed gradually, with average velocities usually below two feet per second. Hydrologic data from 1934 to 1960 indicate that overbank flooding occurred 35 to 50% of the time.

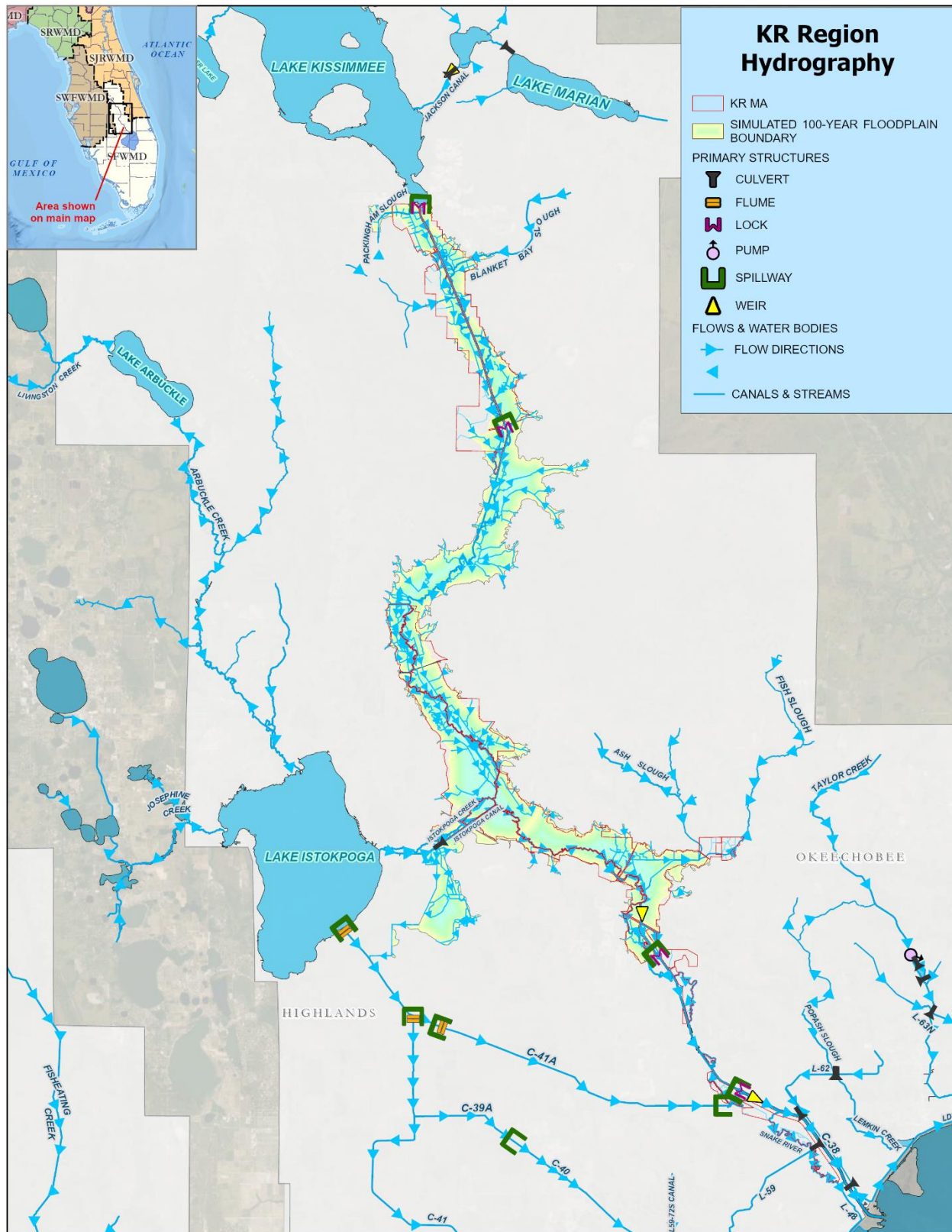
Between 1964 and 1970, several control structures were constructed as part of the Central and South Florida Flood Control Project to manage water levels and outflows in the Upper Basin. This project established a system for regulating water levels in the Upper Basin with a schedule designed to reduce flooding risks. Equipped with multiple gates, these structures can be opened or closed according to a stage regulation schedule that defines the necessary seasonal and monthly limits for the intended flood protection. The primary outfall structure, S-65, located at the southern end of Lake Kissimmee, regulates the outflow of the Upper Basin watershed. Recently, the regulation schedule for the Upper Basin was modified as part of the Headwaters Revitalization Project, which will be implemented in several phases. The new schedule, HRS, will gradually increase seasonal water storage in Lake Kissimmee, Lake Cypress, and Lake Hatchineha over the coming years. Once fully implemented, this schedule will allow lake water levels to rise 1.5 ft higher than the current S-65 schedule permits and will enhance the water storage capacity in the Headwaters Lakes (Kissimmee, Cypress, Tiger, and Hatchineha) by approximately 100,000 acre-feet.

In the Lower Basin, the main source of surface water is the inflow from the S-65 Structure, along with contributions from rainfall, floodplain wetlands, and other storage areas. This water flows into the Lower Basin via the C-38 Canal, subsequently moving into the restored portions of the Kissimmee River and continuing southward to Lake Okeechobee (**Map 11**).

The Lower Basin has experienced a substantial shift in land use over the past 70+ years. Between 1958 and 1972, there was a rapid transformation of natural lands into improved pastures. This shift in land use negatively affected the hydrology of the lower basin because the expansion of agricultural land required the construction of extensive tertiary ditch systems, which ultimately drained the basin. It was estimated that the drainage density in the lower basin increased from approximately 1.59 mi/mi² under historic drainage conditions to about 4.43 mi/mi² after the introduction of artificial drainage. Historically, the Kissimmee River Basin featured vast areas of poorly drained and perched wetlands, attributable to hardpan found one to two feet beneath the surface. The increase in land use and the subsequent need for flood protection in the basin have drained these wetlands using surface drainage systems and by breaking up the original hardpan. These formerly perched wetlands, along with the floodplain marshes, were interconnected with ditches to quickly drain the surface runoff. The extensive ditching and accelerated drainage on agricultural lands led to the straightening and channelization of the drainage systems.



Map 10. Kissimmee River Basin watersheds and sub-watersheds.



After the channelization of the river, five control structures (S-65A, S-65B, S-65C, S-65D, and S-65E) were used to regulate water levels in the Lower Basin, creating impoundments Pools A through E. This regulated flow altered the natural flow and stages of the Kissimmee River, resulting in significantly lower water levels in the northern reach and notably higher levels in the southern reach, which had a significant impact on the marshes in the northern reach. Water levels of around 10 to 12 feet decreased to roughly 3 to 4 feet at each location along the river. From 1970 to 1980, the water levels in Pool B remained below the average floodplain elevation, estimated at 43 feet NGVD (National Geodetic Vertical Datum). In contrast, Pool D experienced floodplain stages that exceeded the average ground elevation of 28.5 feet NGVD roughly 70 percent of the time. The reduced storage upstream and accelerated water movement downstream led to a change in hydrology in the Lower Basin, shifting the characteristics from upland and floodplain retention with slow runoff to upland and floodplain drainage with rapid runoff.

The Kissimmee River Restoration Project dismantled Structures S-65B and S-65C, eliminating their upstream impoundments. Additionally, Structures S-65, S-65A, S-65D, and S-65E were modified to enhance the management of flow and water levels in the Kissimmee River and its floodplain. After the reconstruction was completed in 2021, approximately 69% of the project's length consisted of segments of the natural river channel, which were reconnected to restore historical flow after being severed by the excavation of the C-38 Canal. Another 27% of the project's length consisted of reconstructed river channels that were destroyed during the C-38 Canal's excavation. The remaining 4% included connector channels crossing the backfilled C-38 Canal, which helps prevent erosion. By reestablishing flow in the Kissimmee River channel through the backfill of the C-38 Canal, water levels can now fluctuate with variable flows, leading to periods of floodplain inundation and recession. For example, three floodplain inundation events recorded in 2024 resulted in flows exceeding the bankfull discharge into the river floodplain. Nonetheless, because of the significantly altered hydroperiod, simply backfilling is unlikely to restore adequate flow to the marshes in the Lower Basin because the downstream structure, S-65D, cannot maintain floodplain water levels without considerable inflow from the Upper Basin, which supplies the majority of the water volume. Therefore, to achieve consistent floodplain inundation that simulates pre-channelization conditions, it was crucial to adjust the discharge release schedule from S-65 to better reflect natural flow conditions vital to enhancing the hydrology of the wetlands in the Kissimmee River Basin. The completion of construction for the Kissimmee River Restoration Project marks a major milestone and sets the stage for its final phases. These remaining components include finalizing and implementing HRS to reestablish historical hydrological conditions and continuing ecological monitoring after HRS implementation to evaluate the success of restoring ecological integrity. Hydrological conditions in the KR MA are anticipated to improve as more historic flow patterns are reestablished.

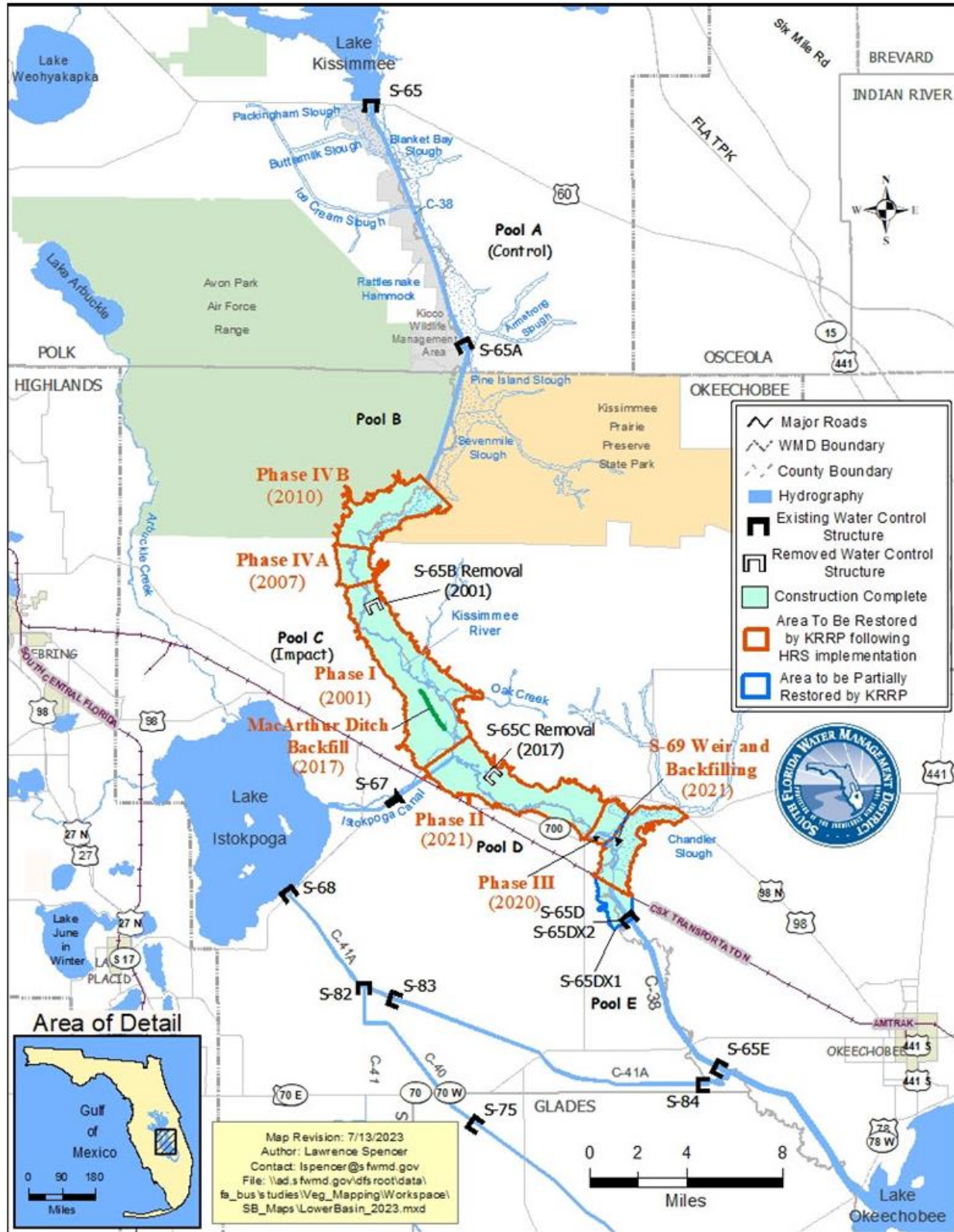


Figure 6. Overview of key features and construction phases of the Kissimmee River Restoration.

5.3 Vegetation

The protection and preservation of native plant communities within the KR MA are central to the Land Stewardship Section’s core mission. Twelve distinct natural community types exist within the KR MA (**Maps 12-13; Figure 7**). These communities are classified according to the Florida Natural Areas Inventory (FNAI) Classification System (FNAI, 2010) and the Florida Land Cover Classification System (Kawula & Redner, 2018), which are used by the District to group and describe natural community types consistently across management areas. These classification systems provide a consistent framework for describing and managing ecological communities across District lands. The communities are actively managed through prescribed fire, invasive species control, and mechanical treatments to maintain ecological integrity and resilience. Adaptive management strategies are applied based on each community’s response to land management practices, allowing for the restoration of degraded habitats, the promotion of native plant diversity, and the prevention of invasive species encroachment. Collectively, these efforts support the long-term conservation of the region’s botanical diversity, including state- and federally listed plant species.

The KR MA is predominantly characterized by extensive floodplain marshes, which provide critical habitat for a diverse array of flora and fauna, contributing significantly to the region’s ecological integrity. Detailed descriptions of both natural communities and altered landcover types are provided in Appendix B, and Appendix C lists the species that utilize these habitats.

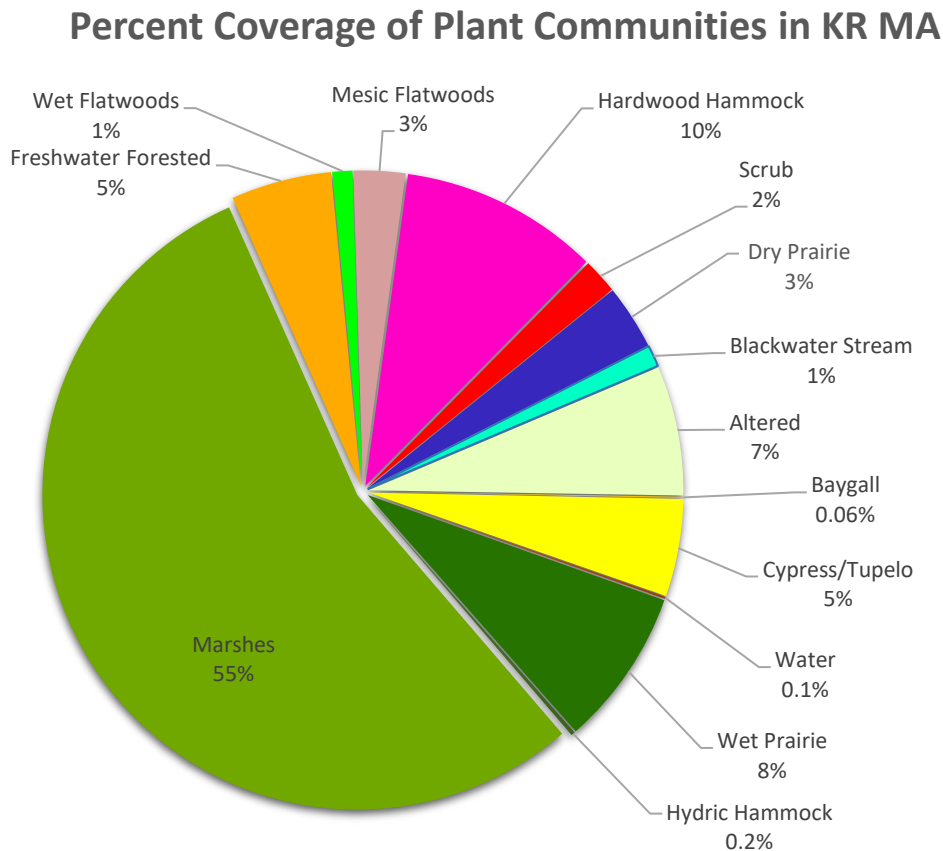
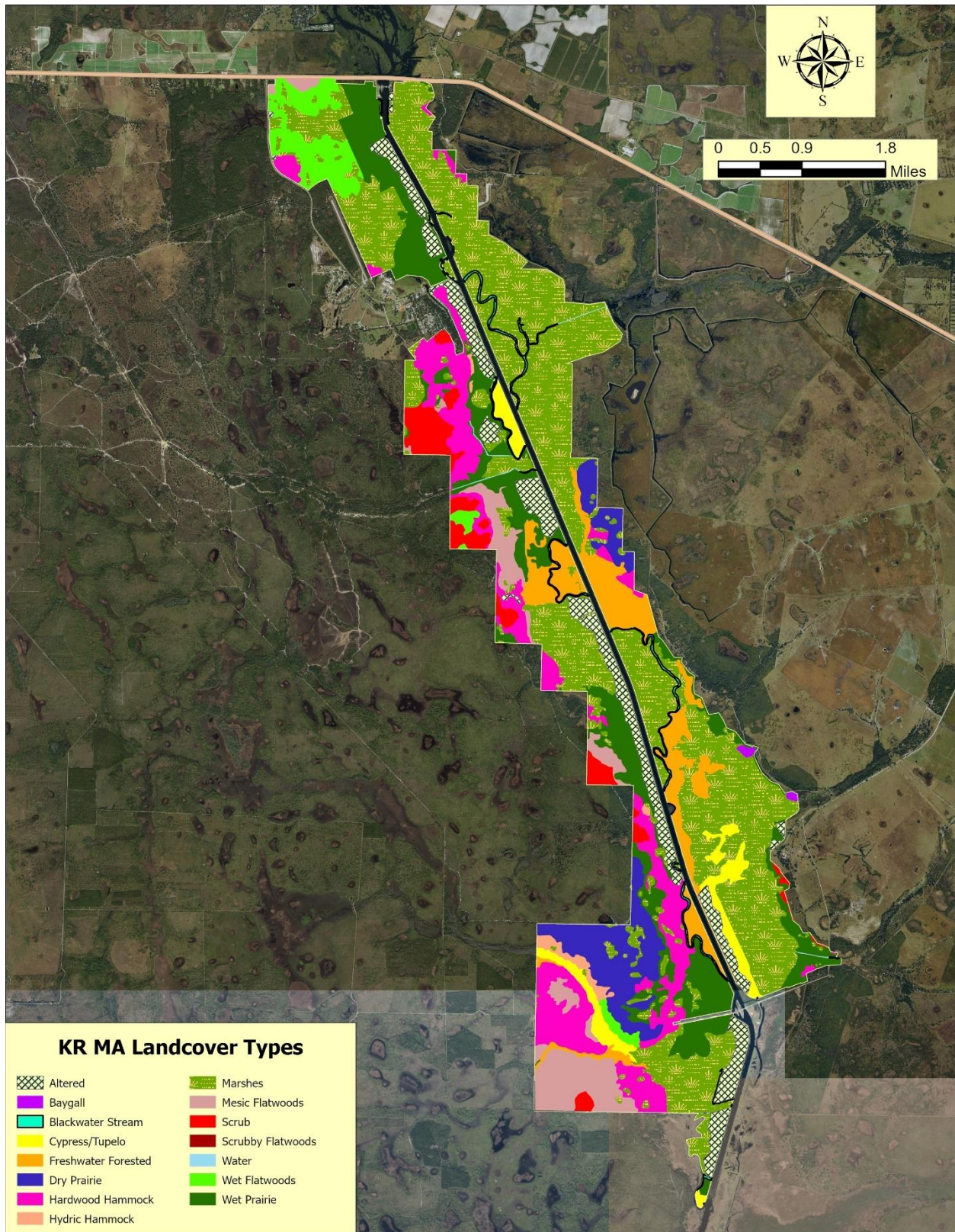
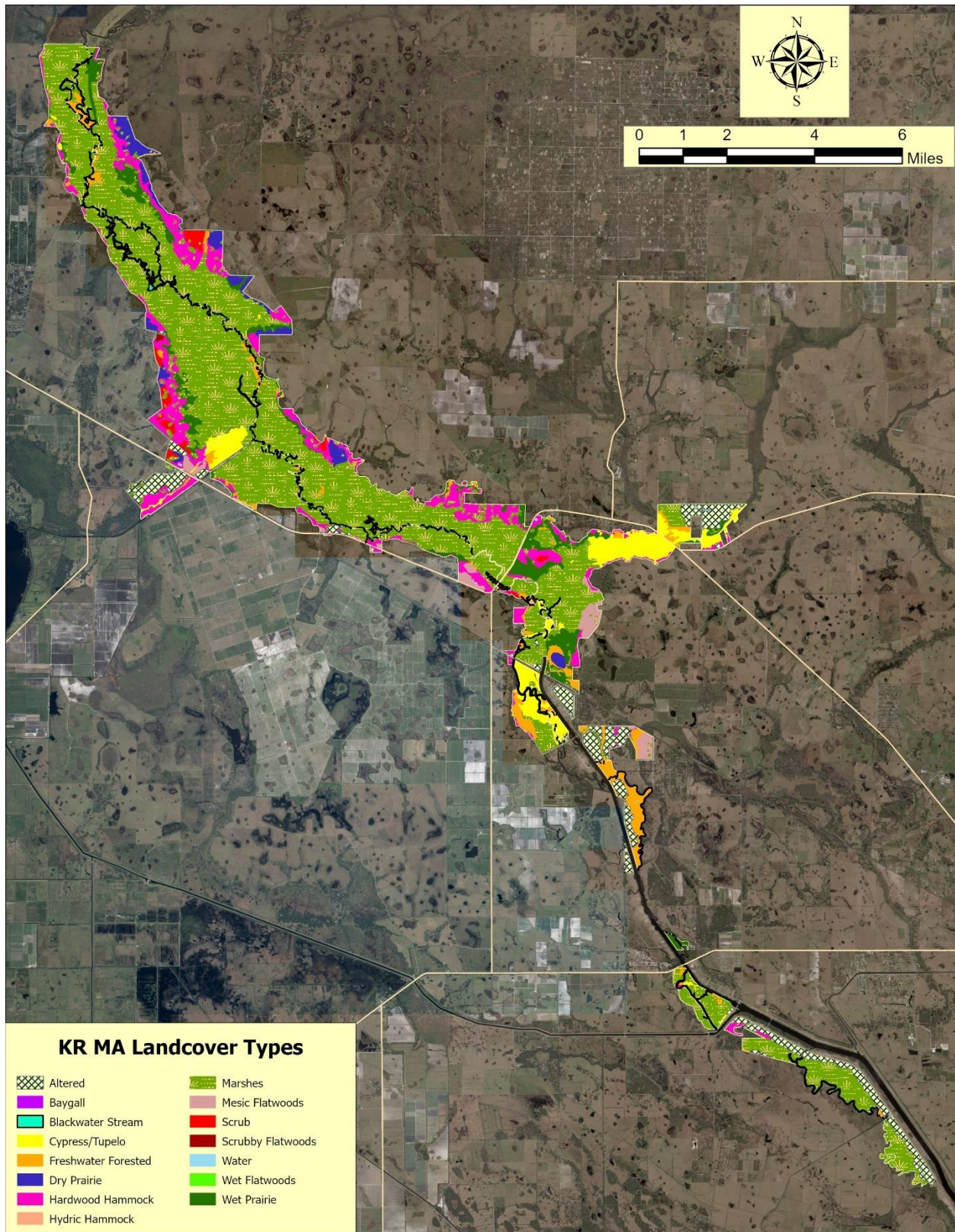


Figure 7. Plant community classifications within KR MA.



Map 12. Distribution of Natural Communities and Altered Landcover in KR MA (North).



Map 13. Distribution of Natural Communities and Altered Landcover in KR MA (South).

Listed Species

Listed species include those plants and animals identified as rare, threatened, or endangered by the U.S. Fish and Wildlife Service (FWS), FWC, and the Florida Department of Agriculture and Consumer Services. The Kissimmee River and its floodplain provide for several federal and state-listed endangered or threatened plant and animal species. **Table 2** provides a list of these plant species identified within the management area.

Table 2. Listed plant species associated with the KR MA and current status.^a

Common Name	Scientific Name	Status
Bulbous wild pine; Northern needleleaf	<i>Tillandsia balbisiana</i>	ST
Cardinal airplant; Stiff-leaved wild pine	<i>Tillandsia fasciculata</i>	SE
Giant orchid	<i>Orthochilus ecristatus</i>	ST
Giant wild pine	<i>Tillandsia utriculata</i>	SE
Giant spiral ladiestresses	<i>Spiranthes longilabris</i>	ST
Lowland loosestrife	<i>Lythrum flagellare</i>	SE
Yellow butterwort	<i>Pinguicula lutea</i>	ST

a. Key to abbreviations: Species listed by the State of Florida as State-designated Threatened (ST) & State-designated Endangered (SE).

Nuisance and Invasive Plant Species

South Florida's subtropical climate provides an excellent growth environment for the rapid spread of nuisance and invasive plants that can cause extensive alterations to the natural ecosystems. Nuisance and invasive plant infestations can result in partial or total displacement of native plants, loss of wildlife habitat, and the degradation of public use areas. Environmental changes caused by extensive hydroperiod alterations have been a major factor in the nuisance and invasive plant colonization within the KR MA. Without proper land management, nuisance and invasive plant expansion will continue to displace our native plants, reduce wildlife utilization, and degrade public use areas. The District is committed to reducing the proliferation of invasive species to protect its management areas' ecological values (SFWMD, 2020).

5.4 Wildlife

The Kissimmee River and its floodplains are home to a rich variety of fish and aquatic life, including unique species of fish. The abundance of fish in the area attracts many birds, some of which migrate seasonally from various continents. The river floodplain has historically been an important habitat for wading birds, waterfowl, amphibians, and reptiles during winter and breeding seasons, serving as a crucial refuge for wildlife. Many endangered bird species rely on the shallow wetlands in the basin for feeding and nesting. The wading bird populations in the Kissimmee River basin steadily declined throughout the 1800s and 1900s due to factors such as commercial plume hunting, destruction of marsh habitats, changes in hydrology, and increased competition from other species. Since the restoration, populations of wading birds and waterfowl have gradually increased,

with the restored portions of the river now averaging numbers that exceed the goals established for these restoration efforts.

The KR MA contains a diverse mosaic of plant communities and wetland systems that support a broad range of wildlife, including birds, amphibians, reptiles, mammals, and fish. These natural communities provide essential ecological functions by supplying foraging areas, nesting sites, breeding habitat, and refuge for native species. Wetlands, in particular, play a key role as nursery grounds for fish associated with the Kissimmee River system and contribute significantly to the productivity and resilience of the ecosystem. To sustain these ecological functions, the District uses integrated land-management practices that maintain habitat quality and address the needs of both common and imperiled wildlife. Management actions are implemented adaptively to ensure long-term support of native species and to respond to changing environmental conditions.

Several surveys have been conducted to create a species inventory of the animals observed in the KR MA, including birds, mammals, reptiles, and amphibians. In addition to the species documented during these surveys, some have expanded from nearby populations, while many migratory species may be transient within the management area during annual migrations. Other species may visit the management area when foraging away from their nearby roosting or breeding sites. As new species are observed, the species list is updated to reflect these observations and their protected status. The latest update can be found in **Appendix C**.

Rare, Threatened and Endangered Listed Species

The KR MA supports a variety of federally protected wildlife species. Several federally listed wildlife species have been observed in the management area, including four (4) listed as endangered, three (3) as threatened, and one (1) as threatened due to similarity of appearance. The area also supports seven (7) species designated as state threatened. Additionally, several other listed species that are known to utilize the Kissimmee River floodplain and nearby preserves may be foraging on the property, although they have not yet been confirmed within the KR MA. A list of these species is included in **Table 3**.

Table 3. Listed wildlife species utilizing the KR MA and current status.^a

	Common Name	Scientific Name	Status
CONFIRMED	Birds		
	Burrowing Owl	<i>Athene cunicularia floridana</i>	ST
	Crested caracara	<i>Caracara plancus</i>	FT
	Everglades Snail Kite	<i>Rostrhamus sociabilis plumbeus</i>	FE
	Florida Grasshopper Sparrow	<i>Ammodramus savannarum floridanus</i>	FE
	Florida Scrub Jay	<i>Aphelocoma coerulescens</i>	FT

Table 3 (Continued). Listed wildlife species utilizing the KR MA and current status.^a

	Common Name	Scientific Name	Status
CONFIRMED	Little blue heron	<i>Egretta caerulea</i>	ST
	Red-cockaded Woodpecker	<i>Picoides borealis</i>	FT
	Roseate Spoonbill	<i>Platalea ajaja</i>	ST
	Southeastern American Kestrel	<i>Falco sparverius paulus</i>	ST
	Tricolored heron	<i>Egretta tricolor</i>	ST
	Herpetofauna		
	American Alligator	<i>Alligator mississippiensis</i>	FT(S/A)
	Eastern Indigo snake	<i>Drymarchon corais couperi</i>	FT
	Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	ST
	Gopher Tortoise	<i>Gopherus polyphemus</i>	ST
UNCONFIRMED	Mammals		
	Florida Bonneted bat	<i>Eumops floridanus</i>	FE
	Florida Panther	<i>Felis concolor caryi</i>	FE
	Florida Manatee	<i>Trichechus manatus latirostris</i>	FT
	Birds		
	Eastern Black Rail	<i>Laterallus jamaicensis jamaicensis</i>	FT
	Whooping crane	<i>Grus americana</i>	FXN
	Herps		
	Bluetailed Mole Skink	<i>Plestiodon egregius lividus</i>	FT
	Sand skink	<i>Neoseps reynoldsi</i>	FE
	Short-tailed Snake	<i>Lampropeltis extenuate</i>	ST

a. Key to abbreviations: Species listed by the State of Florida as Federally-designated Endangered (FE), Federally-designated Threatened (FT), Federally-designated Threatened because of similarity of appearance [FT(S/A)], FXN Federally-designated Threatened Nonessential Experimental Population.

5.5 Cultural Resources

Twenty-one prehistoric archaeological sites identified in the KR MA are registered in the Florida Master Site File due to their significance. These sites include various features, such as prehistoric campsites, middens, mounds, and historic earthworks. Of the twenty sites, eleven have been evaluated for eligibility for the National Register of Historic Places (NRHP), and six of these have been deemed eligible. Additionally, other significant sites have also been identified in the surrounding area.

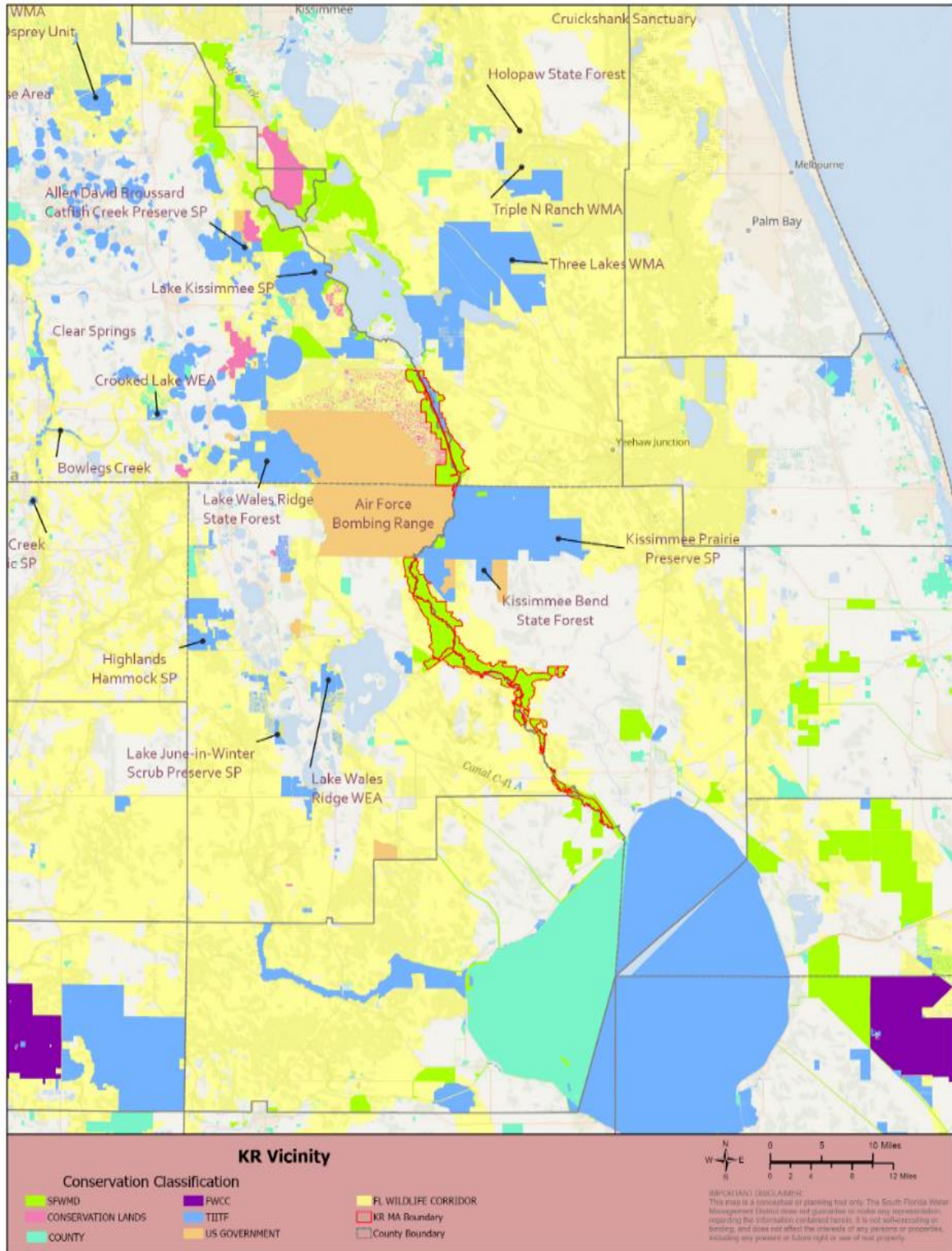
Specific site locations and detailed descriptions of the cultural resources within the KR MA are excluded from this plan due to the sensitive nature of this information. The District is dedicated to preserving the integrity of cultural resource sites within the management area. The management goal for cultural resources within the KR MA is to preserve the sites and artifacts that represent Florida's cultural periods. Land managers focus primarily on monitoring and prohibiting ground-disturbing activities in and around these archaeological sites. Vegetation management and prescribed burning activities are carefully conducted to reduce the impact on these resources.

5.6 Mitigation

The FWC has designated the Fort Basinger Unit as a long-term recipient site for gopher tortoises to satisfy the regulatory mitigation obligations associated with relocating this species. The District acquired a permit (FWC Permit #GTLR-17-00003A) to move gopher tortoises from various District project locations to the Fort Basinger Unit, which has been accepting relocated tortoises since 2017.

5.7 Potential Additions

The District acquires land through donations, mitigation, and purchase. Acquiring land within the Kissimmee River watershed helps achieve the environmental benefits of the Kissimmee River Restoration Project. The District and external partners have acquired almost 100,000 acres within the Kissimmee River basin to date. Land acquisition for the Kissimmee River Restoration Project through the SOR program is nearly complete, with approximately 1,263 acres remaining. While most lands within the Kissimmee River Restoration footprint are held in the public interest or easement, some private inholdings are within the Florida Forever acquisition boundary (**Map 14**). Acquiring these parcels, along with fee simple acquisition of abutting easements through a willing seller program, would enhance the continuity of conservation lands and the configuration of management area boundaries.



Map 14. Conservation Lands in the Vicinity of the KR MA.

6. PUBLIC USE

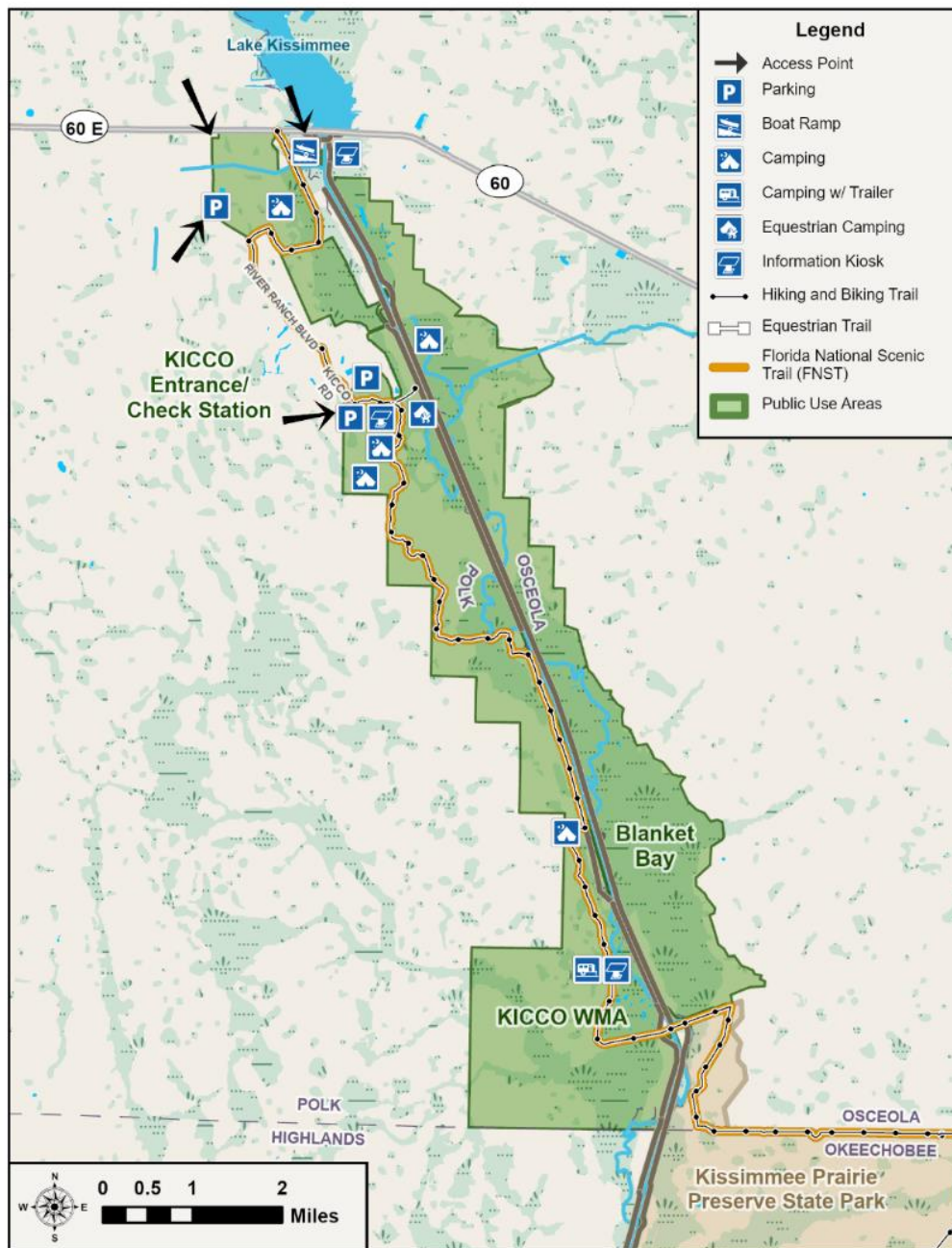
The KR MA is intersected by State Road 60, State Road 70, and US Highway 98. Access to the management area is mainly through public and private boat and airboat ramps, although some management units are accessible by road. This includes the KICCO Unit, which is accessible from SR 60. The Hickory Hammock, Micco Landing, Fort Basinger, Cornwell Marsh West, Turkey Hammock West, and the Chandler Slough units can be accessed via US Highway 98. Paradise Run is accessible from SR 78.

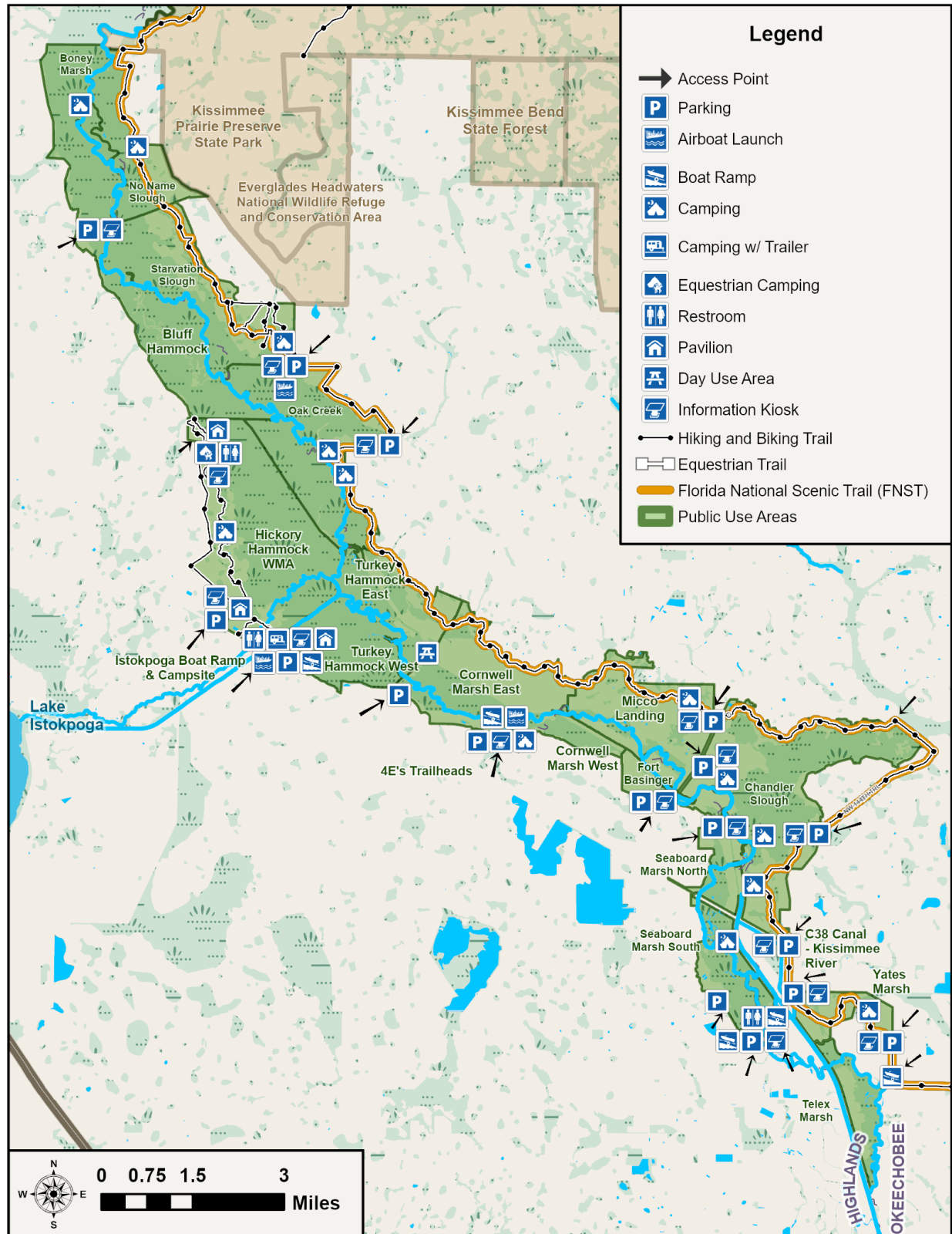
The District encourages public use of management areas for appropriate natural resource-based activities. District lands are generally available for public use, except in instances where the public use would be incompatible with the purposes for which these lands were acquired, there is no legal public access, or where construction activities prohibit public entry. Public input into the management of these areas is solicited at the District's quarterly Recreational Forum Meetings. In coordination with partnering agencies, adjustments to public use opportunities are made on an ongoing basis through the Recreational Forum Meetings and rulemaking, if necessary. This plan describes the scope of public use opportunities available or planned as of the date of the management plan. Compatible recreational activities on District lands typically include hiking, biking, hunting, fishing, frogging, horseback riding, canoeing, geocaching, boating, primitive camping, environmental education, wildlife viewing, nature photography, natural history study, and flora and fauna identification. These activities are designed to maximize the diversity and variety of recreational options available while ensuring the necessary resource protection measures are in place. This approach helps to maintain conservation values and ensures long-term benefits for the public.

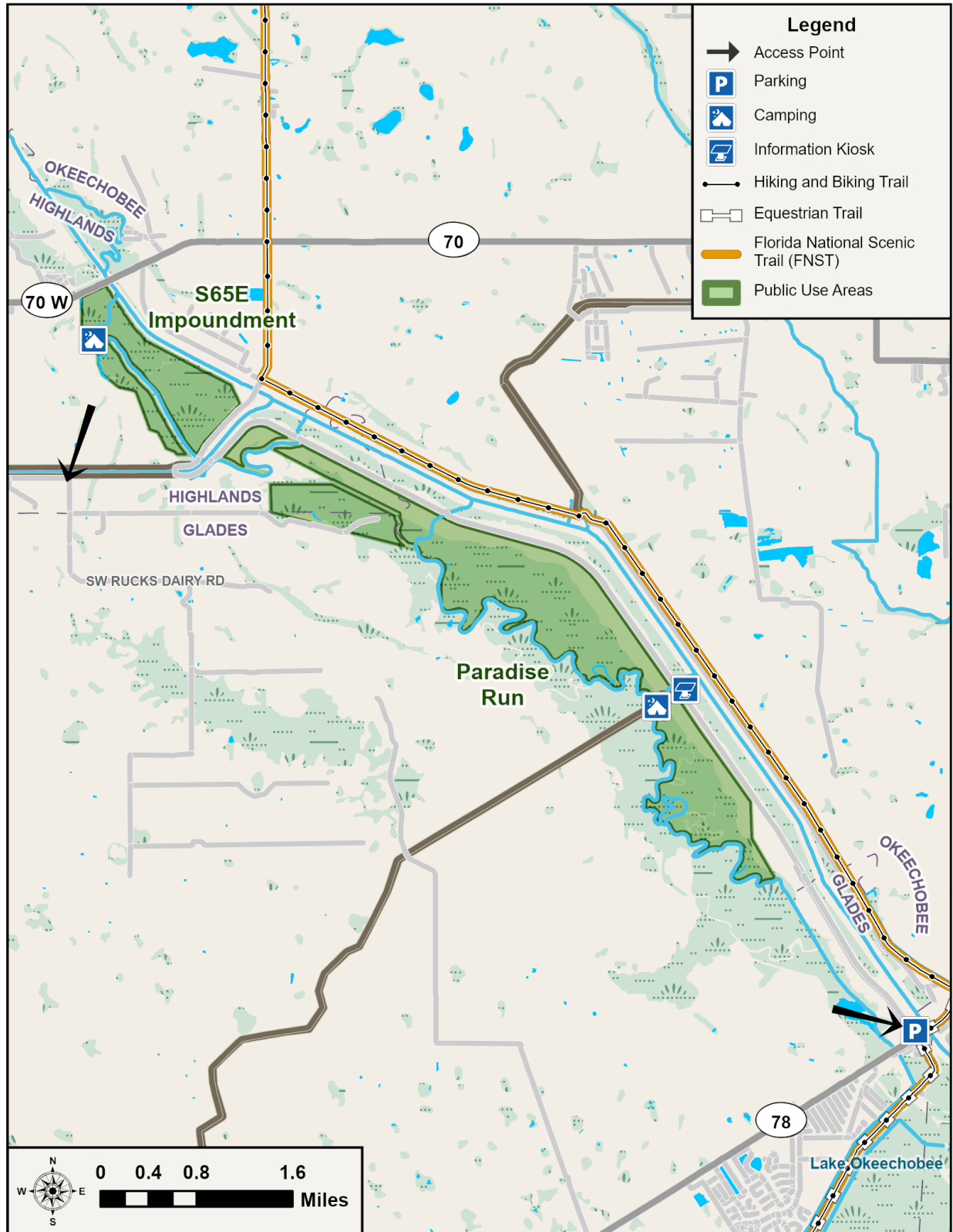
Most of the KR MA property is designated as a Public Use Area (PUA) to provide the public with recreational access. The KICCO and Hickory Hammock units are also designated by FWC as Wildlife Management Areas (WMAs). Popular recreational opportunities offered in the KR MA include boating, airboating, canoeing, kayaking, fishing, picnicking, hiking, biking, horseback riding, camping, hunting, stargazing, wildlife viewing, and nature photography. The campgrounds and recreational trails are popular attractions in the KR MA. The public has access to over 57 miles of hiking and biking trails, along with 23 miles of equestrian trails. Additionally, nearly 42 miles of the Florida National Scenic Trail are located within the KR MA, linking the KR MA management units with nearby parks, including the Kissimmee River Prairie State Park and Three Lakes Wildlife Management Area. Some service roads are accessible to the public with a valid permit. The District offers a Special Use License that allows the public to participate in various recreational activities, including equestrian camping and camping with an RV or Trailer in the KR MA, free of charge. There are designated sites for camping throughout the management area. Primitive camping spots also exist at various locations along the river. Furthermore, the restored Kissimmee River was designated as an official state Blueway in 2024, providing outstanding paddling opportunities along the waterway. The Kissimmee River Blueway extends over 76 miles, from the Lake Kissimmee lock (S-65) to C. Scott Driver Park near Lake Okeechobee. The Fort Basinger Unit, specifically designated for stargazing, offers a unique opportunity for astronomy enthusiasts. The recreational amenities on the KR MA are illustrated in **Maps 15-17**. Additional details, including the locations of recreational points of entry and special use licenses, are available

on the District's recreational guide and website, as well as the websites of the Florida Trail Association, the Florida Paddling Trails Association, and the Office of Greenways and Trails.

The District partners with FWC to manage game species and public hunting opportunities on District lands designated as WMAs, WEAs, PSGHAs, and PUAs. These designations allow FWC to utilize biologists and law enforcement staff to assist in the management of wildlife on District lands and enforce wildlife and public use rules for resource protection purposes. These designations also allow the FWC to establish hunting seasons and promulgate laws regulating public activities in these areas. A hunting brochure (Appendix D) outlining the regulations for hunting and additional information is available online.







Map 17. KR MA public use amenities (South).

Environmental Education

The District promotes educational partnerships with volunteers and various organizations aimed at enhancing visitor knowledge and appreciation of natural areas and cultural resources. These partnerships can include, but are not limited to, youth camps and research studies. Since 1995, the Kissimmee River has functioned as a living laboratory through the collaboration between the District and the Riverwoods Field Laboratory (Riverwoods), a research center managed by Florida Atlantic University's Center for Environmental Studies (CES). Riverwoods supports extensive research and educational activities focused on the restoration of the Kissimmee River, attracting scientists, students, and technicians from around the globe. Interpretive kiosks are also set up throughout the KR MA to educate the public about the crucial role of water management in sustaining resource viability and productivity.

Resource Protection

The District uses law enforcement surveillance to protect natural and cultural resources, safeguard the public, and deter vandalism, dumping, poaching, and other unlawful activities on its lands. As part of the cooperative land management agreement with FWC, the Commission administers hunts for various game species on the KR MA and has the authority to enforce regulations concerning wildlife resources, aquatic life, and public use within the area.

During hunting seasons, FWC maintains a consistent presence in the KR MA. The protection of resources on the KR MA is further enhanced by establishing and maintaining posted property boundaries, fences, and the regular presence of staff in the area. The KR MA has limited access points, which contribute to the protection of its natural resources and District assets. Additionally, the KR MA upland boundaries have been fenced where necessary, and the perimeter is marked with visible signage in areas where entry is likely.

In addition to this primary level of security, the District has implemented an “enhanced patrol” program to increase law enforcement presence on District lands as needed. This program is designed to increase law enforcement presence on District lands when necessary and allocates funding for additional patrols to conduct targeted operations to address specific law enforcement needs.

Lease Administration

The District authorizes reservations, leases, or similar agreements on District lands or interest in land when such use is compatible with the purpose of the acquisition and the long-term use of the land. Historic property uses, such as agriculture, are allowed to continue on selected properties on an interim basis until the land is needed for construction or restoration.

The District administers both revenue-generating cattle leases and non-revenue apiary leases on the KR MA. Cattle grazing is employed as an interim tool to control the growth of improved pasture grasses and suppress woody vegetation. These leased areas are actively managed by the District to conserve natural resources, provide public access, and control nuisance and invasive plant species. Lessees are responsible for maintaining fences and associated infrastructure for

cattle leases, ensuring site security, implementing applicable best management practices (BMPs), securing all necessary permits and approvals, maintaining required insurance coverage, and fulfilling obligations related to taxes, property assessments, and lease payments.

7. NATURAL RESOURCE MANAGEMENT

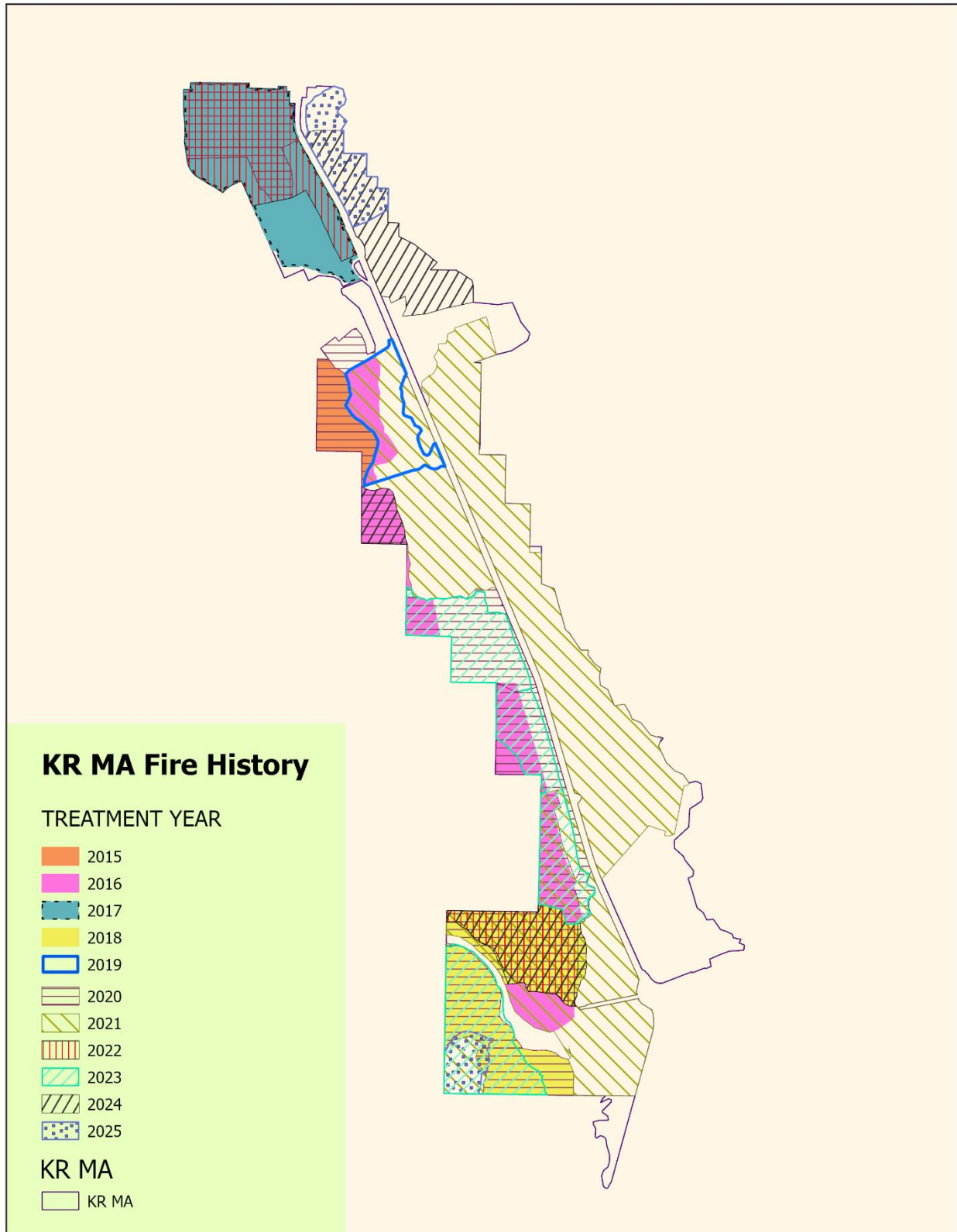
To keep native plant communities healthy and productive, District land managers take appropriate actions to compensate for the loss of natural processes. Several land management practices are utilized to preserve the ecological health and function of the management areas. These practices include prescribed burning fire-dependent plant communities with fire return intervals that mimic natural fire regimes; controlling invasive vegetation through the selective use of herbicides and biological control agents; restoring the physical structure of plant communities and biological diversity through mechanical vegetation management, including mowing, chopping and shredding; and implementing hydrologic restoration activities where the natural hydrology has been altered through ditches, canals, and other surface water drainage features.

7.1 Fire

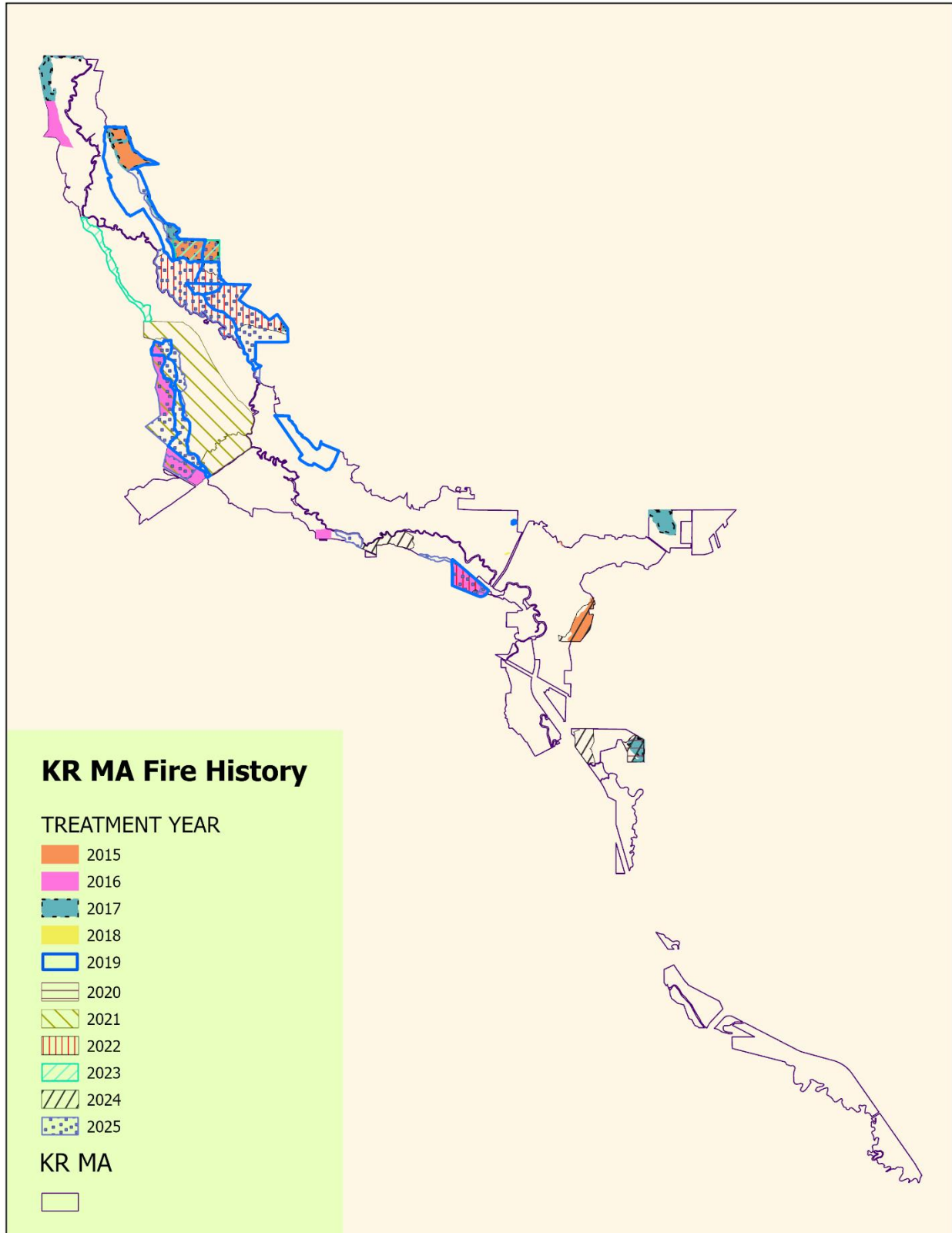
Fire has shaped the distribution of plants in Florida's ecosystems. Historically, wildfires reduced fuel loads in natural communities. Due to habitat fragmentation and human suppression efforts, these fires no longer occur with historical frequency or extent, resulting in alteration to the natural community structure and function in fire-dependent communities. Most plant communities in Florida are adapted to periodic fires and rely on them to maintain their vegetative characteristics and biodiversity. Land Managers use prescribed burning to reduce hazardous buildup of vegetative fuel load, maintain plant species diversity, enhance wildlife habitat, and encourage restoration of native plant communities. Land Stewardship recognizes the importance of fire as a management tool and has integrated prescribed fire into its land management strategy.

Fire History

The KICCO property was frequently burned by the previous landowner, but there is little fire history available for the rest of the KR MA property prior to District acquisition. Native Americans commonly used fire as a tool to clear and encourage the growth of plants for later harvest. Based on the common grazing practices on the property, native ranges were likely burned to improve the forage. Early settlers probably used fire on the property to clear farmlands and rejuvenate the grasses to produce forage for grazing animals. Similarly, wildfires originating from lightning likely played a critical role in maintaining grass communities and fire fuels on the property. Other areas of the property experienced fire exclusion, as evidenced by heavy fuel loads in these areas at the time of acquisition. The District adopted a rigorous prescribed fire program for the Kissimmee River region in the early 1990s. Since the program's initial implementation, a burn rotation has been established for the fire-dependent communities, restoring the natural fire regime for the management area (**Maps 18-19**).



Map 18. KR MA (North) Fire History.



Map 19. KR MA (South) Fire History.

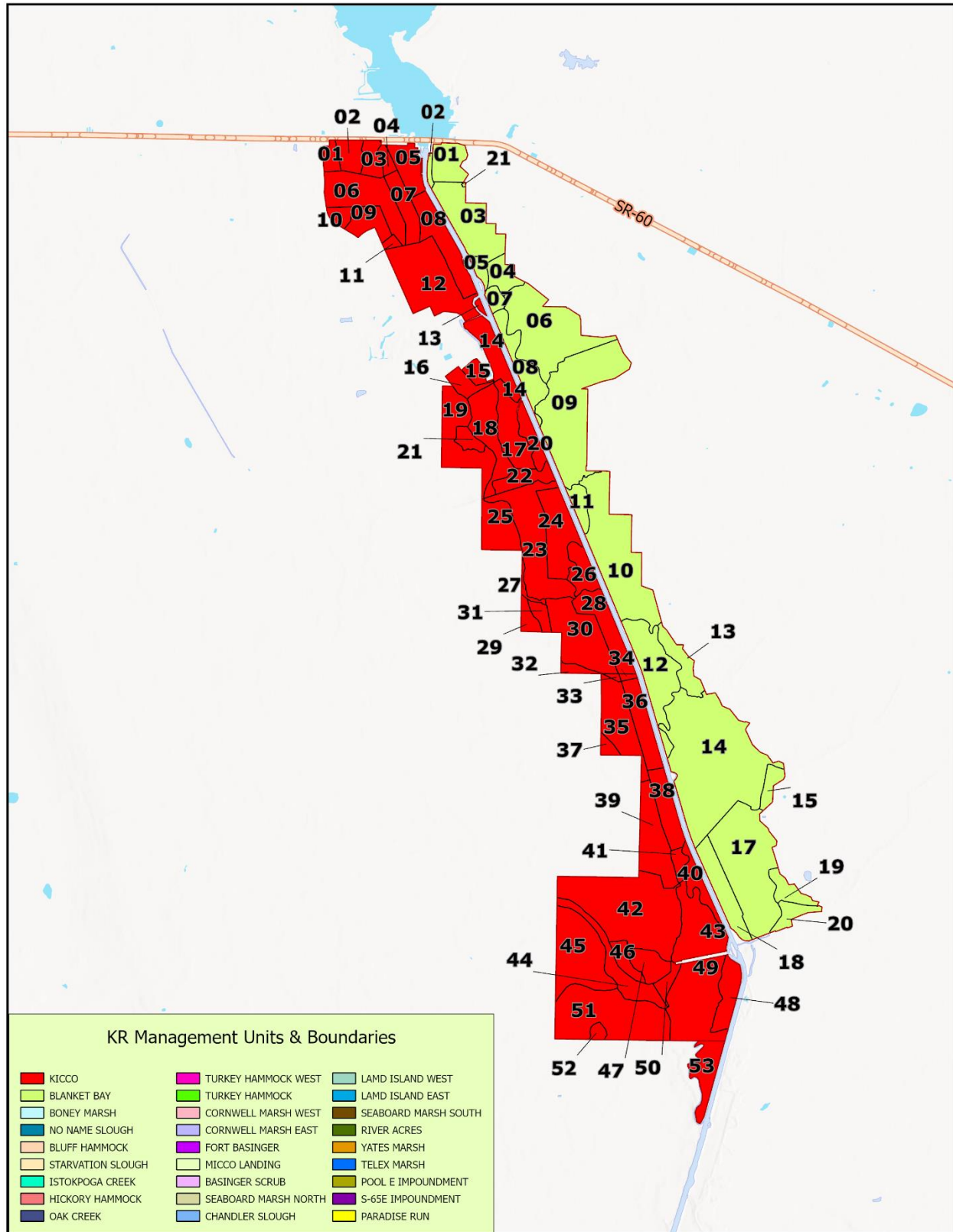
Prescribed Fire Planning

The fire management program for the KR MA includes wildfire prevention, detection and suppression, and prescribed burning. Prescribed burn standards and procedures are outlined in the Land Stewardship's Wildlands Fire Manual, which also serves as a centralized resource for information on fire management on District lands. The manual outlines the procedures that must be followed to ensure compliance with statutory requirements in Chapter 590, Florida Statutes, and Chapter 5I-2 and Rule 62-256, Florida Administrative Code.

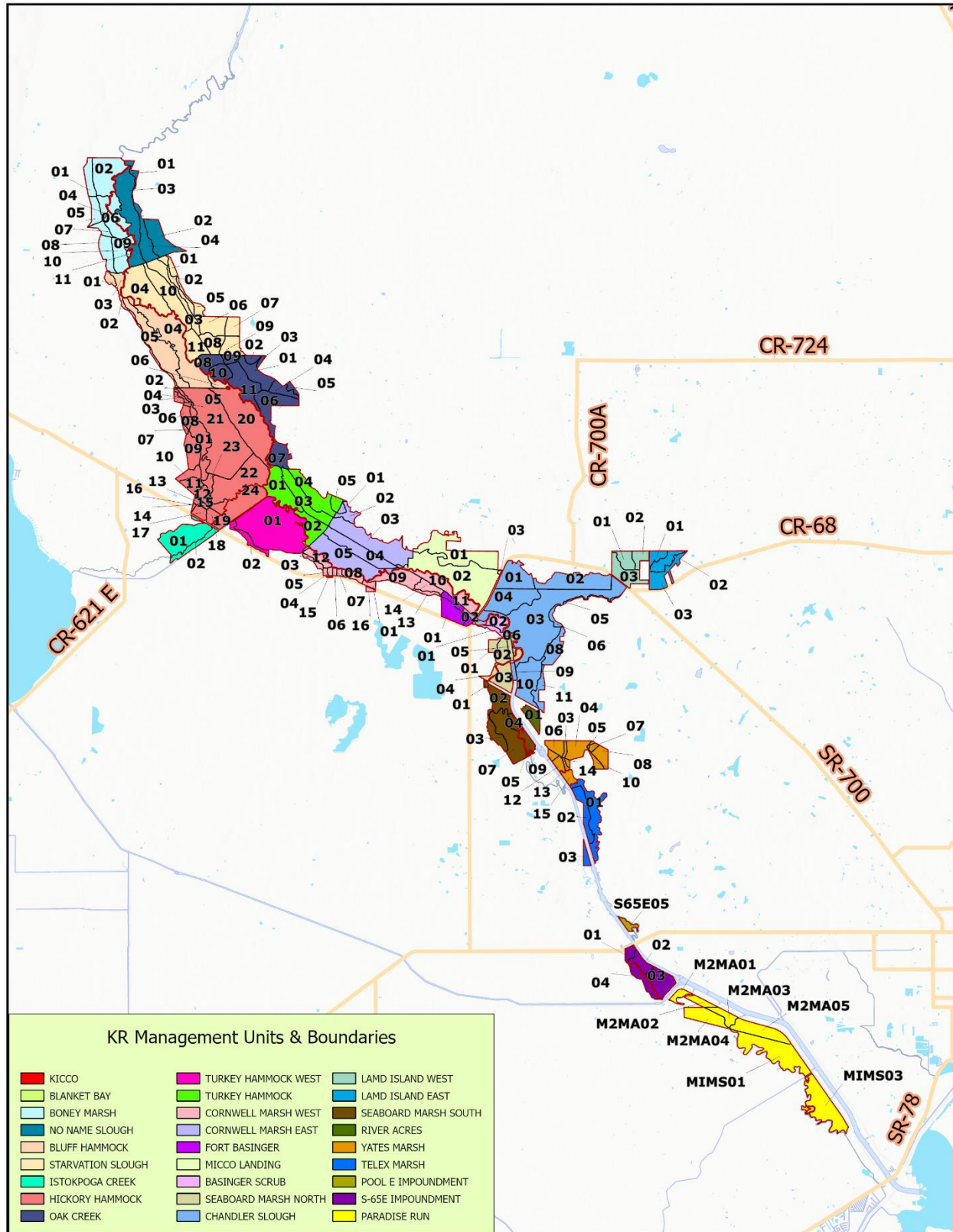
KR MA is divided into management units for the application of prescribed fire (**Maps 20-21**). Existing roads and trails, disked firelines, and, where possible, natural firebreaks such as wetlands and ecotones determine the boundaries of these units. Challenges for a robust fire program include smoke management requirements, zigzagging firebreaks around the management units that follow elevation contours around private property, limited accessibility for fireline preparation, and limited resources. Despite the added difficulties of prescribed burning in the area, fuel loads need to be maintained at low levels to protect the KR MA from destructive wildfires.

Prescribed fire is applied with different management objectives based on plant community needs, wildlife utilization, and specific species requirements. Prescriptions for these burns identify the environmental conditions, return frequency, and ignition techniques to provide for mosaic burns that do not remove all vegetation while redefining the boundaries of embedded plant communities that are not fire-dependent, such as hammocks or swamps. A healthy fauna in South Florida is integrally tied to fire return intervals, seasonality, and intensities. Frequent fire tends to favor understory vegetation that provides essential forage and mobility for wildlife. Although high-intensity winter burns give the appearance of removing more fuels from the landscape, spring and summer burns achieve a more effective reduction of fuel and are preferred from a wildlife management and ecological perspective. Spring growing season burns provide a mosaic effect, allowing for the retention of cover and foraging opportunities for wildlife that winter burns may temporarily eliminate. Late spring and summer burns help to control the spread of hardwoods. Because prolonged dry periods make it increasingly difficult to implement safe and successful spring burns, land managers utilize less intensive summer burns to achieve management goals. Summer burns reduce the likelihood of spot fires and escapes because of the amount of green vegetation and high relative humidity. Burning in late summer and early fall also helps replicate historical fire patterns that occurred in many habitats during occasional lightning strikes. Although spring and summer burns can cause isolated instances of mortality to wildlife and their nests, these species will readily re-nest (i.e., quail, Turkey, etc.), and the summer burns produce ideal brood habitat for fledged young.

Prescribed fire is one of the management tools relied upon by the Kissimmee River Restoration Project to achieve its long-term goals of restoring the marsh and wet prairie vegetation structure that existed before channelization. Ideally, these burns occur in late spring and early summer to more effectively reduce shrub biomass. However, the use of prescribed fire in marsh and wet prairie communities depends on how quickly water levels recede. With the implementation of HRS, more hydrologic changes are expected, which could affect the effectiveness of prescribed fire as a management tool in these marsh and wet prairie communities. For instance, the longer hydroperiod will limit the fire's ability to spread through these areas.



Map 20. KR MA fire management units (North).



Map 21. KR MA (South) fire management units.

Additionally, meeting the prescribed fire goals and objectives for each fire-maintained community is largely dependent on weather conditions, personnel, and statewide emergency situations such as wildfires, hurricanes, and other natural disaster responses. Ideally, burn crews would consist of 6-8 or more individuals. While the District Land Stewardship employees successfully conduct most prescribed burns, some prescribed burns require outside assistance to ensure they are conducted in a safe and effective manner. KR MA receives assistance from FWC, Archbold Ecosystem Management Team, different divisions of the District and regions of Land Stewardship, and trained volunteers.

Wildfire Suppression

Wildfires ignited by lightning are a common occurrence throughout Florida. The Florida Forest Service (FFS) is responsible for preventing, detecting, and suppressing wildfires in Florida (§590.01, Florida Statutes). Maintaining fire-dependent habitats with frequent prescribed burns is the main way the District limits the negative impacts of wildfires and increases the ability of the FFS to respond successfully to wildfire events. When a wildfire is detected, the land manager immediately notifies FFS while the Land Stewardship staff responds and, if appropriate, begins fire suppression efforts. Upon arrival, FFS takes command of the fire while the District continues to provide logistical and situational support as needed.

The FFS District office in Orlando is responsible for responding to wildfire incidents in the Blanket Bay Unit. The FFS District office in Lakeland is responsible for KICCO. The FFS District office in Okeechobee is responsible for units south of the Kissimmee River Prairie State Park.

7.2 Control of Nuisance and Invasive Plant Species

The District's vegetation management program utilizes an Integrated Pest Management strategy to maintain nuisance and invasive plant populations at the lowest feasible level. Integrated Pest Management is an ecosystem-based strategy that focuses on the long-term prevention of pests or their damage through the combination of management techniques, including prescribed fire, herbicide application, mechanical treatment, biological control, and physical removal. The selection of control measures is dependent upon species type, environmental factors, and the natural communities impacted.

Invasive plant control funding represents the largest item in the Land Stewardship Program's annual budget. Land managers have developed specific management area treatment strategies that optimize invasive plant control efforts. Although Category I and II species on the Florida Invasive Species Council (FISC) list threaten the function and ecological stability of natural communities, achieving maintenance on all species identified on these lists is currently not feasible with existing budgetary resources. The primary goal of the Land Stewardship's invasive plant management program is to control the spread of 30 priority invasive species (**Table 4**), in addition to area-specific priority species based on early detection/rapid response and locally significant impacts or potential for impacts.

Table 4. Land Stewardship Section invasive species control priority species.

Scientific Name	Common Name	FISC Category
<i>Abrus precatorius</i>	Rosary Pea	I
<i>Acacia auriculiformis</i>	Earleaf Acacia	I
<i>Albizia julibrissin</i>	Mimosa, Silk Tree	I
<i>Albizia lebbbeck</i>	Woman's Tongue	I
<i>Ardisia crenata</i>	Coral Ardisia, Scratchthroat	I
<i>Ardisia elliptica</i>	Shoebuttton Ardisia	I
<i>Bischofia javanica</i>	Bishopwood	I
<i>Casuarina cunninghamiana</i>	River Sheoak, Australian-Pine	I
<i>Casuarina equisetifolia</i>	Australian-Pine, Beach Sheoak	I
<i>Casuarina glauca</i>	Suckering Australian-Pine, Gray Sheoak	I
<i>Colocasia esculenta</i>	Wild Taro	I
<i>Cupaniopsis anacardioides</i>	Carrotwood	I
<i>Dioscorea alata</i>	Winged Yam	I
<i>Dioscorea bulbifera</i>	Air potato	I
<i>Imperata cylindrica</i>	Cogon Grass	I
<i>Leucaena leucocephala</i>	Lead Tree	II
<i>Lygodium japonicum</i>	Japanese Climbing Fern	I
<i>Lygodium microphyllum</i>	Old World Climbing Fern	I
<i>Melaleuca quinquenervia</i>	Melaleuca, Paper Bark	I
<i>Mikania micrantha</i>	Mile-A-Minute Vine	II
<i>Mimosa pigra</i>	Catclaw Mimosa	I
<i>Rhodomyrtus tomentosa</i>	Downy Rose-Myrtle	I
<i>Schefflera actinophylla</i>	Schefflera, Australian Umbrella Tree; Octopus Tree	I
<i>Schinus terebinthifolia</i>	Brazilian Pepper	I
<i>Senna pendula</i> var. <i>glabrata</i>	Christmas Senna Climbing Cassia, Christmas Cassia	I
<i>Solanum diphyllum</i>	Twoleaf Nightshade	II
<i>Solanum tampicense</i>	Wetland Nightshade, Aquatic Soda Apple	I
<i>Solanum viarum</i>	Tropical Soda Apple	I
<i>Syzygium cumini</i>	Jambolan-Plum, Java Plum	I
<i>Triadica sebifera</i>	Popcorn Tree, Chinese Tallow Tree	I

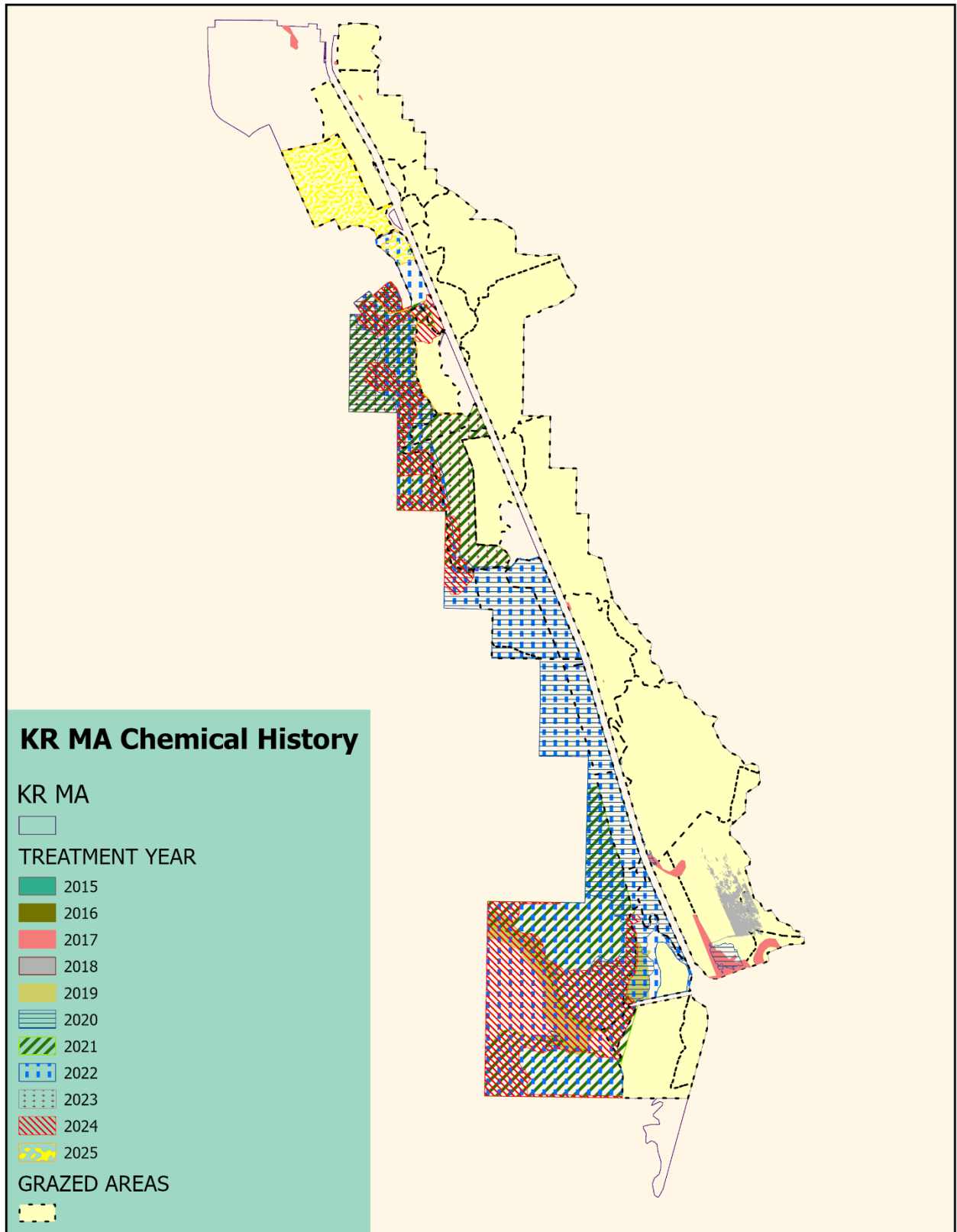
Presently, the main species being targeted for treatment on the KR MA include Brazilian pepper (*Schinus terebinthifolius*), climbing fern (*Lygodium spp.*), Tropical soda apple (*Solanum viarum*), cogon grass (*Imperata cylindrica*), Chinese tallow (*Triadica sebifera*), Chinaberry tree (*Melia azedarach*), air potato (*Dioscorea bulbifera*), rose natalgrass (*Melinis repens*), and tropical

nutrush (*Scleria microcarpa*). Additionally, species found in isolated pockets, including melaleuca (*Melaleuca quinquenervia*), rosary pea (*Abrus precatorius*), Napiergrass (*Cenchrus purpureus*), Indian rosewood (*Dalbergia sissoo*), Castorbean (*Ricinus communis*), and Aquatic soda apple (*Solanum tampicense*), are systematically targeted when observed. **Maps 22 and 23** identify the treatment history for the nuisance and invasive species within the KR MA over the last decade.

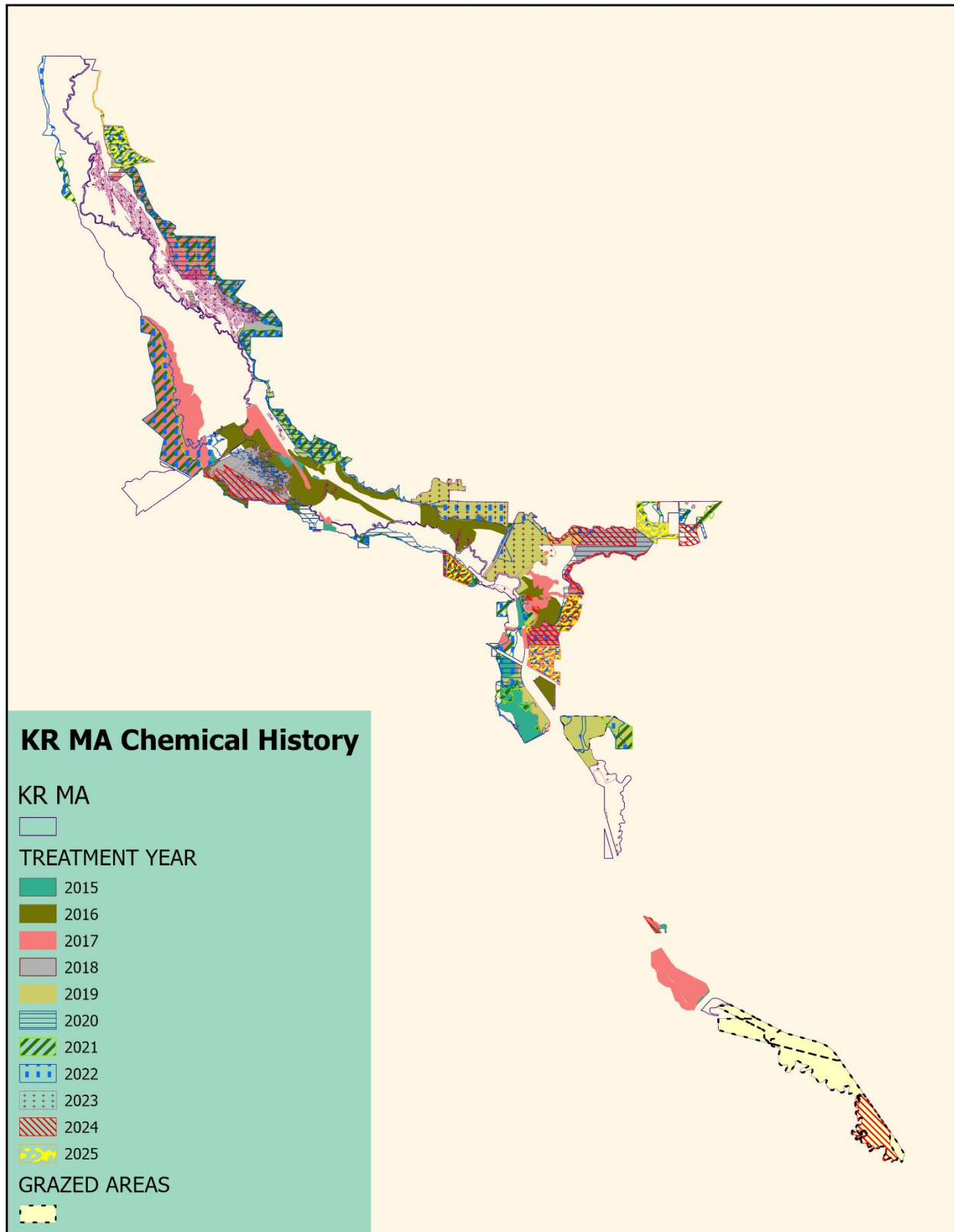
Several other problematic nuisance and invasive species are affecting the river and the KR MA. These include West Indian marsh grass (*Hymenachne amplexicaulis*), Cuban bulrush (*Cyperus blepharoleptos*), hydrilla (*Hydrilla verticillata*), water hyacinth (*Pontederia crassipes*), water lettuce (*Pistia stratiotes*), torpedo grass (*Panicum repens*), limpo grass (*Hemarthria altissima*), paragrass (*Urochloa mutica*), and primrose (*Ludwigia spp.*). While effective control strategies have not yet been established for all these species, broader efforts are underway to manage the spread of invasive and nuisance aquatic plants within the river and its floodplain. Particularly, efforts to control these nuisance grasses are primarily focused on supporting the Kissimmee River Restoration Project and target grasses within the project's construction footprint. These efforts are implemented in high-quality habitats and where treatment results can be most effective. Additionally, the floodplain is treated for emergent and submersed aquatic plants such as Cuban bulrush, water hyacinth, and water lettuce. These treatments are being undertaken through a multi-agency collaboration between FWC and the District's Vegetation Management Section. The Vegetation Management Section is also collaborating with researchers to develop effective strategies for more sustainable and efficient control of invasive grasses in the river and floodplain.

Nuisance and invasive species treatment is primarily conducted by herbicide applicators contracted through the District's Vegetation Management Section. Supplemental efforts by District staff are also conducted on small or sporadically distributed infestations. Treatment areas are scheduled based on the severity of nuisance and invasive plant infestation, time since the last treatment, property access, groundwater conditions, avian nesting seasons, and public use. All treatments follow best management practices for herbicides and use the best available science. Treatment dates, locations, and species treated are recorded in a GIS database. Herbicide use is recorded in the District's nuisance and invasive plant control database.

Land managers also collaborate with the United States Department of Agriculture (USDA) – Agricultural Research Service (ARS) to introduce biological control agents on District lands, helping to reduce the proliferation of invasive pest plants. Federally approved biological control agents that have been introduced or have migrated onto District lands include the melaleuca weevil (*Oxyops vitiosa*), water hyacinth planthopper (*Megamelus scutellaris*), water hyacinth weevils (*Neochetina spp.*), the Brazilian pepper thrips (*Pseudophilothrips ichini*), the Old World climbing fern white lygodium moth (*Austromusotima camptozonale*), brown lygodium moth (*Neomusotima conspurcatalis*), and eriophyid mite (*Floracarus perrepae*). The brown lygodium moth and eriophyid mites were released near Chandler Slough and other areas in the management area to target the region's Old World climbing ferns in the region. The air potato leaf beetles (*Lilioceris cheni* and *Lilioceris egea*) have also been introduced to the river floodplain, including the Fort Basinger and Basinger Scrub units.



Map 22, KR MA (North) invasive treatment history.



Map 23. KA MA (South) invasive treatment history.

7.3 Mechanical Vegetation Control

Prescribed fire is the preferred method for managing vegetation in fire-maintained habitats in South Florida due to its cost-effectiveness and environmental benefits. In areas where prescribed fire cannot be used, such as in urban interface zones, or when other constraints prohibit the use of prescribed fire, mechanical vegetation control offers an alternative way to reduce vegetation coverage and fuel loads. Mechanical vegetation control can reduce woody plant growth and increase plant species diversity through the use of mowing, chopping, and shredding. Selective forest thinning may also be used to improve the natural environmental characteristics of certain habitats.

In the KR MA, mechanical treatments are primarily used prior to burning to reduce fuel height along the boundaries of management units and minimize the risk of escape. Since low-intensity fires result in patchy burns, mechanical treatments are also used to re-structure fuels that build up in fire shadows where prescribed burns do not achieve the desired results. Weedy native vegetation such as bladderpod (*Sesbania vesicaria*), dogfennel (*Eupatorium capillifolium*), and blackberry (*Rubus pensilvanicus*) are also treated mechanically when necessary to improve aesthetics and promote species diversity, especially in grazed areas or where these species become dominant. Additionally, when shrubby vegetation, such as wax myrtle (*Morella cerifera*), saltbush (*Bacharris halimifolia*), willow (*Salix and Ludwigia spp.*), and cabbage palm (*Sabal palmetto*) encroaches upon marsh and prairie communities, it can be controlled through mechanical means to reestablish the herbaceous-dominated characteristics and maintain the open grassland community.

Timber Management

Harvesting timber is another form of mechanical vegetation control. If the District determines that the ecological needs of an area require the timber stand to be thinned, a harvest may be designed for that purpose. However, many listed species depend upon mature pine trees for their survival, so often it is the smaller trees that are targeted. These trees tend not to have the marketability of larger trees, resulting in limited opportunities for a commercial harvest. Historically, areas with high tree density within the KR MA have been commercially harvested. While there are currently no marketable pine stands within the management areas, future harvests may be considered in flatwoods communities in management units such as KICCO, Hickory Hammock, Cornwell Marsh, Chandler Slough, and Fort Basinger Units. When timber assessments indicate that thinning is necessary to meet habitat management objectives, a timber harvest may be planned accordingly. All timber harvests conducted on District lands will adhere to the FFS's silvicultural Best Management Practices (BMPs) and maintain a natural stand density of 30 to 35 square feet of basal area per acre.

Grazing

The District uses cattle grazing to manage nuisance and invasive pasture grasses. This tool is most effective as an interim management tool for managing vegetation on project lands before the water resource project goes into construction. Some management lands include former ranchlands that have a mixture of native range and improved pasture. Cattle grazing is allowed on these

properties to minimize the need for physical manipulation and manage the vegetation coverage until funding is secured to restore the native community. Currently, the District administers eight low-density grazing leases covering approximately 13,931 acres of the KR MA.

7.4 Wildlife Management

Wildlife management on the KR MA relies on active habitat management that addresses the needs of all species present. The Land Stewardship program accomplishes this by implementing management strategies that benefit multiple species and habitats while addressing the specific needs of individual species. These strategies include:

- Conducting land management activities that maintain and enhance native wildlife habitats, including prescribed fire and nuisance and invasive plant control;
- Conducting specific management activities that support protected species;
- Following management guidelines for listed species protection as determined by the South Florida Multi-Species Recovery Plan, Volume 1 (U.S. Fish and Wildlife Service (USFWS) 1999), as well as the Florida's Imperiled Species Management Plan (FWC 2016); and
- Maintaining lists of confirmed and potential wildlife species.

Wildlife management in the KR MA focuses on preserving and enhancing habitats to support both common and imperiled species. The District maintains and improves habitat quality through integrated land-management practices designed to meet the needs of species known to occur within the KR MA and surrounding region, including numerous state- and federally listed species. Conservation efforts are adaptively managed to promote the recovery and long-term sustainability of native wildlife populations, with an emphasis on restoring the natural processes that shape the area's ecological communities. Integrated strategies such as reestablishing appropriate fire rotation have significantly improved vegetation structure, resulting in better foraging and nesting habitat. These improvements have supported increases in snail kite nesting within the management area, red-cockaded woodpecker nesting in KICCO, and suitable foraging habitat for gopher tortoise relocations in the Fort Basinger Unit.

Snail kites

Snail kites have successfully nested in the Kissimmee River Chain of Lakes for many years, but nesting activities in the Kissimmee River Restoration Project area only began after the kites returned in 2014. Since 2016, successful nesting has been intermittently recorded within the KR Management Area, with dozens of nests documented in Buff Hammock, the Cornell Marsh units, and more recently, the Chandler Slough Unit. However, while there have been active nests, many have not resulted in successful fledging. This lack of success has primarily been attributed to insufficient water depth and predation. Nevertheless, the wetland communities in the KR MA offer abundant foraging habitat for the snail kite population along the river. Snail kites are often seen foraging in the floodplain, frequently in large groups. Their consistent use of the floodplain and increase in nest activities within the management area indicate that this area can effectively support the snail kite population in the basin. To improve nesting success within the management area, it is essential to have more consistent flooding of the floodplain and to gradually increase the river's discharge. However, these conditions must be sustained long enough for eggs to hatch and young

kites to fledge. Management efforts will continue to focus on improving the wetland communities to benefit snail kites and various other wildlife species.

Red-cockaded woodpecker (RCW)

The Avon Park Air Force Range, which borders the KICCO Unit, is home to a well-established colony of RCWs. Suitable habitats for RCWs are found along the southern and western boundaries of the KICCO Unit. Habitat management efforts within the unit have created environments that support RCW roosting and nesting. As a result, the RCW population from the Avon Park Air Force Range has begun to expand into the flatwoods located on the southern boundary of the KICCO Unit. With the continued maturation of the pine trees in the area, it is expected that more RCWs will move into this managed habitat. Prescribed burns will continue to be conducted at optimal intervals in the KICCO Unit to maintain the open structure preferred by the Red-cockaded Woodpecker and other species.

Gopher tortoise

The KR MA contains upland communities that provide suitable habitats for gopher tortoises. These include mesic flatwoods, dry prairies, upland ridges formed by remnants of the C-38 canal, and open disturbed areas. Over 50% of the upland communities in the Basinger Unit are managed for gopher tortoise. It is regularly surveyed, inspected, and managed to keep the habitat quality adequate to sustain the gopher tortoise population on the property. Management efforts in this unit focus on promoting desirable herbaceous species. Ongoing management will continue to support a healthy understory of herbaceous species in this area and other identified locations, including but not limited to prescribed burning and mechanical treatments to enhance and preserve the groundcover.

Florida Grasshopper Sparrow

The Florida grasshopper sparrow is the only species that is endemic to dry prairies. Two of the three remaining subpopulations on public land are located in the adjacent Kissimmee Prairie Preserve State Park and Avon Park Air Force Range. These subpopulations have been declining for nearly two decades. While the exact reasons for this decline are unclear, it may be attributed to various factors, including disease, genetic instability, predation, and habitat loss. The dry prairies in the management area provide foraging habitat for the endangered grasshopper sparrow, and the wet prairie community can provide suitable breeding habitats if the grasshopper sparrow becomes more widely established within Avon Park Air Force Range or if the subpopulation in the Kissimmee Prairie Preserve State Park expands. Ongoing management efforts, including the reduction of shrubs in the wet prairie, will continue to enhance prairie communities to support the species that utilize them and facilitate potential expansion into the management area.

Nuisance and Invasive Animal Species

Invasive wildlife species harm native wildlife and can negatively impact native vegetation or seriously interfere with management objectives. Some of the species of concern are Nile monitor (*Varanus niloticus*), purple swamphen (*Porphyrio porphyrio*), feral hog (*Sus scrofa*), pythons

(*Python spp.*), tegu (*Salvator merianae*), and spiny iguana (*Ctenosaura similis*). The District coordinates with FWC to reduce the invasive species populations through trapping and public hunts, where hunting is allowed. The results of population control efforts are monitored by periodic site evaluations.

Feral hogs are the main invasive species currently managed on the KR MA. Feral hogs have significant impacts on natural communities and land management operations. Their disruption of soil and vegetation through rooting alters natural communities and can be especially damaging in sensitive habitats that are slow to recover. Land management objectives are affected when rooting disturbance disrupts prescribed burns by limiting the horizontal spread of fire. Areas of disturbed soil can also be more susceptible to nuisance and invasive plant invasion. Rooting can also impact hiking trails, reptile populations, and ground-nesting birds. Land managers mainly control hog populations through the year-round public hunting program. Since 2005, the District has also utilized no-cost hog control agents to remove feral hog from management areas whenever necessary. In addition to these primary control measures utilized to manage the hog population within the KR MA, hog control agents are periodically dispatched to Blanket Bay, Lamb Island, Yates Marsh, and Paradise Run units outside of the hunting season. Furthermore, the District has partnered with the USDA Animal and Plant Health Inspection Service, Wildlife Services (APHIS Wildlife Services) to integrate the Feral Swine Damage Management Aerial Operations Program into its invasive species management strategy to enhance the effectiveness of the District's Feral Hog Damage Management Program. This program operates in compliance with FAA regulations, NEPA guidelines, and applicable state permits, using aircraft to map and safely target overpopulations of feral hogs on District-managed lands, including the Istokpoga Creek Unit and the Land Island East and West management units.

The Island Apple snail (*Pomacea maculata*) is known to occur in the KR MA but is not being targeted for geographic containment. The native apple snail, Florida apple snail (*Pomacea paludosa*), populations have drastically declined within the Kissimmee River restoration project area. The island apple snail is a highly fecund, fast-growing species that has likely become a permanent part of the Kissimmee River floodplain. Historically, the Florida apple snail has been the main prey for the federally endangered snail kite. This decline in native snails has caused snail kites to forage almost entirely on the non-native apple snail within the Kissimmee River Restoration Project area. Since the island apple snail plays a crucial role as the main food source for the endangered snail kite in the region, it is likely to persist on the floodplain without specific management efforts to support snail kite populations.

The ambrosia beetle (*Xyleborus glabratus*) is a wood-boring beetle native to Asia that infects trees with Laurel Wilt disease, caused by the fungus *Raffaelea lauricola*. This deadly fungal disease affects trees in the *Lauraceae* family, such as red bay (*Persea borbonia*) and swamp bay (*Persea palustris*). Discovered in Florida in 2010, the fungus has since spread across the state through various native and nonnative ambrosia beetles and has been found in every county. Currently, neither the ambrosia beetles nor the Laurel Wilt fungus is targeted for geographic containment due to the lack of effective control methods for the pest or the disease in natural areas.

Other invasive wildlife sightings in the region, such as the Green Iguana (*Iguana iguana*), Cuban Treefrog (*Osteopilus septentrionalis*), and Black Spiny-tailed Iguana, are not currently

being targeted for geographic containment. Management of these species is limited due to factors like a lack of effective control tools, insufficient resources, and limited risk assessment data.

7.5. Hydrologic and Habitat Restoration

The District regularly partners with various agencies and non-profit organizations to implement a wide range of ecological restoration projects that improve wildlife habitats. Land managers often build upon initial restoration efforts, especially hydrologic enhancement projects, to maximize their benefits. Over the past decade, the District has successfully completed construction of the Kissimmee River Restoration.

Kissimmee River Restoration Project

The KR MA benefits from one of the world's largest river restoration projects. In July 2021, the District and USACE celebrated the Kissimmee River Restoration Project's completion. The river floodplain's physical shape was reconstructed in four phases, as shown in **Figure 8**. This milestone marked the successful backfilling of 22 miles of the C-38 canal between Lakes Kissimmee and Okeechobee and the restoration of the flow to 24 miles of the meandering Kissimmee River. Since completing the first phase of the Kissimmee River Restoration Project, the wetland communities that were once disappearing within the KR MA have been preserved and their vegetation has steadily improved. The restoration of these natural communities results from a combination of land management practices used on the KR MA, the restoration of the historic river channel, and drainage improvements in the Kissimmee River Basin.

Continuous monitoring shows a positive trend in the expansion of wetland communities as a result of the restoration efforts. However, the vegetation composition present before channelization has not fully recovered. The monitoring findings reveal an increasing trend in shrub vegetation and facultative plants within historically herbaceous communities. Notably, the spread of shrub species such as wax myrtle, saltbush, Carolina willow, and primrose willow in the marsh and wet prairie communities. These findings underscore the need for further manipulation of vegetation structures in the KR MA to restore the herbaceous vegetation structure in these areas following HRS implementation.

The Kissimmee River Restoration Project seeks to restore the vegetation structure of marsh and wet prairie communities that existed on the floodplain before channelization. To achieve this long-term goal, the project has concentrated on modifying the hydrology and land managers' prescribed fire practices but also supports other management tools as needed to meet its restoration objectives. Mechanical treatments will likely be an essential tool in reducing shrub coverage and restoring the herbaceous vegetation structure that existed before channelization. Using mechanical treatments can be particularly effective for wet prairie communities, where research indicates a substantial seed bank presence for the most common species. However, this approach is likely to be less feasible for long-hydroperiod and deep areas marshes. The duration of flooding and water level fluctuations across the floodplain will determine whether mechanical treatments are practical and effective in reducing shrub coverage in these marsh communities, as long periods of inundation will significantly restrict the use of mechanical equipment and may also hinder the natural recruitment of marsh vegetation seedlings after treatment.

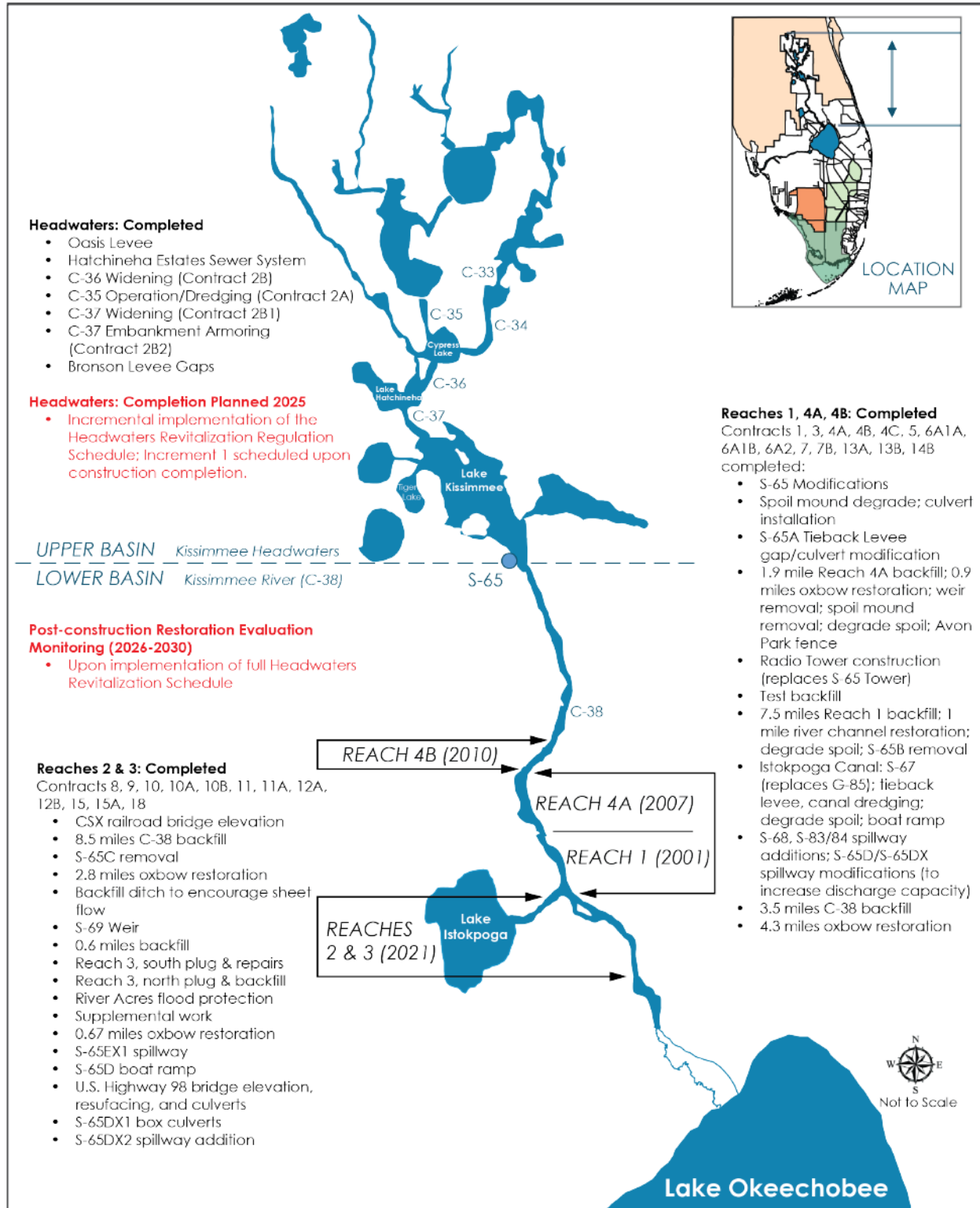


Figure 8. Completed construction marking the completion of the Kissimmee River Restoration (USACE, 2021).

Over the next decade, land managers for KR MA will continue to expand on the Kissimmee River Restoration efforts along with prescribed fire and vegetation management progress. Land management evaluation of the KR MA will also continue to identify additional vegetation improvement or internal drainage improvement needs, such as installing culverts, ditch plugs, or leveling existing spoil piles, if necessary to support wildlife habitat within the KR MA. Restoration plans will be prioritized based on site needs and funding availability.

Along with the efforts of the Kissimmee River Restoration Project, the KR MA land managers plan to use mechanical shredding combined with prescribed fire to reduce the shrub coverage in specific marsh communities within the Blanket Bay Unit. This method will also be implemented in wet prairie areas and other suitable marsh communities throughout the KR MA, where a need has been identified. Additionally, after the HRS is implemented, land managers plan to identify other upland areas suitable for gopher tortoises and develop a habitat restoration plan to support their expansion in the KR MA.

Lamb Island East

In 2004, the District initiated the Lamb Island Tributary Stormwater Project as part of the Lake Okeechobee Protection Plan. This project rehabilitated the former dairy ranch to help reduce phosphorus discharges into Lake Okeechobee. The design involved collecting stormwater runoff from two key areas: a high-intensity area (HIA) with elevated phosphorus levels and the surrounding unimproved pasture, by creating four cells with surface water containment berms. Approximately 16 acres of wetland were created to retain runoff from the pasture, helping to lower the phosphorus levels before the water was discharged. Alum was also utilized to bind and inactivate soluble phosphorus in residual dairy waste within the small onsite ponds, with two of these ponds and the perimeter ditches subsequently backfilled. The constructed wetland was graded to an elevation of approximately 36.25 feet NGVD. Surface water from Lamb Island West now discharges through two 36-inch diameter culverts with risers. One riser discharges the wetland water at 37.75 feet NGVD, while the southwestern discharge point is set at 39 feet NGVD. Additionally, the risers from the overflow culverts in the cells can be maintained at a maximum elevation of 43 feet NGVD. Although the hydrology of the unit has been modified by this manmade system, the project will ultimately restore the area to a wetland system. As a result, wetland vegetation is expected to gradually replace pasture grasses, thereby enhancing the biological uptake of phosphorus as the area remains inundated for extended durations. During this plan period, the Land Stewardship Section plans to continue improving the physical structure of the plant communities through vegetation management. The overall goal of the HIA swale retention area and the outer pasture area was to reduce phosphorus discharge from the site by increasing the time for phosphorus removal through biological and physical processes by limiting the discharge. After the project was completed, follow-up monitoring indicated that over 99% of phosphorus was retained. Over the past decade, management efforts have focused on maintaining system performance, including managing the outer pasture area through harvesting and grazing, enhancing natural communities by controlling invasive species and nuisances, and reducing discharges from the management unit.

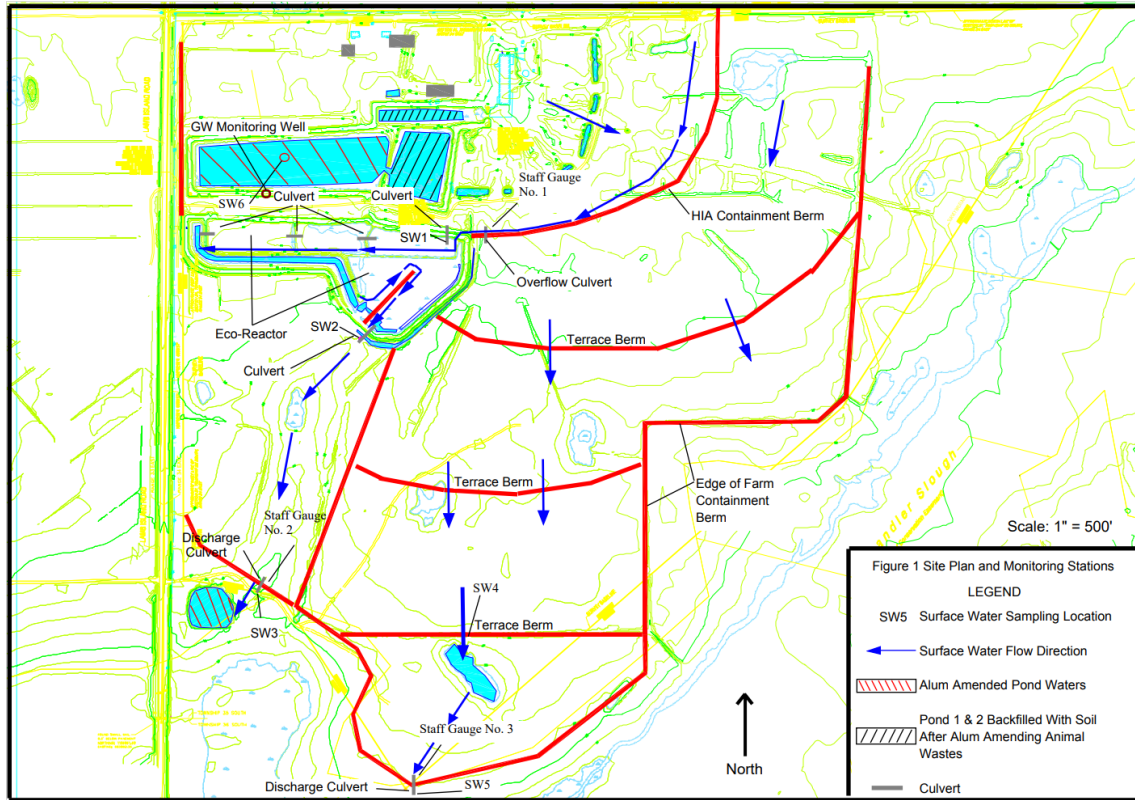


Figure 9. Overview Map of the Lamb Island East Stormwater Project Site.

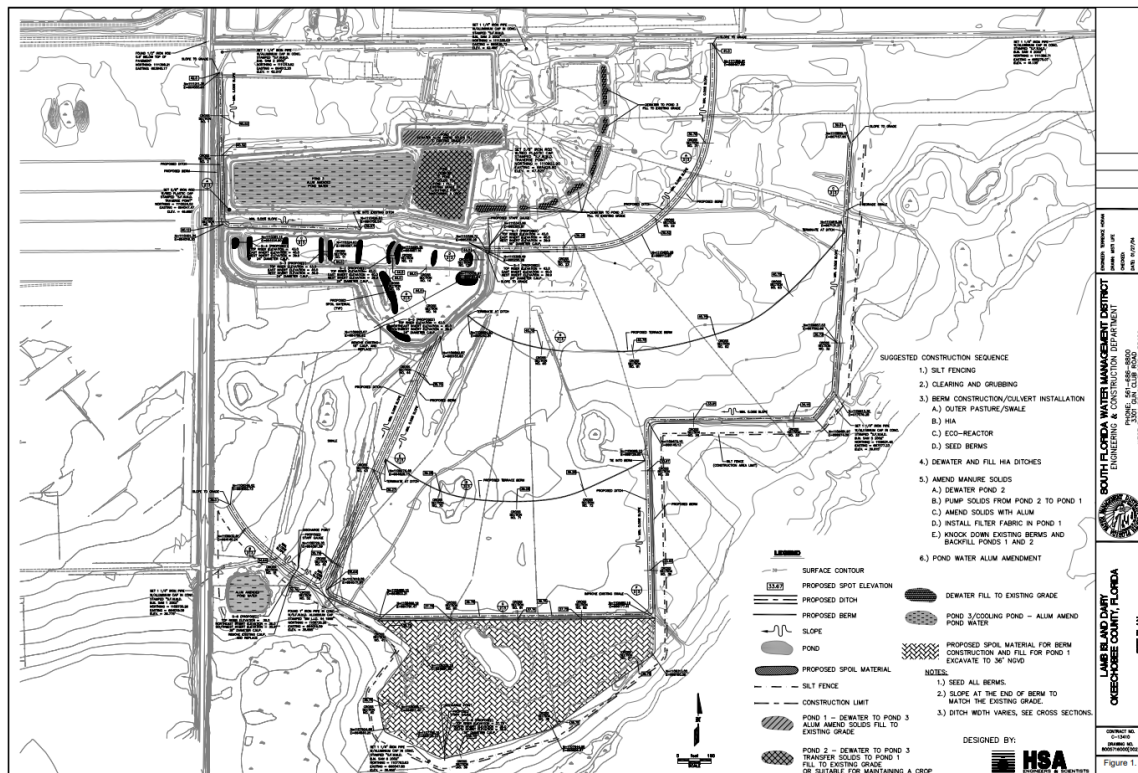


Figure 10. Project Site Plan for Lamb Island East.

Yates Marsh

To support natural vegetation recruitment within the KR MA, supplemental restoration efforts have been implemented as funding allows. In addition to previous efforts to enhance the dry prairie communities in the Starvation Slough Unit, approximately 25 acres of a riparian corridor connected to the natural slough in the Yates Marsh Unit are being restored to enhance water quality and wildlife habitat. This restoration plan includes the installation of a cattle exclusion fence along the corridor and the implementation of a multi-phase planting strategy, with planting zones designed based on the natural topography. The plantings include cypress trees, grasses, wetland and upland shrubs, as well as hardwood trees. To date, approximately 18 acres have been enhanced. During this plan period, the Land Stewardship Section plans to complete the remaining restoration activities and continue improving the physical structure of the plant communities through targeted vegetation management.

7.6. Research and Monitoring

KR MA Condition Class

The primary objective of the Land Stewardship Section's monitoring activities is to assess and document the effects of land management actions, such as the application of fire and herbicides. Land Stewardship managers evaluate habitat conditions and vegetation structures to identify gradual, desirable, or undesirable changes associated with invasive species, prescribed burns, and other factors such as hydrological shifts. During land management activities and routine site assessments, these land managers monitor the natural communities in the KR MA for invasive species. They assess burn units before and after prescribed burns to observe the vegetation's response to fire, thereby enhancing their understanding of how variables such as weather, fuel accumulation, seasonal changes, and water levels interact to influence the targeted vegetation structures. Monitoring observations are documented using condition class assessment tools developed by the District. In addition to the monitoring assessments conducted by the Land Stewardship staff, monitoring studies for the Kissimmee River and its floodplain are conducted by the District and other partnering agencies as part of the Kissimmee River Restoration Evaluation Program (KRREP). The KRREP gathers monitoring data and conducts research, providing valuable information to support the KR MA's land management goals. Consequently, KR MA land managers rely on KRREP monitoring data to make ecologically sound decisions about their land management practices.

Fire Condition Class

The District developed a GIS-based program called “physical condition class” to monitor the status of plant communities based on the time since a physical treatment occurred. Although physical treatments can be mechanical or through cattle grazing, the main tool used by the District is fire due to the natural benefits fire provides. The District uses the physical condition class to prioritize and plan the application of prescribed fire on individual management units.

Management units are delineated by prescribed fire boundaries and the condition of each unit is classified based on fire history and the desired fire-return frequency using FNAI

recommendations for the primary fire-dependent communities in each unit (**Map 24**). Most plant communities in South Florida require fire every 4 years or less to remain healthy and productive, so this is the default return frequency assigned to each management unit. If a management unit has been burned within the identified return interval, that unit is identified as being in condition class 1. If the most recent fire in a management unit exceeded the identified return frequency but less than twice this interval, that unit is identified as being in condition class 2. Condition class 3 includes those units having had fire more than two intervals ago but less than three, and condition class 4 are those fire-dependent units that have not experienced fire for more than three of the recommended return intervals or more than 12 years for most of the fire-dependent units in the management area. Fire-excluded habitats, where fire is generally confined to the periphery, are identified as not actively maintained by fire. This process is depicted in **Figure 11**.

Although the default fire-return frequency in the condition class is based on the prevailing plant communities, management units may contain a mosaic of habitats adapted to more variable return frequency than reflected in the fire condition class. Most fire-dependent communities in the KR MA burn units are burned at a fire-return frequency of 2 to 4 years. The edges of marsh communities in the KR MA often burn along with the surrounding fire-dependent communities, but when water levels in the floodplain drop below the surface, fire can effectively spread through the marshes. Cypress domes and other swamp communities are burned with the surrounding fire-dependent communities when the soil is still saturated. These wetland communities have a fire rotation of 4 to 8 years and fire typically only reaches the edges. Baygall species are fire-intolerant and the humid conditions typically inhibit fire except for prolonged drought periods. In the KR MA, the baygall communities are burned with the adjacent fire-dependent areas, but fire usually only affects the edges.

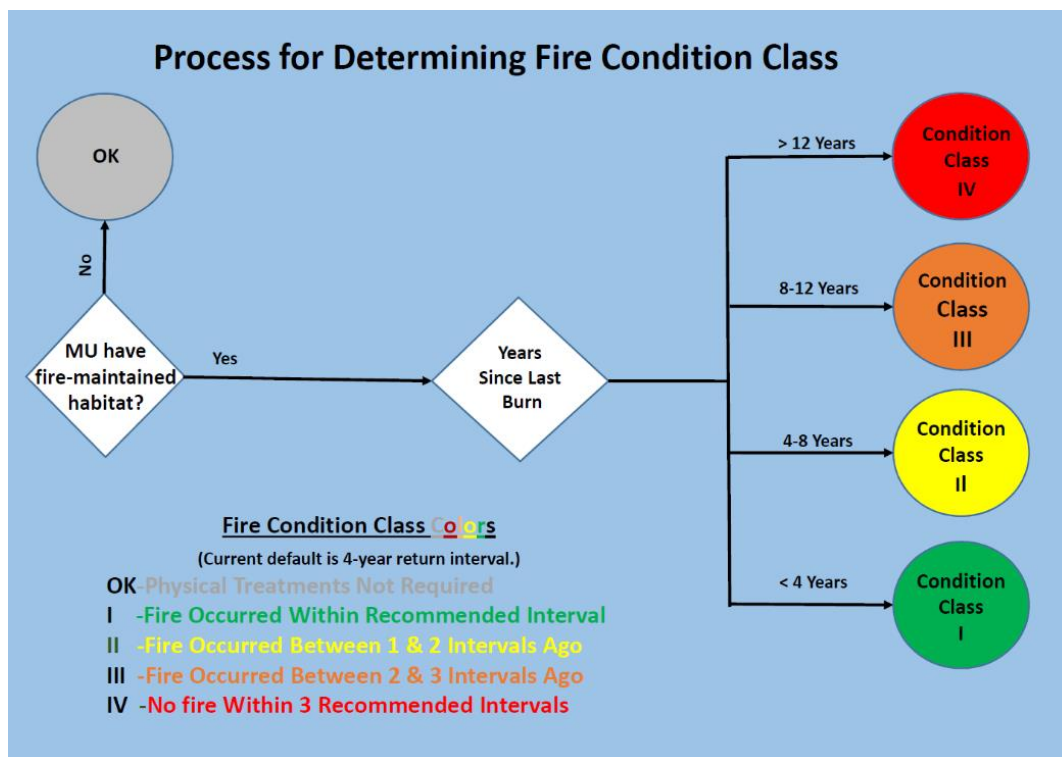
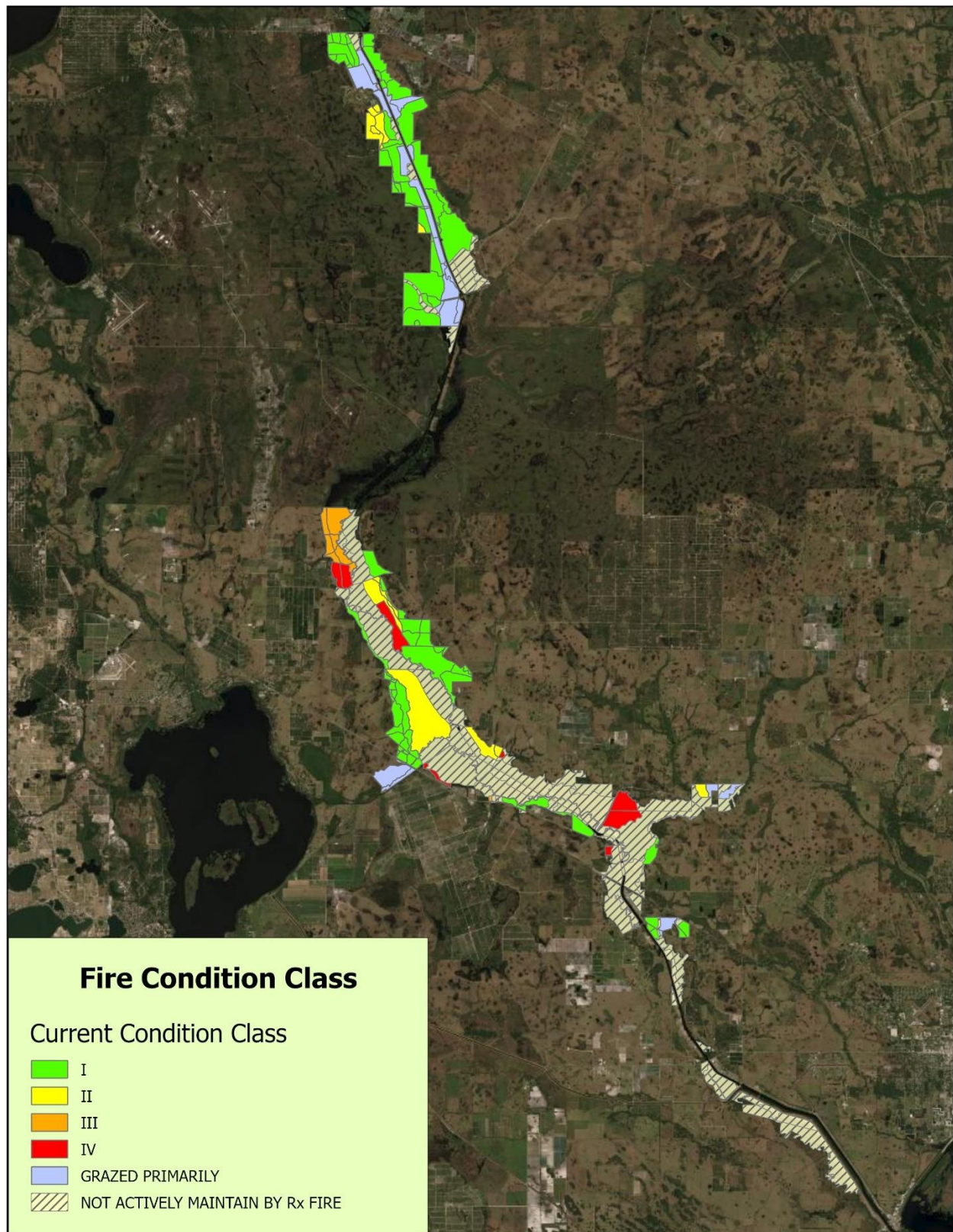


Figure 11. Flowchart illustrating the process for determining fire condition class.



Map 24. KR MA fire condition class.

Nuisance and Invasive Plant Condition Class

The District developed a GIS-based program called “invasive plant condition class” to monitor the status of plant communities based on the population status of prominent nuisance and invasive plant species. The District uses the invasive plant condition class to develop a strategy for treating the KR MA. The strategy prioritizes periodic treatments in management units once maintenance is achieved to keep the unit in maintenance status for specific species, expanding efforts to other areas or species only when available resources are sufficient to achieve and retain maintenance status.

The prevalence of invasive plants within management units is estimated and assigned a condition class value (**Map 25**). Each management unit is given an invasive plant condition class based on the maturity of the population of the primarily targeted species (**Figures 12-13**). Annual work plans are developed to minimize the ecological impacts of these invasive species in a cost-effective manner while minimizing the use of herbicides where practical.

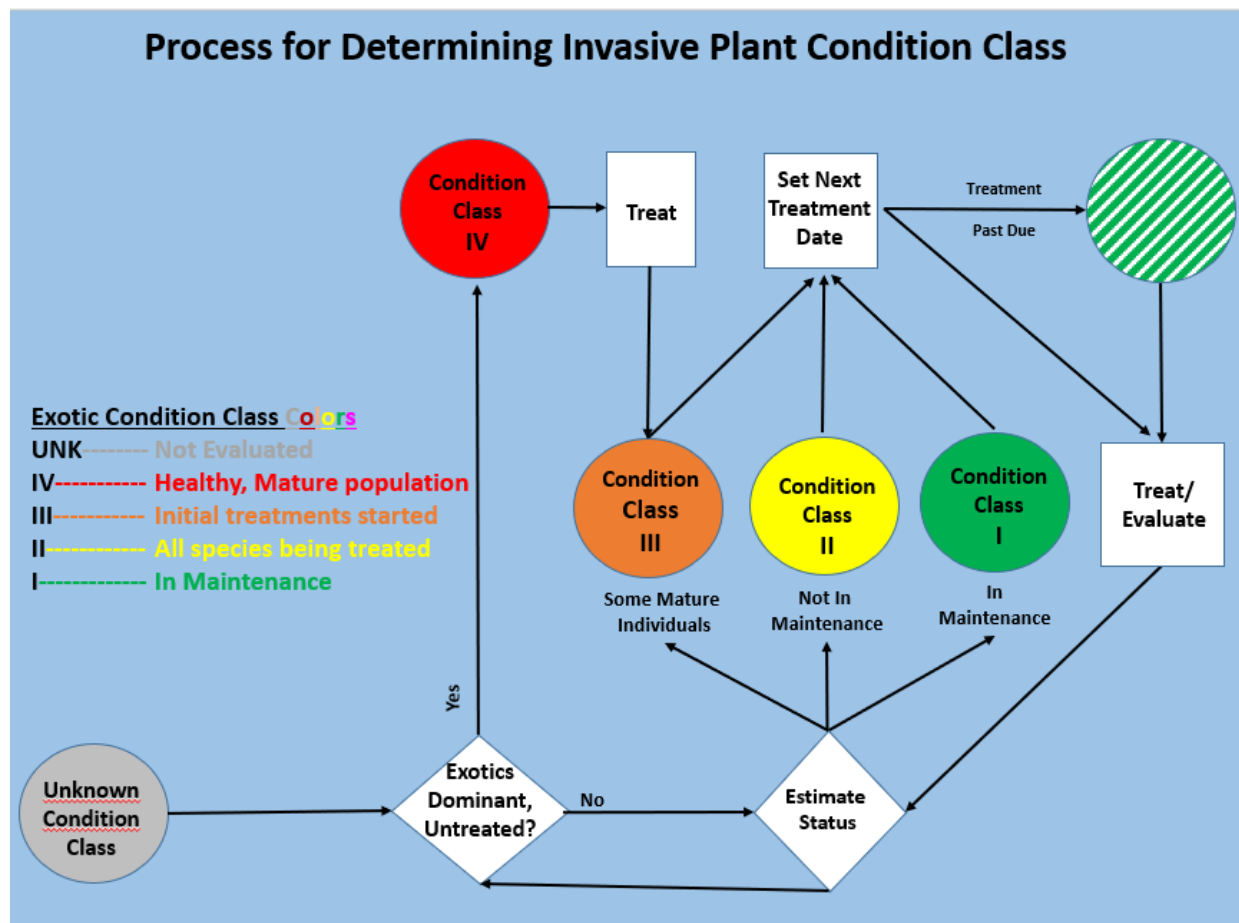
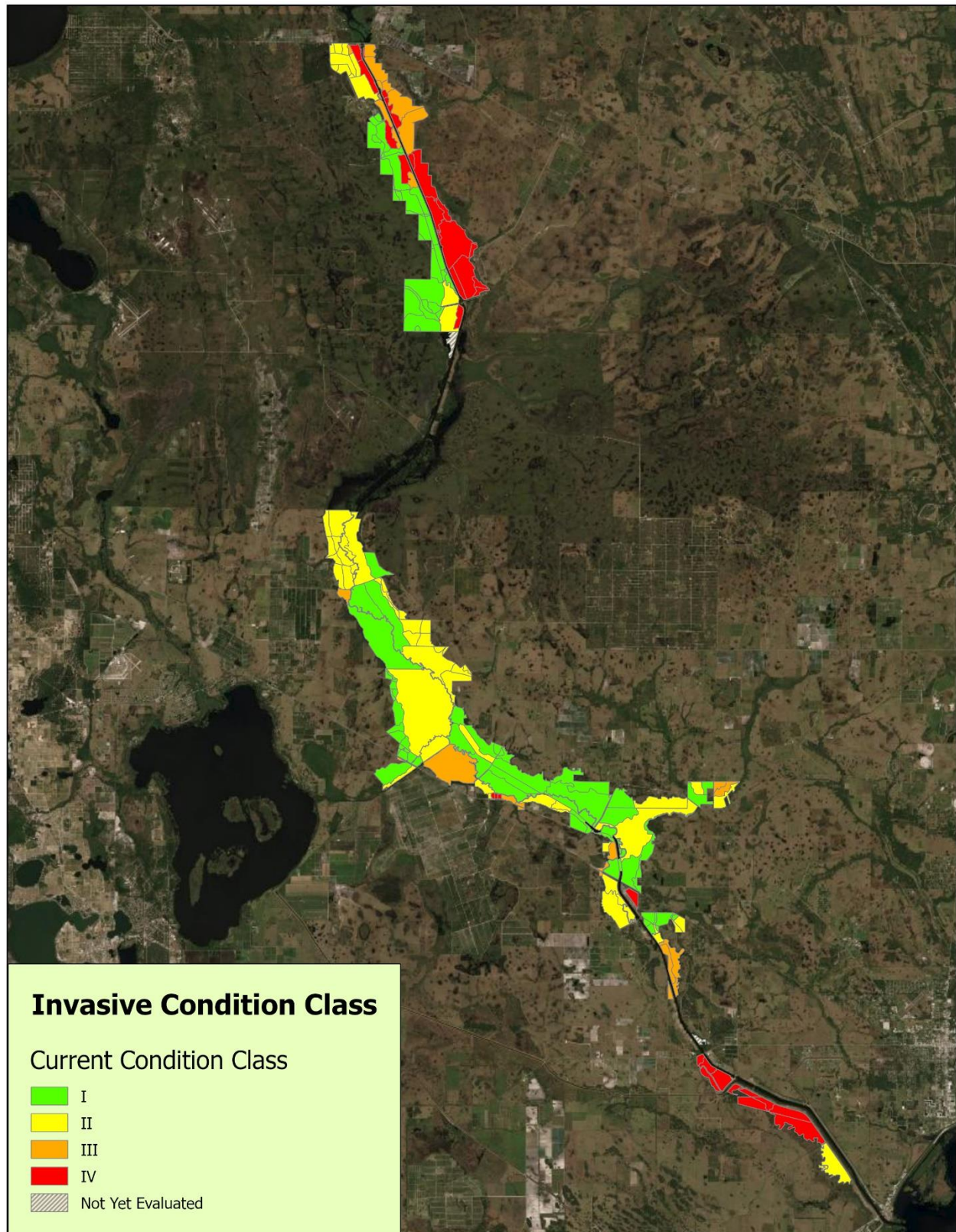


Figure 12. Flowchart illustrating the process for determining invasive plant condition class.

- **Woody vegetation (Melaleuca-Earleaf Acacia-Chinese Tallow-Brazilian Pepper-Ardisia-Senna-Downy Rose Myrtle-Carrotwood-Silk Tree-Mimosa Pigra-Schefflera-Java Plum-Lead Tree-Woman's Tongue)**
 - IV--Tall, dense, mature, many throughout landscape
 - III--Most mature dead, some regrowth/sprouting/isolated misses, many seedlings/suckers
 - II--All or nearly all mature dead, little regrowth, some seedlings
 - I----Occasional seedlings or young plants
- **Vines (Lygodium-Air Potato-Winged Yam-Rosary Pea-Mile-A-Minute Vine)**
 - IV---Heavy blanket covering trees/bushes, dense, some throughout area
 - III---Most trellises dead, lots of sprouting/young plants, some clean areas
 - II---Trellises < 10' high, young plants tending towards "hot spots"
 - I----Limited trellising, mostly young plants in isolated "hot spots"
- **Cogon Grass-Taro**
 - IV—Solid, Dense, Mature Stands
 - III---Main portion mostly dead, regrowth along edges and some internally
 - II---Outlying regrowth and isolated clumps
 - I-----Occasional dispersed clumps of fresh growth
- **Tropical Soda Apple**
 - IV---Thick & tall
 - III---Most dead in main concentrations, frequent outliers
 - II---Widely separated plants
 - I-----Occasional seedling plants

Figure 13. Example of invasive characteristics of target species used to assign condition class.



Map 25. KR MA invasive treatment condition class.

Gopher Tortoise Habitat Monitoring

A long-term monitoring program has been established for the gopher tortoise recipient site at the Fort Basinger Unit. The monitoring program includes the installation and periodic surveying of sixteen permanent vegetation transects to assess habitat conditions and vegetation management efforts. Additionally, gopher tortoise burrow surveys are conducted along these transects during the monitoring period. The monitoring reports, which compile data from the vegetation stations and burrow surveys, are used to inform and guide land management practices across the site.

Kissimmee River Restoration Studies and Monitoring Evaluations

The District has an environmental monitoring program that supports various restoration projects, including the Everglades, Kissimmee River, Lake Okeechobee, Big Cypress Basin, and the water conservation and stormwater treatment areas. This program routinely monitors surface water, fish, and sediment and analyzes them for nutrients, pesticides, trace metals, and ultra-trace mercury. The District has also partnered with Florida Atlantic University's Center for Environmental Studies since 1995 to manage the Riverwoods Field Lab, which serves as a research and education center, providing support staff for the District's KRREP. Additionally, the District partners periodically with the University of Florida and provides funding for research aimed at understanding new invasive pest characteristics and developing more effective invasive management strategies.

For decades, the District and its partners have systematically monitored the Kissimmee River ecosystem to evaluate the progress of restoration. Early Phase I efforts included establishing baseline conditions, identifying pre-channelization reference conditions, assessing construction impacts, and documenting initial responses to canal backfilling and scheduled releases. Baseline studies in Pool C were initiated prior to Phase I construction, and additional monitoring on hydrology, geomorphology, water quality, and biological communities was collected to provide a foundation for evaluating future responses and to serve as a reference for post-restoration comparisons. Throughout construction, KRREP monitored key indicators, including hydrology, dissolved oxygen, floodplain geomorphology, vegetation, fish populations, wading birds, and waterfowl abundance. This monitoring will continue for several years after HRS implementation. Findings from KRREP's long-term monitoring and related research are published annually in the South Florida Environmental Report (SFER), and numerous scientific studies on the Kissimmee River Restoration Project have been published in peer-reviewed journals. The following is a brief overview of surveys and monitoring efforts that inform management practices in the KR MA. Additional details on methods, results, and other studies are available in SFER at <https://www.sfwmd.gov>.

Geomorphology

Channel planform analyses have been conducted since 2001 to quantify changes in the geomorphology of the Kissimmee River channel. The analysis combines planform and channel profile evaluations to measure shifts in the channel's centerline. By comparing a series of regularly collected aerial images with reference data gathered between 1943 and 1958, the study assesses whether the processes that create and maintain the natural river channel and its migration rate have

been reestablished through restoration. This assessment offers valuable insights for land managers regarding the stability of the river channel and floodplain within the restored system.

Habitat monitoring: Community Classification and Treatment Efficacy

Ecological monitoring studies have been conducted to establish baseline conditions in the Kissimmee River floodplain, both before and after channelization. These efforts employed techniques such as aerial photo interpretation, color-infrared remote sensing, and ground-truth field sampling to produce vegetation maps. Between 1998 and 2003, plant species composition and vegetation bed width were surveyed in Pools B and C and compared to Pool A to assess vegetation composition and species abundance during Phase I construction of the Kissimmee River Restoration Project. To standardize vegetation analysis, the KRREP developed a classification system that integrates species cover data, habitat information, aerial imagery, and field observations to categorize habitats at the community level. The District utilizes this system to map the vegetation and identify plant communities across the river, floodplain, and adjacent uplands. This system will play an integral role in tracking the changes in plant communities, including invasive species encroachment and shrub expansion within the floodplain in the long-term.

Following the full implementation of the HRS, additional vegetation assessments will continue to assess the effectiveness of herbicide treatments on invasive grasses within the Kissimmee River floodplain. Systematic experimental trials are currently being conducted to develop optimal control strategies and improve the efficacy of these treatments. Validating these strategies and identifying effective herbicides for managing West Indian marsh grass and other invasive grasses will help land managers address concerns regarding the potential spread of invasive grasses, which may result from the hydrological changes expected with the implementation of the HRS.

Wading Bird and Waterfowl

Monthly aerial surveys of the floodplain are conducted during the dry season to estimate the abundance of foraging wading birds and waterfowl in the Kissimmee River, both in the restored and unrestored sections. The data collected from these surveys is compared to baseline data collected prior to the restoration to evaluate the success of the restoration efforts on avian communities. Additionally, wading bird colonies within the restoration area around the Kissimmee River Basin are monitored and compared with historical records.

Snail Kites

The University of Florida also conducts systematic annual monitoring of statewide snail kite nesting efforts, distribution, and population size. These nest and roost surveys begin in January, with identified nests being revisited roughly every three weeks until they are no longer active. The results from these annual bird abundance and nesting surveys are documented through KRREP to inform water management decisions.

Fisheries, Invertebrates, and Herpetofauna Surveys

Since 2014, fish populations in the river channel have been sampled annually using electrofishing methods to assess abundance and biomass. This ongoing monitoring has helped evaluate how fish respond to restoration efforts, water management, and dissolved oxygen levels in the Kissimmee River. Frequently sampled species include bluegill sunfish (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), redear sunfish (*Lepomis microlophus*), redbreast sunfish (*Lepomis auritus*), spotted sunfish (*Lepomis punctatus*), and warmouth (*Lepomis gulosus*). In addition, herpetofauna and invertebrate populations are sampled through herpetofaunal drift fence surveys and anuran call surveys to assess prey availability for birds in the Kissimmee River.

Other Short-Term Studies

Apple Snail:

A Visual Encounter Survey of apple snails was conducted monthly for more than two years along 24 fixed 50-meter transects within the restoration project area to observe egg masses of both native and non-native apple snails. Additionally, monthly throw trap samples were collected nearby to count live apple snails of both species.

Prescribed Fire:

In 2019, a monitoring study was conducted to assess the effects of prescribed fire on vegetation in the river floodplain. The District established permanent photo-monitoring points and vegetation plots within the burn units to document conditions after the burn. Observations of these ground photo-monitoring points and plots were made at 3-, 6-, 12-, and 24-month intervals following the burn. Long-term monitoring and evaluation of ongoing prescribed fire efforts will continue through photointerpretation of aerial imagery.

Carolina willow:

Experimental trials were conducted in Pool B and C to assess the effectiveness and non-target effects of three herbicide treatments aimed at controlling the spread of the native shrub Carolina willow in the Kissimmee River floodplain. Vegetation data were collected at 1-, 6-, and 12-month intervals following treatment. Ongoing research efforts are focused on developing best management practices to reduce Carolina willow coverage and minimize impacts on non-target species.

8. ADMINISTRATION

Administration of District lands is directed through the Land Stewardship Section within the Land Resources Bureau. Policy decisions, planning and budgeting, procurement of personnel and equipment, contract administration, and program development issues are administrative tasks coordinated through the Land Stewardship Section. Input is provided by regional land managers located over the 16-county area. Regional land managers handle regular administrative duties from their field locations to ensure quick response to local concerns and management issues.

Administrative activities for KR MA will be handled through the District’s field office at the Okeechobee Field Station and the District’s headquarters in West Palm Beach.

8.1. Planning and Budgeting

Planning is a major component of the Land Stewardship Section and is critical to maintaining proper program focus, direction, and coordination with other agencies. This document forms the framework for prioritizing and creating targeted plans for the activities to be conducted within the appropriated budget for the next 10 years.

The principal sources of funding for land management operations on the KR MA include lease revenue, ad valorem tax revenue, and special grants. Overall funding availability determines management activities. Budget distribution among the District’s five land management regions is based on a programmatic prioritization of management activities. Operational funds are distributed to accomplish the management objectives of each management area most effectively. The continued operation and maintenance of the KR MA include costs to cover staffing, ongoing land management expenses, and capital refurbishment/replacement of aging infrastructure. Current conditions and anticipated serviceability determine capital infrastructure needs. Priorities for capital refurbishment/replacement are made on a District-wide basis. Utilities and operational expenses include supplies, electric service, business travel, and safety equipment. Public use costs include maintenance costs for public use facilities. Base-level funding needs may increase in the future in response to increasing operational expenses, including fuel costs, contracted nuisance and invasive plant control needs, equipment and infrastructure repairs, and increasing public expectations. Specific projects on which to spend these funds are prioritized annually to address each management goal. The Fiscal Year 2025 (FY2025; October 1, 2024 – September 30, 2025) budget for the KR MA and projected expenditures through FY2030 are outlined in **Table 5**.

Table 5. KR MA FY 2025 budget and proposed expenditures through FY 2030.

Management Activities	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Resource Management						
Mechanical Vegetation Mgmt.	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Chemical Vegetation Mgmt.	\$137,447	\$137,447	\$137,447	\$137,447	\$137,447	\$137,447
Prescribed Burning/Site Prep	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000
Solid Waste/Debris Removal	\$65,850	\$27,434	\$27,434	\$27,434	\$27,434	\$27,434
Habitat Restoration						
Law Enforcement/Enhanced Patrol	\$23,400	\$23,400	\$23,400	\$23,400	\$23,400	\$23,400

Table 5 (Continued). KR MA FY 2025 budget and proposed expenditures through FY 2030.

Management Activities	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030
Capital Improvements						
Facilities & infrastructure improvements	\$231,376	\$80,000	\$160,000	\$400,000		
Fencing/Signage	\$64,603					
Rec. Facilities Maint.	\$75,762	\$61,387	\$61,387	\$61,387	\$61,387	\$61,387
Support & Administration						
Infrastructure Maint.						
Prescribed Burn PPE	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Contingent Staffing						
Vehicle Replacement						
Vehicle Fuel & Maint.						
Equipment Replacement						
Equipment Fuel & Maint.	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000	\$17,000
Small Tools & Equipment	\$2,800	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Total *	\$662,818	\$208,247	\$208,247	\$208,247	\$208,247	\$208,247

The FY 2025 invasive plant control strategy for the KR MA (**Figure 14**) identifies how nuisance and invasive plant control funding was distributed to achieve the control of nuisance and invasive plants based on current and expected future nuisance and invasive plant condition classes for each management unit. Through this process, efforts are directed toward maintaining nuisance and invasive plant infestations at the most cost-effective levels while minimizing negative impacts on natural communities. This strategy also minimizes the use of herbicides by keeping populations of nuisance and invasive plants at low levels in areas of maintenance.

Similarly, strategies prioritizing equipment and infrastructure replacement (including fencing, public use facilities, administrative structures, and hydrologic components), areas for prescribed fire, and public use needs are also updated annually. These strategies and budgets are developed in concert with District-wide operational priorities and budgetary cycles and prioritized across all areas managed by the Land Stewardship Section.

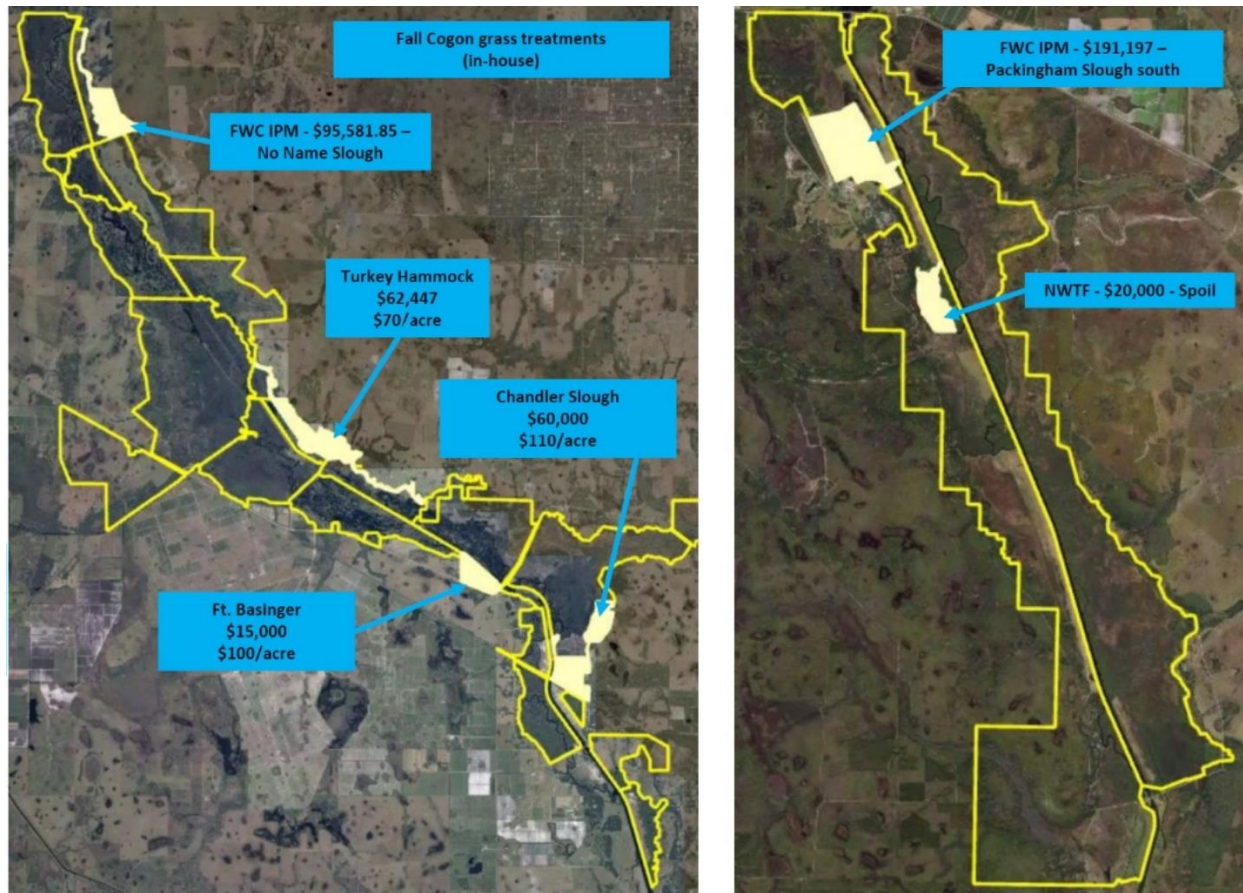


Figure 14. KR MA FY25 invasive plant treatment plan.

8.2. Personnel and Equipment

The Land Stewardship Section is separated into five geographic regions. Each region is assigned a Science Supervisor (Land Manager), one to three Land Management Technicians, and, based on the need in some areas, a Land Management Assistant, Scientist III, and/or Scientist IV position. A Section Leader provides direct oversight and supervision for the land managers. Additional leadership and assistance come from the Land Stewardship Section Administrator, Land Stewardship Senior Scientist, Wildlife and Public Use Section, Vegetation Management Section, and other support personnel from the District's headquarters in West Palm Beach and the Field Stations. Management of the KR MA property is the primary responsibility of the Okeechobee/Kissimmee Region's Science Supervisor, one Senior Land Management Assistant, and one Scientist III.

Staff have access to tools, supplies, four-wheel drive vehicles, fire suppression trucks, all-terrain vehicles, swamp buggies, airboats, and other heavy equipment. This equipment is maintained through the Okeechobee Field Station. Equipment from the other regions, as well as leased equipment, are also available if needed.

8.2. Volunteers

Section 373.1391, Florida Statutes, encourages the District to use volunteers for land stewardship and other services. The District recognizes the merits of volunteerism and welcomes participation in activities appropriate for public involvement. The Land Stewardship Section offers a variety of volunteer opportunities for individuals and groups. These opportunities include creating and maintaining public use trails, maintaining public use facilities and amenities, leading field interpretations and guided tours, organizing cleanups of trails and waterways, conducting invasive plant sweeps, and assisting with District-sponsored public events such as Earth Day and Public Lands Day.

In Fiscal Year 2024, District Lands benefited from 17,036 volunteer hours, which is valued at \$538,508 based on Florida's average volunteer service rate of \$31.61 per hour. The volunteer efforts are supported by dedicated individuals and organizations, including the KR MA Camp hosts, the Kissimmee River Valley Sportsman Association, Lake Okeechobee Airboat Association, the Florida Paddling Trail Association, and the Florida Trail Association. These groups assist in maintaining campsites, the Istokpoga Canal Boat Ramp Area, airboat shelters, hiking trails, and in organizing trash cleanups and posting signage. Additional cleanup efforts along the Kissimmee River involved removing old fence lines and other airboat navigation hazards, and removing deteriorating boardwalk along the FL National Scenic Trail.

8.3. Contractual Management

Effective operation and management of District properties require the services and cooperation of private organizations, other governmental agencies, and volunteers. Contractual management is established through a management agreement jointly executed by the District and the contracting entity, which outlines the responsibilities of each party. In addition to the contractual services for the KR MA, the District has established agreements to facilitate efficient management and protection of its resources, including the following:

Research and Education Agreement

The District contracts with Florida Atlantic University's Center for Environmental Studies to provide field support for District restoration evaluation studies.

Enhanced Patrol Agreement

The District contracts with local law enforcement to provide enhanced patrol services throughout the District. Currently, the District has a contract with Highlands County for enhanced law enforcement support at the Hickory Hammock Equestrian Center and the Istokpoga Canal Boat Ramp Area. The District's resource protection coordinator schedules patrols with input from the Management Area's land manager and FWC.

FWC Agreement

The District has a cooperative agreement with FWC to regulate public use for managing and protecting wildlife and aquatic life on specific District lands. (Multi-Site agreement No.

4600000961). This agreement funds operational expenses for overseeing and regulating public use activities at the KICCO and Hickory Hammock WMAs and the Kissimmee River Public Use Areas.

USDA Agreement

The District has an agreement with USDA authorizing APHIS Wildlife Services to conduct aerial operations to manage feral hog populations on selected District-managed properties.

Lease Agreement

A 50-year lease with the Trustees of the Internal Improvement Trust Fund conveying the management responsibility for sovereign submerged lands within the Kissimmee River to the District (Contract LS040808, Lease No. 4099). Additionally, the District and the Department have entered into a lease agreement that conveys the management of properties within the KR MA that were purchased by TIITF to the District. The Division of State Lands can perform a management review of the leased premises every five years. The Division of State Lands also receives notification of all public notices relating to the development of the site.

9. MANAGEMENT REVIEW

The land management plan update underwent peer review in accordance with Section 373.591, Florida Statutes. The District also opened a formal public comment period for the Draft 2025–2035 Kissimmee River Management Area General Management Plan, during which written comments were solicited to support stakeholder and public engagement. Additionally, updates to the management plan were presented at a public forum to provide further opportunities for public input.

On November 5-6, 2025, a land management review was conducted to update the 2014-2024 KR MA GMP. The review team consisted of representatives from the Department of Environmental Protection, Fish and Wildlife Conservation Commission, Okeechobee County Board of County Commissioners, South Florida Water Management District, a private land manager representing adjacent landowners, and a member of a nonprofit representing a conservation organization in accordance with section 373.591, Florida Statutes. The management assessment reviewed both management actions in the field and the written GMP to ensure they were consistent with acquisition intent and program objectives.

Over the two-day review, the team provided overall positive feedback on land management practices, particularly in the areas of ecosystem restoration, resource protection, and public use opportunities. These comments highlighted the dedication and performance of the land management staff. However, the team also identified areas where management resources were insufficient. There was consensus that additional staffing and increased funding are necessary to fully achieve the management goals for the KR MA. In particular, members emphasized the need for expanded funding for invasive plant control efforts. The team also assessed how thoroughly these topics were addressed in the management plan. Based on their assessment, revisions were incorporated into the final plan, resulting in an improved manuscript.

The review team ranked management actions taken, resource allocation, and the proposed goals and objectives on a scale of “1” (poorest) to “5” (best). An average score of less than “3” was considered insufficient management. A determination that the management area is not being managed according to the management plan would require the District to provide an explanation and/or propose corrective actions. The categories ranked included Biological Resources, Cultural Resources, Resource Management, Public Use, and Staffing/Funding Budget. The average score for each evaluation criterion is identified in **Figure 15**. The Management Plan and Field Review received an overall above-average rating; however, one category scored below a “3.” Specifically, the team found the funding allocated for staffing and resource management to be insufficient. As a result, the land managers will identify specific unmet needs to request additional resources and funding to address any deficiencies.

To support stakeholder and public engagement, the District also opened a formal comment period for the Draft 2025–2035 Kissimmee River Management Area General Management Plan, accepting written comments through January 27, 2026

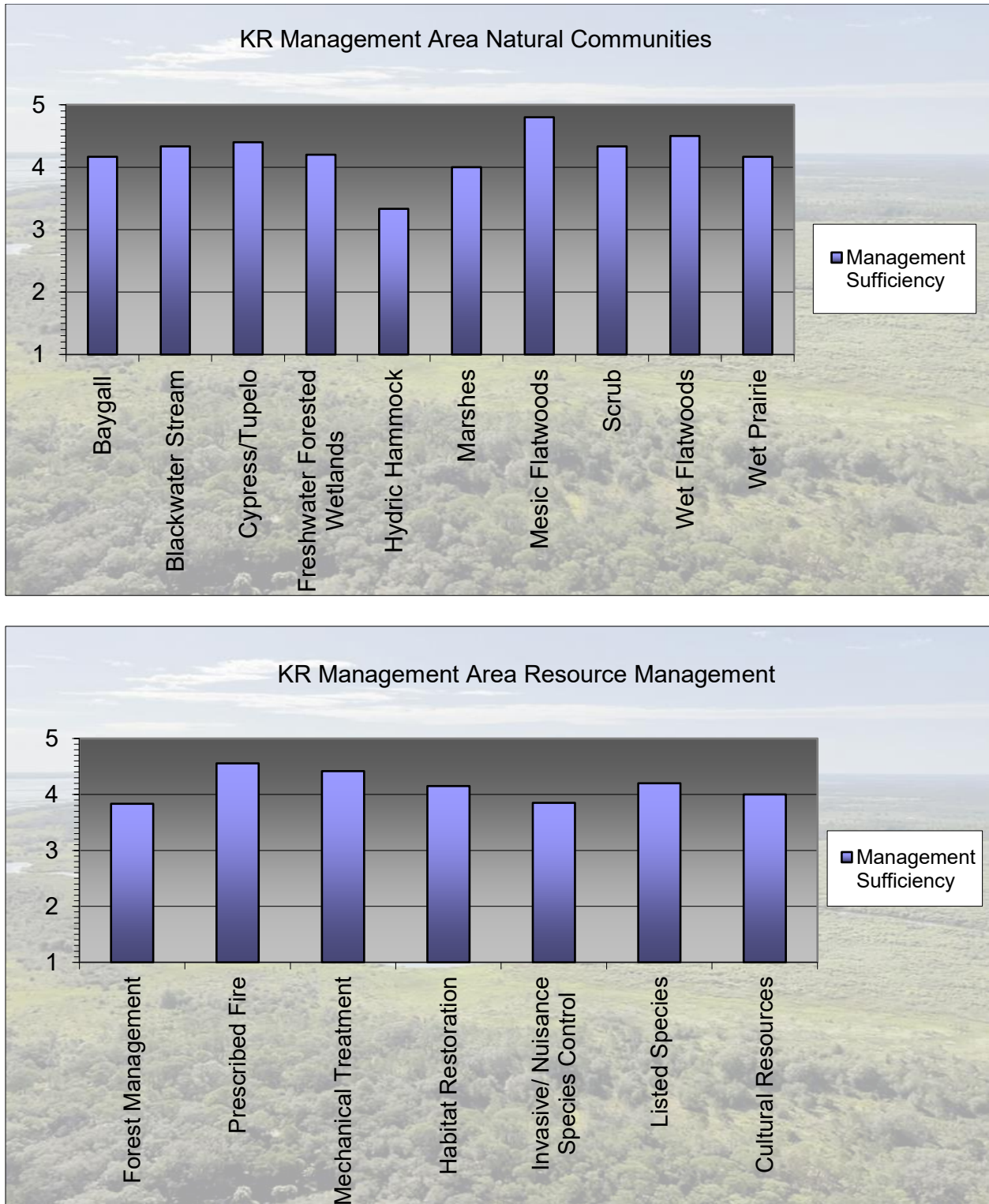


Figure 15. 2025 Land Management Review Results.

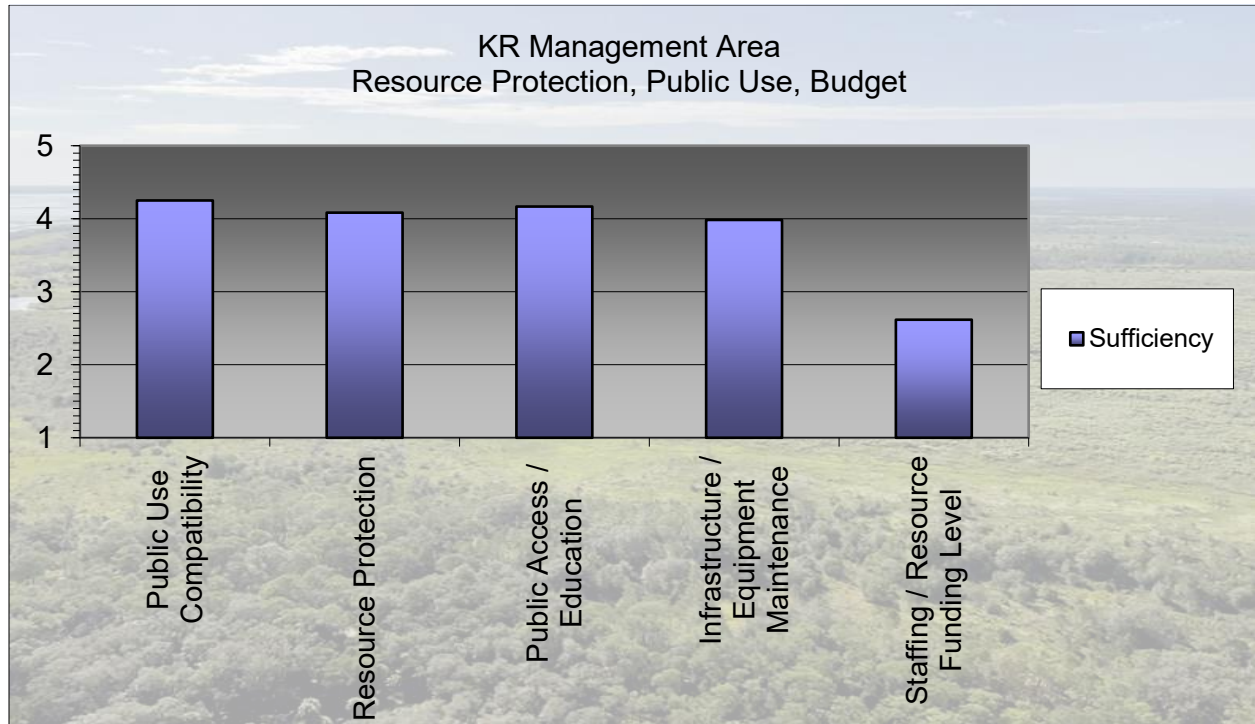


Figure 15 Continued. 2025 Land Management Review Results.

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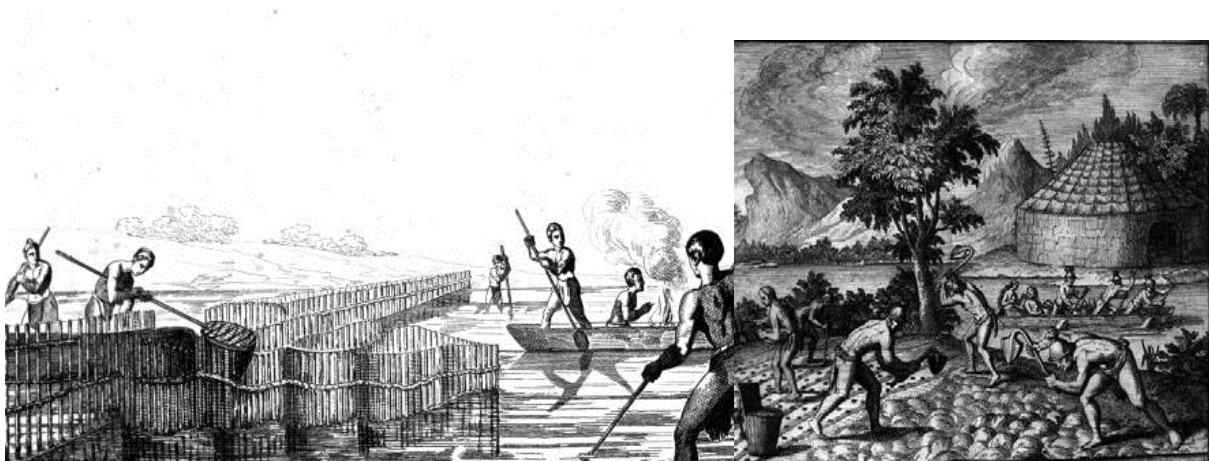
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Appendix A.

Kissimmee River Area History

Historic Overview

The documentation of Native American presence in Florida, as recorded through archaeological and documentary research, dates back to approximately 3000 B.C. Scattered early habitation sites still exist today. During the Spanish colonial period, the region was considered wilderness and was rarely visited. The Spaniards did not map or survey the area during their 300-year rule over Florida, likely due to the difficult terrain. The nearest Franciscan mission during this time was likely La Concepcion de Atoyquime or San Joseph de Jororo, both located just north of present-day Orlando from 1685 to 1697. These frontier outposts had several missionaries killed by the local population and were ultimately abandoned.



Florida Indians as observed by early French settlers trapping fish - left, and tilling and sowing fields - right

The first description of what was likely Lake Kissimmee dates back to 1564, when two Spanish shipwreck survivors were brought to Fort Caroline, a French fort on the Atlantic coast near present-day St. Augustine. The French had heard rumors that two Europeans were living with two nearby chiefs described as Indian kings, Mathiaca and Onachaquara. One of the Spaniards told the French Captain at the fort about his journey while serving as a messenger from the Calusa King, Calos, at Estero Bay to his close ally, King Oathaqua of the Ais, who lived at Cape Canaveral (Cañaveral was a Spanish term for a marsh or reedbed). About halfway through the journey, they came across a large lake, 15 miles from one end to the other, called Sarrope.

The island was home to a population that was one of the most fierce and warlike in Florida. The inhabitants of Sarrope were skilled in cultivating a wide variety of crops, particularly coontie

root, which they traded and used to make high-quality bread. The Spaniards noted that they had become quite wealthy from trading these crops. Their sphere of influence extended 15 miles from the Lake. The Spaniard also recounted a story that demonstrated the strength and confidence of the island population. According to the Spaniard, the inhabitants of the island were so confident in their strength that they angered both the Ais and the Calusa without fear of retribution. King Oathagua had attempted to secure an alliance with the Calusa by arranging a marriage between his daughter and Calos. However, the bride and her entire retinue of maiden attendants were seized by the Sarrope inhabitants on their way to the Calusa and were forced to remain on the island, where they were required to marry the local men instead.

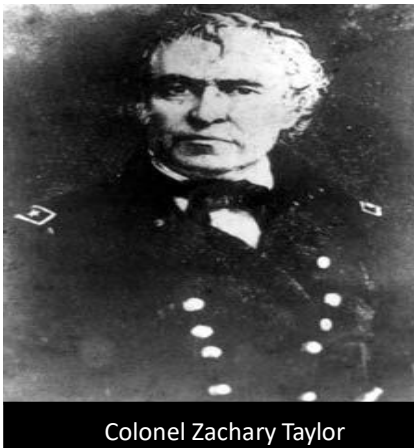


Figure 1. Early maps of Lake Kissimmee (then called Sarrope), 1591 – left, and 1703- right.

The Kissimmee River Basin region was home to several Native American tribes, including the Jororo, Mayaimi, and Seminole. The name Kissimmee originates from the language of the Jororo people and translates to “long water.” The Kissimmee River Basin would have fallen within the Jororo territory. The Jororo were hunter-gatherers who also tended small plots of maize and a few other vegetables. The area likely served as a stronghold for the early Native American culture until the Creek raids in the early to mid-1700s. Although it is not entirely clear how much the Creek raids impacted this specific area, as most accounts are from northern Florida tribes and coastal areas, it is evident that these raids marked the beginning of a significant decline in the tribes that were indigenous to Florida. In 1708, a man named Thomas Nairne from Carolina led 30 Yamasee warriors on a raid through central Florida to enslave Native American Indians. According to the notes from his journey, the village on Brahma Island was called "Cacema," which eventually gave rise to the name "Kissimmee" (Figure 2). Eventually, the Jororo and most of the nearby tribes migrated to St. Augustine, seeking protection, and came to be known as the Costas or Spanish Indians.



During the British colonial period that began in 1763, the region experienced immigration from the Creek and Yamasee tribes. Throughout the Second Spanish Period, the surviving Costas from the interior worked for Spanish fishing villages and rounded up native-range cattle, driving them to the coast for transportation to other Spanish colonies.



The Kissimmee River Basin region remained practically unknown to most Floridians until the Second Seminole War. In 1837, the military began making detailed surveys of the area and established a system of frontier forts intended to keep the Seminoles south of Lake Okeechobee. Fort Gardner, also known as Fort Gardiner, named after a lieutenant who was one of the last to die in the Dade battle of the First Seminole War, was an important outpost on the Kissimmee River Chain of Lakes between Lake Hatchineha and Lake Kissimmee. It was from this fort that Colonel Zachary Taylor (the future President) and 600 soldiers marched out in 1837 to engage in the largest battle of the war, north of Lake Okeechobee, on Christmas Day.

The Duke of Alagon Land Grant

In 1818, just before the end of the Second Spanish period, the Spanish king granted over 12 million acres to the Duke of Alagon. This was the largest land grant in Florida, and it included the Kissimmee basin and most of the rest of central Florida west of the St. John's River and north of Lake Okeechobee. The land was granted to the Duke because he had assured the king that if he had possession of it, he would work with various private enterprises to ensure that the land was settled and improved for agricultural production. However, the Duke promptly sold the land to Richard S. Hackley, of Virginia, who, in turn, leased some of it to a private corporation in 1836.

The treaty that ceded Florida to the United States included a written declaration that declared a land grant void. However, before the treaty was executed, the Spanish king had just agreed to become a constitutional monarch instead of an absolute monarch. Hence, he was limited in his powers and could not take private property without compensating the owner and then, having the action ratified by the Cortes. As a result, the grant and transfer were disputed by the Territory, then the State of Florida. After years of being contested, the U.S. Supreme Court decided in 1853 (*John Doe v. Braden* - Braden was the founder of Bradenton) that the grant and transfer were not valid. The court asserted that the treaty was considered the supreme law of the land unless it violated the U.S. Constitution, not the Constitution of Spain, and assumed that the King had the necessary power to annul the grant. Since the transfer to Hackley occurred before the final ratification of the treaty in February 1821, it became a political decision rather than a judicial one. The treaty assumed the King had the necessary power to annul the grant, so the U.S. was not obliged to recognize the validity of the land grant.

The Court stated that taking ownership of Florida while so much land was in possession and ownership by a single individual would be "altogether inconsistent with the principles and policy upon which this government is founded." With the title being cleared by the U.S. Supreme Court and ownership by the Federal Government confirmed, the land could pass unchallenged to the State as part of the Swamp and Overflowed Lands Act passed by Congress in 1850. Ironically, the State later transferred nearly all the Alagon/Hackley lands to Hamilton Disston - a single individual - in 1881 for the same purpose that the king had granted the land to the Duke of Alagon: improving the land for agricultural production and encouraging settlement. This made Disston the largest individual landowner in the United States.

Table 1 highlights key historical dates pertinent to the Kissimmee region’s history and provides a chronology for the Kissimmee River channelization and restoration projects.

Table 1. Overview and chronology of the Kissimmee region’s history.

Chronology	Activity	Results and Impacts on KR Floodplain
1837	Fort Basinger constructed.	Trails constructed between forts spaced approx. 20 miles apart allowed settlement of the area when the Armed Occupation Act was passed in 1842.
1850	U. S. Congress passed the Swamp and Overflowed Land Act.	Allowed the state legislatures to transfer the ownership of swamp and overflowed lands to private entities to reclaim the land through drainage and levee projects.
1858	Third Seminole War ended.	Forced the Seminoles to relocate south of Lake Okeechobee, opening Kissimmee basin to settlement.
1881-1884	Hamilton Disston’s Atlantic and Gulf Coast Canal and Okeechobee Land Company complete canals and dredging projects throughout the region. Navigable waterway established between Fort Myers and St. Cloud. Started clearing operation to keep the river navigable.	Water levels in the Upper Basin dropped; the River straightened for steamboat traffic; Vegetation communities along the navigable channel destroyed.
1890s	Kissimmee Island Cattle Company (KICCO) acquired land south and west of Lake Kissimmee to use the native range for cattle ranching.	Increased cattle grazing in the floodplain.
1915	Ditches dredged throughout the west of the river to establish KICCO’s company town, resulting in the untenable situation of having a settlement and large operation in the 100-year floodplain.	Drained wetlands in the 100-year floodplain.
1926-1947	Major hurricanes strike in the Kissimmee River Valley. Subsequent “Crying Cow” report demanded better flood protection for agricultural lands in the Kissimmee River Valley after a 100-year flood event.	The flood events revitalized the floodplain and surrounding wetlands.
1948	Congress authorizes the Central and Southern Florida (C&SF) Project for Flood Control and Protection.	Set the stage for massive drainage and flood control projects.
1954	The Kissimmee River channelization is authorized by Congress.	

Table 1 Continued. Overview of the region’s history and chronology of the Kissimmee River Restoration Project.

1954-1960	Planning and design completed for the Kissimmee River flood control project.	
1962-1971	Channelization of the Kissimmee River.	Transformed the river floodplain ecosystem into a series of impoundments. Drained most of the floodplain.
1971-1974	Environmental impacts from the channelization are recognized by the Central and South Florida Flood Control District, and planning efforts to restore the River begin.	
1974	The State purchased 1718 acres within Blanket Bay; granted a flowage easement to SFWMD.	State acquisition kept Blanket Bay from being developed.
1978	1st Feasibility Study for the restoration conducted.	
1983-1985	KICCO in Pool A acquired by the SFWMD. Demonstration project initiated in 1984.	Removal of the existing development from the floodplain. Initiation of the restoration.
1990	2 nd Feasibility Study for the restoration conducted.	
1992	Kissimmee River Restoration Project authorized by Congress.	The first 1000 feet of backfilling was completed in Pool B.
1994	Test filled project conducted.	
1997	Construction begins on Pool A restoration projects. Spoil piles on the south side of Blanket Bay removed; tie-back levees at S-65A constructed.	Increased flows to the Kissimmee River. Increased water storage of Pool A wetlands.
1999-2001	Phase I of the restoration project. Removed the S-65B structure and backfilled of the C-38 in Pool C.	Emergent and shoreline vegetation has reappeared and is thriving. Waterfowl returned. Water quality improved. Wildlife populations increased.
2017-2021	Backfilling of Reach 2. Dredged new channels; Backfilled 6.5 miles of the C-38 Canal; Removed S-65C structure. Construction of the S-69 weir. Completion of the Kissimmee River Restoration Project.	The S-69 weir serves as the endpoint for the C-38 Canal backfill, maximizing the area of wetlands to be rehydrated in the floodplain. The weir dissipates the energy of flows as they transition from the floodplain to the remnant C-38 channel. Completion of the project facilitates the implementation of the Headwaters Revitalization Schedule (HRS).

Settlements in the Kissimmee River Basin

Before the 1840s, human habitation was sparse in the Kissimmee Basin. English-speaking settlers began moving to the area during the 1840s and 1850s, primarily cattlemen and homesteaders who lived mainly off the land and maintained their own small vegetable plots. The government would routinely grant 160-acre tracts to single men or heads of households through successive acts of Congress, such as the Armed Occupation Act of 1842. This act granted 160 acres to settlers who submitted a permit to the regional land office to build and live in a house on the land and cultivate at least 5 acres for a minimum of 5 years. The 160-acre parcels had to be located no closer than 2 miles from an existing military outpost. The trails connecting the military outposts were roughly 20 miles apart, which facilitated settlement in the region after the Armed Occupation Act was enacted in 1842. Fort Kissimmee and Fort Basinger, located along the Kissimmee River, and Fort Gardner to the north, were among the outposts that experienced a surge in settlers (**Figure 4**). Most settlers were veterans of the Second Seminole War who had become familiar with the best parcels of land during their routine patrols. These early settlements were sparse, as only 1,250 homesteads were awarded under the Armed Occupation Act south of Palatka, FL. With few homesteads in the area, the Brighton Seminoles were largely free to roam, establishing hunting and trading camps along Shingle Creek on the west shore of Lake Kissimmee. Their settlements were located along a small lake in Polk County, roughly midway between Lake Pierce and Lake Rosalie.



1838 sketch of Fort Bassinger along the west side of the Kissimmee River from Capt. Backus's Diary.



Figure 4. 1879 land cover map of the Kissimmee Basin depicting the settlement towns along the river.

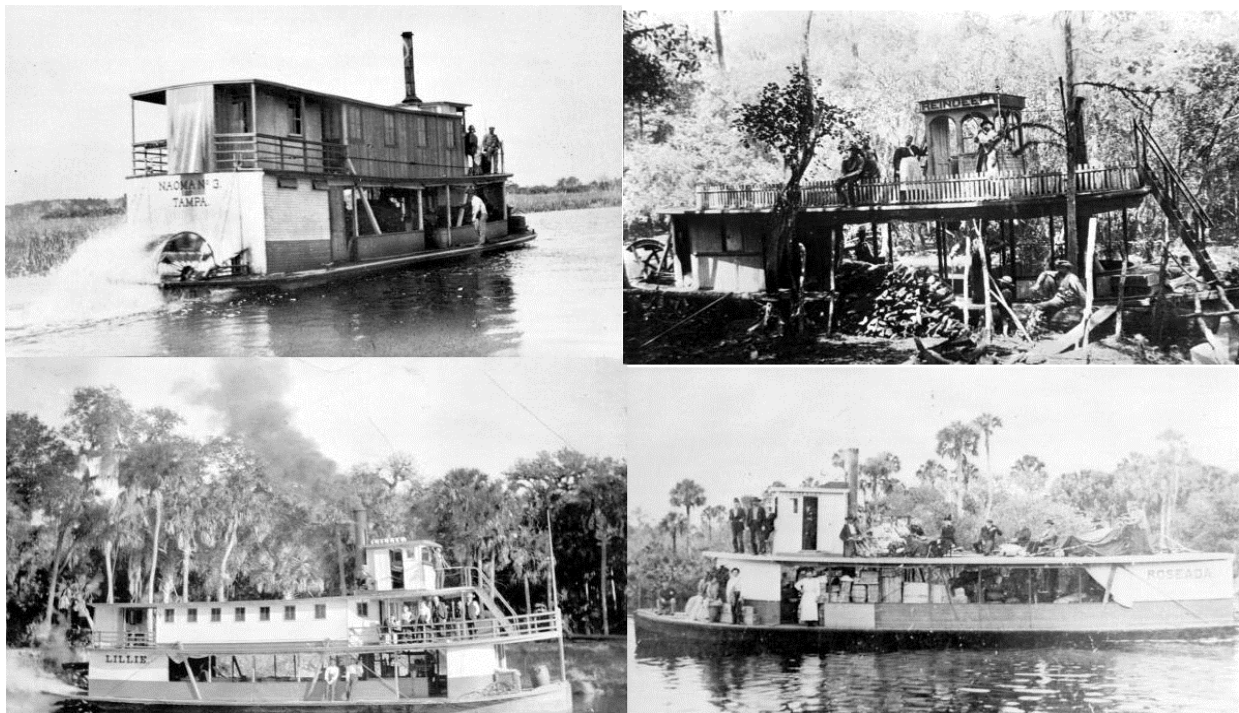
In 1850, the U.S. Congress passed the Swamp and Overflowed Lands Act, which granted states federally owned wetlands to develop internal improvements. Florida received ownership of approximately 20 million acres, including the lands surrounding the Kissimmee River and the Everglades. Swamp land would become the currency of the State and be traded and sold to encourage the settlement and development of South Florida. The Swamp and Overflowed Lands Act of 1850 incentivized the draining of large tracts of land, which opened the area to more homesteaders and development.

During the last two years of the Civil War, many of the Seminole War veterans/homesteaders in the Kissimmee region had been serving in armies in the northern states of the Confederacy but were called home to form a special cavalry battalion to help protect and drive cattle from the interior of the peninsula to Georgia. The land was under the command of Captain Francis A. Hendry, from whom Hendry County is named.

Navigation and Transportation

Steamboats served as the main mode of transportation for passengers and commerce in the region. More settlers began migrating to the area as regular service on several 50-foot steamers started traveling the Kissimmee Chain of Lakes and the Kissimmee River. At the time, steamboats were limited by the condition of the area. Steamers with a two-foot draft, referred to as workhorses of the river, were the only vessels that could be accommodated by the natural river system, and then only during the wet season. These workhorses of the river included the Mary Bell (sunk in 1884), the Lillie, the Tallulah (which ran aground near Ft. Gardner but was later raised, refurbished, and renamed the Reindeer), the Naoma, and the Roseada. The steamers' route ran from Kissimmee to Fort Basinger on a regular basis, as often as water levels permitted.

These steamers were the primary means of transportation for passengers and commerce. The river system was known to be extremely long and torturous, sometimes taking three miles to cover by the river, a distance that was only a quarter mile in a straight line. Every three to four years, dry periods in the winter and spring would close the water route for six to eight months, leaving the settlers to fend for themselves and subsist on their small garden plots, hunting, fishing, and whatever meager provisions they could obtain through small boats and horseback. Commerce came to a complete halt during dry conditions, and entire citrus and winter vegetable crops were left to rot in the fields. Local politicians began to lobby Congress for improvements to the river system to accommodate larger steamers with a deeper draft year-round. Congress then directed the USACE to investigate the possibility of expanding the steamer line from Kissimmee to Florida's southwest coast.

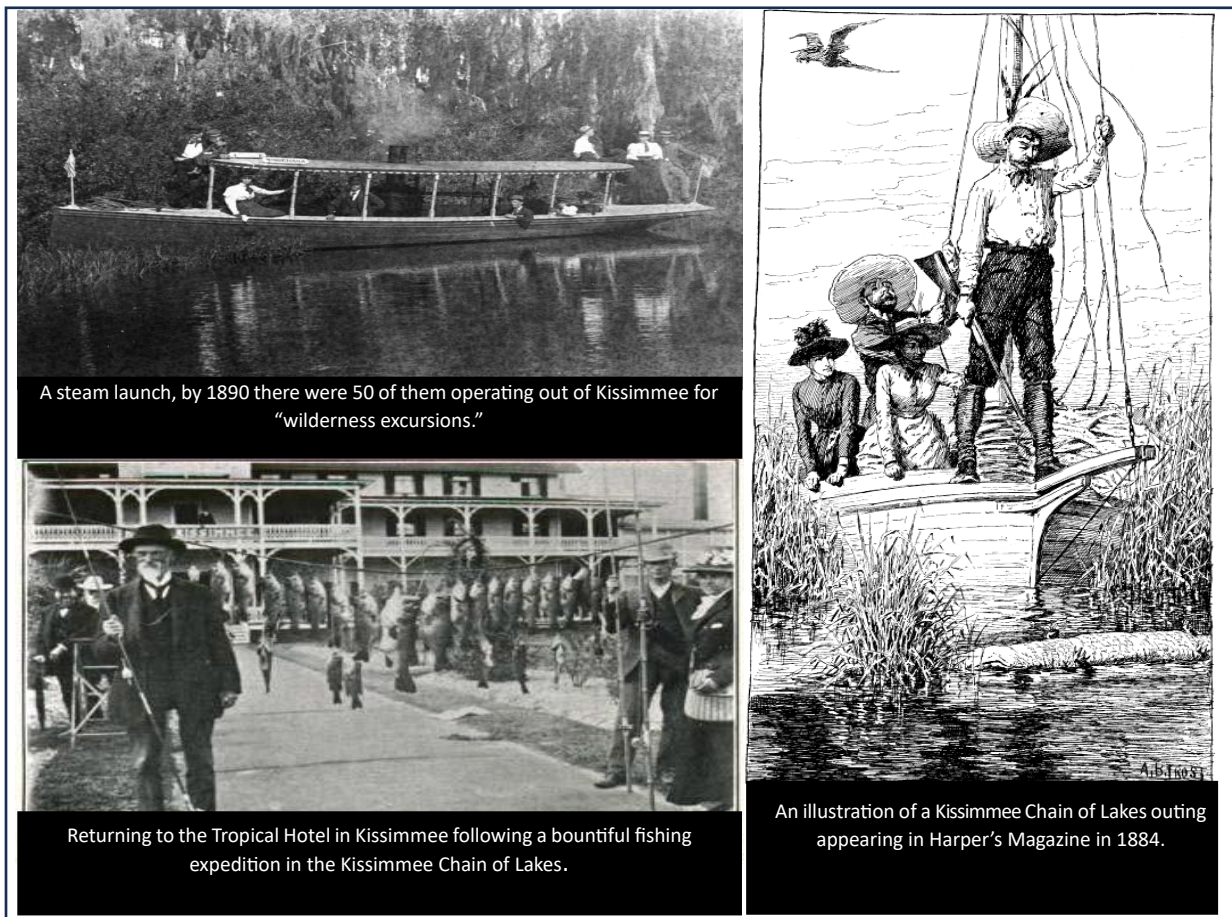


The 50-foot sternwheel steamers of the Kissimmee River system, clockwise from upper left: the Naoma, the Tallulah, the Roseada, and the Lillie.

The USACE completed its feasibility survey in 1882, which provided a cost estimate for dredging shoals, removing snags and overhanging limbs, and creating a series of cutoff canals to shorten the trip and accommodate larger steamboats. At the same time, a businessman from Philadelphia, Hamilton Disston, started making these types of improvements to the river under a contract with the State.

Meanwhile, efforts to establish a railroad system in the region had been ongoing for over a decade. The cattle trade between South Florida and Cuba in 1870 reignited local enthusiasm for building a railroad line in Tampa on the Gulf Coast. However, the expansion of the South Florida Railroad, which connected Sanford to Orlando, was not completed until December 1880. Later, in March 1882, the South Florida Railroad extended its tracks to Kissimmee. The line from Kissimmee to Tampa eventually opened in 1884. Although the first improved roads didn't reach the Kissimmee areas until the 1930s, railroads and roadways gradually replaced the Kissimmee River system as the primary means of transportation.

Tourism



The towns of Orlando and Kissimmee were thriving during the 1880s. The Town of Kissimmee became the main port for steamboats navigating the Kissimmee River from Lake Tohopekaliga to

Okeechobee. The land around the chain of lakes had been essentially depopulated since the first part of the Second Seminole War in the mid-1830s, and as a result, supported a large game and fish population. The town of Kissimmee was the end of the line for many southbound tourists; a frontier town perched on the edge of a vast wilderness. Adventure books and articles in Harper's Magazine and Field & Stream introduced the Kissimmee River basin to tourists and sportsmen from the Northern U.S. and Europe. These adventure seekers stayed at the Tropical Hotel, which was right off the main pier on Lake Toho. A stay at Tropical costs \$3.50. Little steam launches could be rented for \$10 to \$15 per day, a sailboat from \$3 to \$6 per day, and a guide for \$1 or more per day. An out-of-state hunting license cost \$25 and had no restrictions on the type or quantity of game that could be hunted; everything from panthers to bears to manatees was permitted to be hunted with the license.

Hunting cabins were established on the eastern shore of Lake Kissimmee. Largemouth bass were reported to be so plentiful that it was often taken for granted that finding dinner would not be a problem. The hunt guides would dangle a hook behind their boats and receive a strike every few minutes as they traveled downstream. Tourists that came for the hunting were said to have rarely gone home empty-handed. The Seminoles camped on the west shore were only too happy to trade trophy horns and hides to returning tourists who had come up short. Brahma Island (then called Bremer Island) was a popular hunting destination, as was the Gardner Marsh area between Lake Kissimmee and Lake Hatchineha.

Later, the opening of Disney World and other tourist attractions in the early 1970s greatly boosted the area's economic growth. As a result, both tourism and residential development in the region increased significantly by the late 1970s.

Hamilton Disston and the River Drainage Projects (1881 - 1909)

From the year of statehood in 1845, the Florida legislature passed several resolutions to drain the Everglades and wetlands in the interior of Florida. The ability to successfully drain those areas had already been demonstrated by English settlers, who successfully drained wetlands on the East



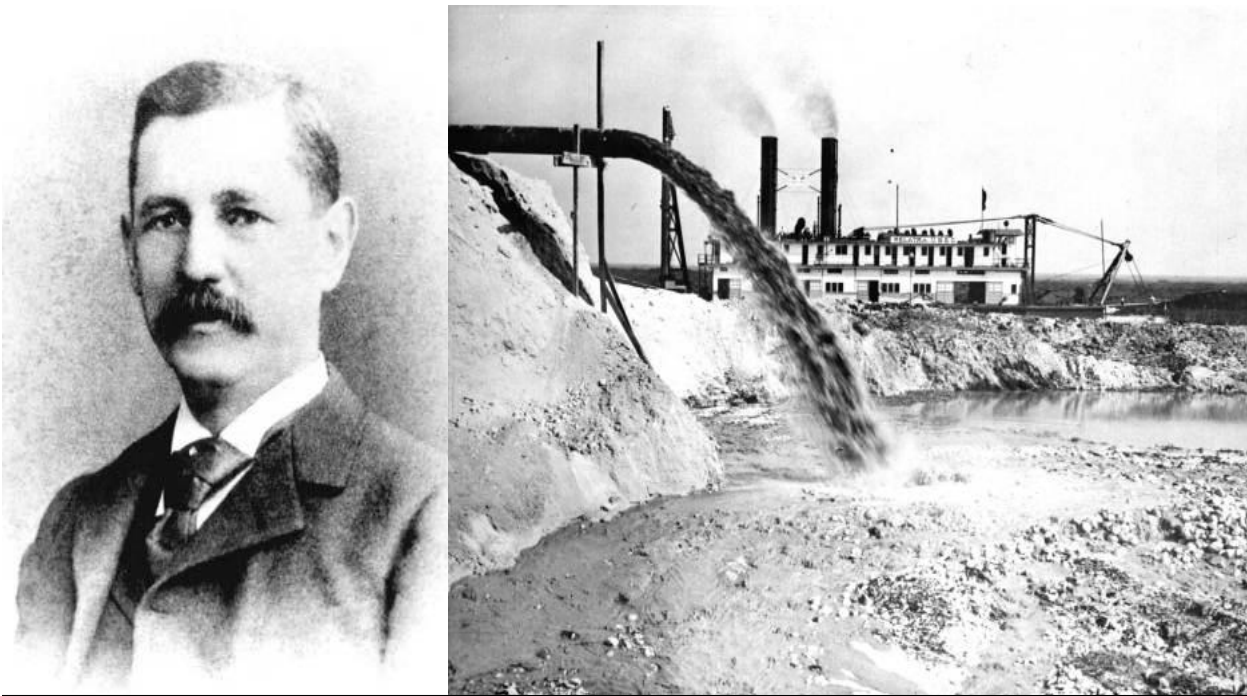
Buckingham Smith

Coast in the late 1700s and converted these lands to sugar cane and other crops. When the Seminole boundaries were being mapped under the Treaty of Ft. Moultrie in 1823, multiple military engineers and surveyors had evaluated the possibility of a drainage project for the Everglades. To the surveyors' surprise, they discovered that the Everglades basin was several feet above sea level and could be drained by dredging canals that tied into the natural river systems along the coast. In 1847, U.S. Senator J.D. Westcott Jr. requested a report on the feasibility of reclaiming interior organic wetland soils through drainage for agricultural production. Buckingham Smith was appointed to create the report and submitted his findings to the U.S. Treasury Department in 1848. His report outlined how high-quality organic soils in the Kissimmee Chain of Lakes, around Lake

Okeechobee, and within the Everglades basin could be drained and cultivated by lowering the water level of Lake Okeechobee by 5 to 6 feet with a series of drainage canals that would simultaneously create a cross-state navigable waterway through the lake.

Hamilton Disston was an entrepreneur from Philadelphia who organized the Florida Land and Improvement Company and the Atlantic and Gulf Coast Canal and Okeechobee Company. The State entered into an agreement with Disston in 1881 where Disston purchased four million acres of odd-numbered sections of a nine-million-acre drainage district that included most of the interior peninsula of Florida, south of Kissimmee. Disston paid 25 cents per acre and was also entitled to half of the remaining sections upon their successful reclamation. Railroad companies also received a large portion of the remaining even-numbered sections because the legislature had promised them 4,000 to 10,000 acres for every mile of railroad constructed. The general policy of the railroad companies and Disston was to sell off the extra land to settlers and other investors.

In 1882, Disston initiated a reclamation operation by constructing a large steam-powered bucket chain dredge barge. The barge could dig a 37-foot wide and 6-foot-deep canal at a speed of 12 linear feet per hour. As the barge moved through the prairies, it automatically built a levee on either side. A crew of 12 worked on the dredge to begin constructing a canal that connected Lake Tohopekaliga and Cypress Lake during the summer of 1882. Disston employed the steamer Roseada to move the dredge. The barge was propelled by the lake water, which pushed it towards Cypress Lake. By May 1883, the canal was completed, and a steady current of 2½ miles per hour had drained Lake Tohopekaliga by 5 feet, draining 40,000 acres of land. However, Disston only cultivated a small portion of this land, with 2,000 acres planted in sugar cane and 6,000 acres in rice.



Hamilton Disston and his steam dredge

Disston's company also improved navigation on the Kissimmee River by creating cutoff canals, removing snags and limbs, and dredging shoals. By 1884, the Kissimmee River and Kissimmee Chain of Lakes were navigable by 100-foot steamers from Ft Myers to the Town of Kissimmee. Disston's Florida enterprises were effectively terminated by plummeting land prices following the 1895 Great Freeze, which followed a previous freeze in 1894, the economic panic of 1893, and the elimination of a two-cent-per-pound subsidy on sugar in 1894.

Between 1902 and 1909, several additional improvements were made to the Kissimmee Chain of Lakes to enhance navigation. These included clearing out shoals, armoring the entrances to Disston's canals to prevent further shoaling, and creating more cut-off canals. This work was done to secure a minimum three-foot deep and 30-foot-wide channel navigable from Kissimmee to Ft. Basinger.

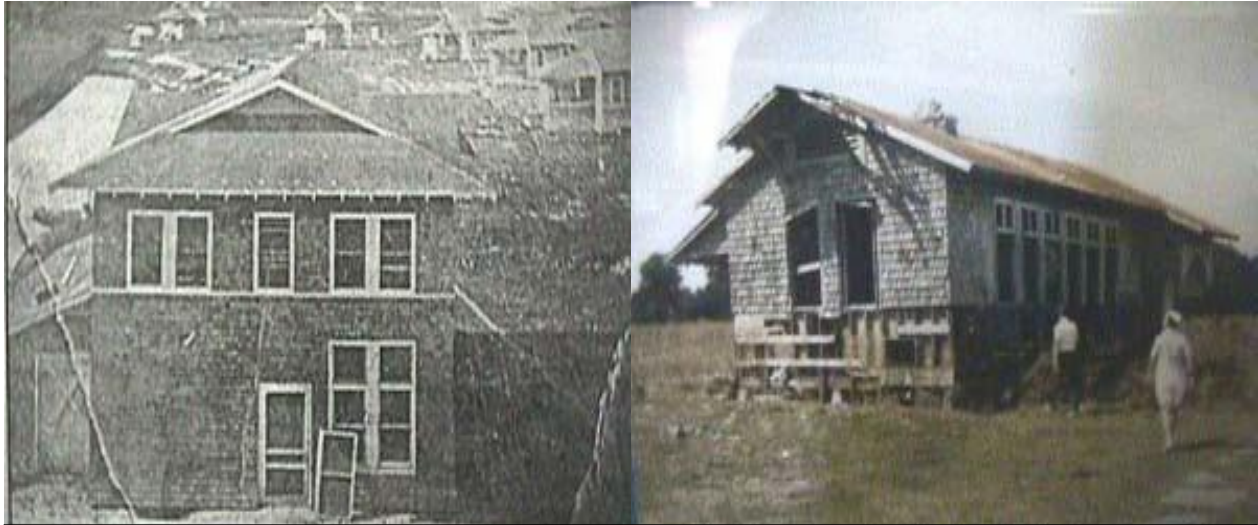
Timber and Cattle

Cattle ranching in Central and South Florida saw significant growth from the 1840s up to the Civil War. Cattle were shipped to the Confederate Army or traded with Cuba for supplies. After the war, the cattle industry was revitalized and established itself as the primary industry it remains today. The improved river navigation drew ranchers to settle in the Kissimmee River Basin. Land southwest of Lake Kissimmee stayed unfenced, with scattered homesteads along the river's banks. These residents were later incorporated into the small town of KICCO, a small town founded by the Kissimmee Island Cattle Company, which coordinated the annual drives of the native-range cattle. Livestock grazing continued to increase, relying less and less on the free-roaming Spanish cattle that had long been part of the landscape. From 1926 to 1929, over 5,000 "purebred" cattle were introduced into the area.

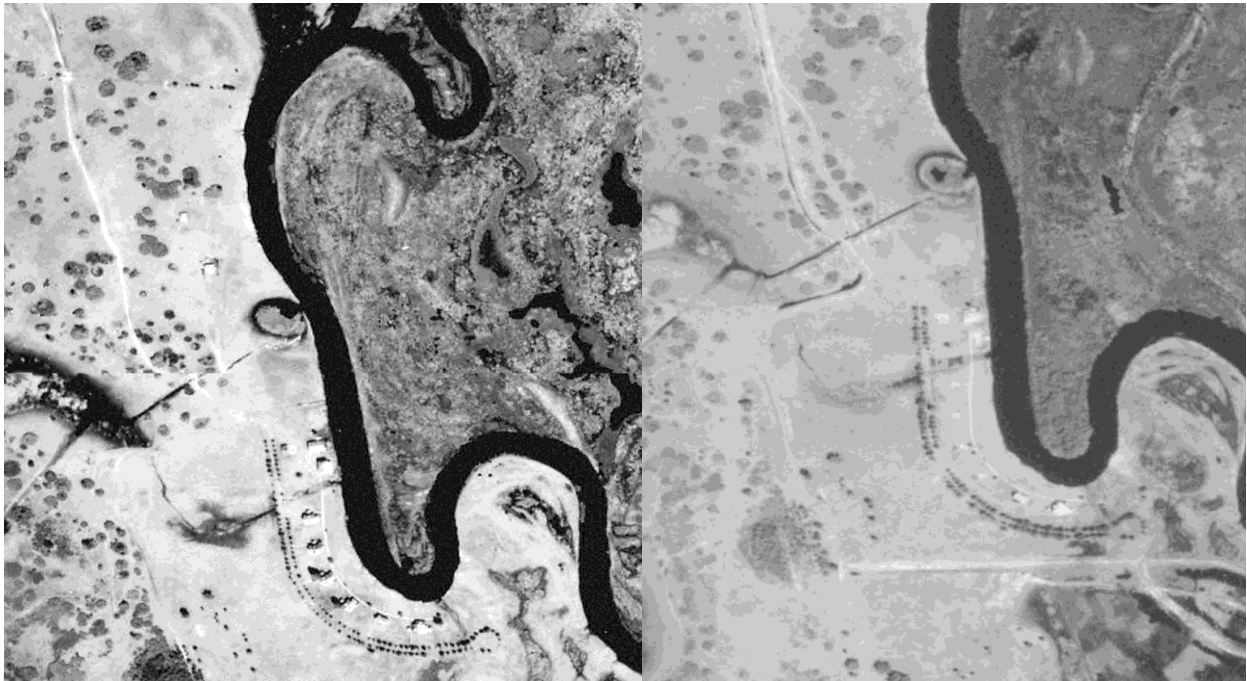


The channelized river drained the floodplain wetland, later converted to improved pasture.

The town was established at the site of a former steamboat port and supported operations and employees of KICCO from around 1915 to the late 1920s. Although the town declined after this period, several homesteads remained occupied until a major flood in 1947 destroyed many structures. Remnants of these buildings persisted on the property into the late 1980s. Following the acquisition of the site by the District, the Florida Division of Historical Resources (FDHR) surveyed the remaining house and school building for historical preservation. As no agencies or organizations were able to facilitate the relocation of these buildings, they were ultimately demolished.



The houses (left) and school building (right) at KICCO.



Town of KICCO, 1941

Town of KICCO, 1953

The improved navigation also provided access to the pinelands in the Kissimmee River basin for timber and turpentine operations. The pines were heavily logged in the 1920s (**Figure 4**). By 1929, Polk County had 21 operational sawmills. The remnants of a turpentine operation still existed near the southwest shore of Lake Kissimmee.



A river steamboat loading rosin for transportation to a turpentine still.

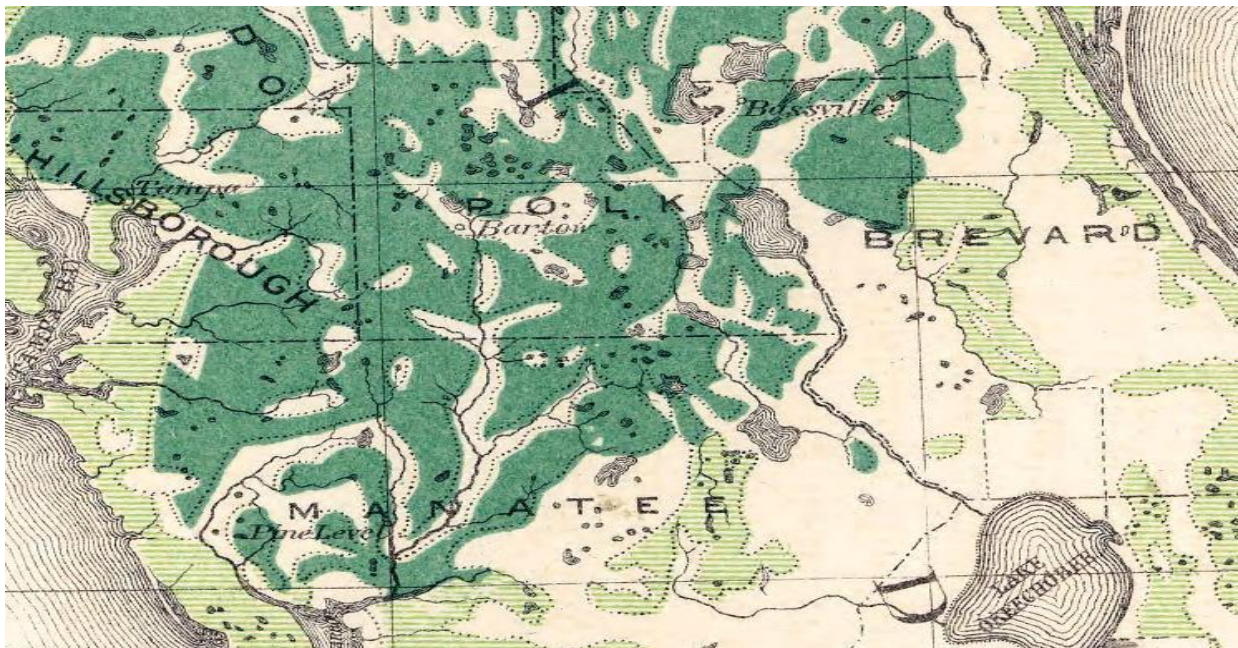
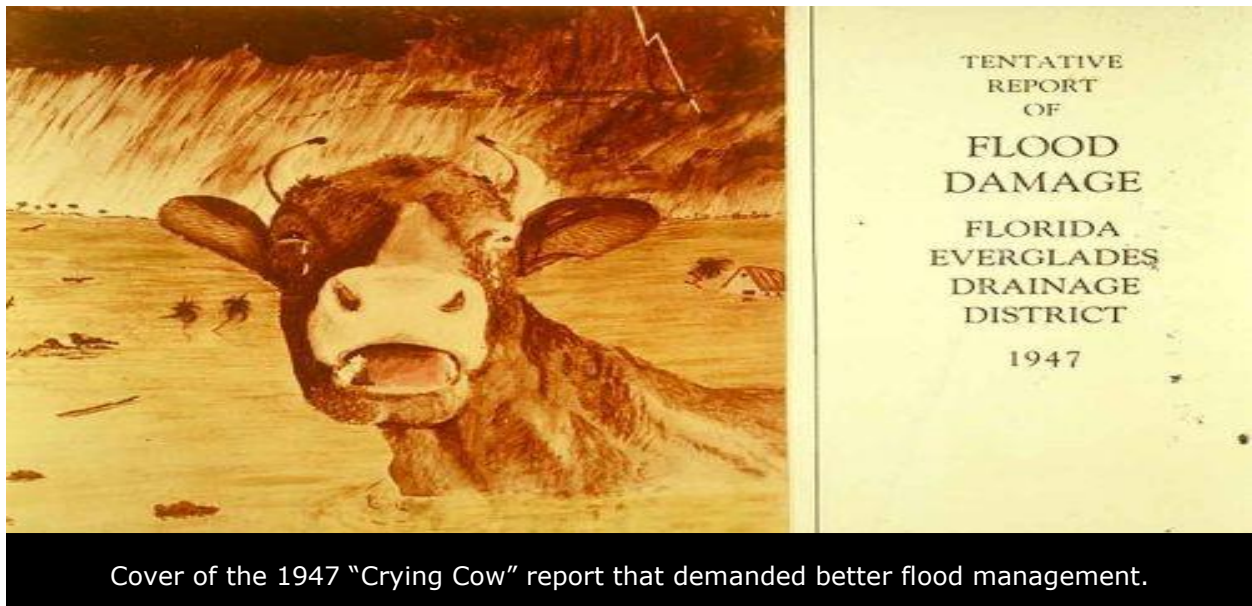


Figure 5. 1881 timber map with longleaf pine in dark green and slash pine in light green.

Kissimmee River Flood Control and Restoration Projects

After World War II, the floodplain experienced more rapid settlement. The establishment of the Everglades Drainage District by the State of Florida in 1907 and the enactment of the General Drainage Act in 1913 also contributed to the rapid development in central and south Florida, setting the stage for extensive flooding in the Kissimmee River basin. These settlements suffered extensive damage during a series of hurricanes in 1926, 1928, and 1947. The mass flooding events following the 1947 hurricane intensified public pressure for measures to reduce the threat of flood damage within the Kissimmee system. The State of Florida responded with a request to the federal government to design a flood-control plan for central and southern Florida.



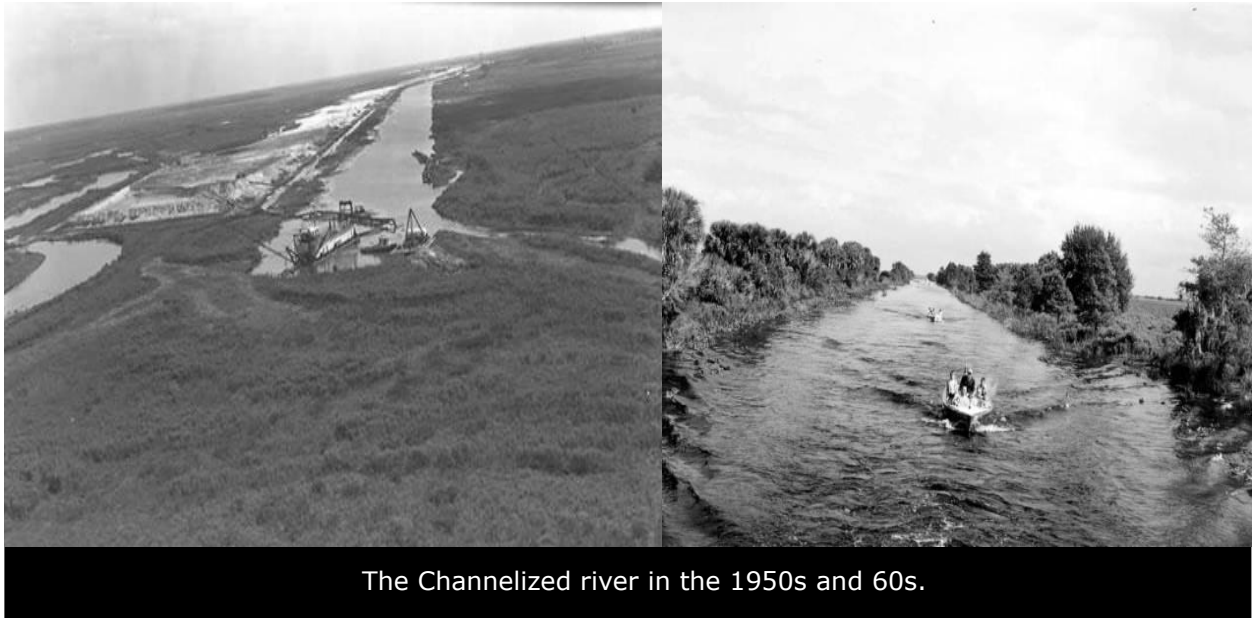
Cover of the 1947 "Crying Cow" report that demanded better flood management.



Figure 6. Photographs of the 1948 flooding in Kissimmee.

In 1948, Congress authorized the USACE to initiate construction of the Central & Southern Florida (C&SF) Project for Flood Control and Protection. In 1954, Congress authorized the Kissimmee River portion of the project, which was planned and designed from 1954 to 1960. The state acquired roughly 11,312 acres of land for the channelization of the Kissimmee River. Between 1962 and 1971, the meandering river was transformed into a 56-mile-long, 30-foot deep, 300-foot-wide canal. Excavation of the canal and deposition of the resulting spoil eliminated approximately 35 miles of river channel and 6,200 acres of floodplain wetland habitat. The floodplain was transformed into a series of impounded reservoirs, designated as Pools A-E (**Figure 7**). Six water control structures regulated inflow from the Kissimmee Chain of Lakes, the first of which was located at the outflow of Lake Kissimmee into the Kissimmee River. Water control structures and canals were constructed in the Kissimmee region, enabling the regulation of water flow within and between the lakes in the Upper Basin.

The hydrologic alterations and the transformation of the river-floodplain ecosystem into a series of deep impoundments drained much of the floodplain, eliminated historical water-level fluctuations, and substantially modified flow characteristics. Approximately 26,000 to 31,000 acres of pre-channelized floodplain wetlands were drained, covered with spoil, or converted into canals. The floodplain at the lower end of each pool remained inundated, but the pre-channelization water level fluctuations were eliminated, and the upper pools dried out. The effects of channelization, including these hydrologic alterations, largely destroyed the floodplain wetlands and degraded the fish and wildlife habitat of the Kissimmee River ecosystem. Most of the converted floodplain was used as ranch land, owned by local ranchers for beef cattle production. To support ranch operations, extensive drainage ditch networks were constructed to remove water from the land. Additionally, the natural vegetation was replaced with non-native pasture grasses.



The Channelized river in the 1950s and 60s.

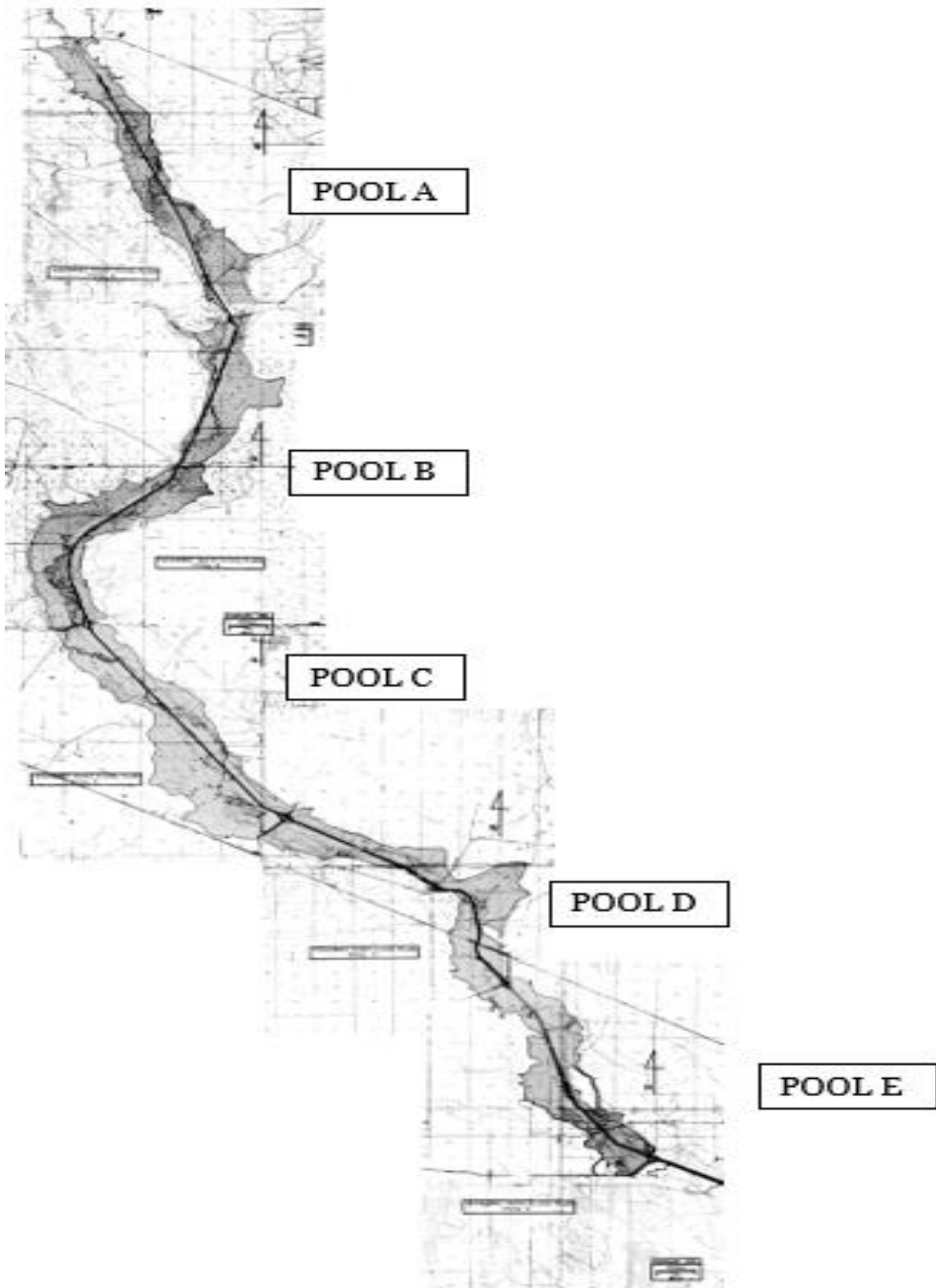
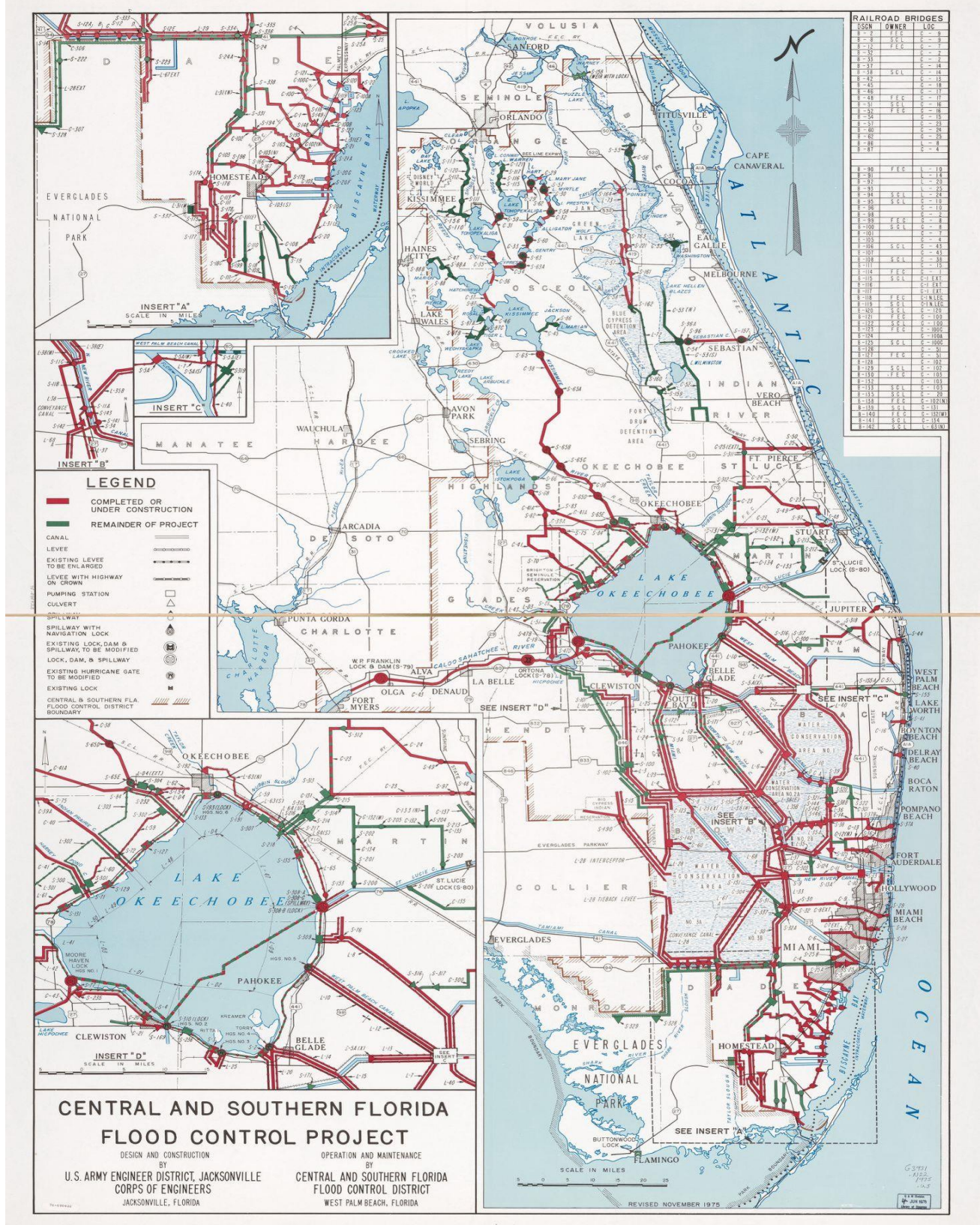


Figure 7. Map showing Pools A-E created for the C&SF Project.

Kissimmee River Management Area General Management Plan 2025 – 2035
South Florida Water Management District, Land Stewardship Section



Map 1. 1975 map showing the C&SF Project drainage network.

In 1981, the Florida Legislature passed the Save Our Rivers program, which allowed the five water management districts to acquire environmentally sensitive land. This legislation, §373.59, Florida Statutes, established the Water Management Lands Trust Fund and granted the water management districts the authority to acquire lands necessary for managing, protecting, and conserving the state's water resources. Once acquired, these lands would be restored to their natural state and managed for conservation.

The Kissimmee River Restoration Project was authorized by Congress later in the 1992 Water Resources Development Act as a joint partnership between the District and the USACE. The project was initially designed to restore over 40 square miles of river and floodplain ecosystem, including 43 miles of meandering river channel and 27,000 acres of wetlands. The restoration involves reestablishing inflows from the Kissimmee Chain of Lakes to achieve flow velocities and volumes similar to those that existed prior to channelization. The construction of the Kissimmee River Restoration Project involved backfilling approximately 22 miles of the C-38 Canal, reconnecting the original river channel across the backfilled sections, restoring portions of the river channel that were destroyed during the construction of the C-38 Canal, and removing the S-65B and S-65C water control structures along with their associated tieback levees.

The District began acquiring additional land for water storage, water quality, and flood control through the Save Our Rivers initiative. This decision followed findings from District and USACE scientists and engineers involved in the Kissimmee River Restoration Project, who concluded that an additional 100,000 acre-feet of water storage was necessary in the Headwaters Lakes (Lake Kissimmee, Cypress Lake, Tiger Lake, and Lake Hatchineha) to ensure adequate water levels in the Upper Basin to provide base flow and seasonal flow variability needed for the restoration project in the Lower Basin. The additional storage would be provided by modifying the regulation schedule and operational rules of the S-65 water control structure, thus allowing lake stages to fluctuate more naturally in response to rainfall and inflows from the Upper Basin's watershed. The proposed schedule modification would raise the current lake elevations from 52.5 feet to 54.0 feet NGVD. Additional real estate interests, such as fee title or flowage easements around the Headwaters Lakes, would be essential for the proposed modification. To date, 31,132 acres have been acquired in the Upper Basin and 86,914 acres in fee and shared-fee interests in the Lower Basin to support the Kissimmee River Restoration and Headwater Revitalization projects.

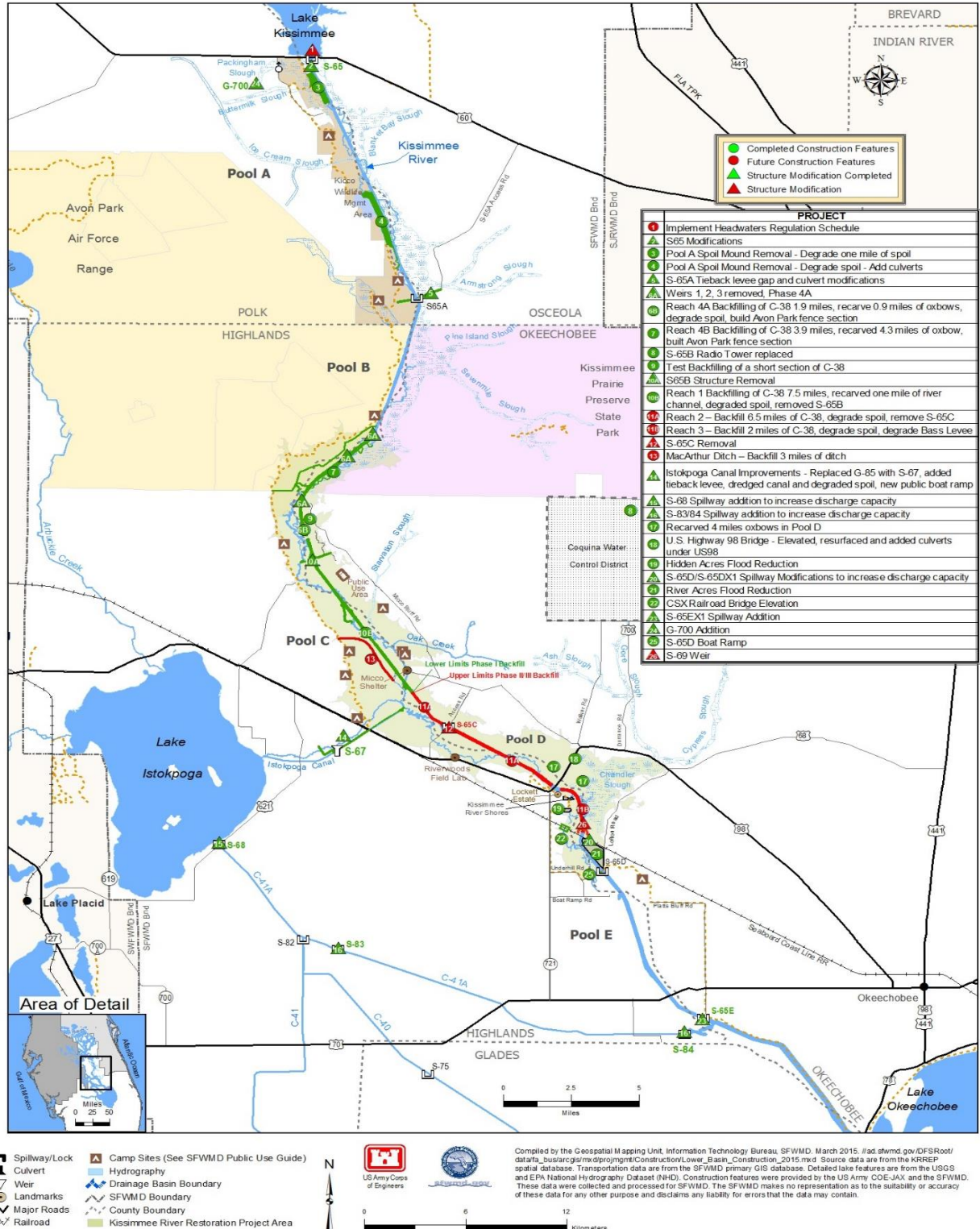
Starting in 1999, the Kissimmee River Restoration Project dismantled Structures S-65B and S-65C, eliminating the Pools B, C, and D impoundments. Additionally, Structures S-65, S-65A, S-65D, and S-65E were modified to enhance the management of flow and water levels in the Kissimmee River and its floodplain. **Map 2** illustrates the major hydrologic and structural features within the Lower Kissimmee Basin, including canals, water control structures, and impoundments. The river was reconstructed in four phases, with the final phase completed in July 2021. **Figure 8** highlights the construction activities and completion dates based on the 2021 USACE status updates.

Water levels and flow to or from the Kissimmee River and its floodplain are managed by control structures S-65, S-65A, and S-65D. The purpose of these structures is to aid the restoration of the river-floodplain ecosystem while also providing flood control. The regulated discharge from these structures is based on an established schedule known as the Interim Schedule. Several

variations of discharge plans under the Interim Schedule have been partially implemented in recent years in efforts to improve the duration and continuity of floodplain inundation in the Kissimmee River. The completion of the construction for Kissimmee River Restoration Project sets the stage for gradually implementing a new stage regulation schedule, known as the Headwaters Revitalization Schedule (HRS), for the S-65 water control structure and the Headwaters Lakes. With HRS, the lake's water levels will be allowed to rise to 1.5ft higher than the current S-65 Interim Schedule, increasing the water storage capacity of Headwaters Lakes to approximately 100,000 acre-feet. This will help restore hydrological conditions for the lake's littoral zones while achieving the desired durations and seasonal flow variability to the Lower Basin.

As of 2025, the remaining components of the Kissimmee River Restoration Project include finalizing and implementing HRS to reestablish historical hydrological conditions, along with continued monitoring to evaluate the success of ecological integrity restoration following HRS implementation.

Kissimmee River Management Area General Management Plan 2025 – 2035
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Map 2. 2015 map showing the construction features and completed phases of the restoration project.

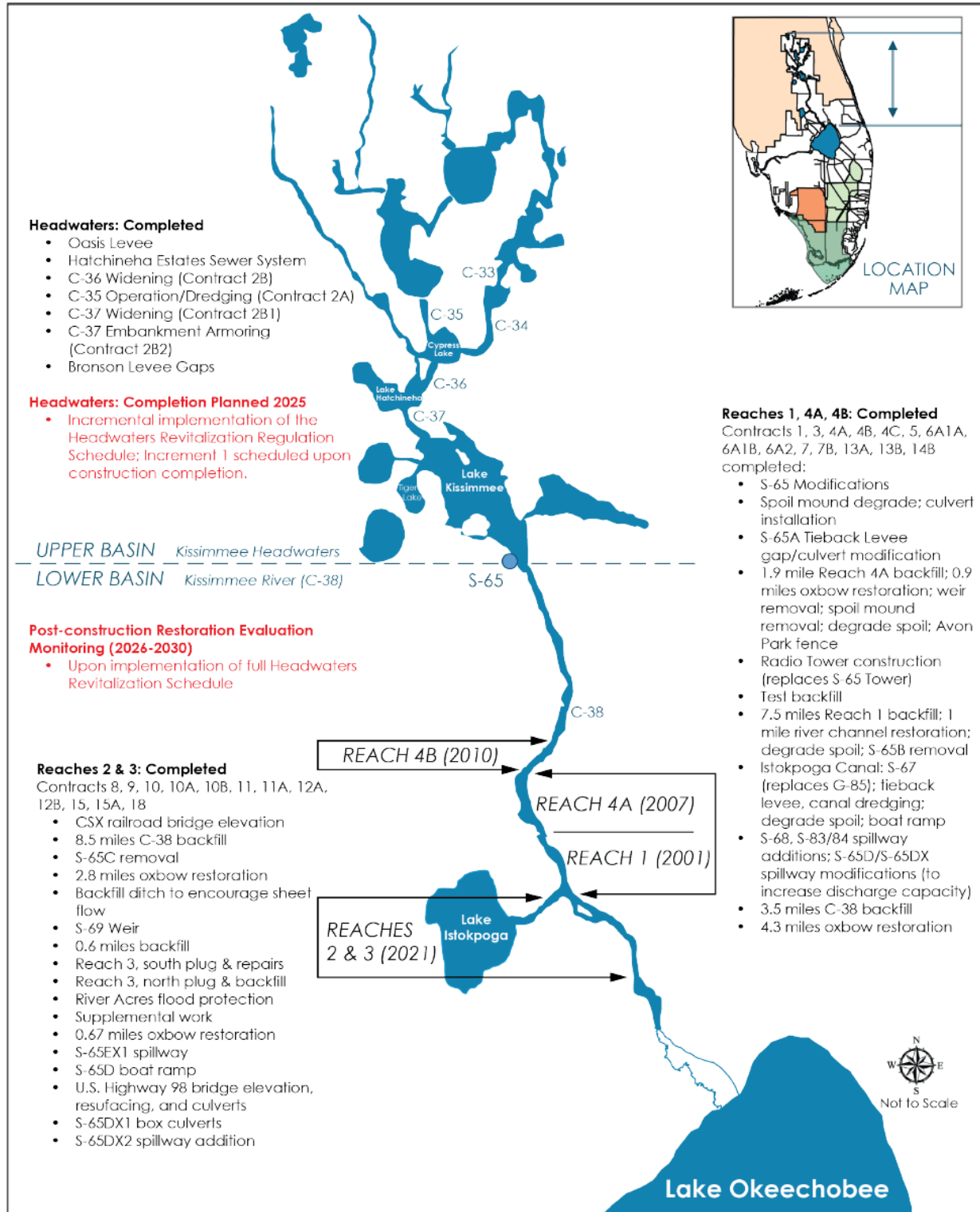


Figure 8. Completion of the Kissimmee River Restoration Project Construction phase.

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Appendix B.

KR MA Natural Communities

The KR MA comprises 13 distinct natural communities and several altered landcover types, based on a combination of vegetation, landscape position, and hydrology (FNAI 2010). These communities are managed through achieving and maintaining optimal fire return intervals for fire-dependent communities, control of invasive plant and animal species, maintenance of natural hydrological functions, maintenance of proper vegetative structure that represents the natural diversity of the community, maintenance of healthy populations of plant and wildlife species (including those that are imperiled or endemic), and maintenance of intact ecotones between natural communities across the landscape.

The natural communities within the KR MA were historically impacted by agricultural practices and other land use activities. Over decades, targeted management efforts such as manipulating vegetation structure, facilitating natural recruitment, and restoring hydrology have led to substantial ecological recovery and the successful restoration of key ecosystem functions. These communities now exhibit strong indicators of recovery, including the dominance of native plant species, reduced invasive cover, reestablished hydroperiods, improved vegetation structure, increased wildlife utilization, and the return of natural fire regimes. While no longer pristine, these systems are not classified as altered land cover types, as they can function as resilient, sustainable habitats that are consistent with Florida’s natural ecological patterns and overall align with FNAI’s descriptions of natural communities.

The natural communities and other landcover types identified on the KR MA are classified as follows:

- Altered Landcovers
- Baygall
- Blackwater Stream
- Cypress/Tupelo
 - Dome Swamp
 - Floodplain Swamp
- Dry prairie
- Freshwater Forested Wetland
- Hardwood Hammock
 - Mesic Hammock
 - Xeric Hammock
- Hydric Hammock
- Marshes
 - Depression Marsh
 - Floodplain Marsh
- Mesic Flatwoods
- Scrub
- Wet Flatwoods
- Wet Prairie

Community Description and Assessment

NATURAL LANDCOVER TYPES

BAYGALL (0.06%)

Baygalls are generally characterized as densely forested wetlands of bay species typically found on wet soils at the edges of floodplains, bases of slopes, and in depressions and stagnant drainages. Baygall can develop from deep swamps dominated by cypress/tupelo when peat accumulation raises the soil level, eventually allowing bay species to become established. As broad-leaved species proliferate, shade-intolerant Bald cypress (*Taxodium distichum*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*) seedlings are inhibited, shifting vegetation and soil conditions to favor broadleaf species that can germinate and grow in low light. Baygall is ranked statewide and globally as apparently secure (G4/S4), though it may be quite rare in parts of its range, especially at the periphery.

In the KR MA, the baygall community encompasses 24 acres. These small, dense thickets are mostly surrounded by hardwood communities. The common vegetation in the canopy includes loblolly bay (*Gordonia lasianthus*), red bay (*Persea borbonia* var. *borbonia*), swamp bay (*Persea palustris*), and sweetbay (*Magnolia virginiana*). The subcanopy is densely covered with dahoon holly (*Ilex cassine*), wax myrtle (*Morella cerifera*), red maple (*Acer rubrum*), fetterbush (*Lyonia lucida*), and sweet gallberry (*Ilex coriacea*). Groundcover typically includes a variety of ferns, including chain fern (*Woodwardia* spp.) and cinnamon fern (*Osmundastrum cinnamomeum*).

Broad-leaved baygall species are fire-intolerant and are best managed by maintaining high-quality upland-wetland ecotones around them. In the KR MA, prescribed fire is applied to adjacent communities and naturally extinguishes at the edges of the baygall. The objective for managing the vegetation in this community is to target the recurrence of nuisance and invasive species to achieve and maintain maintenance condition.

BLACKWATER STREAM (1%)

Blackwater Streams are characterized as perennial or intermittent, seasonal watercourses that originate deep in sandy lowlands. These lowlands contain wetlands with organic soils that act as reservoirs, collecting rainfall and gradually releasing it into the stream. Emergent and floating aquatic vegetation may be found along the slow-moving and shallow parts of the stream. Blackwater Streams are ranked as apparently secure globally and vulnerable statewide (G4/S3) due to a restricted range, relatively fewer populations (often fewer than 80), recent and widespread declines, or other factors.

In the KR MA, the Blackwater streams encompass approximately 470 acres. These include oxbows of the Kissimmee River and small river segments located within the management area boundaries. Generally, these streams do not require active management. Some oxbows, previously disconnected from the river's historic flow due to the construction of the C-38 canal, have naturally recruited vegetation over time. With the completion of construction for the

Kissimmee River Restoration and implementation of the HRS, more natural water level fluctuations are expected. These changes should help restore historic flow patterns and improve conditions in oxbows that were once isolated from the main river channel.

The primary management objective for blackwater streams in the KR MA is to monitor and assess the effects of water level fluctuations on adjacent ecological communities.

HYDRIC HAMMOCK (0.2%)

Hydric hammocks are characterized by well-developed hardwood and cabbage palm forests with a variable understory often dominated by palms and ferns. Typical plants include cabbage palm (*Sabal palmetto*), red maple, swamp bay, sweetbay, water oak (*Quercus nigra*), wax myrtle (*Morella cerifera*), saw palmetto (*Serenoa repens*), dahoon holly, royal fern (*Osmunda spectabilis*), and vines such as poison ivy (*Toxicodendron radicans*), pepper vine (*Nekemias arborea*), and Virginia creeper (*Parthenocissus quinquefolia*). Hydric hammocks are ranked globally and statewide as apparently secure (G4/S4), though they may be quite rare in parts of their range, especially at the periphery.

In the KR MA, the hydric hammock community encompasses 86 acres. This community features a closed-canopy hardwood system dominated by cabbage palm. Common vegetation includes cabbage palm, sweet gum (*Liquidambar styraciflua*), sweetbay, red maple, common persimmon (*Diospyros virginiana*), American elm (*Ulmus Americana*), and various oaks. The understory is generally open and sparsely vegetated, with species like wax myrtle, twinberry (*Mitchella repens*), Green arrow arum (*Peltandra virginica*), St. John's wort (*Hypericum spp.*), and occasional patches of ferns, like netted chain fern (*Woodwardia areolata*), and cinnamon fern (*Osmundastrum cinnamomeum*).

Hydric hammock communities are not fire-dependent. Due to the limited herbaceous groundcover and moist soil throughout most of the year, hydric hammocks rarely burn. Typically, fires spread into this community from surrounding fire-maintained communities during the dry season, burning the available fuels. Hydric hammocks in the KR MA have the desired vegetation structure. The objectives for managing vegetation in this community include treating nuisance and invasive species to maintain vegetation condition and periodically assessing the area to evaluate the effects of lake water-level changes on vegetation structure.

WET FLATWOODS (1%)

Wet flatwoods are characterized as pine forests with a sparse midstory and a dense groundcover of hydrophytic grasses, herbs, and low shrubs. The density of shrubs and herbaceous vegetation can vary significantly in wet flatwoods, with shrubs dominating where fire has been suppressed for a long period or where winter burns predominate. Wet flatwoods are ranked as apparently secure in their range globally and statewide (G4/S4).

In the KR MA, the wet flatwoods community encompasses approximately 441 acres. The wet flatwoods community in the KR MA is characterized by a canopy dominated by Florida slash pine (*Pinus elliotti*) and interspersed with scattered cabbage palm. Scattered cypress and hardwood

species such as water oak, laurel oak (*Quercus laurifolia*), red bay, and red maple can also be found in the peripherals. The understory is composed of a variety of native grasses, including maidencane (*Hymenachne hemitomon*), yellow-eyed grass (*Xyris caroliniana*), blue-eyed grass (*Sisyrinchium* spp.), beakrush (*Rhynchospora* spp.), and arrowhead (*Sagittaria lancifolia*). Typical wet flatwoods shrubs, including wax myrtle, and dahoon holly, and sweet gallberry, are scattered. In areas where pasture grasses (i.e., bahia grass (*Paspalum notatum*) had previously displaced native groundcover, natural regeneration has been allowed to re-establish the native understory. These naturally recruited species include maidencane (*Hymenachne hemitomon*), rushes (*Juncus* spp.), beakrush (*Rhynchospora* spp.), wiregrass, bluestem (*Andropogon* spp.), blue maidencane (*Amphicarpum muehlenbergianum*), meadowbeauty (*Rhexia* spp.), blue-eyed grass (*Sisyrinchium* spp.), carpet grass (*Axonopus* spp.), and yellow-eyed grass (*Xyris caroliniana*).

Prescribed fire considerations in the wet flatwoods community are similar to those for mesic flatwoods. In the absence of frequent fire, this community tends to accumulate dense shrubby undergrowth, which can alter its structure and ecological function. The desired vegetation structure is a relatively open canopy forest of pine trees, sparsely scattered cabbage palms and shrub midstory, and a dense groundcover dominated by grasses. The objectives for managing wet flatwoods vegetation in the KR MA include treating nuisance and invasive species to maintain maintenance conditions and applying prescribed fire to limit shrub coverage in the understory.

SCRUB (2%)

Scrubs are characterized as a community of evergreen shrubs, with or without a canopy of pines. These communities typically occur on the highest, driest elevations, underlain by sandy, well-drained, loose, and nutrient-poor soils. Signature scrub species are Florida rosemary (*Ceratiola ericoides*), sand pine (*Pinus clausa*), and a variety of shrubby oaks. Scrub communities are being lost at an alarming rate, ranking them at the second most endangered level both statewide and globally (G2/S2).

In the KR MA, the scrub community encompasses approximately 768 acres. It is characterized by dense thickets of scrub oak (*Quercus inopina*) and other shrubs in the understory. Common vegetation in this community includes sand live oak, myrtle oak (*Quercus myrtifolia*), scrub oak, Silk bay (*Persea borbonia* var. *humilis*), Florida rosemary, big-flower pawpaw (*Asimina obovata*), and scrub-hyssop (*Sophronanthe hispida*). Saw palmetto, rusty staggerbush (*Lyonia Ferruginea*), and wiregrass are occasionally found in transitional areas but are not widespread throughout the scrub matrix.

Scrub communities within the KR MA provide habitats that can support the expansion of the Florida scrub-jay. Scrub ecosystems rely on fire for maintenance, but due to sparse groundcover and the slow accumulation of fuels, they are not easily ignited. However, under dry conditions, the woody shrub vegetation can burn rapidly and with high intensity. In the absence of fire, scrub communities gradually accumulate organic matter and eventually transition into xeric hammocks. The desired vegetation structure for scrub in the KR MA is an open canopy, dense patches of low shrubs interspersed with areas of bare sand, and minimal grass cover. This vegetation structure is currently well-established due to the application of frequent prescribed fire. Management objectives for the scrub communities in the KR MA include treating invasive species to maintain

maintenance conditions, using prescribed fire to preserve the existing vegetation structure, and employing mechanical vegetation treatments between fire intervals to restructure the vegetation when low-intensity burns don't achieve the desired results. Additionally, although not expected to impact the scrub communities directly, an important management consideration is to ensure that seasonal water level fluctuations resulting from hydrologic changes associated with the implementation of the HRS do not lead to elevated seasonal groundwater levels within the scrub habitats.

DRY PRAIRIE (3%)

Dry prairies are characterized as low-shrub and grass-dominated communities with few or no pines and a dense understory of wiregrass, saw palmetto, and a variety of grasses, herbs, and low shrubs. They occur on similar soils and share many species with mesic flatwoods. Common shrub species include saw palmetto, dwarf live oak, gallberry (*Ilex glabra*), fetterbush, shiny blueberry, netted pawpaw (*Asimina reticulata*), Atlantic St. John's wort (*Hypericum tenuifolium*), wax myrtle, and dwarf huckleberry (*Gaylussacia dumosa*). Groundcover vegetation typically includes wiregrass (*Aristida stricta* var. *beyrichiana*), bottlebrush threeawn (*Aristida spiciformis*), hemlock witchgrass (*Dichanthelium portoricense*), broomsedge bluestem (*Andropogon virginicus*), lopsided Indiangrass (*Sorghastrum secundum*), and cypress witchgrass (*Dichanthelium ensifolium*), narrowleaf silkgrass (*Pityopsis graminifolia*), milkworts (*Polygala* spp.), meadowbeauties, yellow-eyed grasses (*Xyris* spp.), and wild pennyroyal (*Piloblephis rigida*). Dry prairies are ranked at the second most endangered level both statewide and globally (G2/S2).

In the KR MA, the dry prairie community encompasses 1,423 acres. It is characterized by an open canopy and a low-shrub understory dominated by saw palmetto, shiny blueberry, and grasses. Common species include wiregrass, broomsedge, threeawn, tarflower (*Bejaria racemosa*), slender flattop goldenrod (*Euthamia caroliniana*), fetterbush (*Lyonia lucida*), Coastalplain staggerbush (*Lyonia fruticosa*), gallberry, Atlantic St. John's-wort, elephant's foot (*Elephantopus elatus*), gayfeather (*Liatris* spp.), and various sedges (*Carex* spp.). Scattered shrubs include dwarf live oak, sand live oak, and myrtle oak.

Dry prairie communities within the KR MA provide habitats that can support the expansion of the Florida grasshopper sparrow. Pines are rarely found in the dry prairie communities of the KR MA due to the regular application of prescribed fire. The desired vegetation structure has been largely achieved through natural recruitment and consistent fire management. However, remnants of past and current agricultural use have resulted in the presence of pasture grasses within the prairie matrix. Management objectives for dry prairie communities in the KR MA include treating nuisance and invasive species to maintain maintenance condition and utilizing prescribed fire to promote healthy grass cover and sustain the target vegetation structure. Growing season burns are particularly emphasized to enhance native grass coverage and maintain the open, fire-adapted prairie matrix.

MESIC FLATWOODS (3%)

Mesic flatwoods are characterized by an open-canopy forest of widely spaced pine trees with a dense understory of herbs and shrubs. These communities occur on poorly drained soils that are

seasonally saturated during the wet season but rarely inundated for extended periods. In northern and central Florida, longleaf pine (*Pinus palustris*) is typically present or dominant, while in southern Florida, slash pine (*Pinus elliottii*) is more common. The shrub layer often includes saw palmetto, gallberry, coastalplain staggerbush, fetterbush, dwarf live oak, runner oak, shiny blueberry, Darrow's blueberry (*Vaccinium darrowii*), and dwarf huckleberry. The herbaceous layer is predominantly grasses, including wiregrass, dropseed (*Sporobolus spp.*), panicgrass (*Dichanthelium spp.*), and broomsedges (*Andropogon spp.*), and various showy forbs. Mesic flatwoods are ranked as apparently secure in their range globally and statewide (G4/S4).

In the KR MA, the mesic flatwoods community encompasses 1137 acres. These flatwoods are dominated by slash pine, with occasional scattered patches of longleaf pine, cabbage palm (*Sabal palmetto*), and live oak (*Quercus virginiana*) in the canopy. The midstory is generally absent due to the regular application of prescribed fire. The dense shrub layer is dominated by saw palmetto, gallberry, and fetterbush, shiny blueberry, queen's delight (*Stillingia sylvatica*), wax myrtle, myrsine (*Myrsine cubana*), coastalplain staggerbush. The groundcover consists of a diverse mix of herbs and grasses, including threeawn, goldenrod, broomsedge, pawpaw, gopher apple (*Geobalanus oblongifolius*), St. Johns-wort, tarflower, carpet grass (*Axonopus spp.*), wiregrass, Spanish needles (*Bidens bipinnata*), and various sedges, vines, and other ruderal species. Nuisance grasses such as rose natalgrass (*Rhynchelytrum repens*) and bahia grass can be problematic in some areas.

Mesic flatwoods in the KR MA provide important habitat for red-cockaded woodpeckers (*Dryobates borealis*), which are established in the northern portion of the site (i.e., KICCO Unit). The desired vegetation structure for this community is a pine-dominated canopy with an understory of low shrubs, grasses, and forbs. The objectives for managing mesic flatwoods vegetation in the KR MA include treating nuisance and invasive species to maintain maintenance condition, applying prescribed fire to control shrub density and maintain the fire-adapted structure of the community, and utilizing growing season burns to promote healthy grass coverage.

CYPRESS/TUPELO (5%)

Cypress/tupelo wetlands are frequently flooded wetlands dominated by cypress or tupelo (black gum) species. In the KR MA, the cypress/tupelo community covers 2,142 acres and includes a mix of floodplain and dome swamps.

Floodplain Swamp

Floodplain swamps are closed-canopy forests that occur along streams, rivers, depressions, and oxbows within floodplains. These communities are ranked as apparently secure both globally and statewide (G4/S4), though they may be rare in certain parts of their range, particularly at the periphery.

In the KR MA, floodplain swamps are identified by their cypress-dominated canopy, which distinguishes them from other areas mapped as freshwater forested wetlands. These swamps generally have flowing water during high water periods. The canopy includes bald cypress, water oak, and black gum, while pond Cypress (*Taxodium ascendens*) is commonly found along stretches

of the river. The midstory is vegetated with swamp bay, pop ash (*Fraxinus caroliniana*), black gum, pond apple (*Annona glabra*), swamp bay, sweet bay, Carolina willow (*Salix caroliniana*), laurel oak, and cabbage palm. The understory includes wax myrtle and buttonbush (*Cephalanthus occidentalis*), false nettle (*Boehmeria cylindrica*), lizard's tail (*Saururus cernuus*), alligator flag (*Thalia geniculata*), woolly witchgrass (*Dichantheium scabriusculum*), sawgrass (*Cladium jamaicense*), rushes (*Juncus* spp.), sedges (*Carex* spp.), and various ferns and *Tillandsia* spp.

Dome Swamp

Dome swamps are isolated, forested, depressional wetlands within fire-maintained communities. They are typically circular in shape and exhibit a domed profile, with taller trees in the center and shorter vegetation along the edges. Shrub cover ranges from sparse to moderate but is often absent in areas with frequent fire. Dome swamps are ranked as apparently secure both globally and statewide (G4/S4), although they may be rare in certain parts of their range, particularly at the periphery.

In the KR MA, dome swamps are relatively small and scattered across the landscape. The canopy is dominated by bald cypress. Transitional zones along the swamp edges support red maple, dahoon holly, and occasional slash pine. Shrub vegetation is generally limited but includes species such as St. John's wort (*Hypericum* spp.), buttonbush, and wax myrtle. Common groundcover species include a mix of ferns, soft rush (*Juncus effusus* var. *solutus*), maidencane, smartweed (*Persicaria* spp.), bladderwort, ten-angled pipewort (*Eriocaulon decangulare*), sedges, rushes, arrowhead, pickerelweed, and alligator flag. The center of the dome typically features open water with floating vegetation, including bladderwort (*Utricularia* spp.) and floating heart (*Nymphoides aquatica*), or supports emergent vegetation, such as alligator flag. In some areas, it has become overgrown with shrubs like Carolina willow and pond apple.

While not usually managed with prescribed fire, periodic fire is essential for maintaining the cypress component and limiting hardwood encroachment in cypress/tupelo systems. Fire plays a critical role in preserving the structure and species composition of dome swamps. Without regular fire, peat accumulation and hardwood intrusion can reduce cypress dominance, potentially leading to a transition toward baygall communities. However, reintroducing fire in long-unburned cypress/tupelo areas can result in high tree mortality due to accumulated fuels and altered stand structure. In the KR MA, prescribed fire is typically applied to the surrounding communities when the swamp soil is saturated. Under these conditions, fire often spreads to the swamp edges but is extinguished before reaching the interior. Fire frequency in the cypress/tupelo varies, with the edges burning every 3-5 years, while the interior, where longer hydroperiods typically maintain high moisture levels, does not burn. Past land use, including hydrologic alterations within the Kissimmee River floodplain, has impacted the natural hydrology of the cypress/tupelo communities. In addition, fire exclusion and the spread of nuisance and invasive species have altered the vegetation structure, contributing to increased hardwood composition. The cypress/tupelo systems in the KR MA are mature and reflect structural characteristics typical of communities affected by these types of disturbances. Despite these changes, the cypress/tupelo communities currently exhibit the desired vegetation structure. Management objectives include preserving the cypress canopy structure in floodplain swamps, preventing hardwood encroachment in dome swamps with prescribed fire, and treating nuisance and invasive species to maintain

desired ecological conditions.

FRESHWATER FORESTED WETLANDS (5%)

The freshwater forested wetlands within the KR MA encompass approximately 2,208 acres and are subclassified as mixed hardwood-coniferous swamps. These communities were classified under the broader category of freshwater forested wetlands rather than being grouped with the cypress/tupelo type, due to the predominance of hardwood species in their canopy composition and overall structure. This classification reflects the ecological distinctiveness of these hardwood-dominated systems and helps differentiate them from cypress-dominated wetlands, which exhibit different successional dynamics.

Mixed hardwood-coniferous swamps are seasonally or semi-permanently flooded or saturated forested wetlands characterized by a diverse canopy composed of both broadleaf deciduous hardwoods and needle-leaved conifers. These wetlands typically occur in low-lying areas such as floodplains, depressions, or along the rivers and streams, where hydrologic conditions fluctuate seasonally. The canopy is often a mosaic of species, with dominant hardwoods including red maple, black gum, and laurel oak, interspersed with conifers such as bald cypress and slash pine. The midstory may include species like swamp bay, dahoon holly, and wax myrtle, while the understory and groundcover layers support a mix of ferns, sedges, rushes, lizard's tail, false nettle, and smartweeds (*Polygonum spp.*).

In the KR MA, mixed hardwood-coniferous swamps exhibit sparse cypress coverage, primarily along river margins and occasionally scattered throughout the landscape. These swamps likely originally formed from floodplain swamps, primarily as a result of hydrologic alterations in the Kissimmee River floodplain. Due to their shared origin and the integration of cypress within a diverse matrix of wetland hardwoods, they can be difficult to distinguish from floodplain swamps in aerial interpretation. Differentiating them from mixed wetland hardwoods (hydric hammocks) on the property can also be challenging, particularly where mosaic hardwood species are prevalent. However, the deeper water levels and longer hydroperiods typical of mixed hardwood-coniferous swamps help distinguish them from mixed wetland hardwoods. The canopy of mixed hardwood-coniferous swamps typically includes bald cypress, black gum, water hickory (*Carya aquatica*), and laurel oak. The midstory is composed of species such as swamp bay, pop ash, pond apple, and cabbage palm. The understory supports a diverse assemblage of shrubs and herbaceous plants, including wax myrtle, buttonbush, Carolina willow, pickerelweed, lizard's tail, alligator flag, bladderwort, arrowhead, smartweed, and various sedges, rushes, and various ferns.

Mixed hardwood-coniferous swamp wetlands in the KR MA may experience occasional fire, particularly during dry years or along their upland margins. As with other communities not actively managed with prescribed fire, burns are typically applied to adjacent fire-adapted communities when swamp soils are saturated. Under these conditions, fire may occasionally creep into the swamp edges but is usually extinguished before reaching the interior. Given the maturity of these communities, a reversal of the hardwood-dominated trend is not expected despite hydrologic improvements from the restoration efforts and the implementation HRS. As the current vegetation structure persists, these areas will continue to be managed as mixed hardwood-coniferous swamp communities. The primary management objective for these wetlands is to control nuisance and

invasive species to achieve and maintain maintenance condition.

WET PRAIRIE (8%)

Wet prairies are characterized by an herbaceous community with many showy flowering herbs intermixed with short shrubs. They are some of the most diverse communities in the United States. Wet prairies are found on continuously saturated soils between lower-lying depression marshes, shrub bogs, or dome swamps and slightly higher wet, mesic flatwoods, or dry prairie. Wet prairies are ranked as the second most endangered level both statewide and globally (G2/S2).

In the KR MA, the wet prairie community encompasses 3,459 acres. Historically, these areas were heavily impacted by intensive cattle grazing and pasture conversion prior to acquisition by the District. Many wet prairie areas were modified for pasture use, with the introduction of non-native grasses such as bahia grass, smutgrass (*Sporobolus indicus*), and crabgrass (*Digitaria* spp.), which significantly altered the native plant composition. Since acquisition, reduced grazing pressure and hydrologic restoration efforts have facilitated the natural recruitment of native vegetation in many areas, although some sites continue to be grazed.

Vegetation in the KR MA wet prairie includes low-growing groundcover typical of reference sites, as well as dense woody shrubs that are more common in areas affected by hydrologic alteration and fire suppression. Dominant shrubs include wax myrtle, saltbush (*Baccharis halimifolia*), Carolina willows, common persimmon, and elderberry. Scattered pockets of tree species, such as red maple, cabbage palm, and oaks, as well as occasional cypress, and slash pine, can be observed in the landscape or encroaching in transitional zones. Pasture grass remains prominent in some areas, particularly where grazing is still active. The low-growing groundcover commonly includes diverse species including St. John's-wort, blue maidencane, maidencane, sugarcane plume grass (*Saccharum giganteum*), bog white violet (*Viola lanceolata*), bladderworts, primrose-leaf violet (*Viola primulifolia*), bearded prangletop (*Diplachne fusca* var. *fascicularis*), pink sundew (*Drosera capillaris*), threeawn, goldenrod, ten-angled pipewort (*Eriocaulon* spp.), Yellow bristlegrass (*Setaria parviflora*), beggarticks (*Bidens* sp.), whitehead bogbutton (*Lachnocaulon anceps*), milkwort, butterwort (*Pinguicula* spp.), bluestem, cordgrass (*Spartina bakeri*), yellow-eyed grass, crab grass (*Digitaria* spp.), bahia grass, smutgrass, nutrush (*Scleria* spp.), and various sedges and rushes.

Like other grassland ecosystems, wet prairies are fire-dependent. Without regular fire, they can become overgrown with dense shrubs, reducing herbaceous diversity and altering habitat structure. In the KR MA, past fire suppression and hydrologic changes have contributed to the development of shrub-dominated pockets within the wet prairie. These areas remain classified as prairie communities and are managed with the intent of reestablishing a dominant herbaceous groundcover. Exceptions are made where shrub dominance supports desired wildlife habitat and where maintaining a mosaic structure is ecologically beneficial. The management objective for wet prairie vegetation in the KR MA is to promote a diverse mix of herbaceous species and low shrubs, interspersed with dense shrub pockets, to achieve structural and ecological diversity that supports optimal wildlife use. Management actions include the application of prescribed fire, control of invasive and nuisance plant species, and regulated grazing in appropriate areas.

HARDWOOD HAMMOCK (10%)

Hardwood forested uplands or hardwood hammocks are hardwood-dominated communities. The hardwood hammock communities within the KR MA are classified as xeric and mesic hammocks, encompassing approximately 4,375 acres.

Mesic Hammock

Mesic hammocks are characterized by a dense, evergreen hardwood canopy dominated by live oak (*Quercus virginiana*) and cabbage palm (*Sabal palmetto*), along with a shrubby understory. The mature canopy trees support a variety of epiphytes, including listed species. Unlike hydric hammocks, mesic hammocks lack wetland trees such as sweetbay and swamp tupelo. Mesic hammocks are ranked as vulnerable globally and statewide (G3/S3?) due to either a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors, although additional research is required for a definitive statewide classification for this community.

The mesic hammock community is the largest among hardwood-dominated communities in the Management Area. In the KR MA, the mesic hammock community is dominated by live oaks and cabbage palms, as is typical of such habitats. Abundant epiphytes are also found in this community. Other common canopy vegetation includes sweetgum (*Liquidambar styraciflua*), Hackberry (*Celtis laevigata*), and slash pine. The common shrubby understory typically consists of a mix of saw palmetto, American beautyberry (*Callicarpa americana*), gallberry, hog plum (*Ximenia americana*), common persimmon, and various berry species (*Vaccinium spp.*). In the KR MA, mesic hammocks generally have a well-developed canopy, though portions of this habitat are still subject to low-intensity cattle grazing. The understory is naturally sparse due to shading; however, cattle grazing and trampling have further degraded the shrub and groundcover layers, reducing the abundance of species typically associated with mesic hammocks. In grazed areas, native vegetation has often been replaced by opportunistic species such as broomweed/fanpetals (*Sida sp.*), tropical soda apple (*Solanum viarum*), and caesarweed (*Urena lobata*). The main objective for managing mesic hammock vegetation in the KR MA is to control nuisance and invasive species to maintain maintenance conditions. Regulated grazing will continue in the interim.

Xeric Hammock

Xeric Hammocks are characterized by a relatively closed, low canopy dominated by sand live oak. The understory is typically open and includes a sparse or absent herbaceous layer and shrubs that are typical of sandhill or scrub, depending on the hammock's origin. Xeric hammocks can be distinguished from scrub and scrubby flatwoods by the relatively closed canopy of evergreen oaks. Xeric hammocks are ranked as vulnerable globally and statewide (G3/S3) due to either a restricted range, relatively few populations (often fewer than 80), recent and widespread declines, or other factors.

In the KR MA, xeric hammock is a scarce community type. It is characterized by a closed canopy dominated by oaks. Common canopy species include live oak, sand live oak, myrtle oak,

Chapman oak, and red bay. The understory is relatively sparse due to dry soil conditions and overstory shading. Common understory species include Florida rosemary, saw palmetto, rusty staggerbush, fetterbush, blueberry, goldenrod, and patches of wiregrass and witchgrass, Carolina jessamine (*Gelsemium sempervirens*), dog fennel (*Eupatorium* spp.), and other ruderal species. Wild pine (*Tillandsia balbisina*) and various vines are common arboreal species. The main objective for managing xeric hammock vegetation in the KR MA is to treat nuisance and invasive species to maintain maintenance conditions.

Mesic hammocks can tolerate occasional ground fires; however, the presence of live oaks tends to limit fuel buildup in the understory. These hammocks typically burn only when fire spreads from adjacent habitats, and fires often extinguish naturally where fuel is insufficient. In contrast, xeric hammocks usually develop in areas where fire has been excluded, allowing the oak canopy to establish and persist. This community is not maintained through prescribed fire.

MARSHES (54%)

Marshes are the most prevalent natural community type within the KR MA, encompassing approximately 23,374 acres. These marshes are classified as floodplain marshes and depression marshes.

Marshes in the KR MA are characterized by expansive, open herbaceous systems dominated by a diverse assemblage of grasses, sedges, broadleaf emergents, and floating aquatic plants. However, in areas where vegetation has been disturbed, fire has been historically excluded, or hydrology has been altered, dense thickets of shrubs have replaced the native herbaceous communities through natural successional processes. Many of the marshes within the KR MA have also been historically used for cattle grazing. In the past, much of this land was intensively grazed, and some areas were successfully converted to pasture. While grazing continues in certain locations, overall grazing pressure has been significantly reduced. This reduction in grazing, combined with ongoing hydrologic restoration efforts, has facilitated the natural recruitment and recovery of native vegetation in many areas that were previously converted to pasture. In currently grazed areas, opportunistic ruderal species and remnant pasture grasses are still commonly observed.

Depression Marsh

Depression marshes are characterized as shallow depressions in the sand substrate with herbaceous vegetation, often in concentric bands. They frequently form an outer rim around swamp communities, are seasonally inundated, and often burn with the surrounding landscape. Depression marshes are ranked as apparently secure in their range globally and statewide (G4/S4).

In the KR MA, depression marshes are scattered throughout the management area. The common vegetation includes St. John's wort (*Hypericum* sp.), spikerush (*Eleocharis* sp.), yellow-eyed grass, chain fern, primrose willow (*Ludwigia* spp.), pickerelweed, maidencane, arrowhead, alligator flag, pickerelweed, and bladderwort. Other species include umbrella sedge (*Fuirena* sp.), marsh pennywort (*Hydrocotyle* spp.), soft rush (*Juncus* sp.), dotted smartweed, beakrush, pipewort, torpedo grass (*Panicum repens*), cordgrass, buttonbush, and wax myrtle.

Floodplain Marsh

Floodplain Marshes are herbaceous and shrubby wetlands found in river floodplains. They are associated with and often grade into wet prairies or riverine communities. These marshes are typically flooded with flowing water for most of the year. Floodplain marshes are ranked as vulnerable globally and statewide (G3/S3) due to either a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

In the KR MA, floodplain marshes dominate the river's floodplain, supporting a diverse assemblage of wetland shrubs and herbaceous species. The vegetation is characterized by a mosaic of plant communities, including emergent and floating species such as sawgrass, floating marsh pennywort, smartweed, pickerelweed, arrowhead, yellow pondlily (*Nuphar advena*), bladderwort, water-lettuce (*Pistia stratiotes*), Para grass (*Urochloa mutica*), primrose willow, West Indian marshgrass (*Hymenachne amplexicaulis*), and cordgrass. Shrub-dominated areas, particularly on isolated islands and previously farmed lands, are dominated by species such as water hemlock, groundsel tree (*Baccharis halimifolia*), common buttonbush, wax myrtle, and Carolina willow. These zones reflect subtle changes in hydrology and elevation, transitioning from clumps of forbs to grasses, sedges, and rushes, to floating aquatics, and finally to dense shrub thickets.

Wet depressions within the floodplain tend to retain water and support a rich diversity of broadleaves dominated by pickerelweed, arrowhead, alligator flag, and smartweed species. Closer to the river, marshes are deeper and remain inundated for longer periods, favoring broadleaf emergent vegetation. These deeper marshes are typically dominated by yellow pondlily, Southern watergrass (*Luziola fluitans*), pickerelweed, arrowhead, alligator flag, maidencane, smartweed, and bulrush (*Scirpus* spp.). Interspersed within these broadleaf marshes are pockets of shrub-dominated vegetation, particularly buttonbush and Carolina willow. Along the river's edge and in open water pockets, floating-leaved aquatics such as yellow pondlily, waterlily (*Nymphaea* spp.), and water hyacinth (*Pontederia crassipes*) are abundant. These areas also support mats of species like Southern watergrass, bulrush, American cupscale (*Sacciolepis striata*), and marsh pennywort, which form dense floating or emergent vegetation. The aquatic plant communities are rich in both free-floating and submersed species. Common species include water spangles (*Salvinia minima*), frog's-bit (*Limnobium spongia*), Valdivia duckweed (*Lemna valdiviana*), coontail (*Ceratophyllum demersum*), hydrilla (*Hydrilla verticillata*), bladderwort (*Utricularia* spp.), and muskgrass (*Chara* spp.). These species contribute to the structural complexity and ecological function of the aquatic habitat throughout the floodplain.

Marsh communities generally require periodic fire to maintain their vegetation structure and ecological function. Herbaceous-dominated marshes typically experience fire every three to five years, while shrub-dominated marshes tend to burn less frequently, on a three to ten-year cycle. Unburned marshes accumulate peats, which gradually raise the ground surface. This elevation change reduces the marsh's water storage capacity and can shift the plant community toward a hardwood swamp. In the absence of fire or with reduced hydroperiods, these systems are vulnerable to encroachment by woody species such as wax myrtle, saltbush, and various invasive shrubs. Conversely, the reintroduction of fire promotes habitat heterogeneity, helps maintain open herbaceous structure, and enhances foraging opportunities for a wide range of waterbird species. Within the KR MA, floodplain marshes are not actively managed with prescribed fire but are allowed to burn opportunistically when site conditions permit. This is primarily due to the limited

availability of fine fuels necessary to ignite and sustain fire, variable water levels, and the narrow range of weather conditions suitable for conducting safe and effective prescribed burns, which makes planning and implementation challenging.

Vegetation zonation within marshes is primarily influenced by water depth and the extent of peat accumulation. Therefore, the zonation patterns in the floodplain marshes are expected to shift with the implementation of the HRS. The HRS Project is expected to improve the hydroperiod downstream of Pool B, thereby improving floodplain marsh conditions in the downstream management units. The desired outcome is a vast, herbaceous-dominated system characterized by a diverse mix of grasses, broadleaf plants, and floating aquatics. From a land management perspective, maintaining a mosaic of grasses, sedges, rushes, broadleaves, and scattered shrubs is more feasible with the available resources. While long-term goals include controlling nuisance and invasive species, effective treatment methods for many of these species have yet to be fully developed. Currently, control efforts are being conducted on a trial basis by the restoration team through systematic experimental treatments. These trials aim to identify optimal strategies for long-term management of invasive and nuisance species within the floodplain marshes. In the interim, land management objectives for marshes in the KRMA focus on treating nuisance and invasive species in depression marshes to maintain them in a maintenance condition. Additionally, the land stewardship management focus is to enhance the vegetation structure across the floodplain marshes in collaboration with the restoration team. This includes supporting invasive species control where manageable and applying prescribed fire and mechanical treatments to reduce undesirable shrub cover when water levels and site conditions permit.

OTHER LANDCOVER TYPES

OPEN WATER (0.1%)

The open water areas within the KR MA comprise approximately 43 acres of small waterbodies, including small segments of ditches that have been plugged or are used for conveyance and small artificial (cattle) ponds. Depending on the depth and slope, these waterbodies usually have an open water zone with occasional floating and submerged aquatic plants. Typically, the open water areas in the KR MA do not require direct management.

ALTERED LANDCOVERS (7%)

Altered land cover types within the KRMA encompass approximately 2,847 acres where natural vegetation has been significantly modified. These areas include former agricultural fields, unrestored improved pastures, spoil piles, remnant levees, berms, ditches, open spaces with recreational infrastructure, and various other small-scale disturbances. These sites are often dominated by native opportunistic species and invasive plants.

Spoil banks are primarily vegetated with ruderal species and invasive grasses such as cogongrass and torpedograss. Old fields are overgrown with invasive species including smutgrass, cogongrass, and torpedograss. Improved pastures are scattered with native woody vegetation,

primarily wax myrtle, slatbush, and oak species, and are commonly dominated by bahia grass, Bermuda grass (*Cynodon dactylon*), crabgrass, smutgrass, dog fennel, flatsedge (*Cyperus spp.*), carpetgrass, and rustweed (*Polypremum procumbens*). These pastures are actively grazed and may be periodically mowed, burned, or treated for invasive species in coordination with management of adjacent natural communities.

Due to the site's riverine origin and past land use, natural levees and manmade linear features such as plugged ditches, berms, and degraded spoil piles are dispersed throughout the natural community landscape. While these features may still be visible in aerial imagery, small in scale and well-integrated into the surrounding natural communities. As a result, they were mapped as part of the adjacent natural systems and are not included in the total for the altered landcover types.

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Appendix C. Species List

Table 1. List of plants on the KR MA and status.^a

Scientific Name	Common Name	Listing Status
<i>Abrus precatorius</i>	Rosary pea	Non-Native
<i>Acalypha gracilens</i>	Slender threeseed mercury	
<i>Acer rubrum</i>	Red maple	
<i>Acrostichum danaeifolium</i>	Giant leather fern	
<i>Alternanthera philoxeroides</i>	Alligatorweed	Non-Native
<i>Amaranthus australis</i>	Southern amaranth	
<i>Amaranthus spinosus</i>	Spiny amaranth	Non-Native
<i>Ambrosia artemisiifolia</i>	Ragweed; common ragweed	
<i>Ambrosia trifida</i>	Giant ragweed	
<i>Ammannia latifolia</i>	Pink redstem; toothcup	
<i>Amphicarpum muehlenbergianum</i>	Blue maidencane	
<i>Andropogon glomeratus</i>	Bushy broom grass; busy bluestem	
<i>Andropogon gyrans</i>	Elliott's bluestem	
<i>Andropogon virginicus</i>	Chalky bluestem; broomsedge bluestem	
<i>Annona glabra</i>	Pond apple	
<i>Apios americana</i>	Groundnut	
<i>Aristida patula</i>	Tall threeawn	Endemic
<i>Aristida stricta</i>	Wiregrass	
<i>Asclepias currisavica</i>	Tropical milkweed	Non-Native
<i>Asclepias incarnata</i>	Swamp milkweed	
<i>Asclepias lanceolata</i>	Fewflower milkweed	
<i>Asclepias pedicellata</i>	Savannah milkweed	
<i>Asimina obovata</i>	Big-flower pawpaw	
<i>Asimina reticulata</i>	Netted pawpaw	
<i>Axonopus compressus</i>	Broadleaf carpetgrass, flat joint carpetgrass; tropical carpetgrass	
<i>Axonopus fissifolius</i>	Common carpetgrass	
<i>Axonopus furcatus</i>	Big carpet grass	
<i>Azolla caroliniana</i>	Carolina mosquito fern	
<i>Azolla filiculoides</i>	American waterfern	
<i>Baccharis halimifolia</i>	Groundsel tree; salt bush; sea myrtle	
<i>Bacopa caroliniana</i>	Lemon bacopa; blue waterhyssop	
<i>Bacopa monnieri</i>	Water hyssop; herb-of-grace	
<i>Bejaria racemosa</i>	Tarflower	
<i>Bidens alba</i>	Beggarticks	
<i>Bidens bipinnata</i>	Spanish needles	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Bidens laevis</i>	Bur marigold	
<i>Bidens mitis</i>	Marsh beggartick; smallfruit beggarticks	
<i>Boehmeria cylindrica</i>	Smallspike false nettle; bog hemp	
<i>Boltonia diffusa</i>	Smallhead boltonia; doll's daisy	
<i>Borreria remota</i>	Woodland false buttonweed	
<i>Callicarpa americana</i>	American beautyberry	
<i>Calystegia sepium</i> var. <i>limnophila</i>	Hedge false bindweed	
<i>Canna flaccida</i>	Golden canna; bandanna- of-the-everglades	
<i>Cardiospermum microcarpum</i>	Heartseed	
<i>Carex alata</i>	Broadwing sedge	
<i>Carex glaucescens</i>	Clustered sedge	
<i>Carex longii</i>	Long's sedge	
<i>Carex lupuliformis</i>	False hop sedge	
<i>Carex verrucosa</i>	Warty sedge	
<i>Carex vexans</i>	Florida hammock sedge	
<i>Carya aquatica</i>	Water hickory	
<i>Celtis laevigata</i>	Hackberry	
<i>Cenchrus echinatus</i>	Southern sandspur	
<i>Cenchrus purpureus</i>	Napier grass; elephant grass	Non-Native
<i>Cenchrus spinifex</i>	Field sandbur	
<i>Centella asiatica</i>	Asian coinleaf, spadeleaf	
<i>Cephalanthus occidentalis</i>	Buttonbush	
<i>Ceratophyllum demersum</i>	Coontail	
<i>Ceratopteris thalictroides</i>	Watersprite	
<i>Chamaecrista nictitans</i>	Sensitive partiridge pea	
<i>Chamaecrista nictitans</i> var. <i>aspera</i>	Sensitive pea	
<i>Chara</i> spp.	Chara; muskgrass	
<i>Chloris neglecta</i>	Fingergrass	Non-Native
<i>Cicuta maculata</i>	Spotted water hemlock	
<i>Cirsium horridulum</i>	Yellow thistle; purple thistle	
<i>Cirsium nuttallii</i>	Nuttall's thistle	
<i>Citrus</i> spp.	Citrus	Non-Native
<i>Cladium jamaicense</i>	Sawgrass; jamaica swamp sawgrass	
<i>Coelorachis rugosa</i>	Wrinkled jointtailgrass	
<i>Coleataenia anceps</i>	Beaked panic grass; beaked panicum	
<i>Coleataenia rigidula</i>	Redtop panicum	
<i>Colocasia esculenta</i>	Wild taro	Non-Native
<i>Commelina diffusa</i>	Spreading or common dayflower	Non-Native
<i>Commelina gigas</i>	Climbing dayflower	Non-Native
<i>Conoclinium coelestinum</i>	Blue mistflower	
<i>Coreopsis leavenworthii</i>	Leavenworth's tickseed	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Commelina gigas</i>	Climbing dayflower	Non-Native
<i>Cornus foemina</i>	Swamp dogwood; stiff dogwood	
<i>Crotalaria pallida</i> var. <i>obovata</i>	Smooth rattlebox	Non-Native
<i>Ctenium aromaticum</i>	Toothache grass	
<i>Cuphea carthagenensis</i>	Columbian waxweed	Non-Native
<i>Cynodon dactylon</i>	Bermudagrass	Non-Native
<i>Cyperus articulatus</i>	Jointed flatsedge	
<i>Cyperus blepharoleptos</i>	Cuban bulrush; burhead sedge	Non-Native
<i>Cyperus brevifolius</i>	Shortleaf spikesedge	Non-Native
<i>Cyperus compressus</i>	Poorland flat sedge	
<i>Cyperus croceus</i>	Baldwin's flatsedge	
<i>Cyperus distinctus</i>	Marshland flatsedge; swamp flatsedge	
<i>Cyperus erythrorhizos</i>	Redroot flatsedge	
<i>Cyperus esculentus</i>	Yellow netgrass	Non-Native
<i>Cyperus flavescens</i>	Yellow flatsedge	
<i>Cyperus haspan</i>	Sharp edge sedge; haspan flatsedge	
<i>Cyperus hortensis</i>	Low spikesedge	
<i>Cyperus lanceolatus</i>	Epiphytic flatsedge	Non-Native
<i>Cyperus odoratus</i>	Fragrant flatsedge	
<i>Cyperus polystachyos</i>	Manyspike flatsedge	
<i>Cyperus retrorsus</i>	Retorse flat sedge; pinebarren flatsedge	
<i>Cyperus sesquiflorus</i>	Fragrant flatsedge	
<i>Cyperus</i> spp.	Flat sedges	
<i>Cyperus strigosus</i>	Strawcolored flatsedge	
<i>Cyperus surinamensis</i>	Tropical flatsedge	
<i>Cyperus virens</i>	Green flatsedge	
<i>Dalbergia sissoo</i>	Indian rosewood	Non-Native
<i>Decodon verticillatus</i>	Willow herb; swamp loosestrife	
<i>Desmodium incanum</i>	Zarzacoa comun	Non-Native
<i>Desmodium triflorum</i>	Threeflower ticktrefoil	Non-Native
<i>Dichanthelium aciculare</i>	Needleleaf witchgrass	
<i>Dichanthelium dichotomum</i>	Cypress witchgrass	
<i>Dichanthelium erectifolium</i>	Erectleaf witchgrass	
<i>Dichanthelium erectifolium</i>	Erectleaf witchgrass	
<i>Dichanthelium scabriusculum</i>	woolly witchgrass	
<i>Dichanthelium sphaerocarpon</i>	Roundseed witchgrass	
<i>Dichondra carolinensis</i>	Carolina ponysfoot	
<i>Dichromena colorata</i>	White-tops	
<i>Dichromena latifolia</i>	White-bracted sedge	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Digitaria ciliaris</i>	Southern crabgrass	
<i>Digitaria longiflora</i>	Indian crabgrass	Non-Native
<i>Digitaria pentzii</i>	Pangolagrass	Non-Native
<i>Digitaria serotina</i>	Dwarf crabgrass; blanket crabgrass	
<i>Digitaria spp.</i>	Crabgrass	
<i>Digitaria subcalva</i>	Plant city crabgrass	Endemic
<i>Diodia virginiana</i>	Virginia buttonweed	
<i>Dioscorea bulbifera</i>	Air potato	Non-Native
<i>Diospyros virginiana</i>	Common persimmon	
<i>Diplachne fusca v. fascicularis</i>	Bearded sprangletop grass	
<i>Drosera brevifolia</i>	Dwarf sundew	
<i>Drosera capillaris</i>	Pink sundew	
<i>Drymaria cordata</i>	Drymary	Non-Native
<i>Dysphania ambrosioides</i>	Mexican tea	Non-Native
<i>Echinochloa crus-galli</i>	Barnyard grass	Non-Native
<i>Echinochloa walteri</i>	Walter's millet; coast cockspur	
<i>Eclipta prostrata</i>	Yerba de tajo, eclipta; false daisy	
<i>Edrastima uniflora</i>	Clustered mille graine	
<i>Eichhornia crassipes</i>	Water hyacinth; common water-hyacinth	Non-Native
<i>Eleocharis baldwinii</i>	Baldwin's spikerush; roadgrass	
<i>Eleocharis cellulosa</i>	Club-rush; gulf coast spikerush	
<i>Eleocharis flavescens</i>	Pale spikerush; yellow spikerush	
<i>Eleocharis geniculata</i>	Canada spikerush	
<i>Eleocharis interstincta</i>	Jointed spikerush; knotted spikerush	
<i>Eleocharis olivacea</i>	Brightgreen spikerush	
<i>Eleocharis vivipara</i>	Sprouting spikerush; viviparous spikerush	
<i>Elephantopus elatus</i>	Tall elephant's foot	
<i>Eleusine indica</i>	Indian goosegrass	Non-Native
<i>Emilia fosbergii</i>	Florida tassleflower	Non-Native
<i>Emilia sonchifolia</i>	Lilac tassleflower	Non-Native
<i>Enterolobium contortisiliquum</i>	Earpod tree	Non-Native
<i>Eragrostis atrovirens</i>	Thalia lovegrass	Non-Native
<i>Eragrostis bahiensis</i>	Bahia lovegrass	Non-Native
<i>Eragrostis eliotti</i>	Elliot's lovegrass	
<i>Eragrostis lugens</i>	Morning lovegrass	Non-Native
<i>Eragrostis spectabilis</i>	Purple lovegrass	
<i>Erechtites hieraciifolius</i>	American burnweed	
<i>Eremochloa ophiuroides</i>	Centipedegrass	Non-Native
<i>Erigeron quercifolius</i>	Oakleaf fleabane	
<i>Eriocaulon compressum</i>	Flattened pipewort	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Eriocaulon decangulare</i>	Tenangle pipewort	
<i>Eriocaulon ravenelii</i>	Ravenel's pipewort	
<i>Eryngium baldwinii</i>	Baldwin's eryngo	
<i>Eucalyptus grandis</i>	Grand eucalyptus	Non-Native
<i>Eupatorium capillifolium</i>	Small dogfennel; dogfennel	
<i>Eupatorium serotinum</i>	Lateflowering thoroughwort	
<i>Euthamia caroliniana</i>	Fragrant goldenrod; slender flattop goldenrod	
<i>Ficus aurea</i>	Strangler fig	
<i>Fimbristylis autumnalis</i>	Slender fimbry	
<i>Fimbristylis caroliniana</i>	Carolina fimbry	
<i>Fimbristylis dichotoma</i>	Tall fimbry; forked fimbry	
<i>Fimbristylis schoenoides</i>	Ditch fimbry	Non-Native
<i>Fraxinus caroliniana</i>	Carolina ash; pop ash	
<i>Fraxinus pennsylvanica</i>	Green ash	
<i>Fuirena breviseta</i>	Saltmarsh umbrellasedge	
<i>Fuirena pumila</i>	Dwarf umbrella-grass; dwarf umbrellasedge	
<i>Fuirena scirpoidea</i>	Rush fuirena, southern umbrellasedge	
<i>Funastrum clausum</i>	White twinvine	
<i>Galactia elliottii</i>	Elliott's milkpea	
<i>Galactia regularis</i>	Eastern milkpea	
<i>Galium bermudense</i>	Coastal bedstraw	
<i>Galium tinctorium</i>	Stiff marsh bedstraw	
<i>Gelsemium sempervirens</i>	Carolina jessamine	
<i>Geobalanus oblongifolius</i>	Gopher apple	
<i>Geranium carolinianum</i>	Carolina cranesbill	
<i>Gymnopogon chapmanianus</i>	Chapman's skeletongrass	
<i>Habenaria floribunda</i>	Toothpetal false reinorchid; mignonette orchid	
<i>Habenaria repens</i>	Water-spider orchid; false reinorchid	
<i>Helianthus agrestis</i>	Southeastern sunflower	
<i>Helianthus angustifolius</i>	Swamp sunflower; narrowleaf sunflower	
<i>Hemarthria altissima</i>	Limpograss	Non-Native
<i>Heterotheca subaxillaris</i>	Camphorweed	
<i>Hibiscus grandiflorus</i>	Swamp rosemallow	
<i>Hydrilla verticillata</i>	Hydrilla; waterhyme	Non-Native
<i>Hydrocotyle ranunculoides</i>	Floating penny wort; floating marsh pennywort	
<i>Hydrocotyle umbellata</i>	Manyflower marsh pennywort	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Hymenachne amplexicaulis</i>	West indian marsh grass	Non-Native
<i>Hymenachne hemitomom</i>	Maidencane	
<i>Hypericum brachyphyllum</i>	Coastalplain St. John's-wort	
<i>Hypericum cistifolium</i>	Roundpod St. John's-wort	
<i>Hypericum fasciculatum</i>	Sandweed, peelbark St. John's-wort	
<i>Hypericum hypericoides</i>	St. Andrew's cross	
<i>Hypericum mutilum</i>	Slender st. John's-wort	
<i>Hypericum myrtifolium</i>	Myrtleleaf St. John's-wort	
<i>Hypericum tenuifolium</i>	Atlantic St. John's-wort	
<i>Hypericum tetrapetalum</i>	Fourpetal St. John's-wort	
<i>Hyptis alata</i>	Clustered bushmint; musky mint	
<i>Iatris tenuifolia</i>	Shortleaf gayfeather	
<i>Ilex cassine</i>	Dahoon holly; dahoon	
<i>Ilex coriacea</i>	Sweet gallberry; Large gallberry	
<i>Ilex glabra</i>	Inkberry; gallberry	
<i>Imperata cylindrica</i>	Cogongrass	Non-Native
<i>Ipomoea alba</i>	White morning glory	
<i>Ipomoea quamoclit</i>	Cypressvine	
<i>Ipomoea sagittata</i>	Saltmarsh morning glory	
<i>Iris savannarum</i>	Blue flag; virginia iris	
<i>Iva microcephala</i>	Piedmont marshelder	
<i>Juncus effusus</i>	Soft rush	
<i>Juncus marginatus</i>	Shore rush	
<i>Juncus megacephalus</i>	Bighead rush	
<i>Juncus spp.</i>	Rush	
<i>Justicia angusta</i>	Pineland waterwillow	
<i>Kellochloa verrucosa</i>	Warty panic grass	
<i>Kosteletzkyia pentacarpos</i>	Virginia seashore mallow; virginia saltmarsh mallow	
<i>Lachnanthes caroliana</i>	Redroot	
<i>Lachnocaulon anceps</i>	Whitehead bogbutton	
<i>Lachnocaulon beyrichianum</i>	Southern bogbutton	
<i>Landoltia punctata</i>	Dotted duckweed	Non-Native
<i>Lantana strigocamara</i>	Lantana; shrub verbena	Non-Native
<i>Leersia hexandra</i>	Southern cutgrass	
<i>Lemna sp.</i>	Duckweed	
<i>Lepidium virginicum</i>	Poor man's peppergrass; virginia pepperweed	
<i>Liatris garberi</i>	Garber's gayfeather	
<i>Liatris gracilis</i>	Slender gayfeather	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Liatris spicata</i>	Dense gayfeather	
<i>Limnobium spongia</i>	Frog's-bit; american spongeplant	
<i>Lindernia dubia</i>	Yellowseed false pimpernel	
<i>Lindernia grandiflora</i>	Savanna false pimpernel	
<i>Liquidambar styraciflua</i>	Sweetgum	
<i>Lobelia feayana</i>	Bay lobelia	
<i>Ludwigia alternifolia</i>	Seedbox	
<i>Ludwigia decurrens</i>	Primrosewillow; wingleaf primrosewillow	
<i>Ludwigia hexapetala</i> syn. <i>grandiflora</i>	Uruguay water-primrose	Non-Native
<i>Ludwigia leptocarpa</i>	Anglestem primrosewillow	
<i>Ludwigia maritima</i>	Seaside primrosewillow	
<i>Ludwigia octovalvis</i>	Mexican primrosewillow	
<i>Ludwigia peruviana</i>	Peruvian primrosewillow	Non-Native
<i>Ludwigia repens</i>	Red ludwigia; creeping primrosewillow	
<i>Ludwigia suffruticosa</i>	Shrubby seedbox	
<i>Luziola fluitans</i>	Southern watergrass	
<i>Lygodium japonicum</i>	Japanese climbing-fern	Non-Native
<i>Lygodium microphyllum</i>	Old world climbing fern, small leaf climbing fern	Non-Native
<i>Lyonia ferruginea</i>	Rusty lyonia	
<i>Lyonia fruticosa</i>	Coastalplain staggerbush	
<i>Lyonia lucida</i>	Fetterbush	
<i>Lythrum alatum</i>	Winged loosestrife	
<i>Lythrum flagellare</i>	Lowland loosestrife	SE
<i>Macroptilium lathyroides</i>	Wild bushbean	Non-Native
<i>Magnolia virginiana</i>	Sweetbay; magnolia	
<i>Melaleuca quinquenervia</i>	Melaleuca; punktree	Non-Native
<i>Melia azedarach</i>	Chinaberry tree	Non-Native
<i>Melinis repens</i>	Natalgrass; rose natalgrass	Non-Native
<i>Melothria pendula</i>	Creeping cucumber	
<i>Micranthemum umbros</i>	Baby tears; shade mudflower	
<i>Mikania scandens</i>	Climbing hempweed; climbing hempvine	
<i>Mitchella repens</i>	Twinberry	
<i>Mitreola petiolata</i>	Stalked miterwort; lax hornpod	
<i>Momordica charantia</i>	Wild balsam apple; balsampear	Non-Native
<i>Morella cerifera</i>	Wax myrtle; southern bayberry	
<i>Myriophyllum aquaticum</i>	Parrot feather; watermilfoil	Non-Native
<i>Myrsine cubana</i>	Myrsine	
<i>Najas guadalupensis</i>	Southern naiad; southern waternymph	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Nekemias arborea</i>	Pepper vine	
<i>Nuphar advena</i>	Spatterdock; yellow pondlily	
<i>Nymphaea mexicana</i>	Yellow waterlily	
<i>Nymphaea odorata</i>	Fragrant white waterlily	
<i>Nymphoides aquatica</i>	Banana lilly; big floatingheart	
<i>Nymphoides cristata</i>	Crested floatingheart	Non-Native
<i>Nyssa sylvatica</i> var. <i>biflora</i>	Swamp black gum; swamp tupelo	
<i>Orthochilus ecristatus</i>	Giant orchid	ST
<i>Osmunda spectabilis</i>	Royal fern	
<i>Osmundastrum cinnamomeum</i>	Cinnamon fern	
<i>Oxalis corniculata</i>	Creeping woodsorrel; common yellow woodsorrel	
<i>Oxalis debilis</i>	Pink woodsorrel	Non-Native
<i>Packera glabella</i>	Butterweed	
<i>Panicum repens</i>	Torpedograss	Non-Native
<i>Parietaria floridana</i>	Florida pellitory	
<i>Parthenocissus quinquefolia</i>	Virginia creeper; woodbine	
<i>Paspalidium geminatum</i>	Egyptian paspalidum; kissimmeegrass	Non-Native
<i>Paspalum acuminatum</i>	Brook crowngrass	Non-Native
<i>Paspalum conjugatum</i>	Sour paspalum; hilograss	
<i>Paspalum dilatatum</i>	Dallisgrass	Non-Native
<i>Paspalum dissectum</i>	Mudbank paspalum; mudbank crowngrass	
<i>Paspalum distichum</i>	Joint paspalum; knotgrass	
<i>Paspalum floridanum</i>	Florida paspalum	
<i>Paspalum laeve</i>	Field paspalum	
<i>Paspalum notatum</i>	Bahiagrass	Non-Native
<i>Paspalum pubiflorum</i>	Hairyseed paspalum	
<i>Paspalum repens</i>	Water paspalum	
<i>Paspalum setaceum</i>	Thin paspalum	
<i>Paspalum urvillei</i>	Vasey grass	Non-Native
<i>Passiflora incarnata</i>	Purple passionflower; maypop	
<i>Passiflora suberosa</i>	Corkystem passionflower	
<i>Peltandra sagittifolia</i>	Spoonflower; white arrow arum	
<i>Peltandra virginica</i>	Green arrow arum	
<i>Persea borbonia</i>	Red bay	
<i>Persea borbonia</i> var. <i>humilis</i>	Silk bay	
<i>Persea palustris</i>	Swamp bay	
<i>Persicaria glabra</i>	Denseflower smartweed; denseflower knotweed	
<i>Persicaria hirsuta</i>	Hairy smartweed	
<i>Persicaria hydropiperoides</i>	Swamp smartweed; mild waterpepper	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Persicaria punctata</i>	Knotweed, smartweed	
<i>Phragmites australis</i>	Common reed	Non-Native
<i>Phyla nodiflora</i>	Turkey tangle fogfruit; capeweed	
<i>Physalis pubescens</i>	Husk tomato	
<i>Phytolacca americana</i>	Common pokeweed; american pokeweed	
<i>Piloblephis rigida</i>	Wild pennyroyal	
<i>Pinguicula lutea</i>	Yellow butterwort	ST
<i>Pinus elliotti var. Densa</i>	South Florida slash pine	
<i>Pinus palustris</i>	Longleaf pine	
<i>Pistia stratiotes</i>	Water lettuce	Non-Native
<i>Pleopeltis michauxiana</i>	Resurrection fern	
<i>Pluchea baccharis</i>	Stinkweed; rosy camphorweed	
<i>Pluchea foetida</i>	Stinking camphorweed	
<i>Pluchea odorata</i>	Sweetscent	
<i>Polygonum punctatum</i>	Dotted smartweed	
<i>Polypremum procumbens</i>	Juniperleaf; rustweed	
<i>Pontederia cordata</i>	Pickrelweed	
<i>Proserpinaca palustris</i>	Marsh mermaidweed	
<i>Psidium cattleianum</i>	Strawberry guava	Non-Native
<i>Psidium guajava</i>	Common guava	Non-Native
<i>Ptilimnium capillaceum</i>	Mock bishopsweed; herbwilliam	
<i>Quercus chapmanii</i>	Chapman oak	
<i>Quercus geminata</i>	Sand live oak	
<i>Quercus inopina Ashe</i>	Scrub oak	
<i>Quercus laurifolia</i>	Laurel oak; diamond oak	
<i>Quercus minima</i>	Dwarf live oak	
<i>Quercus myrtifolia</i>	Myrtle oak	
<i>Quercus nigra</i>	Water oak	
<i>Quercus virginiana</i>	Live oak	
<i>Ranunculus parviflorus</i>	Smallflower buttercup	Non-Native
<i>Rhexia mariana</i>	Pale meadowbeauty; maryland meadowbeauty	
<i>Rhexia nashii</i>	Maid marian	
<i>Rhus copallinum</i>	Winged sumac	
<i>Rhynchospora cephalantha</i>	Bunched beaksedge	
<i>Rhynchospora chalarocephala</i>	Loose head beakrush	
<i>Rhynchospora colorata</i>	Star-rush	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Rhynchospora decurrens</i>	Swampforest beaksedge	
<i>Rhynchospora divergens</i>	Spreading beaksedge	
<i>Rhynchospora eximia</i>	Florida breaksedge	
<i>Rhynchospora fascicularis</i>	Fasciculate beak ush	
<i>Rhynchospora globularis</i>	Globe beakrush	
<i>Rhynchospora grayi</i>	Gray's beakrush	
<i>Rhynchospora inundata</i>	Inundated beakrush; narrowfruit horned beaksedge	
<i>Rhynchospora microcarpa</i>	Southern beakrush; souther beaksedge	
<i>Rhynchospora microcephala</i>	Capitate beakrush; bunched beaksedge	
<i>Rhynchospora nitens</i>	Baldrush; shortbeak beaksedge	
<i>Rhynchospora odorata</i>	Fragrant beakrush; fragrant beaksedge	
<i>Rhynchospora scirpoides</i>	Longbeak beaksedge	
<i>Rhynchospora tracyi</i>	Tracy's beakrush	
<i>Ricciocarpos natans</i>	Liverwort; purple-fringed riccia	
<i>Richardia scabra</i>	Rough mexican clover	Non-Native
<i>Ricinus communis</i>	Castorbean	Non-Native
<i>Rotala ramosoir</i>	Lowland rotala	
<i>Rubus cuneifolius</i>	Sand blackberry	
<i>Ruellia sp.</i>	Wild petunia	
<i>Sabal palmetto</i>	Cabbage palm	
<i>Sabatia bartramii</i>		
<i>Sabatia decandra</i>	Bartram's rosegiant	
<i>Saccharum giganteum</i>	Sugarcane plumegrass	
<i>Sacciolepis indica</i>	Glenwood grass; indian cupscale	Non-Native
<i>Sacciolepis striata</i>	American cupscale	
<i>Sacoila lanceolata</i>	Leafless beaked orchid	
<i>Sagittaria lancifolia</i>	Duck potato; bulltongue arrowhead	
<i>Sagittaria latifolia</i>	Broadleaf arrowhead; common arrowhead; duck potato	
<i>Salix caroliniana</i>	Coastalplain willow; carolina willow	
<i>Salvinia minima</i>	Water fern; water spangles	Non-Native
<i>Sambucus nigra spp.</i>	Elderberry	
<i>Sarcostemma clausum</i>	White twinevine	
<i>Saururus cernuus</i>	Lizard's-tail	
<i>Schinus terebinthifolius</i>	Brazilian pepper	Non-Native
<i>Schoenoplectus californicus</i>	Southern bulrush; giant bulrush; california bulrush	
<i>Schoenoplectus californicus</i>	Giant bulrush; california bulrush	
<i>Schoenoplectus tabernaemontani</i>	Softstem bulrush	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Scleria reticularis</i>	Netted nutrush	
<i>Scoparia dulcis</i>	Licoriceweed; sweetbroom	
<i>Senecio vulgaris</i>	Common groundsel	
<i>Senna obtusifolia</i>	Coffeeweed, sicklepod	
<i>Senna occidentalis</i>	Septicweed; coffee senna	Non-Native
<i>Serenoa repens</i>	Saw palmetto	
<i>Sesbania herbacea</i>	Danglepod	
<i>Sesbania punicea</i>	Spanish gold; rattlebox	Non-Native
<i>Sesbania vesicaria</i>	Bagpod rattle bush; bladderpod	
<i>Setaria geniculata</i>	Bristlegrass	
<i>Setaria magna</i>	Giant foxtail; giant bristlegrass	
<i>Setaria parviflora</i>	Knotroot foxtail; Yellow bristlegrass	
<i>Sida cordifolia</i>	Lima	Non-Native
<i>Sida elliottii</i>	Elliott's fanpetals	
<i>Sida rhombifolia</i>	Arrow leaf sida; cuban jute; indian hemp	
<i>Sida ulmifolia</i>	Sida; common wireweed; common fanpetals	
<i>Sisyrinchium angustifolium</i>	Blue-eyed grass; narrowleaf blue-eyed grass	
<i>Smilax auriculata</i>	Wild bamboo	
<i>Smilax bona-nox</i>	Saw greenbrier	
<i>Smilax laurifolia</i>	Laurel greenbrier; bamboo vine	
<i>Smilax rotundifolia</i>	Common greenbrier; bullbrier; roundleaf greenbrier	
<i>Smilax walteri</i>	Coral greenbrier	
<i>Solanum americanum</i>	American black nightshade	
<i>Solanum capsicoides</i>	Soda apple, cockroach- berry	Non-Native
<i>Solanum diphyllum</i>	Twoleaf nightshade	Non-Native
<i>Solanum jamaicense</i>	Jamaican nightshade	Non-Native
<i>Solanum tampicense</i>	Aquatic soda apple	Non-Native
<i>Solanum viarum</i>	Tropical soda apple	Non-Native
<i>Solidago fistulosa</i>	Pinebarren goldenrod	
<i>Solidago tortifolia</i>	Twistedleaf goldenrod	
<i>Sophronanthe hispida</i>	Scrub hyssop, rough hedge hyssop	
<i>Sorghastrum secundum</i>	Lopsided indiagrass	
<i>Spartina bakeri</i>	Sand cord grass	
<i>Sphagnum spp.</i>	Sphagnum moss	
<i>Sphenoclea zeylanica</i>	Chickenspike	Non-Native

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Spiranthes longilabris</i>	Giant spiral lady's slippers	ST
<i>Spiranthes vernalis</i>	Spring lady's slippers	
<i>Sporobolus indicus</i>	Smutgrass	Non-Native
<i>Steinchisma hians</i>	Gaping panic grass	
<i>Stillingia aquatica</i>	Corkwood; water toothleaf	
<i>Stillingia sylvatica</i>	Queen's delight	
<i>Suriana maritima</i>	Bay cedar	
<i>Symphytotrichum carolinianum</i>	Climbing aster	
<i>Symphytotrichum dumosum</i>	Rice button aster	
<i>Symphytotrichum elliotti</i>	Elliott's aster	
<i>Taxodium ascendens</i>	Pond cypress	
<i>Taxodium distichum</i>	Bald-cypress	
<i>Telmatoblechnum serrulatum</i>	Swamp fern; toothed midsorus fern	
<i>Teucrium canadense</i>	American germander; woodsage; canadian germander	
<i>Thalia geniculata</i>	Fireflag; alligatorflag	
<i>Thelypteris dentata</i>	Downy maiden fern; downy shield fern	
<i>Thelypteris interrupta</i>	Willdenow's maiden fern; willdenow's fern; downy maiden fern	
<i>Thelypteris kunthii</i>	Widespread maiden fern; southern maiden fern	
<i>Thelypteris palustris</i> var. <i>pubescens</i>	Marsh fern	
<i>Thelypteris</i> spp.	Maidenferns	
<i>Tillandsia balbisiana</i>	Bulbous wild pine; northern needleleaf	ST
<i>Tillandsia fasciculata</i>	Cardinal airplant; stiff-leaved wild pine	SE
<i>Tillandsia usneoides</i>	Spanish moss	
<i>Tillandsia utriculata</i>	Giant wild pine	SE
<i>Toxicodendron radicans</i>	Poison ivy	
<i>Triadenum virginicum</i>	Marsh st. John's wort	
<i>Triadica sebifera</i>	Chinese tallow	Non-Native
<i>Trifolium repens</i>	White clover	Non-Native
<i>Triumfetta semitriloba</i>	Burweed; sacramento burrbark	Non-Native
<i>Typha domingensis</i>	Southern cattail	
<i>Typha latifolia</i>	Broadleaf cattail	
<i>Urena lobata</i>	Caesarweed	Non-Native
<i>Urochloa distachyos</i>	Tropical signalgrass	Non-Native
<i>Urochloa maxima</i> syn. <i>Megathyrsus</i>	Guineagrass	Non-Native
<i>Urochloa mutica</i>	Paragrass	Non-Native
<i>Urtica chamaedryoides</i>	Heartleaf nettle	

Table 1 (Continued). List of plants on the KR MA and status.

Scientific Name	Common Name	Listing Status
<i>Utricularia spp.</i>	Bladderwort	
<i>Vaccinium corybosum</i>	Highbrush blueberry	
<i>Vaccinium myrsinites</i>	Shiny blueberry	
<i>Vallisneria americana</i>	Tapegrass	
<i>Verbena scabra</i>	Sandpaper vervain; harsh vervain	
<i>Vicia acutifolia</i>	Fourleaf vetch	
<i>Vigna luteola</i>	Cowpea; hairy pod cowpea	
<i>Vigna speciosa</i>	Wandering cowpea	Non-Native
<i>Viola lanceolata</i>	Bog white violet	
<i>Viola palmata</i>	Early blue violet	
<i>Viola primulifolia</i>	Primroseleaf violet	
<i>Viola sororia</i>	Common blue violet	
<i>Vitis aestivalis</i>	Summer grape	
<i>Vitis munsoniana</i>	Wild grape	
<i>Vitis rotundifolia</i>	Muscadine grape	
<i>Vittaria lineata</i>	Shoestring fern	
<i>Wolffiella gladiata</i>	Sword bogmat; florida mudmidget	
<i>Woodwardia areolata</i>	Netted chain fern	
<i>Woodwardia spp.</i>	Chain fern	
<i>Woodwardia virginica</i>	Virginia chain fern	
<i>Ximenia americana</i>	Hog plum	
<i>Xyris ambigua</i>	Coastalplain yelloweyed grass	
<i>Xyris brevifolia</i>	Shortleaf yelloweyed grass	
<i>Xyris calcicola</i>	Limestone yelloweyed grass	
<i>Xyris caroliniana</i>	Carolina yelloweyed grass	
<i>Xyris difformis var. floridana</i>	Florida yelloweyed grass	
<i>Xyris ellioti</i>	Elliott's yellow-eyed grass	
<i>Xyris fimbriata</i>	Fringed yelloweyed grass	
<i>Xyris flabelliformis</i>	Savannah yelloweyed grass	
<i>Xyris jupicae</i>	Richard's yellow-eyed grasses	
<i>Xyris jupicai</i>	Richard's yelloweyed grass	
<i>Xyris platylepis</i>	Tall yelloweyed grass	
<i>Xyris smalliana</i>	Small's yelloweyed grass	
<i>Yucca filamentosa</i>	Adam's needle	

a. Key to abbreviations: Species listed by the State of Florida State-designated Threatened (ST) and State-designated Endangered (SE).

Table 2. List of birds utilizing the KR MA and status.^{a, 1}

Scientific Name	Common Name	Listing Status	Presence
<i>Empidonax virescens</i>	Acadian Flycatcher		◆
<i>Anhinga anhinga</i>	American Anhinga		☞
<i>Botaurus lentiginosus</i>	American Bittern		☞
<i>Corvus brachyrhynchos</i>	American Crow		☞
<i>Carduelis tristis</i>	American Goldfinch		☞
<i>Falco sparverius</i>	American Kestrel		☞
<i>Anthus rubescens</i>	American Pipit		◆
<i>Setophaga ruticilla</i>	American Redstart		☞
<i>Turdus migratorius</i>	American Robin		☞
<i>Mareca americana</i>	American Wigeon		◆
<i>Scolopax minor</i>	American Woodcock		☞
<i>Aimophila aestivalis</i>	Bachman's Sparrow		☞
<i>Haliaeetus leucocephalus</i>	Bald Eagle		☞
<i>Riparia riparia</i>	Bank Swallow		◆
<i>Tyto alba</i>	Barn Owl		☞
<i>Hirundo rustica</i>	Barn Swallow		☞
<i>Strix varia</i>	Barred Owl		☞
<i>Ceryle alcyon</i>	Belted Kingfisher		☞
<i>Anas rubripes</i>	Black Duck		◆
<i>Coragyps atratus</i>	Black Vulture		☞
<i>Mniotilta varia</i>	Black-and-white Warbler		☞
<i>Dendrocygna autumnalis</i>	black-bellied Whistling duck		☞
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo		◆
<i>Nycticorax nycticorax</i>	Black-crowned Night heron		☞
<i>Himantopus mexicanus</i>	Black-necked Stilt		☞
<i>Setophaga striata</i>	Blackpoll Warbler		☞
<i>Dendroica caerulescens</i>	Black-throated Blue Warbler		☞
<i>Setophaga virens</i>	Black-throated Green Warbler		☞
<i>Vireo altiloquus</i>	Black-whiskered Vireo		◆
<i>Guiraca caerulea</i>	Blue Grosbeak		◆
<i>Cyanocitta cristata</i>	Blue Jay		☞
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher		☞
<i>Vireo solitarius</i>	Blue-headed Vireo		☞
<i>Spatula discors</i>	Blue-winged teal		☞
<i>Quiscalus major</i>	Boat-tailed Grackle		☞
<i>Dolichonyx oryzivorus</i>	Bobolink		☞
<i>Colinus virginianus</i>	Bobwhite Quail		☞
<i>Euphagus cyanocephalus</i>	Brewer's Blackbird		☞
<i>Pelecanus occidentalis</i>	Brown Pelican		◆
<i>Toxostoma rufum</i>	Brown Thrasher		☞
<i>Molothrus ater</i>	Brown-headed Cowbird		☞

Table 2 (Continued). List of birds utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Athene cunicularia floridana</i>	Burrowing Owl		☞
<i>Aythya varisineria</i>	Canvasback		◆
<i>Thryothorus ludovicianus</i>	Carolina Wren		☞
<i>Bombycilla cedrorum</i>	Cedar Waxwing		☞
<i>Chaetura pelagica</i>	Chimney Swift		☞
<i>Spizella passerina</i>	Chipping Sparrow		☞
<i>Petrochelidon pyrrhonota</i>	Cliff Swallow		◆
<i>Gallinula galeata</i>	Common Gallinule		☞
<i>Quiscalus quiscula</i>	Common Grackle		☞
<i>Columbina passerina</i>	Common Ground Dove		☞
<i>Gavia immer</i>	Common Loon		◆
<i>Chordeiles minor</i>	Common Nighthawk		☞
<i>Sterna hirundo</i>	Common Tern	FT	◆
<i>Geothlypis trichas</i>	Common Yellowthroat		☞
<i>Oporonis agilis</i>	Connecticut Warbler		◆
<i>Accipiter cooperii</i>	Cooper's Hawk		☞
<i>Caracara plancus</i>	Crested caracara		☞
<i>Nannopterum auritum</i>	Double-crested Cormorant		☞
<i>Picoides pubescens</i>	Downy Woodpecker		☞
<i>Laterallus jamaicensis jamaicensis</i>	Eastern Black Rail	FT	◆
<i>Sialia sialis</i>	Eastern Bluebird		☞
<i>Sturnella magna</i>	Eastern Meadowlark		☞
<i>Sayornis phoebe</i>	Eastern Phoebe		☞
<i>Megascops asio</i>	Eastern Screech-owl		☞
<i>Pipilo erythrophthalmus</i>	Eastern Towhee		☞
<i>Caprimulgus vociferus</i>	Eastern Whip-poor-will		☞
<i>Contopus virens</i>	Eastern Wood-pewee		☞
<i>Streptopelia decaocto</i>	Eurasian collared-Dove		☞
<i>Sturnus vulgaris</i>	European Starling		☞
<i>Sturnus vulgaris</i>	European Starling		☞
<i>Rostrhamus sociabilis plumbeus</i>	Everglade Snail Kite	FE	☞
<i>Corvus ossifragus</i>	Fish Crow		☞
<i>Ammodramus savannarum floridanus</i>	Florida Grasshopper Sparrow	FE	☞
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	ST	☞
<i>Plegadis falcinellus</i>	Glossy Ibis		☞
<i>Ammodramus savannarum</i>	Grasshopper Sparrow		☞
<i>Dumetella carolinensis</i>	Gray Catbird		☞
<i>Ardea herodias</i>	Great Blue Heron		◆
<i>Myiarchus crinitus</i>	Great Crested Flycatcher		☞
<i>Ardea alba</i>	Great Egret		☞
<i>Bubo virginianus</i>	Great Horned Owl		☞
<i>Tringa melamoleuca</i>	Greater Yellowlegs		☞

Table 2 (Continued). List of birds utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Butorides virescens</i>	Green Heron		☞
<i>Anas crecca</i>	Green-winged Teal		☞
<i>Picoides villosus</i>	Hairy Woodpecker		☞
<i>Numida meleagris</i>	Helmeted Guineafowl		☞
<i>Ammodramus henslowii</i>	Henslow's Sparrow		◆
<i>Catharus guttatus</i>	Hermit Thrush		☞
<i>Lophodytes cululatus</i>	Hooded merganser		☞
<i>Wilsonia citrina</i>	Hooded Warbler		◆
<i>Passer domesticus</i>	House Sparrow		☞
<i>Troglodytes aedon</i>	House Wren		☞
<i>Pavo cristatus</i>	Indian Peafowl		☞
<i>Passerina cyanea</i>	Indigo Bunting		☞
<i>Oporonis formosus</i>	Kentucky Warbler		◆
<i>Charadrius vociferus</i>	Killdeer		☞
<i>Rallus elegans</i>	King Rail		◆
<i>Ammodramus leconteii</i>	Le Conte's Sparrow		◆
<i>Ixobrychus exilis</i>	Least Bittern		☞
<i>Calidris minutilla</i>	Least Sandpiper		☞
<i>Tringa flavipes</i>	Lesser Yellowlegs		☞
<i>Aramus guarauna</i>	Limpkin		◆
<i>Egretta caerulea</i>	Little blue heron	ST	☞
<i>Lanius judovicianus</i>	Loggerhead Shrike		☞
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher		☞
<i>Parkesia motacilla</i>	Louisiana Waterthrush		☞
<i>Cistothorus palustris</i>	Marsh Wren		☞
<i>Falco columbarius</i>	Merlin		☞
<i>Anas fulvigula</i>	Mottled Duck		☞
<i>Zenaida macroura</i>	Mourning Dove		☞
<i>Stelgidopteryx serripennis</i>	N. Rough-winged Swallow		◆
<i>Colinus virginianus</i>	Northern Bobwhite Quail		☞
<i>Cardinalis cardinalis</i>	Northern Cardinal		☞
<i>Colaptes auratus</i>	Northern Flicker		☞
<i>Circus cyaneus</i>	Northern Harrier		☞
<i>Mimus polyglottos</i>	Northern Mockingbird		☞
<i>Baltimore Oriole</i>	Northern Oriole		◆
<i>Parula americana</i>	Northern Parula Warbler		☞
<i>Anas acuta</i>	Northern Pintail		◆
<i>Spatula clypeata</i>	Northern shoveler		☞
<i>Parkesia noveboracensis</i>	Northern Waterthrush		☞
<i>Leiothlypis celata</i>	Orange-crowned Warbler		☞
<i>Pandion haliaetus</i>	Osprey		☞
<i>Seiurus aurocapilla</i>	Ovenbird		☞

Table 2 (Continued). List of birds utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Passerina ciris</i>	Painted Bunting		☞
<i>Setophaga plamarum</i>	Palm Warbler		☞
<i>Calidris melanotos</i>	Pectoral Sandpiper		☞
<i>Falco peregrinus</i>	Peregrine Falcon		☞
<i>Podilymbus podiceps</i>	Pied-billed Grebe		☞
<i>Dryocopus pileatus</i>	Pileated Woodpecker		☞
<i>Setophaga pinus</i>	Pine Warbler		☞
<i>Setophaga discolor</i>	Prairie Warbler		☞
<i>Protonotaria citrea</i>	Prothonotary Warbler		◆
<i>Porphyrio martinica</i>	Purple Gallinule		☞
<i>Progne subis</i>	Purple Martin		☞
<i>Gallus gallus</i>	Red Junglefowl		☞
<i>Melanerpes carolinus</i>	Red-bellied Woodpecker		☞
<i>Mergus serrator</i>	Red-breasted Merganser		◆
<i>Picoides borealis</i>	Red-cockaded Woodpecker	FT	☞
<i>Vireo olivaceus</i>	Red-eyed Vireo		☞
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker		☞
<i>Buteo lineatus</i>	Red-shouldered Hawk		☞
<i>Buteo jamaicensis</i>	Red-tailed Hawk		☞
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	ST	☞
<i>Larus delawarensis</i>	Ring-billed Gull		☞
<i>Columba livia</i>	Rock Pigeon		☞
<i>Platalea ajaja</i>	Roseate spoonbill	ST	☞
<i>Corthylio calendula</i>	Ruby-crowned Kinglet		☞
<i>Archilochus colubris</i>	Ruby-throated Hummingbird		◆
<i>Passerculus sandwichensis</i>	Savannah Sparrow		☞
<i>Tyrannus forficatus</i>	Scissor-tailed Flycatcher		◆
<i>Aphelocoma coerulescens</i>	Scrub Jay		☞
<i>Cistothorus platensis</i>	Sedge Wren		☞
<i>Accipiter striatus</i>	Sharp-shinned Hawk		☞
<i>Asio flammeus</i>	Short-eared Owl		◆
<i>Buteo brachyurus</i>	Short-tailed Hawk		☞
<i>Crotophaga ani</i>	Smooth-billed Ani		◆
<i>Egretta thula</i>	Snowy Egret		☞
<i>Tringa solitaria</i>	Solitary Sandpiper		☞
<i>Melospiza melodia</i>	Song Sparrow		◆
<i>Porzana carolina</i>	Sora		☞
<i>Falco sparverius paulus</i>	Southeastern American Kestrel		☞
<i>Actitis macularius</i>	Spotted Sandpiper		☞
<i>Piranga rubra</i>	Summer Tanager		☞
<i>Elanoides forficatus</i>	Swallow-tailed Kite		☞

Table 2 (Continued). List of birds utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Melospiza georgiana</i>	Swamp Sparrow		☑
<i>Leiothlypis peregrina</i>	Tennessee Warbler		☑
<i>Tachycineta bicolor</i>	Tree Swallow		☑
<i>Egretta tricolor</i>	Tricolored heron	ST	☑
<i>Baeolophus bicolor</i>	Tufted Titmouse		☑
<i>Cathartes aura</i>	Turkey Vulture		☑
<i>Rallus limicola</i>	Virginia Rail		☑
<i>Ardea ibis</i>	Western Cattle Egret		☑
<i>Eodcimus albus</i>	White Ibis		☑
<i>Accipiter striatus</i>	White Pelican		☑
<i>Vireo griseus</i>	White-eyed Vireo		☑
<i>Elanus caeruleus</i>	White-tailed Kite		☑
<i>Zonotrichia albicollis</i>	White-throated Sparrow		☑
<i>Zenaida asiatica</i>	White-winged Dove		☑
<i>Meleagris gallopavo</i>	Wild Turkey		☑
<i>Gallinago delicata</i>	Wilson's Snipe		☑
<i>Aix sponsa</i>	Wood Duck		☑
<i>Mycteria americana</i>	Wood stork		☑
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker		☑
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo		☑
<i>Nyctanassa violacea</i>	Yellow-crowned Night-heron		☑
<i>Setophaga coronata</i>	Yellow-rumped Warbler		☑
<i>Vireo flavifrons</i>	Yellow-throated Vireo		☑
<i>Setophaga dominica</i>	Yellow-throated Warbler	ST	◆

a. Key to abbreviations: Species listed as Federally-designated Endangered (FE) and Federally-designated Threatened (FT).

1. Key to abbreviations: ◆ = Potential and ☑ = Confirmed

Table 3. List of reptiles and amphibians on the KR MA and status.^a

Scientific Name	Common Name	Listing Status	Presence
SNAKES			
<i>Agkistrodon piscivorus conanti</i>	Florida Cottonmouth		☞
<i>Cemophora coccinea coccinea</i>	Florida Scarlet		☞
<i>Coluber constrictor priapus</i>	Southern Black Racer		☞
<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake		☞
<i>Diadophis punctatus</i>	Southern Ringneck		◆
<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	FT	☞
<i>Farancia abacura abacura</i>	Eastern Mudsnake		☞
<i>Farancia erythrogramma seminola</i>	Southern Florida Rainbow	endemic	◆
<i>Heterodon platyrhinos</i>	Eastern Hognose snake		◆
<i>Lampropeltis calligaster occipitolineata</i>	South Florida Mole Kingsnake		☞
<i>Lampropeltis extenuate</i>	Short-tailed Snake	ST	◆
<i>Lampropeltis getulus</i>	Common Kingsnake Snake		☞
<i>Lampropeltis triangulum elapsoides</i>	Scarlet Kingsnake		◆
<i>Liodytes alleni</i>	Striped Swampsnake		☞
<i>Masticophis flagellum flagellum</i>	Eastern Coachwhip		◆
<i>Micrurus fulvius fulvius</i>	Eastern Coral Snake		☞
<i>Nerodia cyclopion floridana</i>	Florida Green Watersnake		☞
<i>Nerodia fasciata pictiventris</i>	Florida Watersnake		☞
<i>Nerodia taxispilota</i>	Brown Watersnake		☞
<i>Opheodrys aestivus</i>	Rough Green Snake		☞
<i>Pantherophis guttata guttata</i>	Corn Snake		☞
<i>Pantherophis quadrivittatus</i>	Eastern Rat Snake		☞
<i>Pituophis melanoleucus mugitus</i>	Florida Pine Snake		☞
<i>Rhadinaea flavilata</i>	Pine woods Snake		◆

Table 3 (Continued). List of reptiles and amphibians on the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Sistrurus miliarius barbouri</i>	Dusty Pygmy Rattlesnake		☞
<i>Storeria victa</i>	Florida Brown Snake		◆
<i>Tantilla relicta relicta</i>	Florida Crown Snake		◆
<i>Thamnophis sauritus sackenii</i>	Peninsula Ribbon snake		☞
<i>Thamnophis sirtalis</i>	Common Garter Snake		☞
LIZARDS			
<i>Anolis carolinensis</i>	Green Anole		☞
<i>Anolis sagrei sagrei</i>	Brown Anole		☞
<i>Eumeces inexpectatus</i>	Southeastern Five-lined Skink		☞
<i>Neoseps reynoldsi</i>	Sand Skink	FE	◆
<i>Ophisaurus ventralis</i>	Eastern Glass Lizard		☞
<i>Plestiodon egregius lividus</i>	Bluetailed Mole Skink	FT	◆
<i>Sceloporus undulatus undulatus</i>	Southern Fence Lizard		◆
<i>Sceloporus woodi</i>	Florida Scrub Lizard		◆
<i>Scincella lateralis</i>	Ground Skink		☞
FROGS & TOADS			
<i>Acris gryllus dorsalis</i>	Florida Cricket Frog		☞
<i>Bufo quercicus</i>	Oak Toad		☞
<i>Bufo terrestris</i>	Southern Toad		☞
<i>Dryophytes femoralis</i>	Pinewoods Treefrog		☞
<i>Gastrophryne carolinensis carolinensis</i>	Eastern Narrow-mouthed Toad		☞
<i>Hyla cinerea</i>	Green Treefrog		☞
<i>Hyla gratiosa</i>	Barking Treefrog		☞

Table 3 (Continued). List of reptiles and amphibians on the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Hyla squirella</i>	Squirrel Treefrog		☒
<i>Limaedus ocularis</i>	Little Grass Frog		☒
<i>Osteopilus septentrionalis</i>	Cuban Treefrog		☒
<i>Pseudacris nigrita verrucosa</i>	Southern Chorus Frog		☒
<i>Rana areolata aesopus</i>	Florida Gopher Frog		☒
<i>Rana catesbeiana</i>	Bullfrog		☒
<i>Rana grilio</i>	Pig frog		☒
<i>Rana sphenoccephala</i>	Southern Leopard Frog		☒
<i>Scaphiopus holbrooki</i>	Eastern Spadefoot		◆
SALAMANDERS			
<i>Amphiuma means</i>	Two-toed Amphium		☒
<i>Eurycea quadridigitata</i>	Southeastern Dwarf Salamander		☒
<i>Notophthalmas viridescens piaropicola</i>	Peninsula Newt		☒
<i>Pseudobranchus striatus axanthus</i>	Narrow-striped Dwarf Siren		◆
<i>Pseudobranchus striatus belli</i>	Everglades Dwarf Siren		◆
<i>Siren intermedia intermedia</i>	Eastern Lesser Siren		☒
<i>Siren lacertina</i>	Greater Siren		☒
TURTLES			
<i>Apalone ferox</i>	Florida Softshell		☒
<i>Chelydra serpentina osceola</i>	Florida Snapping		☒
<i>Deirochelys reticularia chrysea</i>	Florida Chicken		☒

Table 3 (Continued). List of reptiles and amphibians on the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Gopherus polyphemus</i>	Gopher Tortoise	ST	☞
<i>Kinosternon baurii</i>	Striped Mud		☞
<i>Kinosternon subrubrum steindachneri</i>	Florida Mud		◆
<i>Pseudemys floridana peninsularis</i>	Peninsula Cooter		☞
<i>Pseudemys nelsoni</i>	Florida Redbelly		☞
<i>Sternotherus odoratus</i>	Common Musk		◆
<i>Terrapene carolina bauri</i>	Florida Box		☞
CROCODYLIA			
<i>Alligator mississippiensis</i>	American Alligator	FT(S/A)	☞

a. Key to abbreviations: Species listed as Federally-designated Threatened because of similarity of appearance [FT(S/A)] and FXN Federally-designated Threatened Nonessential Experimental Population.

Table 4. List of mammals utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Blarina carolinensis</i>	Short-tailed Shrew		☞
<i>Canis latrans</i>	Coyote		◆
<i>Cryptotis parva</i>	Least Shrew		☞
<i>Dasypus novemcinctus</i>	Nine-banded Armadillo		☞
<i>Didelphis marsupialis</i>	Opposum		☞
<i>Eptesicus fuscus fuscus</i>	Big Brown Bat		☞
<i>Eumops floridanus</i>	Florida Bonneted bat	FE	☞
<i>Felis concolor coryi</i>	Florida Panther	FE	☞
<i>Geomys pinetis</i>	Southeastern Pocket Gopher		◆
<i>Glaucomys volans</i>	Southern Flying Squirrel		◆
<i>Lasiurus cinereus</i>	Hoary Bat		◆
<i>Lasiurus intermedius floridanus</i>	Northern Yellow Bat		◆
<i>Lasiurus seminolus</i>	Seminole Bat		◆
<i>Lontra canadensis</i>	River Otter		☞
<i>Lynx rufus</i>	Bobcat		☞
<i>Mephitis mephitis</i>	Striped Skunk		☞
<i>Mustela frenata</i>	Long-tailed Weasel		◆
<i>Mustela frenata peninsulæ</i>	Florida long-tailed Weasel		◆
<i>Myotis austroriparius</i>	Southeastern Brown Bat		◆
<i>Neofiber alleni</i>	Round-tailed Muskrat		☞
<i>Neotoma floridana</i>	Eastern Woodrat		☞
<i>Nycticeius humeralis</i>	Evening Bat		◆
<i>Odocoileus virginianus</i>	Whitetail Deer		☞
<i>Oryzomys palustris</i>	Rice Rat		☞
<i>Peromyscus gossypinus</i>	Cotton Mouse		☞
<i>Pipistrellus subflavus</i>	Eastern Pipistrel		◆
<i>Plecotus rafinesquii</i>	Southeastern Big-eared Bat		◆
<i>Podomys floridanus</i>	Florida Mouse		◆
<i>Procyon lotor</i>	Raccoon		☞
<i>Scalopus aquaticus</i>	Eastern Mole		☞
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel		☞
<i>Sciurus niger niger</i>	Southern Fox Squirrel		☞
<i>Sigmodon hispidus</i>	Hispid Cotton Rat		☞
<i>Spilogale putorius</i>	Spotted Skunk		☞
<i>Sus scrofa</i>	Feral Hog		☞

Table 4 (Continued). List of mammals utilizing the KR MA and status.

Scientific Name	Common Name	Listing Status	Presence
<i>Sylvilagus floridanus</i>	Eastern Cottontail Rabbit		☞
<i>Sylvilagus palustris</i>	Marsh Rabbit		☞
<i>Tadarida brasiliensis cynocephala</i>	Brazilian Free-tailed Bat		◆
<i>Trichechus manatus latirostris</i>	Florida Manatee	FT	☞
<i>Urocyon cinereoargenteus</i>	Gray Fox		☞
<i>Ursus americanus floridanus</i>	Florida Black Bear		◆
<i>Vulpes vulpes fulvus</i>	Red Fox		◆

Table 5. List of invertebrates on the KR MA and status.

Family	Genus
AMPHIPODA - Shrimps	
<i>Hyalellidae</i>	<i>Hyalella</i>
COLEOPTERA - Beetles	
<i>Gyrinidae</i>	<i>Dineutus</i>
<i>Haliplidae</i>	<i>Peltodytes</i>
<i>Hydrophilidae</i>	<i>Berosus</i>
DIPTERA - Flies	
<i>Ceratopogonidae</i>	<i>Bezzia</i>
<i>Ceratopogonidae</i>	<i>Forcipomyia</i>
<i>Chironomidae</i>	<i>Rheotanytarsus</i>
<i>Chironomidae</i>	<i>Tribelos</i>
<i>Chironomidae</i>	<i>Dicrotendipes</i>
<i>Chironomidae</i>	<i>Nanocladius</i>
<i>Chironomidae</i>	<i>Polypedilum</i>
<i>Chironomidae</i>	<i>Stenochironomus</i>
<i>Chironomidae</i>	<i>Tanypodinae</i>
<i>Chironomidae</i>	<i>Chironomus</i>
<i>Chironomidae</i>	<i>Goeldichironomus</i>
<i>Chironomidae</i>	<i>Cricotopus</i>
<i>Chironomidae</i>	<i>Glyptotendipes</i>
<i>Chironomidae</i>	<i>Tanytarsini</i>
<i>Chironomidae</i>	<i>Parachironomus</i>
<i>Chironomidae</i>	<i>Tanytarsus</i>
<i>Chironomidae</i>	<i>Kiefferulus</i>
<i>Chironomidae</i>	<i>Endochironomus</i>
<i>Chironomidae</i>	<i>Corynoneura</i>
<i>Chironomidae</i>	<i>Thienemanniella</i>
<i>Chironomidae</i>	<i>Trebelos</i>
EPHEMEROPTERA - Mayflies	
<i>Baetidae</i>	<i>Baetis</i>
<i>Baetidae</i>	<i>Callibaetis</i>
<i>Caenidae</i>	<i>Caenis</i>
GASTROPODA - Snails, Slugs	
<i>Corbiculidae</i>	<i>Corbicula</i>
<i>Physidae</i>	<i>Physella</i>
<i>Planorbidae</i>	<i>Planorbella</i>
<i>Sphaeriidae</i>	
LEPIDOPTERA - Butterflies, Moths, Skippers	
<i>Pyalidae</i>	
TRICHOPTERA - Caddisflies	
<i>Hydropsychidae</i>	<i>Cheumatopsyche</i>
<i>Hydroptilidae</i>	<i>Orthotrichia</i>

Table 5 (Continued). List of invertebrates on the KR MA and status.

Family	Genus
<i>Hydroptilidae</i>	<i>Hydroptila</i>
<i>Hydroptilidae</i>	<i>Oecetis</i>
<i>Hydroptilidae</i>	<i>Oxythira</i>
<i>Polycentropodidae</i>	<i>Cynellus</i>

Table 6. List of fish species frequently observed and captured in Kissimmee River surveys.

Species Name	Common Name	Listing Status
<i>Ameiurus catus</i>	White Catfish	
<i>Ameiurus natalis</i>	Yellow Bullhead	
<i>Ameiurus nebulosus</i>	Brown Bullhead	
<i>Amia calva</i>	Bowfin	
<i>Cichlasoma urophthalmus</i>	Mayan Cichlid	Non-native
<i>Clarias batrachus</i>	Walking Catfish	Non-native
<i>Dorosoma cepedianum</i>	Gizzard Shad	
<i>Dorosoma petenense</i>	Threadfin Shad	
<i>Elassoma gilberti</i>	Pigmy Sunfish	
<i>Erimyzon sucetta</i>	Lake Chubsucker	
<i>Esox niger</i>	Chain Pickerel	
<i>Etheostoma fusiforme</i>	Swamp Darter	
<i>Fundulus chrysotus</i>	Golden Topminnow	
<i>Fundulus seminolis</i>	Seminole killifish	
<i>Gambusia spp.</i>	Mosquitofish	
<i>Hemichromis letourneuxi</i>	African jewelfish	Non-native
<i>Heterandria formosa</i>	Least Killifish	
<i>Hoplosternum littorale</i>	Brown Hoplo	Non-native
<i>Ictalurus punctatus</i>	Channel Catfish	
<i>Jordanella floridae</i>	Flagfish	
<i>Labidesthes sicculus</i>	Brook Silverside	
<i>Lepisosteus osseus</i>	Longnose Gar	
<i>Lepisosteus platyrhincus</i>	Florida Gar	
<i>Lepomis auritus</i>	Redbreast Sunfish	
<i>Lepomis gulosus</i>	Warmouth	
<i>Lepomis macrochirus</i>	Bluegill Sunfish	
<i>Lepomis microlophus</i>	Redear Sunfish	
<i>Lepomis punctatus</i>	Spotted Sunfish	
<i>Micropterus salmoides</i>	Largemouth Bass	
<i>Notemigonus crysoleucas</i>	Golden Shiner	
<i>Notropis maculatus</i>	Taillight Shiner	
<i>Oreochromis aureus</i>	Blue Tilapia	Non-native
<i>Poecilia latipinna</i>	Sailfin Molly	
<i>Pomoxis nigromaculatus</i>	Black Crappie	
<i>Pterygoplichthys multiradiatus</i>	Sailfin Catfish	Non-native



Florida Fish and Wildlife
Conservation Commission

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South Florida Water
Management District

sfwmd.gov

Kissimmee River

Public Use Area

Regulations Summary and Area Map
July 01, 2025 - June 30, 2026

2025-
2026

Hunting
Season

This brochure is designed to provide the public with information and a summary of regulations pertaining to hunting and other recreational use on the Kissimmee River Public Use Area. **Regulations that are new or differ substantially from last year are shown in bold print.** Area users should familiarize themselves with all regulations. For exact wording of the wildlife laws and regulations, see the Florida Fish and Wildlife Conservation Commission's wildlife code, on file with the Secretary of State and state libraries. This brochure, the Florida Hunting Regulations handbook, and quota permit worksheets should provide the information necessary for you to plan your hunting activities. These publications are available at MyFWC.com.

Persons using the public use area are required to have appropriate licenses, permits and stamps. The following persons are exempt from all license and permit requirements (except for quota permits when listed as "no exemptions," recreational use permits, antlerless deer permits; the Migratory Bird Hunting and Conservation Stamp [federal duck stamp], and **WMA deer-dog hunting permit**, if applicable): Florida residents who are 65 years of age or older; residents who possess a Florida Resident Disabled Person Hunting and Fishing Certificate; residents in the U.S. Armed Forces, not stationed in Florida, while home on leave for 30 days or less, upon submission of orders; and children under 16 years of age. Children under 16 years of age are exempt from the federal duck stamp. Anyone born on or after June 1, 1975 and 16 years of age or older must have passed a Commission-approved hunter-safety course prior to being issued a hunting license, except the Hunter Safety Mentoring exemption allows anyone to purchase a hunting license and hunt under the supervision of a licensed hunter, 21 years of age or older.

Youth and mentor license holders are required to be accompanied by a supervisor during any hunt. A youth hunter (less than 16 years of age) must be supervised by a person at least 18 years of age. A mentor license holder must be supervised by a licensed hunter at least 21 years of age. Unless exempt, only those supervisors with proper licenses and permits may hunt.

Licenses and permits may be purchased from county tax collectors, license agents, by telephone at 888-486-8356 or at GoOutdoorsFlorida.com. A no-cost Migratory Bird Permit is available when purchasing a hunting license. Any waterfowl hunter 16 years of age or older must possess a federal duck stamp.

Quota Permit Information:

Quota permits are not required for this area.

General Area Regulations:

All general laws and regulations relating to wildlife and fish shall apply unless specifically exempted for this area. Hunting or the taking of wildlife or fish on this area shall be allowed only during the open seasons and in accordance with the following regulations:

1. Any person hunting deer or accompanying another person hunting deer shall wear at least 500 square inches of daylight fluorescent-orange material as an outer garment, above the waistline. These provisions are not required when hunting with a bow and arrow during archery season.
2. Taking of spotted fawn, swimming deer or roasted turkey is prohibited.
3. It is illegal to hunt over bait or place any bait or other food for wildlife on this area.
4. Driving a metal object into any tree, or hunting from a tree into which a metal object has been driven, is prohibited.
5. No person shall cut, damage or remove any natural, man-made or cultural resource without written authorization of the landowner or primary land manager.
6. Taking or attempting to take any game with the aid of live decoys, recorded game calls or sounds, set guns, artificial light, net, trap, snare, drug or poison is prohibited. Recorded calls and sounds can be used to hunt furbearers, wild hog and crows.
7. The wanton and willful waste of wildlife is prohibited.
8. Hunting, fishing or trapping is prohibited on any portion of the area posted as closed to those activities.
9. Taking or herding wildlife from any motorized vehicle, aircraft or boat which is under power is prohibited, until power and movement from that power, has ceased.
10. Most game may be hunted from ½ hour before sunrise until ½ hour after sunset (see exceptions under each season).
11. The release of any animal is prohibited, except by permit from FWC or written authorization from the landowner or primary land manager.
12. The skull plate with any attached antler, if applicable, shall remain with any harvested deer. The head and beard, if applicable, shall remain with any harvested turkey. See the Florida Hunting Regulations handbook for details.
13. The planting or introduction of any non-native plant is prohibited, without written authorization of the landowner or primary land manager.
14. Wild hog may not be transported alive.
15. A hunting license is not required to hunt wild hog.
16. Littering is prohibited.
17. It is unlawful to set fire to any forest, grass or woodlands.
18. A Law Enforcement Officer may search any camp, vehicle or boat, in accordance with law.

19. Falconers may hunt during the statewide falconry season anytime this area is open for public access, except rabbit may be hunted only when squirrel hunting is allowed and crow hunting is allowed during the first phase of crow season only.
20. Wild hogs are considered wildlife and may only be hunted from ½ hour before sunrise until ½ hour after sunset and only with those methods of take allowed for taking game mammals during each open season.
21. **An annual hunting license is required for nonresidents to hunt wild turkey.**

Public Access and Vehicles:

1. Open to public access year round.
2. Persons must enter and exit the area from the Florida National Scenic Trail, the Kissimmee River, the Istokpoga Canal, the C-38 Canal, the C-41 Canal and at designated entry points.
3. Camping, vehicle authorization, gate combinations, and horses require a Special Use License (SUL) from South Florida Water Management District (SFWMD). To apply and receive an SUL by email, visit www.SFWMD.gov/sul. To receive an SUL by US Mail, contact SFWMD at 1-800-432-2045 (allow 7-10 business days). All vehicles used under an SUL must have the SUL reference number displayed on the driver's side of the dashboard.
4. The use of airboats is prohibited in those areas posted as closed to airboat use.
5. The use of tracked vehicles, swamp buggies, all-terrain vehicles and other types of off-road vehicles is prohibited.
6. A marked footpath called the Florida Trail traverses the area. This trail is open to hikers throughout the year.
7. Class 1 electric bicycles may be operated according to rules for traditional, non-motorized bicycles. All other electric bicycles may be operated only on named or numbered roads open to motorized vehicles. For more information visit MyFWC.com/ebike.

Personal Property:

1. Erecting or maintaining treestands or elevated shooting platforms more than 10 days before or more than 10 days after any authorized hunting season is prohibited.
2. The FWC is not responsible for protection of personal property and will not be liable for theft of or damage to personal property.

Hunters and Harvest Reporting:

1. Hunters must log each harvested deer or turkey prior to moving it from the point of recovery and report any deer or turkey they harvest within 24 hours of recovery. See Florida Hunting Regulations handbook or MyFWC.com for deer and turkey harvest reporting instructions.
2. Zone A is that portion of the area South of State Road 70 and Zone C is that portion of the area north of State Road 70.
3. Harvesting wildlife with any gun, crossbow or bow is prohibited in the northern portion of Bluff Hammock (see map).
4. Hunting is prohibited outside of the Kissimmee River Channel, the C-38 Canal and the Istokpoga Canal except from the beginning of rail season through the end of the spring turkey season.
5. Hunting is prohibited within 300 yards of any active construction site.

Guns:

1. Hunting with centerfire rifles is prohibited.
2. In the Starvation Slough Hunt Area, hunting is allowed only with the following guns: only bows may be used during archery, crossbow and general gun seasons; only muzzleloading guns may be used during muzzleloading gun season; only bows and muzzleloading guns may be used during small game season (after the close of general gun season) and only bows and muzzleloading shotguns may be used during spring turkey season.
3. Hunting at night with a gun is prohibited (see furbearer season for exceptions).
4. Muzzleloading guns used for taking deer must be .30 caliber or larger, if firing a single bullet, or be 20 gauge or larger if firing 2 or more balls.
5. Hunting deer with rimfire or non-expanding, full metal jacket (military ball) ammunition is prohibited.
6. Hunting wildlife (other than migratory birds) with air guns. See Florida Hunting Regulations handbook for details. Hunting with air guns is prohibited in the Starvation Slough Hunt Area.
7. Hunting deer with air guns is prohibited, except pre-charge pneumatic (PCP) air guns propelling a bolt, arrow or bullet .30 caliber or larger.
8. Hunting turkey with air guns is prohibited, except PCP air guns propelling a bolt or arrow. During general gun season, PCP air guns propelling a bullet .20 caliber or larger may also be used for hunting turkey.
9. Children under the age of 16 hunting with a firearm or air gun must be in the presence of a supervising adult.
10. No person shall discharge a firearm or have a loaded firearm in hand while under the influence of alcohol or drugs.
11. For hunting non-migratory game, only shotguns, rifles (rimfire only), pistols, air guns, muzzleloading guns, bows, crossbows, **airbows** or falconry may be used.
12. For hunting migratory game, only centerfire and muzzleloading shotguns, bows, crossbows, **airbows** or falconry may be used. Shotguns shall not be larger than 10 gauge and shall be incapable of holding more than 3 shells in the magazine and chamber combined.
13. Hunting with full-automatic firearms, explosive or drug-injecting devices and set guns is prohibited.
14. The discharge of a firearm outside of periods open to hunting or in areas closed to hunting is prohibited per s. 790.15 FS.

Dogs:

1. Hunting deer with dogs is allowed during general gun season.
2. Hunting wild hog with dogs is allowed during general gun, wild-hog dog and small game seasons only.
3. Hunting with dogs is prohibited in the Starvation Slough Hunt Area before January 19.
4. Hunting deer or wild hog with dogs is prohibited during the archery, crossbow and muzzleloading gun seasons (Note: wild hog may be hunted with dogs during the "overlap" with small game season).
5. The taking or pursuing of deer, wild hog, fox or coyote with dogs (only as allowed during area seasons) is prohibited unless each dog is equipped and monitored with devices that allow remote tracking and behavior correction.

6. No person shall allow any dog to pursue or molest any wildlife during any period in which the taking of wildlife by the use of dogs is prohibited.
7. Dogs on leashes may be used for trailing wounded game.
8. Dogs are allowed during periods or in areas closed to hunting with dogs, but must be kept under physical restraint at all times.
9. **A valid WMA deer-dog hunting permit is required to hunt deer with the aid of dogs.**

Camping:

1. Camping is allowed by persons possessing a [Special Use License](#). Camping is limited to 8 continuous days.
2. Quiet Hours: Between the hours of 11 p.m. and 7 a.m. loud music, barking dogs or any other activity causing excessive noise is prohibited in camping areas. Generators are allowed except as restricted by posted sign.
3. Pets must be leashed and under control within camping areas.

Bag and Possession Limits:

1. Deer - No person shall exceed statewide bag limits.
 - A. Area limits -
Archery season - Daily limit 2 deer, except in Zone A where antlerless deer may only be harvested **August 23 -31**.
Crossbow, muzzleloading gun and general guns seasons - Daily limit 2 antlered deer.
 - B. Statewide limits - Annual limit 5 deer (only 2 of which may be antlerless), daily limit 2, possession limit 4.
 - C. As part of the statewide annual deer limit, youth less than 16 years of age may harvest 1 deer annually not meeting antler point requirements but having at least 1 antler 5 inches or more in length.
2. Wild hog - No size or bag limit.
3. Turkey - No person shall exceed statewide bag limits.
 - A. Area limits - Daily limit 1.
 - B. Statewide limits - All fall seasons combined limit 2, spring season limit 2, daily limit 2, possession limit 2.
4. Gray squirrel, quail and rabbit - Daily limit 12, possession limit 24 for each.
5. Raccoon, opossum, armadillo, beaver, coyote, skunk and nutria - No bag limits.
6. Bobcat and otter - Possession limit 1 unless in possession of a trapping license.
7. Migratory birds - See Florida Hunting Regulations handbook.
8. Non-protected birds (African and Eurasian collared-doves, common pigeon, Egyptian goose, house sparrow, and common starling) – No bag limits.

Archery Season:

Zone A: August **2-31**

Zone C: September **13** - October **12**

Permit, Stamp and License Requirements - Hunting license, archery permit, deer permit (if hunting deer), wild turkey permit (if hunting wild turkey), migratory bird permit (if hunting migratory birds), and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Deer with at least 1 antler having 3 or more points (each point 1-inch or more in length) OR a main beam length of 10 inches or more, antlerless deer (Zone A: Aug. **23-31** only; Zone C: Sept. **13** through Oct. **12**) (which includes does and bucks with antlers less than 5 inches in length), wild hog, bearded turkey or gobbler, gray squirrel, quail (beginning November **8**), rabbit (beginning October **11**), armadillo, migratory birds in season, and non-protected birds.

Regulations Unique to Archery Season -

1. Only bows may be used for hunting, except that centerfire and muzzleloading shotguns are allowed for hunting migratory birds and non-protected birds. Hunting with crossbows, airbows, or bows equipped with a draw-lock device is prohibited (except by Persons With Disabilities Crossbow Permit).
2. Only bows may be used for hunting in the Starvation Slough Hunt Area. Hunting with crossbows, airbows, or bows equipped with a draw-lock device is prohibited (except by Persons With Disabilities Crossbow Permit).
3. **An annual hunting license is required for nonresidents to hunt wild turkey.**

Crossbow Season:

Zone A: September **1-5**

Zone C: October **13-17**

Permit, Stamp and License Requirements - Hunting license, crossbow permit, deer permit (if hunting deer), wild turkey permit (if hunting wild turkey) and migratory bird permit (if hunting migratory birds).

Legal to Hunt - Deer with at least 1 antler having 3 or more points (each point 1-inch or more in length) OR a main beam length of 10 inches or more, wild hog, bearded turkey or gobbler, gray squirrel, quail (beginning November **8**), rabbit (beginning October **11**), armadillo, migratory birds in season, and non-protected birds.

Regulations Unique to Crossbow Season -

1. Only bows, crossbows, and airbows (**pre-charged pneumatic airguns firing arrows**) may be used for hunting, except that centerfire and muzzleloading shotguns are allowed for hunting migratory birds and non-protected birds.
2. Only bows may be used for hunting in the Starvation Slough Hunt Area. Hunting with crossbows is prohibited (except by disabled crossbow permit).
3. **An annual hunting license is required for nonresidents to hunt wild turkey.**

Muzzleloading Gun Season:

Zone A: September **6-19**

Zone C: October **18-31**

Permit, Stamp and License Requirements - Hunting license, muzzleloading gun permit, deer permit (if hunting deer), wild turkey permit (if hunting wild turkey) and migratory bird permit (if hunting migratory birds).

Legal to Hunt - Deer with at least 1 antler having 3 or more points (each point 1-inch or more in length) OR a main beam length of 10 inches or more, wild hog, bearded turkey or gobbler, gray squirrel, quail (beginning November 8), rabbit (beginning October 11), armadillo, migratory birds in season, and non-protected birds.

Regulations Unique to Muzzleloading Gun Season -

1. Only bows, crossbows, **airbows (pre-charged pneumatic airguns firing arrows)** or muzzleloading guns may be used for hunting, except that centerfire and muzzleloading shotguns are allowed for hunting migratory birds and non-protected birds.
2. Only muzzleloading guns may be used for hunting in the Starvation Slough Hunt Area.
3. **An annual hunting license is required for nonresidents to hunt wild turkey.**

General Gun Season:

Zone A: September 20 - October 19, November 22 - January 4

Zone C: November 1 - January 18

Permit, Stamp and License Requirements - Hunting license, deer permit (if hunting deer), WMA deer-dog hunting permit (if hunting deer with dogs), wild turkey permit (if hunting wild turkey), migratory bird permit (if hunting migratory birds), and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Deer with at least 1 antler having 3 or more points (each point 1-inch or more in length) OR a main beam length of 10 inches or more, wild hog, bearded turkey or gobbler (Zone A: Oct. 6-19 and Nov. 22 through Jan. 4; Zone C: Nov. 1 through Dec. 28 only), gray squirrel, quail, rabbit (beginning October 11), raccoon, opossum, armadillo, beaver, coyote, skunk, nutria, migratory birds in season, and non-protected birds. Bobcat and otter beginning December 1 until the end of the general gun season in each zone.

Regulations Unique to General Gun Season -

1. Hunting with dogs is allowed, except in the Starvation Slough Hunt Area.
2. **A valid WMA deer-dog hunting permit is required to hunt deer with the aid of dogs.**
3. Hunting with centerfire rifles is prohibited.
4. Only bows (except by disabled crossbow permit) may be used for hunting in the Starvation Slough Hunt Area.
5. **An annual hunting license is required for nonresidents to hunt wild turkey.**

Small Game Season:

October 11 - March 1

Permit, Stamp and License Requirements - Hunting license, migratory bird permit (if hunting migratory birds), and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - Wild hog, gray squirrel, quail (beginning November 8), rabbit, armadillo, migratory birds in season, and non-protected birds.

Regulations Unique to the Small Game Season -

1. Hunting with dogs is prohibited in the Starvation Slough Hunt Area before January 19.
2. Hunting with centerfire rifles is prohibited.
3. Only bows (except by disabled crossbow permit) may be used for hunting in the Starvation Slough Hunt Area before January 19, and only bows (except by disabled crossbow permit) or muzzleloading guns may be used during the remainder of the small game season.

Furbearer Season:

Zone A: September 20 - October 19, November 22 - January 4

Zone C: November 1 - January 18

Permit, Stamp and License Requirements - Trapping license (if using traps or taking for commercial purposes) or hunting license (if using only guns and dogs, and taking for noncommercial purposes).

Legal to Trap or Hunt - Raccoon, opossum, armadillo, beaver, coyote, skunk and nutria. Bobcat and otter beginning December 1.

Regulations Unique to Furbearer Season -

1. Except in the Starvation Slough Hunt Area, raccoon or opossum may be hunted at night by the aid of a light and dogs, with .22 rimfire firearms other than .22 magnum, or with a single-shot .410 gauge shotgun using shot no larger than No. 6. Hunting raccoon or opossum by display or use of a light from a moving vehicle, boat or animal is prohibited.
2. Only bows may be used in the Starvation Slough Hunt Area. Hunting with crossbows is prohibited (except by disabled crossbow permit).

Spring Turkey Season:

Youth Turkey, Zone A: February 27 - March 2

Spring Turkey, Zone A: March 7 - April 12

Youth Turkey, Zone C: March 13-16

Spring Turkey, Zone C: March 21 - April 26

Permit, Stamp and License Requirements - Hunting license and wild turkey permit.

Legal to Hunt - Bearded turkey or gobbler.

Regulations Unique to Spring Turkey Season -

1. Only bows, crossbows, PCP air guns propelling a bolt or arrow and centerfire and muzzleloading shotguns using a #2 or smaller shot size may be used for hunting.
2. Only bows or muzzleloading shotguns using a #2 or smaller shot size may be used for hunting in the Starvation Slough Hunt Area. Hunting with crossbows is prohibited (except by disabled crossbow permit).
3. Legal shooting hours are ½ hour before sunrise until sunset.
4. Hunting other animals is prohibited.
5. During the youth turkey hunt, only youth under 16 years of age may hunt and must be under the supervision and in the presence of an adult not younger than 18 years of age. Adults with required licenses and permits may participate when in the presence of a youth, but may not harvest a wild turkey.
6. **An annual hunting license is required for nonresidents to hunt wild turkey.**

Wild Hog-Dog Season:

2025 Hunt Dates: April 30 - May 4, May 23-27

2026 Hunt Dates: April 29 - May 3, May 22-26

Permit, Stamp and License Requirements - No license or permit required.

Legal to Hunt - Wild hog.

Regulations Unique to Wild Hog-Dog Season -

1. Hunting with centerfire rifles is prohibited.
2. Only bows or muzzleloading guns may be used for hunting in the Starvation Slough Hunt Area. Hunting with crossbows is prohibited (except by disabled crossbow permit).

Migratory Bird Season:

Migratory game birds may be hunted during their respective statewide seasons. Crows may be hunted during the first phase of crow season only. [See migratory game bird hunting regulations.](#)

Permit, Stamp and License Requirements - Hunting license, migratory bird permit, military license or ID (if harvesting waterfowl during the Veterans and Active Military Waterfowl Hunt Days), and state waterfowl permit and federal duck stamp (if hunting waterfowl).

Legal to Hunt - [See migratory bird season dates, bag limits and regulations.](#) Non-protected birds may also be taken.

Regulations Unique to Migratory Bird Seasons - All Migratory Bird Regulations shall apply.

1. Hunting ducks, geese and coot with lead shot is prohibited.
2. Centerfire and muzzleloading shotguns are allowed for hunting during established area seasons when migratory birds are legal to hunt, except in the Starvation Slough Hunt Area.
3. Shooting hours for mourning and white-winged doves are ½ hour before sunrise until sunset.
4. Non-hunting assistants with required licenses and permits may actively participate in the Veterans and Active Military Waterfowl Hunting Days, provided they may not harvest wildlife.
5. Adults with required licenses and permits may actively participate in Youth Waterfowl Hunting Days, provided they may not harvest wildlife.

Fishing and Frogging:

Allowed year round.

Permit, Stamp and License Requirements - Fishing license (if fishing).

Legal to Take - See Florida Freshwater Fishing Regulations Summary.

Regulations Unique to Fishing and Frogging - All General Freshwater Fishing Regulations shall apply. Shooting frogs is allowed only during the listed open hunting seasons and only with the legal methods of take during each particular season. Frogs may only be taken by firearms during daylight hours.

General Information:

1. Information for persons with disabilities can be found at MyFWC.com/ADA.
2. If you have any questions about this material, please call the Fish and Wildlife Conservation Commission at 863-648-3200 (TDD 800-955-8771).
3. Zone A is that portion of the area South of State Road 70 and Zone C is that portion of the area north of State Road 70.
4. Please report the location of any sick or extremely skinny deer to the Chronic Wasting Disease hotline, toll free at 866-293-9282.

South Florida Water Management District Information:

This land was acquired under the Save Our Rivers (SOR) Program. The purpose of SOR is to conserve and protect unique and irreplaceable lands, restore areas to their original condition as much as possible, and allow controlled multiple recreational and educational uses consistent with this purpose.

Cooperation Requested:

If you see law violators or suspicious activities, contact your nearest Commission regional office or call 888-404-FWCC. You may qualify for a cash reward from the Wildlife Alert Reward Association.

The FWC receives financial assistance from the Department of the Interior (DOI), U.S. Fish & Wildlife Service. The DOI prohibits discrimination on the basis of race, color, national origin, age, sex, or disability. If you believe that you have been discriminated against in any program, activity, or facility or you need more information, please contact the FWC at: FWC, Office of Human Resources, 620 S Meridian St., Tallahassee, FL 32399, (850) 488-6411, or write to: Office of Diversity, Inclusion & Civil Rights, Dept. of the Interior, 1849 C St., NW, Washington, D.C. 20240.

