DUNNS CREEK CONSERVATION AREA AND MURPHY CREEK CONSERVATION AREA
COMBINED LAND MANAGEMENT PLAN

PUTNAM COUNTY, FLORIDA

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

JANUARY 13, 2026


Northwest Florida
Water Management District
Suwannee River
Water Management
District
St. Johns
River Water
Management
District
Southwest
Florida Water
Management
District
South Florida
Water Management
District

EXECUTIVE SUMMARY

CONSERVATION AREA SIZE:
Dunns Creek Conservation Area (DCCA): 3,182 acres
Murphy Creek Conservation Area (MCCA): 4,828 acres

DATE OF ACQUISITION: Acquisition of parcels within the DCCA began in December 1992. Acquisition of parcels within the MCCA began in December 1987.

DATE OF PLAN: January 13, 2026
MAJOR BASIN: Lower St. Johns River
PLANNING BASINS:
DCCA: Crescent Lake
MCCA: South Mainstem

LOCATION: The DCCA is in southeastern Putnam County, near San Mateo. The MCCA is in southern Putnam County, spanning several disjunct parcels, with its northern parcels near Palatka and its southern parcels near Satsuma. Collectively, the two conservation areas are referred to as the "Properties."

FUNDING SOURCES: The acquisition funding source for the DCCA was Preservation 2000 (P2000). The acquisition funding sources for the MCCA included Save Our Rivers, P2000, ad valorem, District land acquisition, mitigation donations, and a property exchange.

MANAGEMENT PARTNERS: The St. Johns River Water Management District (District) serves as lead manager for the Properties. The District has entered into an agreement with the Florida Fish and Wildlife Conservation Commission (FWC) designating the DCCA as a Wildlife Management Area (WMA). The District intends to enter into an agreement with FWC to incorporate the MCCA into the Dunns Creek Wildlife Management Area within the scope of this plan.

RESOURCE PROTECTION AND MANAGEMENT:

- **WATER RESOURCES** – For both the DCCA and the MCCA, the overall condition of the water resources is undisturbed, and protection was accomplished through acquisition. Alterations from past management activities include roads and ditching.
- **FOREST MANAGEMENT AND RESTORATION** – Forest management activities will include thinning or clearcut harvest and replanting within pine plantations, monitoring for disease and insect infestation, and re-establishing longleaf and slash pine where appropriate.
- **FIRE MANAGEMENT** – The application of prescribed fire will occur in accordance with the Properties' annual burn plan and the DCCA/MCCA Combined Fire Management Plan.
- **FLORA AND FAUNA** – The DCCA and the MCCA provide habitat for numerous wildlife species, including the Florida black bear (*Ursus americanus floridanus*), bald eagle (*Haliaeetus leucocephalus*), and gopher tortoise (*Gopherus polyphemus*). Invasive plant

and animal species occur on the Properties. The District regularly monitors for the presence of invasive plants and animals and executes appropriate control actions.

- **CULTURAL AND HISTORICAL RESOURCES** – A review of the Department of State Division of Historical Resources (DHR) Master Site File indicates no known or registered cultural sites within the boundaries of the DCCA. A review of the Department of State DHR Master Site File indicates 16 known or registered cultural sites within the boundaries of the MCCA.

LAND USE MANAGEMENT:

- **ACCESS** – Two designated public access points are located on the DCCA. Two designated public access points are located on the MCCA, one for the trail system near Satsuma and another for the trail system on Murphy Island, which is boat-access only.
- **RECREATION** – The DCCA and the MCCA are open to the public for hiking, bicycling, horseback riding, primitive camping, and wildlife viewing. The DCCA currently allows (and the MCCA will allow pending execution of an agreement with the FWC) hunting under the management of FWC.
- **SECURITY** – Maintenance of fence lines, parking areas, campsites, gates, locks, and a boat dock located at the MCCA is conducted by the District.

ADMINISTRATION:

- **REAL ESTATE ADMINISTRATION** – 1,556 acres have been identified as potential acquisitions to the DCCA. At the MCCA, 3,392 acres have been identified as potential acquisitions. In addition, the District may consider purchasing parcels near the Properties that become available and will aid in the conservation of water resources within the Crescent Lake and South Mainstem basins. The District may also pursue acquisition of small parcels, property exchanges, or access easements with adjacent landowners to provide additional/improved access to the Properties. Any acquisition of parcels by the District requires Governing Board approval.
- **COOPERATIVE AND SPECIAL USE AGREEMENTS, LEASES, AND EASEMENTS** – There is a deeded access easement on the DCCA. There is an access easement agreement on the MCCA benefiting the Whitehead tracts. There are two special-use authorizations (SUAs) for biological research on both Properties. The District administers a revenue-generating cattle lease on the MCCA and a revenue-generating apiary lease on both Properties. The DCCA is included in the FWC WMA cooperative agreement. Both Properties are included in the Florida Forest Service (FFS) Wildfire Management cooperative agreement.
- **MANAGEMENT COSTS AND REVENUES** – Management costs at the DCCA and the MCCA were $584,327 from 2010–2025 and are projected at approximately $696,250 from 2025–2035. Revenues from the cattle lease, apiary lease, and timber sales were $162,019 from 2010–2025 and are projected at approximately $171,000 from 2025–2035.

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OVERVIEW

This document provides the goals and strategies to guide land management activities at both the Dunns Creek Conservation Area (DCCA) and the Murphy Creek Conservation Area (MCCA), collectively known as the Properties, over the next 10 years. These two conservation areas are being combined in this plan due to their proximity to each other, similarity in natural communities, and management needs. This combined land management plan was developed in accordance with Sections 373.1391 and 373.591, Florida Statutes. This is the fifth land management plan for the DCCA and the third land management plan for the MCCA.

The St. Johns River Water Management District (District) owns an interest in nearly 780,000 acres of land across 18 counties, acquired for the purposes of water management, water supply, and the conservation and protection of water resources. The District is the lead manager of approximately 435,000 acres of these lands.

LOCATION

The DCCA encompasses approximately 3,182 acres in Putnam County, within the Crescent Lake planning basin of the Lower St. Johns River Basin. The DCCA includes two parcels in numerous sections of Townships 10 and 11 South of Range 27 East.

The DCCA is located west of State Road (SR) 100 near the unincorporated town of San Mateo. The DCCA includes frontage on Dunns Creek along the western boundary. Figure 1 depicts the location and Figure 2 is a 2022 aerial image of the DCCA.

The MCCA encompasses approximately 4,828 acres in Putnam County, within the South Mainstem planning basin of the Lower St. Johns River Basin. The MCCA includes eight parcels in numerous sections of Townships 10 and 11 of Range 26 East and Townships 10 South of Range 27 East.

The MCCA is located south of the city of Palatka along the St. Johns River and includes a tract near the unincorporated town of Satsuma. Figure 3 depicts the location and Figure 4 is a 2023 aerial image of the MCCA.

The District is the lead manager for the Properties. The Florida Fish and Wildlife Conservation Commission (FWC) administers hunting regulations on the WMA portions of the Properties.

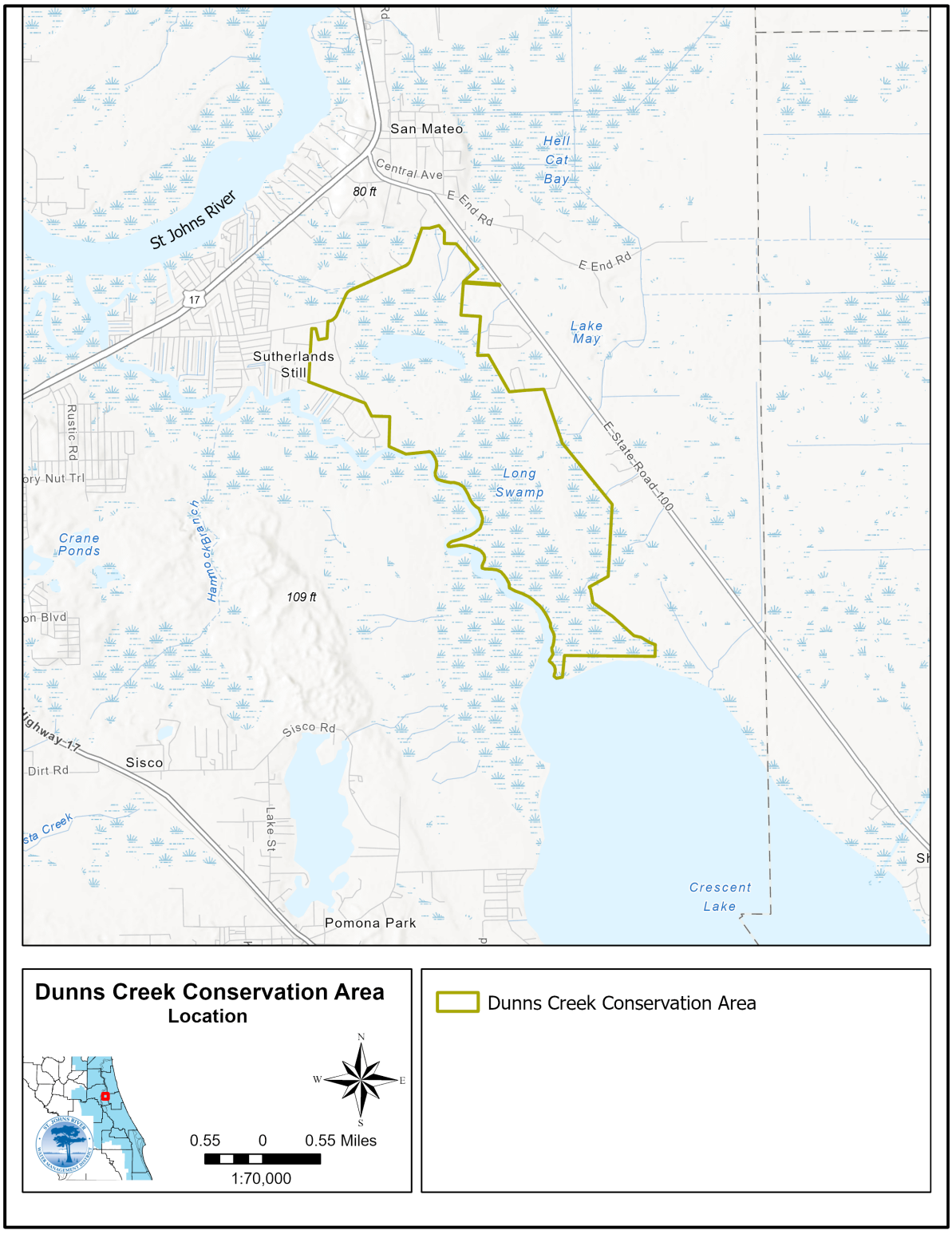

Figure 1: DCCA General Location

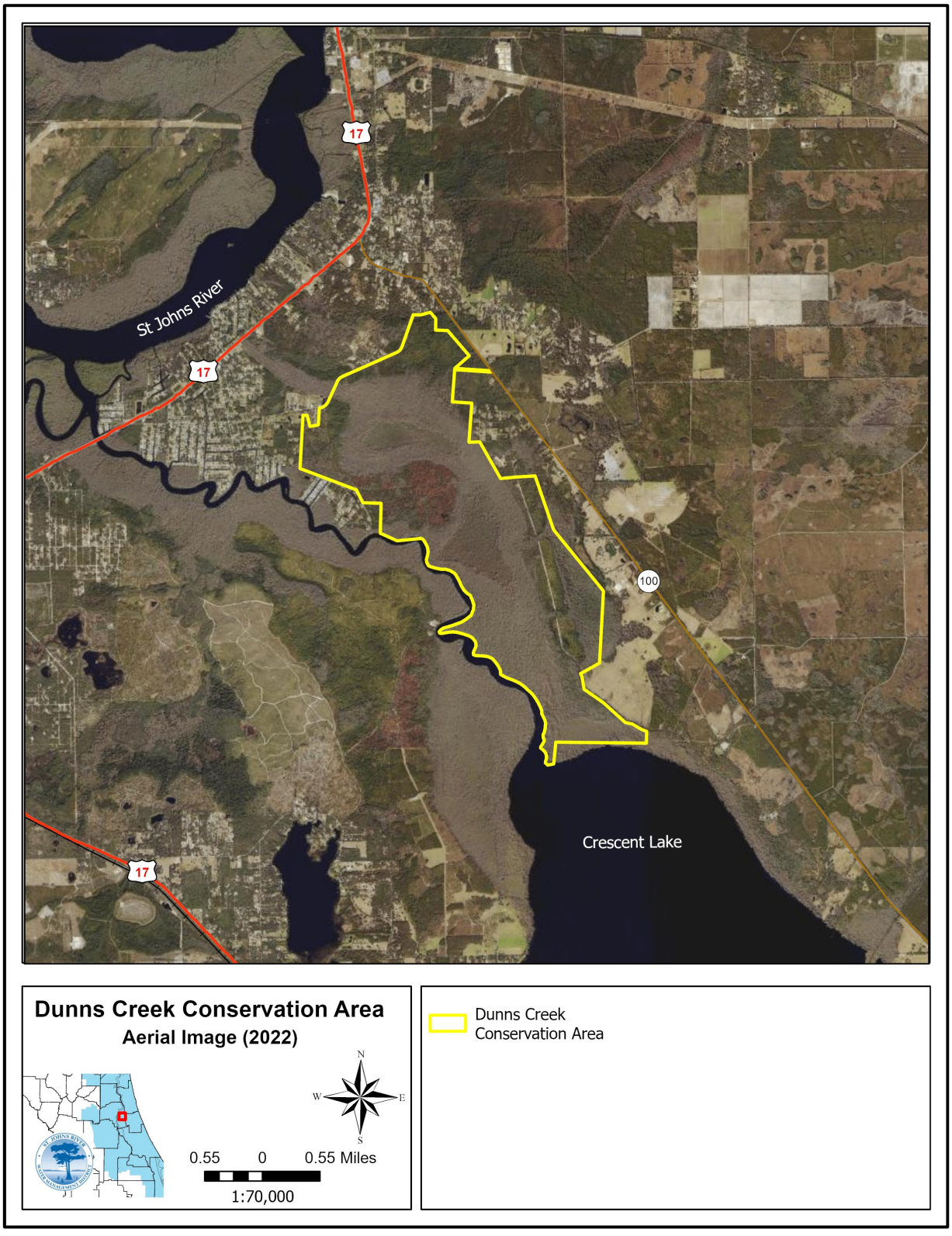

Figure 2: DCCA Aerial Imagery

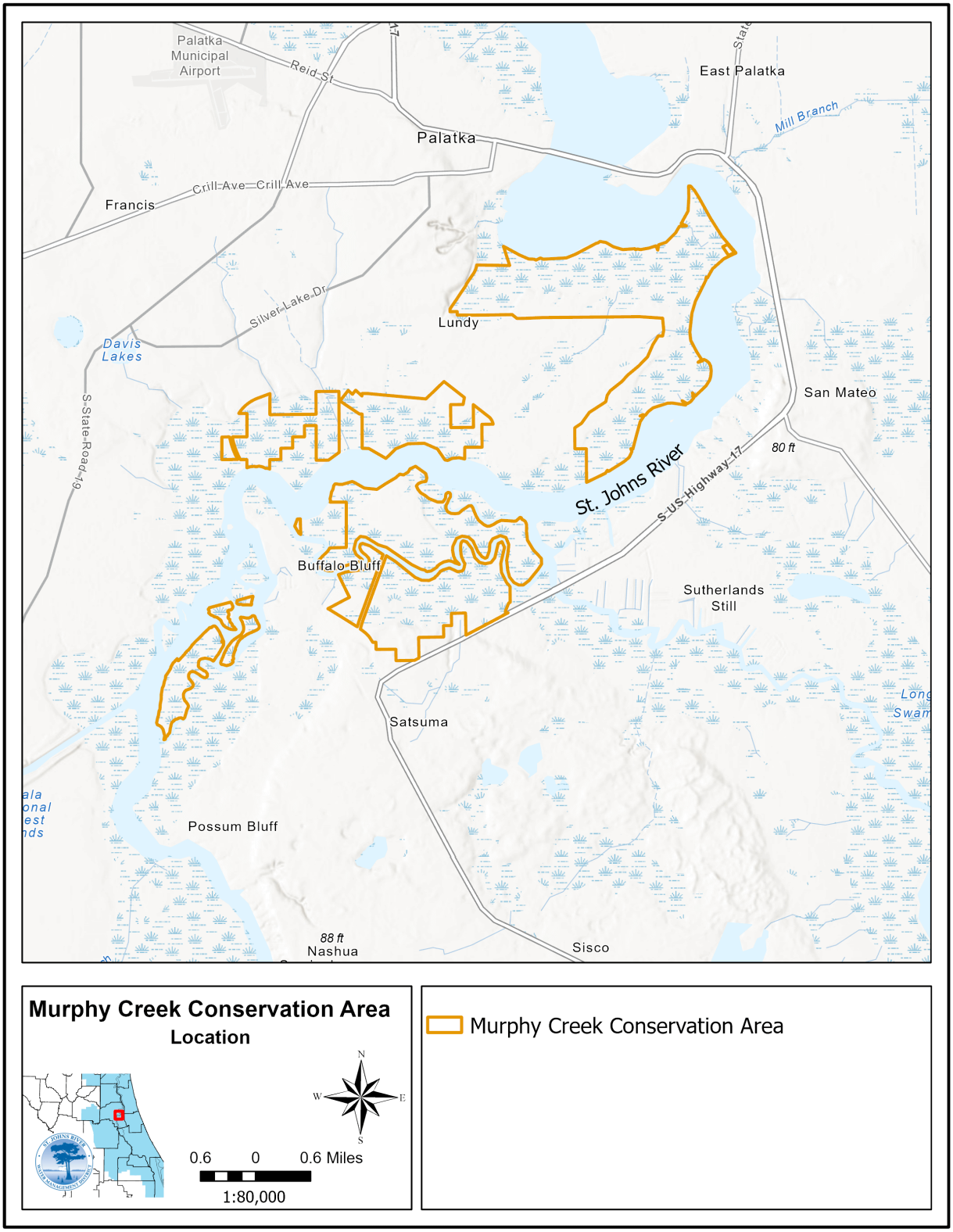

Figure 3: MCCA General Location

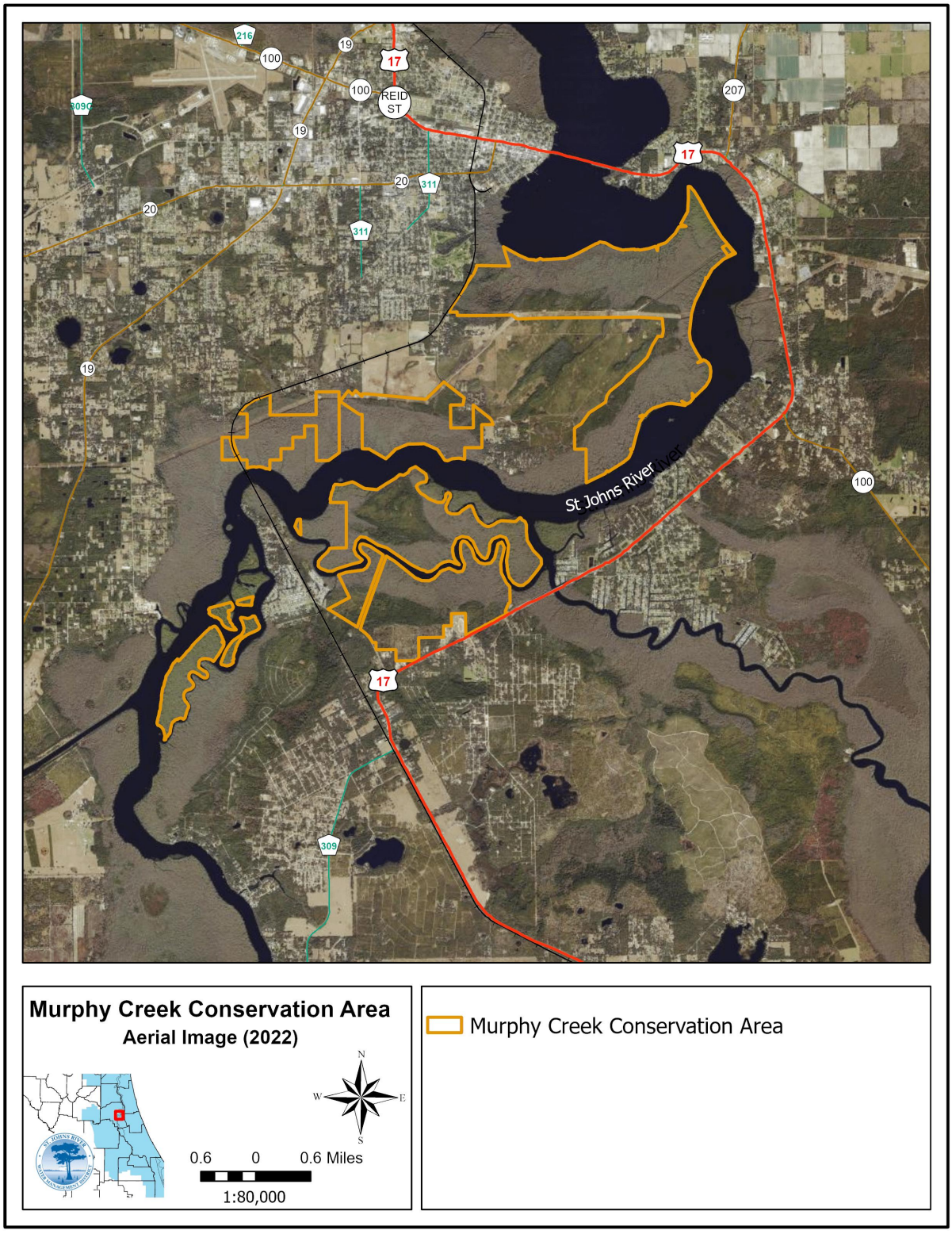

Figure 4: MCCA Aerial Imagery

REGIONAL SIGNIFICANCE

The Properties are integral components of a larger network of conservation lands in Putnam County and provide linkage between a multitude of publicly owned land and conservation easements, including lands managed by the Florida Department of Environmental Protection (DEP) and the Florida Forest Service (FFS) (Figure 5). These interconnected lands include Dunns Creek State Park, Ravine Gardens State Park, the Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area and the Caravelle Ranch Wildlife Management Area (Table 1). This network of lands provides for the protection of water quality and storage, and native plant and wildlife species, as well as numerous natural resource-based recreational opportunities.

Table 1: Proximate Properties

Lead Manager	**Conservation Area**
District	Crescent Lake Conservation Area
District	Deep Creek Conservation Area
District	Lake George Conservation Area
District	Rice Creek Conservation Area
Flagler County	Haw Creek Preserve
DEP	Dunns Creek State Park
DEP	Haw Creek Preserve State Park
DEP	Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area
Florida Fish and Wildlife Conservation Commission	Caravelle Ranch Wildlife Management Area
FFS	Belmore State Forest
FFS	Etoniah Creek State Forest
FFS	Welaka State Forest
Private Landowner	Fish Tail Swamp Mitigation Bank
Private Landowner	Green Ox Conservation Easement
Private Landowner	Wetland Preserve Conservation Easement
U.S. Forest Service	Ocala National Forest

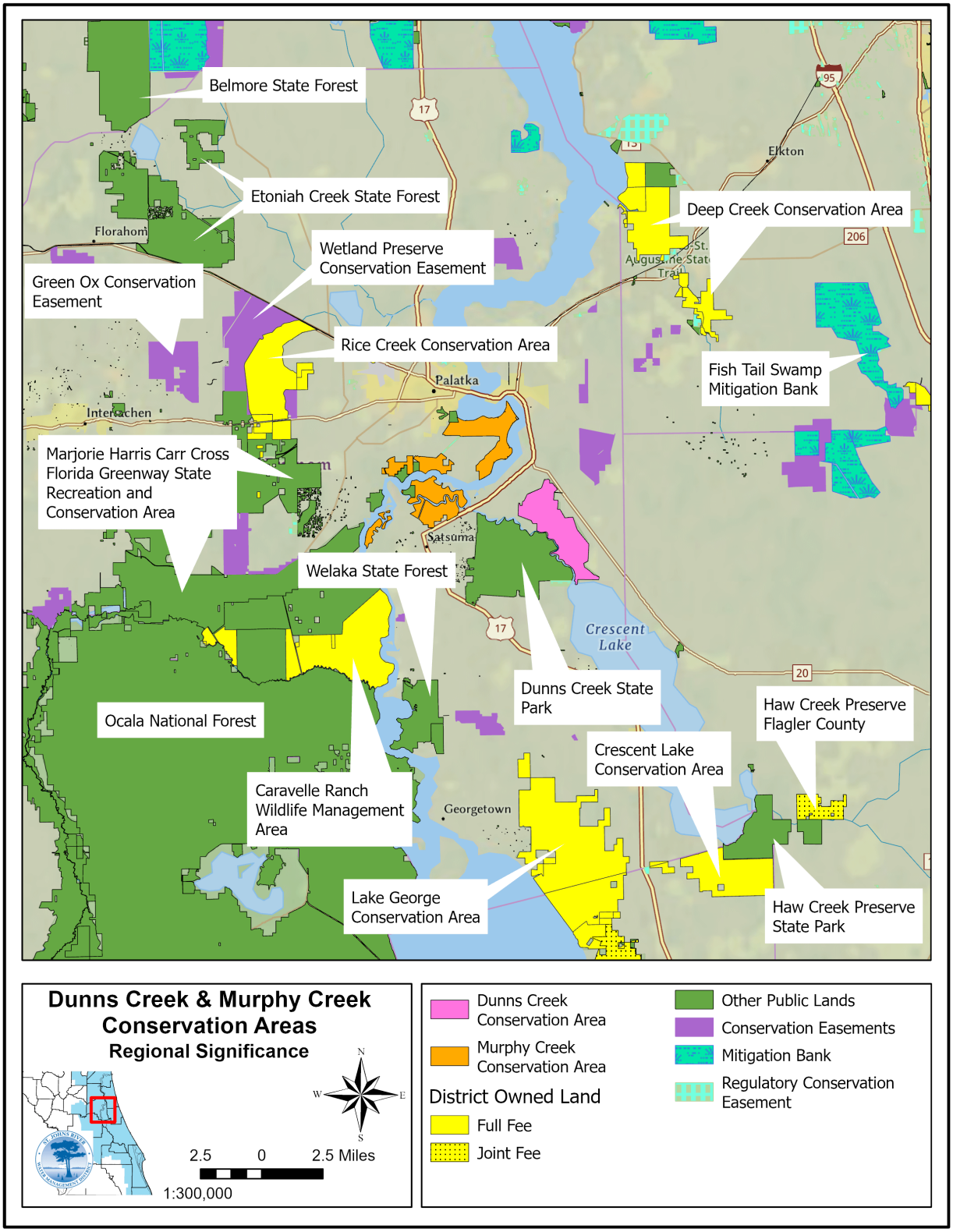

Figure 5: Regional Significance

ACQUISITION HISTORY

Acquisition of the parcels that comprise the Properties provide for the protection of important water resources and ecological functions. These acquisitions are consistent with the goals of Lower St. Johns River Basin projects as set forth in the District's Five-Year Strategic Plan.

- Improve water quality, maintain natural hydrological regimes, and maintain flood protection by preserving important wetland areas
- Restore, maintain, and protect native natural communities and diversity
- Provide opportunities for recreation where compatible with the goals listed above

The DCCA is comprised of two parcels and an easement, totaling 3,182 acres, both acquired in 1992 (Figure 6). The parcels that currently comprise the DCCA are listed below, and all acreage reported is derived from deed information.

Pauline Tilton (2,150 acres, 5.11-acre easement), Land Acquisition No. 1992-021-P1:

The Pauline Tilton parcel totals 2,150 acres and was acquired by the District on December 23, 1992, for $1,053,000.00 using P2000 funds. There is a deeded access and utility easement that benefits the parcel via Tram Road. This easement is 5.11 acres in area.

Austin and SJ and Elissa Tilton (1,026.55 acres), Land Acquisition No. 1992-022-P1:

The Austin and SJ and Elissa Tilton parcel totals 1,026.55 acres and was acquired by the District on December 23, 1992, for $703,350.00 using P2000 funds. Of this, 5.45 acres was surplused to Putnam County on April 27, 2006, for $3,714.40 to expand the right-of-way for the paving of San Mateo Cemetery Road.

The MCCA is comprised of eight parcels, totaling 4,828 acres. Acquisition began in 1981 with the latest addition occurring in 2024 (Figure 7). The parcels that currently comprise the MCCA are listed below, and all acreage reported is derived from deed information.

Seven Sisters Islands (270 acres), Land Acquisition No. 1981-011-P1:

The Seven Sisters Islands parcel totals 270 acres and was acquired by the District on December 31, 1987, for $49,950.00 using Save Our Rivers/Bond 85 funds.

Skinner Smith (161 acres), Land Acquisition No. 1990-035-P2:

The Skinner Smith parcel totals 161 acres and was donated to the District as mitigation on August 30, 1990.

McMillan FDOT (830 acres), Land Acquisition No. 1991-024-P1:

The McMillan FDOT parcel totaled 840 acres and was acquired by the District on December 29, 1993, for $255,000.00 using ad valorem tax funds. On July 23, 2002, 10 acres of this parcel was exchanged for 20 acres of the Potter parcel (Land Acquisition No. 1991-024-PB), reducing the acreage of this parcel to the current 830 acres.

Whitehead Tracts 2 and 3 (2,589 acres), Land Acquisition No. 1989-027-P1:

The Whitehead Tracts 2 and 3 parcel totals 2,589 acres and was acquired by the District on June 26, 1997, for $1,446,972.50 using Save Our Rivers/Bond 95 funds.

Murphy Island (853 acres), Land Acquisition No. 1996-030-P1:

The Murphy Island parcel totals 853 acres and was acquired by the District on October 28, 1999, for $767,700.00 utilizing Save Our Rivers and mitigation funds.

Turner (4.5 acres), Land Acquisition No. 1999-016-P1:

The Turner parcel was acquired on January 25, 2000, for $4,500 using ad valorem tax funds.

Potter (20 acres), Land Acquisition No. 1991-024-PB:

The Potter parcel totals 20 acres and was exchanged to the District for 10 acres of the McMillan FDOT parcel (Land Acquisition No. 1991-024-P1) on July 23, 2002. No funds were utilized for this exchange.

Wooten Properties (100 acres), Land Acquisition No. 2023-017-P1:

The Wooten Properties parcel totals 100 acres and was acquired by the District on March 8, 2024, for $215,000 using Land Acquisition Fund Balance funds.

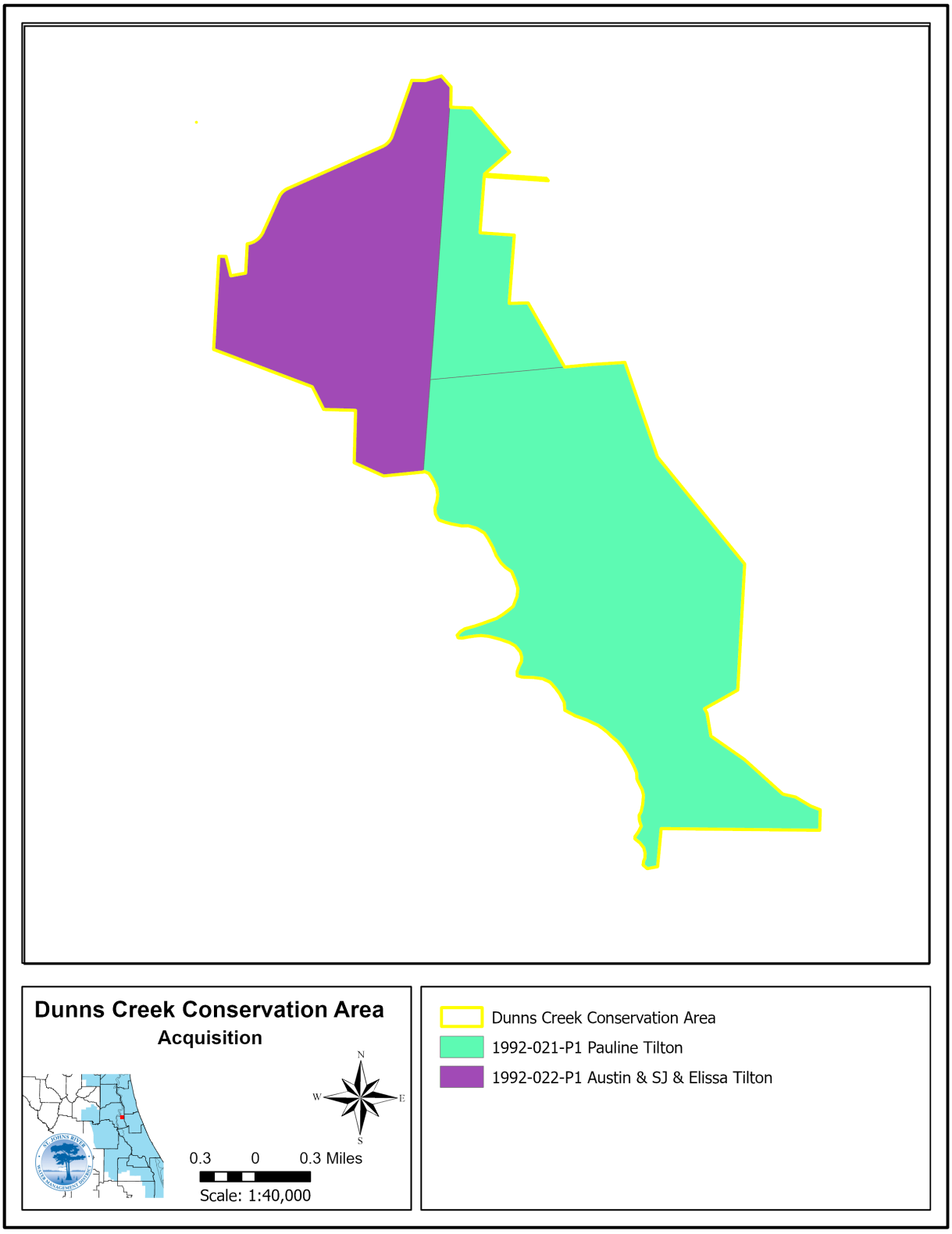

Figure 6: DCCA Acquisition

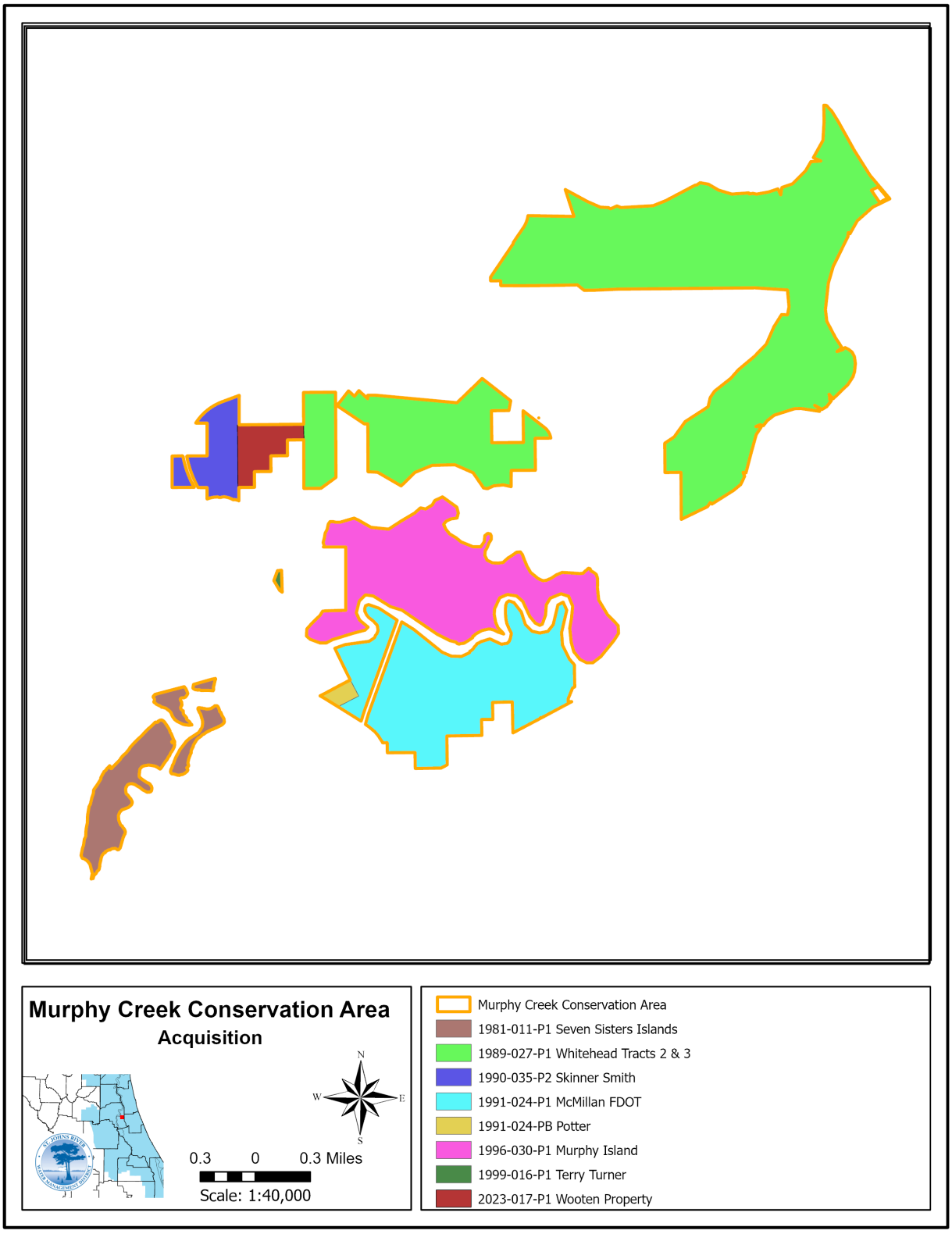

Figure 7: MCCA Acquisition

LOCAL GOVERNMENT LAND USE DESIGNATION

Putnam County

According to the 2045 Putnam County Comprehensive Plan, the Future Land Use designations for the Properties are Conservation as defined:

- The Conservation land use category depicted on the Future Land Use Map includes areas designated for the purpose of conserving or protecting natural resources including groundwater, surface water, wildlife habitats, vegetative communities, floodplains, and wetlands. Areas warranting protection, which are subject to re-evaluation by the County and may result in map amendments to designate other areas as Conservation, include seepage streams, slope forests, spring run streams, sand hill upland lakes, known listed species habitat, scrub uplands and longleaf pine-xeric oak vegetative communities, public and private lands acquired for the purpose of preservation, all jurisdictional wetlands adjacent to the main stem of the St. Johns River, Dunns Creek, and Crescent Lake including the wetlands associated with Murphy, Hog, and Drayton islands, all outparcels within the Ocala National Forest, and the jurisdictional wetlands of Levys Prairie, Goodsons Prairie and Fowlers Prairie. Conservation of resources will also be accomplished in the other land use categories through implementation of environmental protection policies stated throughout the plan. The types of land uses allowed in this future land use category, and guidelines and standards applicable to them are listed below.

The surrounding Future Land Use designations include the above as well as:

- Agriculture: areas used for cropland, pasture/rangeland, silviculture and other agricultural activities, vacant land, and residential parcels of land, some of which currently exceed the density allowed in this future land use category. It is intended that a large share of this land will remain in active agricultural production in the future.
- Rural Residential: areas located adjacent to municipalities and areas designated Urban Service, Urban Reserve, and Rural Center; areas interspersed within the active agricultural areas; and areas around water bodies. In certain locations the Rural Residential category provides a transition of land use, density, and intensity between the rural areas designated Agriculture, and the municipalities and areas designated Urban Service, Urban Reserve, and Rural Center.
- Urban Reserve: areas in close proximity to municipalities or adjacent to designated Urban Service areas. Many of these areas have not been provided with the full range of urban type infrastructure. Future development in this category is expected to be at a lower density and intensity of use than the Urban Service designations.

NATURAL RESOURCES

WATER RESOURCES

The Properties are located within the Crescent Lake and South Mainstem Unit planning basins of the Lower St. Johns River Basin. Planning basins are aggregations of fine scale hydrologic features, such as creeks, ditches and wetlands that flow to a common basin. Major Basins are aggregations of planning basins and generally correspond to U.S. Geological Survey hydrologic cataloging unit delineations. The major waterbodies of these planning basins include Crescent Lake, Lake Broward, and the St. Johns River (Figure 8). The Properties are not located within an Aquatic Preserve or an Area of Critical State Concern pursuant to Section 380.05, F.S.

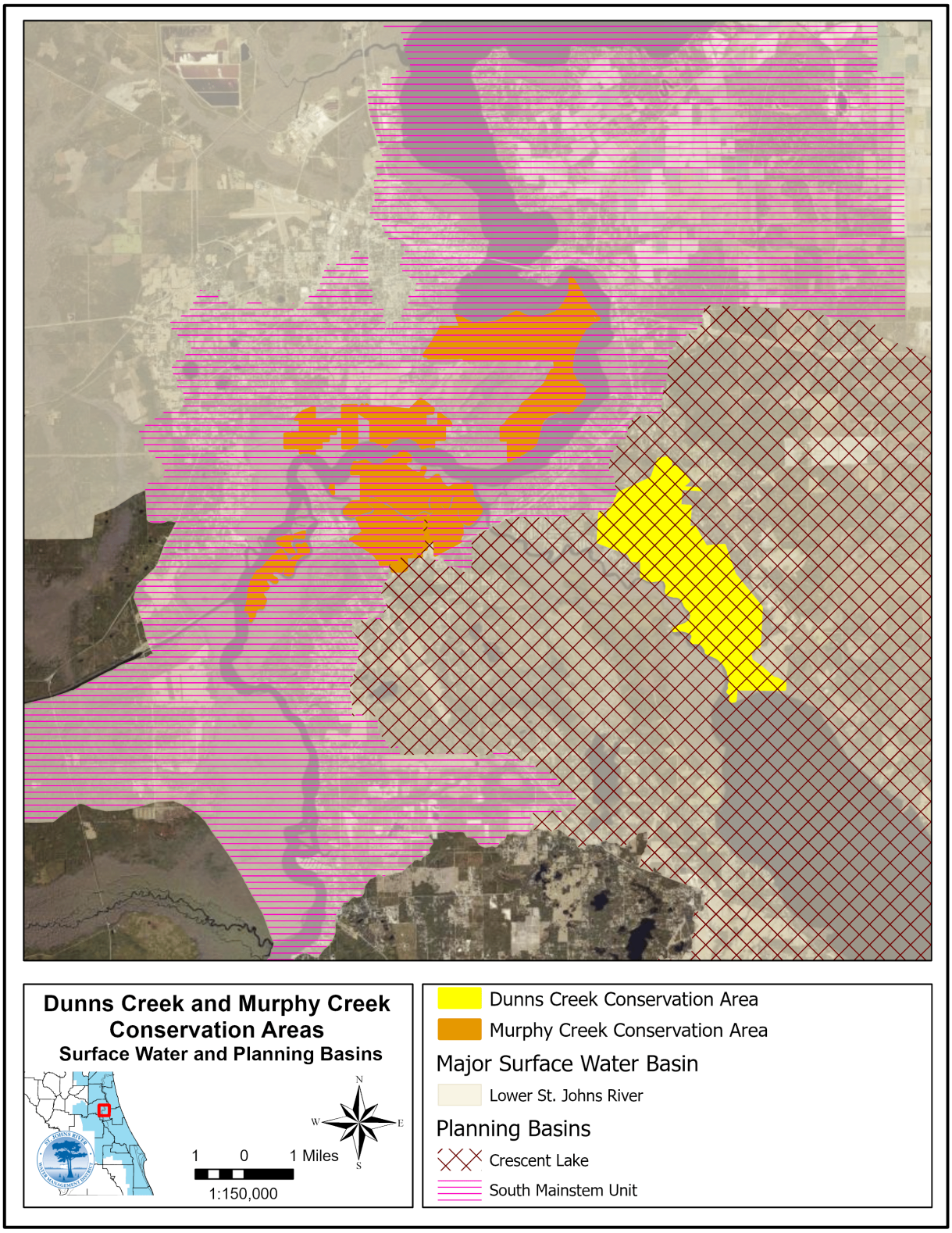

Figure 8: Surface Water and Planning Basins

Geomorphology

The entirety of the DCCA and the northern portion of the MCCA is within the Lower St. Johns River Valley Province within the Barrier Island Sequence Geomorphology District (BISD). The BISD occurs along and inland from the Atlantic Coast of Florida. Pliocene-Pleistocene and Holocene coastal processes formed extensive barrier islands, beaches, lagoons, embayments, and shallow water marine terraces. The estuarine coastlines consist of tidal marshes in the north, gradually changing to mangrove swamps to the south. The reaches of the St. Johns River Valley that are north of Palatka and south of Lake Monroe were once lagoons or embayments. Wetlands are commonly coast-parallel in the swales between the ridges of the strand plains and tidal marshes or mangrove swamps landward of the barrier islands. Inland, there are broad, relatively flat provinces that are Pliocene-Pleistocene marine terraces (Figure 9) (Williams et al., 2022).

Elevations in the BISD range from sea level to approximately 260 feet (ft) mean sea level (msl) in the southwest portion of the BISD. Ninety percent of the elevations lie between 5 and 90 ft msl. The median elevation is approximately 25 ft msl (Williams et al., 2022).

The remainder of the MCCA is within the Crescent City Ridge and St. Johns River Offset provinces within the Lake District (LD) Geomorphology District. The LD occupies much of central peninsular Florida. It is a geomorphically complex district with numerous, north-to-south trending ridges separated by valleys and large lakes. The district also includes an important segment of the St. Johns River Valley and the headwaters of the Peace and Ocklawaha rivers (Figure 9) (Williams et al., 2022).

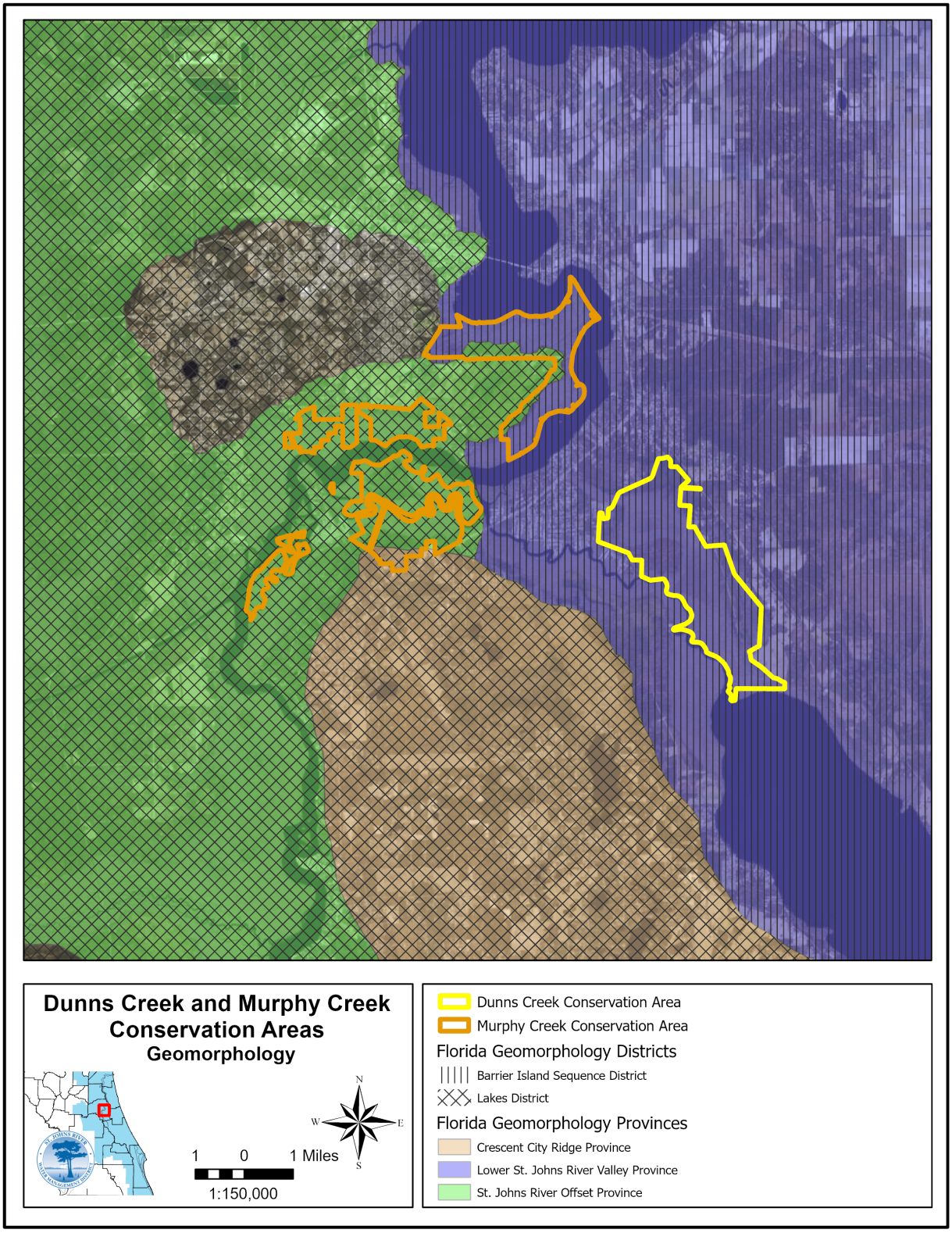

Figure 9: Geomorphology

Elevations in the LD range from near 5 ft msl in the St. Johns River Offset Province to 312 ft msl on Sugarloaf Mountain in the northernmost part of the Lake Wales Ridge Complex Province. Ninety percent of the elevations in the LD lie between 10 feet and 160 feet msl with a median elevation of approximately 85 ft msl. Topographic relief between the sandy ridges and the karst lakes and depressions can be over 100 ft in the hillier portions of the LD. In some areas, the distribution of karst lakes is controlled by the beach ridges created during the deposition of the Cypresshead Formation. Lakes occur in the ancient swales and at lower elevations on the flanks of the ridges (Williams et al., 2022).

Figures 10 and 11 depict the topographic features of the DCCA and the MCCA, respectively, as well as the surrounding area.

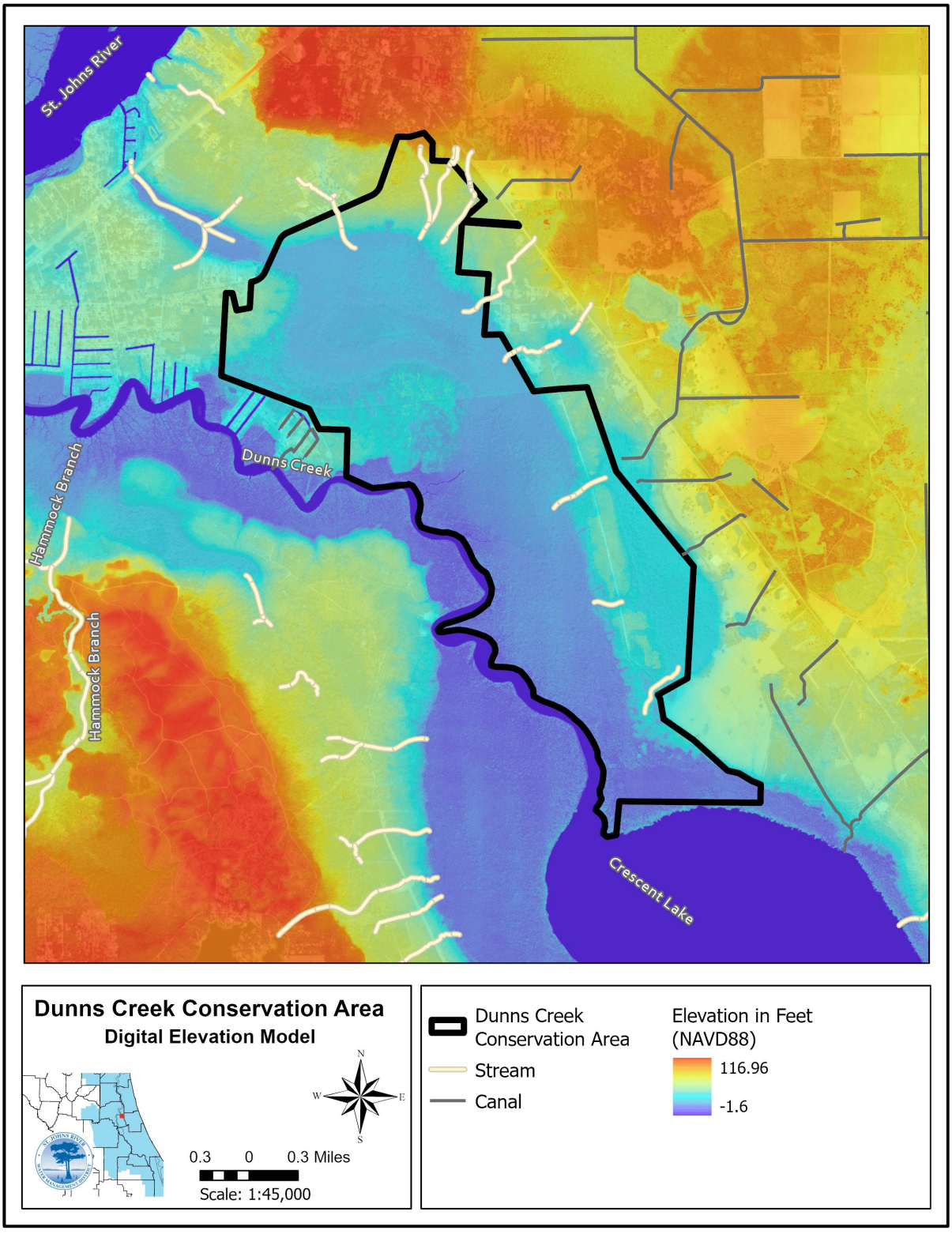

Figure 10: DCCA Topography

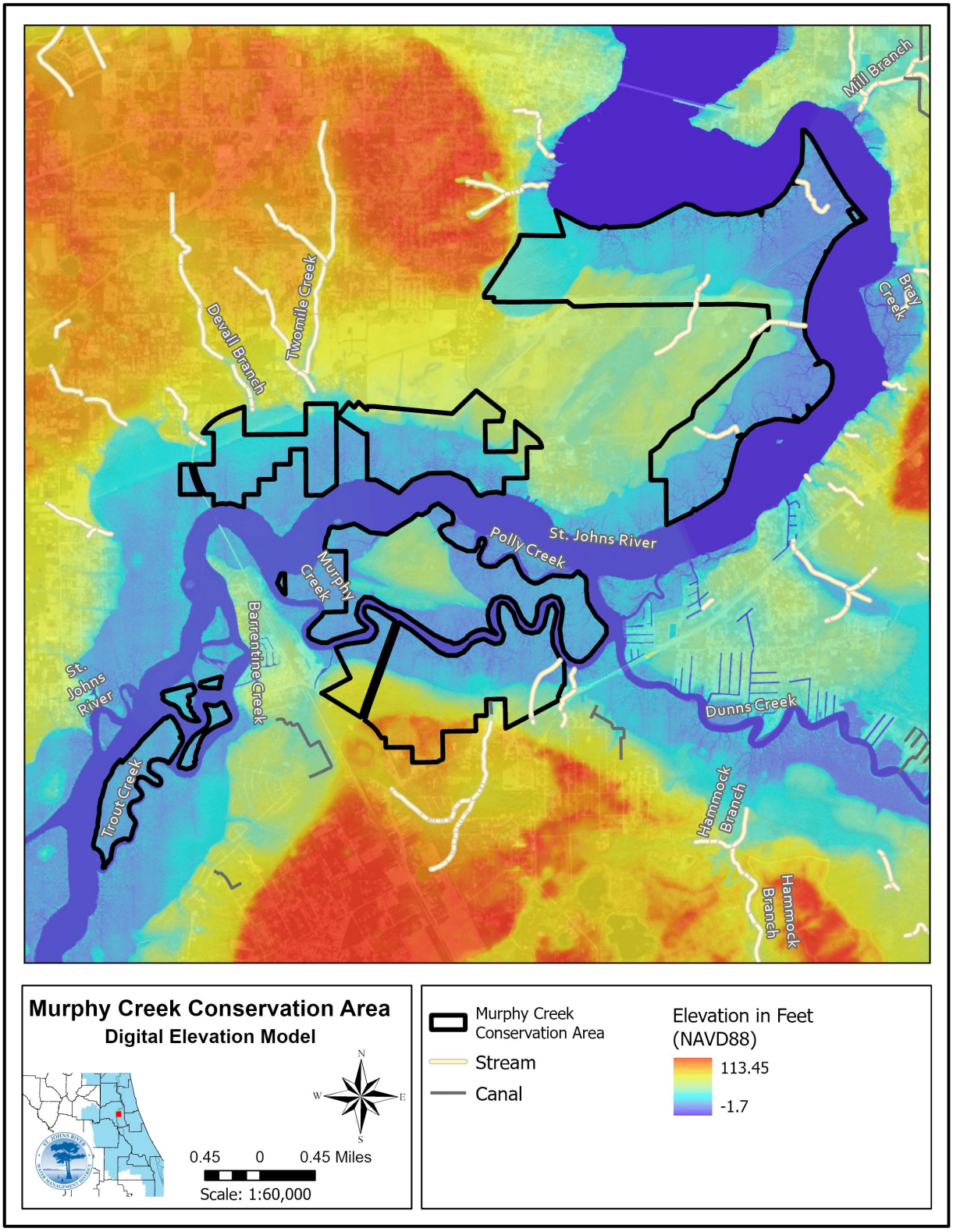

Figure 11: MCCA Topography

Water Levels

The District has active groundwater monitoring well sites located within the Properties, identified as P-0196 on the DCCA (Figure 12) and P-4043 on the MCCA (Figure 13), which monitor surficial aquifer levels. These sites are automatically monitored daily and are most representative of conditions found at the Properties. The peaks of the graphs show high aquifer levels such as periods of heavy rainfall, while the valleys show times of low levels such as periods of drought, relative to the well surface elevation. Water levels for these sites for the past 12 years are plotted below. The locations of P-0196 and P-4043 are indicated on Figure 14.

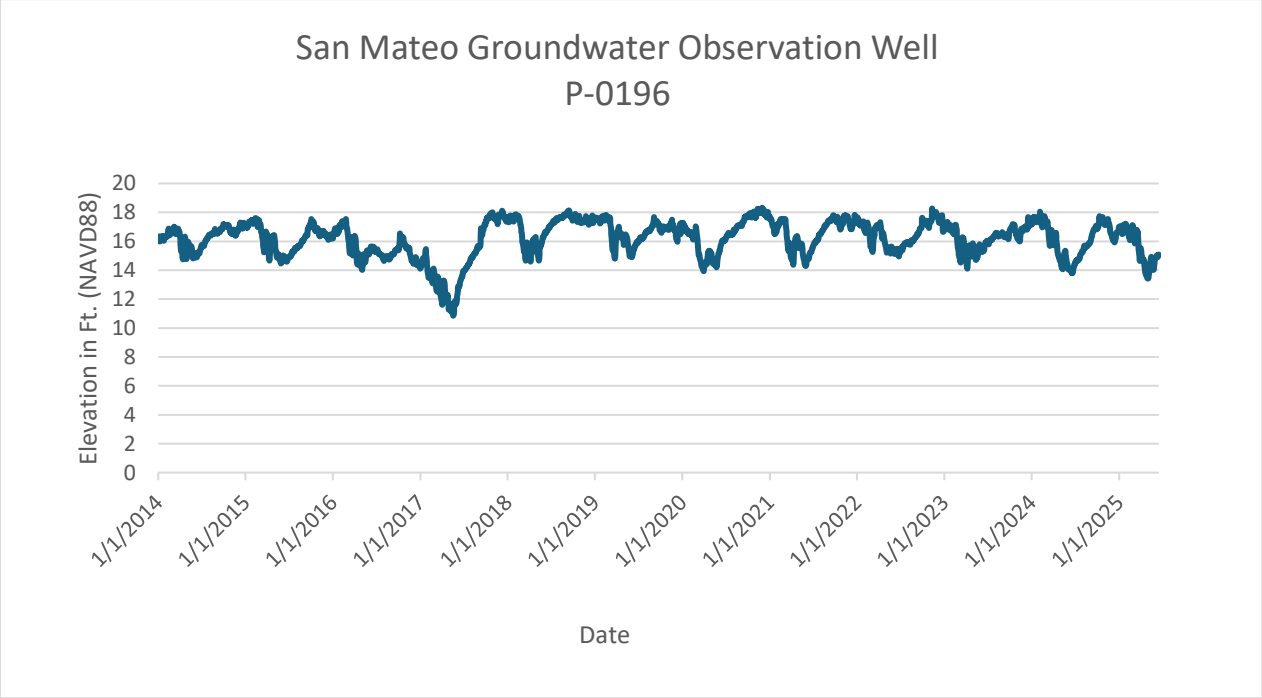

Figure 12: DCCA Groundwater Observation Well Site P-0196

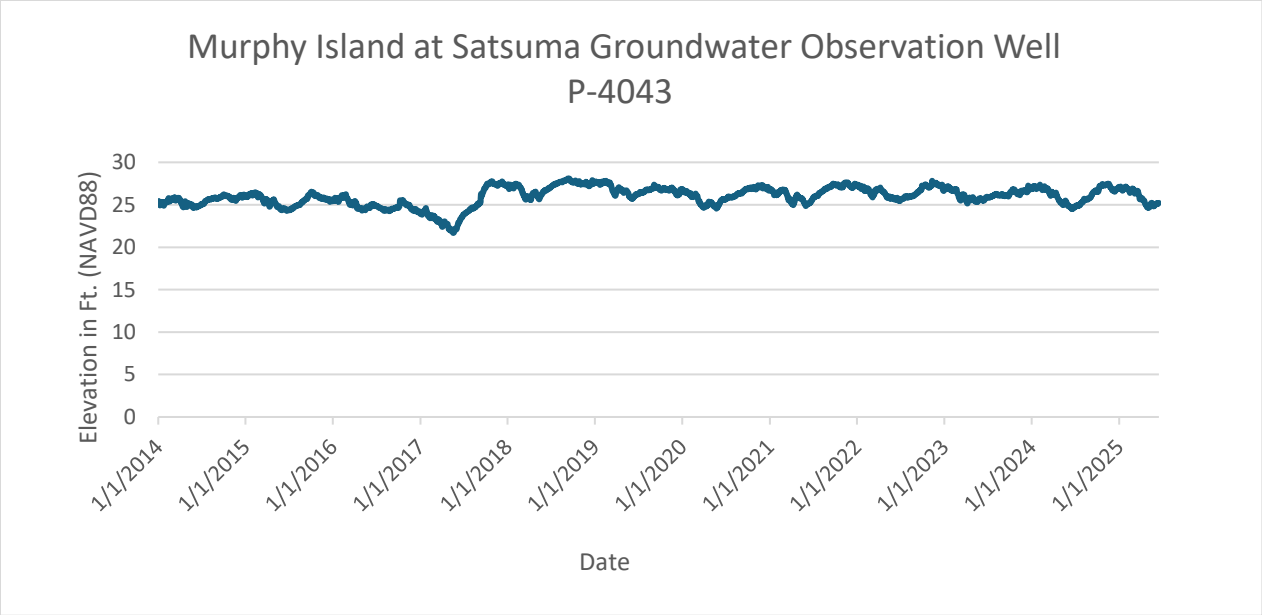

Figure 13: MCCA Groundwater Observation Well Site P-4043

Water Chemistry

Basic water chemistry data are collected at three sites near the Properties within the Lower St. Johns River watershed: (1) Crescent Lake Outlet (ACRESLM), located south of the DCCA in Crescent Lake, (2) St. Johns River at Buffalo Bluff (BB22), located within the MCCA on the St. Johns River, and (3) St. Johns River at Palatka (SJP), north of both the Properties on the St. Johns River (Figure 13).

Water chemistry data are typically collected on a bimonthly basis. Water chemistry parameters discussed in this section include total phosphorus (phosphorus), total nitrogen (nitrogen), salinity, dissolved oxygen (DO), hydrogen ion potential (pH), total suspended solids (TSS) and Chlorophyll-*a* (Chl-a). Field data including water temperature, pH, specific conductivity, and DO are collected, as well as grab samples analyzed for nutrients, minerals, and metals.

The following parameters are discussed in relative terms for the past 15-year period as described in the District's 2024 Status and Trends Report.

Crescent Lake Outlet (Station ACRESLM)
Nitrogen and DO are in the mid-range and stable. Phosphorous is in the mid-range and increasing. pH, salinity, and TSS are in the mid-range and decreasing. Chl-a is in the high range and decreasing.

St. Johns River at Buffalo Bluff (Station BB22)
Nitrogen and pH are in the mid-range and stable. Phosphorous is in the mid-range and increasing. DO and salinity are in the mid-range and decreasing. Chl-a is in the high range and stable. TSS is

in the high range and decreasing.

St Johns River at Palatka (Station SJP)
Nitrogen, DO, and pH are in the mid-range and stable. Phosphorous is in the mid-range and increasing. Chl-a is in the high range and stable. Salinity and TSS are in the mid-range and decreasing.

Surface water chemistry data do not exist within the Properties, but these sites provide insight into the water quality conditions in the Lower St. Johns River watershed. The acquisition and protection of the Properties help protect water quality and storage in this area of the watershed.

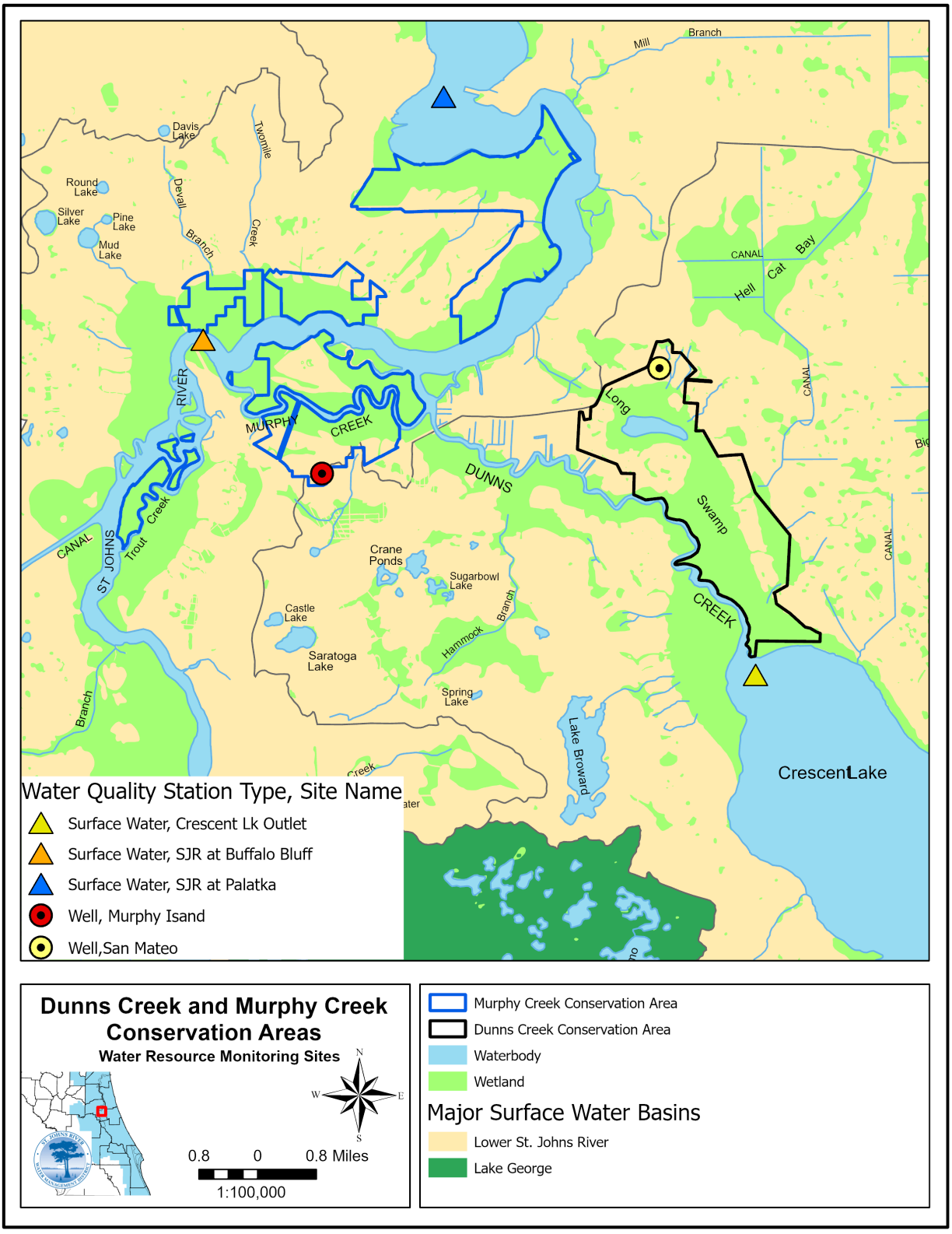

Figure 14: Water Resource Monitoring Sites

NATURAL COMMUNITIES
The 3,182 acres that comprise the DCCA (Figure 15) and the 4,828 acres of the MCCA (Figure 16) consist primarily of floodplain swamp and include a diverse array of other natural communities.

Information relative to the natural communities within both properties is derived from several sources including aerial photo interpretation, timber stand information, and personal observations of District staff. The general natural community descriptions are characterized using descriptions published in the Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida (*FNAI, 2010).

Floodplain Swamp (DCCA: 1,989 acres, 62%; MCCA: 3,419 acres; 71%)
Floodplain swamp communities typically occur on flooded soils along stream channels and within river floodplains. The floodplain swamp communities within the DCCA are associated with Dunns Creek. Despite past disturbances, the floodplain swamp communities within the DCCA are largely intact and functional.

Typical of the floodplain swamp system, the examples of this community type within the MCCA include a closed-canopy forest of hydrophytic, buttressed trees including bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*). Floodplain swamps within the MCCA appear relatively intact.

Soils that support floodplain swamp communities are variable, but may include a mixture of sand, organic, and alluvial material. The most important physical factor associated with the shaping and maintenance of the floodplain swamp is the hydroperiod. Extended periods of inundation, which may last for most of the year, are common in the floodplain swamp environment. Since this community type is maintained by hydrologic regimes, it is not fire dependent; however, fires may occur during times of drought.

Mesic Flatwoods (DCCA: 806 acres; 25%; MCCA: 576 acres; 12%)
Soils that support mesic flatwoods communities are generally poorly drained, acidic, and sandy soils deposited on ancient, shallow seabeds. Many flatwoods communities have a clay or organic hardpan. Hardpan soils become saturated during the rainy season causing the accumulation of surface water. The presence of the hardpan translates to extreme seasonal fluctuations in the amount of water available to support plant life. These seasonal hydroperiods are essential in the maintenance of the flatwoods system.

Intact mesic flatwoods typically have a layered appearance, with a distinct, high, discontinuous canopy, low shrub layer, and diverse herbaceous layer. The canopy densities are variable and may include (depending on location) longleaf pine (*Pinus palustris*), slash pine (*P. elliottii*), loblolly pine (*P. taeda*), or pond pine (*P. serotina*). The shrub layer may include a mixture of species or be dominated by species such as saw palmetto (*Serenoa repens*), wax myrtle (*Morella cerifera*), and numerous members of the Ericaceae family. The herbaceous coverage may be dominated by

wiregrass, however species abundance and diversity are often dictated by the openness of both shrub and canopy layers.

The mesic flatwoods communities within the DCCA are disturbed, with the most significant alterations resulting from the effects of prolonged fire exclusion. Shrub layers within the mesic flatwoods are largely in good condition with a few areas being overgrown. Additionally, groundcover assemblages vary in diversity and abundance within this community type. Pine species present within the flatwoods communities on the DCCA include longleaf, slash, and pond pine.

The mesic flatwoods communities within the MCCA are disturbed, with the most significant areas of alterations being in the silvicultural areas of the Whitehead parcel. Groundcover assemblages in these areas are suppressed and, in some areas, void of these components. Pine species present within the flatwoods communities on the MCCA include longleaf, slash, and loblolly.

Fire is an important physical factor associated with the shaping and maintenance of this community type. The District targets natural fire frequency intervals of approximately every 2–4 years within the mesic flatwoods, which is consistent with the FNAI 2010 description.
Fires in well-maintained mesic flatwoods tend to burn quickly and at relatively low temperatures. Areas that have experienced prolonged fire exclusion, altered hydrology, or hardwood encroachment typically have higher soil and fuel moistures and may require more extreme conditions to facilitate a fire.

Wet Flatwoods (DCCA: 249 acres; 8%; MCCA: 322 acres; 7 %))
Soils that support wet flatwoods communities are generally very poorly drained sandy soils that may have a mucky texture in upper horizons. Wet flatwoods occur as ecotonal areas between the drier mesic flatwoods and wetter areas such as bogs or swamps. They may also occur in broad, low flatlands embedded within these communities.

Well-maintained wet flatwoods exhibit a relatively open-canopy forest of scattered pine trees (*Pinus spp.*) or cabbage palms (*Sabal palmetto*) with either a thick shrubby understory and sparse groundcover or sparse understory with dense groundcover. Understory species of the subcanopy and shrub layers may include sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and saw palmetto, as well as a suite of ericaceous plants. The groundcover layer may include species such as wiregrass (*Aristida stricta*), blue maidencane (*Amphicarpum muhlenbergianum*), and numerous hydrophytic species. The variations in structure and composition may be attributed to subtle edaphic differences as well as differences in hydrologic and fire regimes.

The wet flatwoods within the DCCA are disturbed. Fire exclusion has resulted in portions of this community within the DCCA exhibiting suppressed groundcover assemblages and an overgrown midstory that includes a dense coverage of loblolly bay. The wet flatwoods plant community is fire dependent, and the District targets return intervals ranging from 2–4 years, which is consistent with FNAI 2010 descriptions.

The wet flatwoods plant community is fire dependent with return intervals ranging from 2–4 years. In areas such as the MCCA, shrubs tend to dominate wet flatwoods where fire has been either low in intensity or absent. Wet flatwoods within the conservation area suffer from prolonged fire exclusion and include midstory components that are heavily overgrown.

Scrubby Flatwoods (MCCA only: 126 acres; 3%)
Scrubby flatwoods communities generally occur on moderately well drained, sandy soils. This community type occurs on slight rises within mesic flatwoods and in broad transitional areas. Standing water is uncommon in scrubby flatwoods as the depth to the water table is generally higher than adjacent mesic flatwoods.

Scrubby flatwoods have a stratified appearance and are characterized as an open canopy forest of widely scattered pine trees with a sparse shrubby understory and numerous areas of barren white sand. The vegetation in these ecotonal areas is a combination of mesic flatwoods and scrub species. Canopies of the scrubby flatwoods in northern and central Florida may include longleaf and slash pine. Shrub layers will often include scrub oaks, saw palmetto and various Ericaceous plants. Groundcover, while generally sparse, may include wiregrass.

Scrubby flatwoods communities within the MCCA are disturbed. The most significant areas of alterations occur within the silvicultural areas and are primarily a result of prolonged fire exclusion. The shrub layer in these areas is overgrown and groundcover assemblages are sparse with only the most resilient species remaining.

Fire is an integral component in the perpetuation of this community type. The open areas of bare sand, sparse groundcover vegetation and coverage of largely incombustible oak leaf litter typical of most scrubby flatwoods results in a fire return interval of between 8 and 25 years. Examples of scrubby flatwoods with a higher herbaceous or saw palmetto component may burn at a lower fire return frequency.

Sandhill (MCCA only: 158 acres; 3%)
Sandhills are characterized as a forest of widely spaced pine trees with a sparse understory of deciduous oaks and a fairly dense and diverse groundcover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak (*Quercus laevis*), and wiregrass. Sandhills occur on crests and slopes of rolling hills and ridges. Soils are deep marine deposited, yellowish sands that are well drained and relatively infertile.

The sandhill plant community is a fire climax community. Frequent, low- intensity, and seasonally appropriate fire is necessary to perpetuate the proliferation of fire adapted plant species and to restrict the successional changes that may transition these areas into xeric hammocks. Fire return intervals within sandhill communities range from 1–3years.

Sandhills are within the MCCA are degraded. Past alterations from possible cattle grazing operations, silviculture, and a prolonged absence of fire have caused many of these areas to undergo ecological succession to xeric hammock. These areas have some remnant longleaf pine but are dominated by offsite oaks including laurel (*Quercus laurifolia*), water (*Q. nigra*), and live

oak (*Q. virginiana*), as well as cabbage palm. Groundcover is suppressed in most areas and is absent all together in many areas as a result of shading.

Floodplain Marsh (DCCA: 106 acres; 3%; MCCA: 1 acre; <1%))
Floodplain marshes are herbaceous or shrubby freshwater wetlands connected to floodplains. Floodplain marshes are found along rivers and streams from just below the headwaters to the freshwater portions of tidally influenced river mouth and may be located within non-pyrogenic plant communities. Plant species compositions can be divided into submersed, floating-leafed, emergent, and grassy zones.

Floodplain marshes are directly influenced by river flooding on an annual or semi-annual basis where most of the marsh is inundated from approximately 120–350 days per year. Soils are typically sand or a thin to thick organic layer over sand and may be saturated for most of the year. Floodplain marsh may burn periodically depending on dominant vegetation.

The floodplain marsh within the DCCA is disturbed, with the most significant disturbances being the prolonged absence of fire and altered hydrology. The floodplain marsh is embedded within the floodplain swamp in the northern portions of the DCCA and is heavily encroached by coastal plain willow (*Salix caroliniana)* and other woody species. It is believed that this example floodplain marsh was historically dominated by sawgrass (*Cladium jamaicense*), as a highly suppressed remnant coverage of this species remains scattered throughout the marsh.

Mesic Hammock (MCCA only: 25 acres; 1%)
Mesic hammocks are well-developed evergreen hardwood and/or palm forests on soils that are rarely inundated. They exhibit a closed canopy dominated by live oak and may include cabbage palm and southern magnolia. The shrub layers may vary in density and include a mix of saw palmetto, American beautyberry (*Callicarpa americana*), and *Vacciniums*. Herbaceous layers tend to be sparse or patchy but may consist of numerous graminoids including panic grasses and sedges, as well as various ferns and forbs.

Soils that support mesic hammocks are typically sandy, mixed with organics, and include a thick layer of leaf litter. Mesic hammocks occur as islands on high ground within floodplain wetlands in areas that have been historically protected from fire. Although mesic hammocks are not generally considered a pyric plant community, some may experience occasional low-intensity ground fires. An example of the mesic hammock community is located on Murphy Island.

Basin Marsh (MCCA only: 9 acres; <1%)
Basin marshes are herbaceous or shrubby freshwater wetlands in large irregularly shaped basins. These marshes typically develop in large solution depressions that were formerly shallow lakes and may also be located within non-pyrogenic plant communities. Plant species compositions can

be divided into submersed, floating-leaved, emergent, and grassy zones. An example of a basin marsh community is embedded within the floodplain swamp on the Whitehead parcel.

Hydroperiods of approximately 200 days are essential to the maintenance of this natural community as is frequent fire. The fire return interval for basin marshes is every 1–10 years with more herbaceous systems having a return of between 1–3 years.

Depression Marsh (DCCA: 3 acres; <1%; MCCA: 6 acres; <1%)
Depression marsh communities often occur embedded within a matrix of well-maintained pyric plant communities (FNAI, 2010). Depression marshes are typically found on flat landscapes throughout Florida. They develop when the overlying sand has slumped into a depression in the limestone underlayment. Soils are typically depressional phases of fine sands. Depression marshes are maintained in part against woody shrub invasion by fluctuations in water levels associated with rainfall, fire, and in many cases a combination of both. These seasonal ponds are important habitat for numerous species of wildlife but are particularly important for many amphibians that require breeding sites that are free of predatory fish.

Without frequent fire, herbaceous components of the depression marsh systems may give way to woody shrub species. The frequency of fire within these areas is determined by the fire frequency of the surrounding natural community. The depression marshes within the Properties will have fire return intervals influenced by the fire frequency of the surrounding mesic flatwoods, which is between 1–8 years.

Dome Swamp (DCCA only: 4 acres; <1%)
Dome swamp communities typically occur embedded within well-maintained pyric plant communities such as flatwoods (FNAI, 2010). The dome swamp communities within the DCCA occur within the mesic flatwoods.

Dome swamps are typically found on flat terraces, where they develop when the overlying sand has slumped into a depression in the limestone underlayment. Soils that support dome swamp communities are variable but may include a layer of peat that thickens towards the center. The peat layer is typically underlain with acidic sands or marl and then limestone or a clay lens. An important physical factor associated with the shaping and maintenance of the dome swamp is the hydroperiod. Water levels in dome swamps fluctuate seasonally with rainfall changes. Normal dome swamp hydroperiods are from 180–270 days per year (FNAI, 2010).

Typical of the dome swamp system, many of the examples of this community type within the DCCA include a dome-shaped profile created by the presence of smaller trees growing in the shallow waters of the outer edge with the large trees growing in the deeper center. The canopy of hydrophytic trees is dominated by cypress (*Taxodium spp.*).

Without frequent fire, cypress may become less dominant, being replaced by hardwood or bay species, and may exhibit an increase in peat accumulation. Fire frequency within these communities is greatest around the edges. The longer hydroperiods within the center of most dome swamps will restrict the advance of most fires under normal conditions. Thus, the fire return

interval for dome swamps may range from 3–5 years along the edges and may be as great as 102–150 years in the center (FNAI, 2010).

Scrub (MCCA only:4 acres; <1%)
Scrub is characterized as a closed to open canopy forest of sand pines with dense clumps or vast thickets of scrub oaks and other shrubs dominating the understory. The groundcover is generally very sparse, being dominated by ground lichens or rarely, herbs. Open patches of barren sand are common. Where the overstory is widely scattered or absent altogether, the understory and barren sands are exposed to more intense sunlight.

Scrub occurs on Murphy Island, in a small, isolated patch. Scrub communities are fire maintained and generally burn catastrophically every 20–80 years. The high variability of fire intervals within scrub systems is relative to the productivity of the site. Sites with higher productivity will burn more frequently.

Xeric Hammock (DCCA only: 1 acre; <1%)
Xeric hammock is characterized as an evergreen forest with a low canopy and little understory plants other than palmetto, or a multi-storied forest of tall trees with an open or closed canopy. Several gradations between these extremes may occur.

The xeric hammock natural community is typically an advanced successional stage of scrub or sandhill. It is a climax community, having been protected from fire for 30 or more years. When fire does occur in the xeric hammock, it is under extreme conditions, burns catastrophically, and it may revert the community back to an earlier successional stage. An example of xeric hammock occurs on the northern portion of the DCCA and is typical as described by FNAI in that it appears succeeded from sandhill.

Altered Communities

Utility Corridor (MCCA only: 182 acres, 4%)
Utility corridors are an altered land type. They include areas utilized for electric, gas, and telephone rights-of-way. A high-tension electrical line and right-of-way that is collocated with a gas line is located on the MCCA. This utility corridor traverses the Whitehead parcel.

Successional hardwood forest (DCCA only: 23 acres; <1%)
A portion of pasture that was mowed for several years has now seeded in with hardwoods from the adjacent swamp. Restoration activities will include monitoring natural afforestation species composition and managing invasive plants.

Developed (DCCA only: 1 acre; <1%)
The developed areas on the DCCA include the parking areas as well as the campsite area.

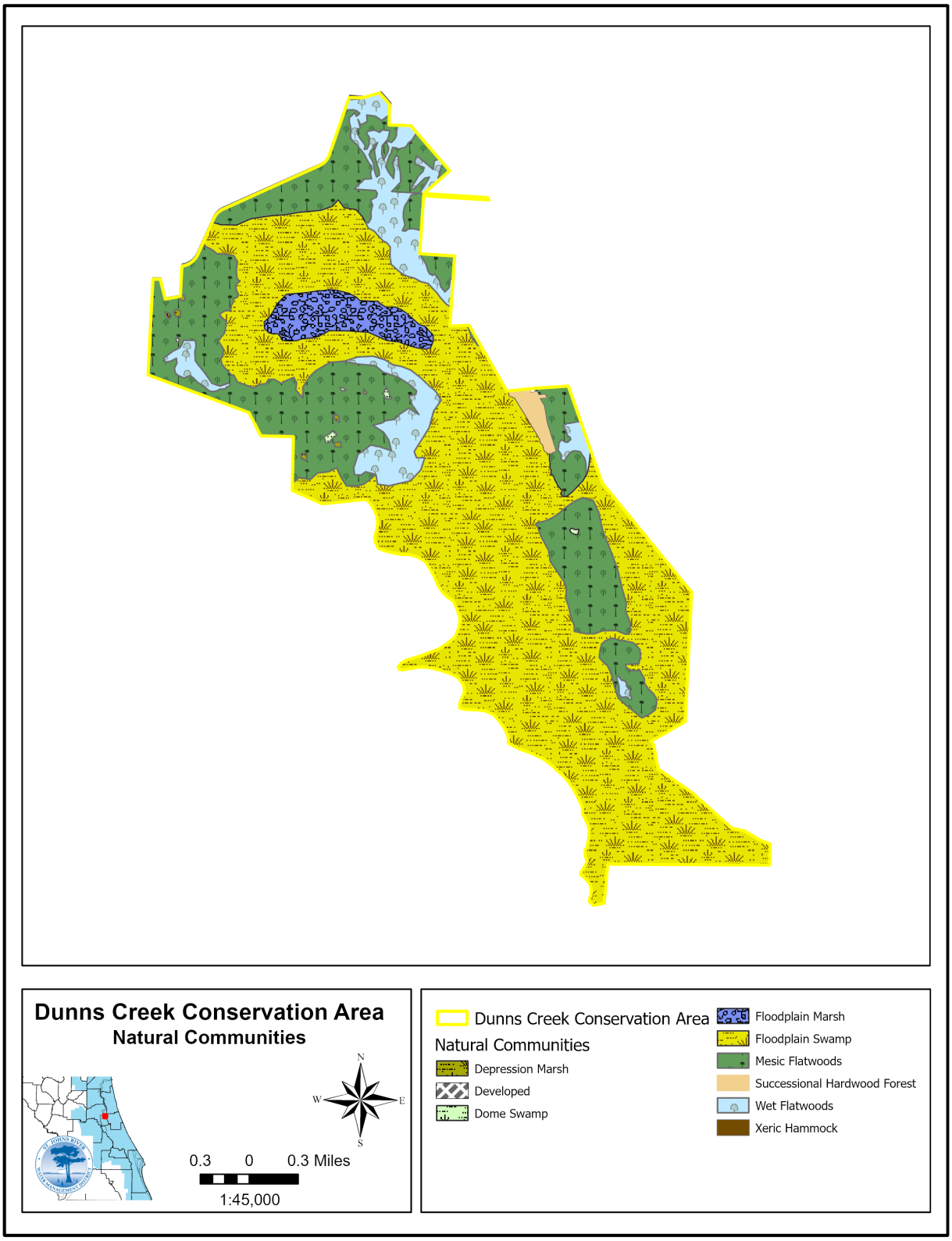

Figure 15: DCCA Natural Communities

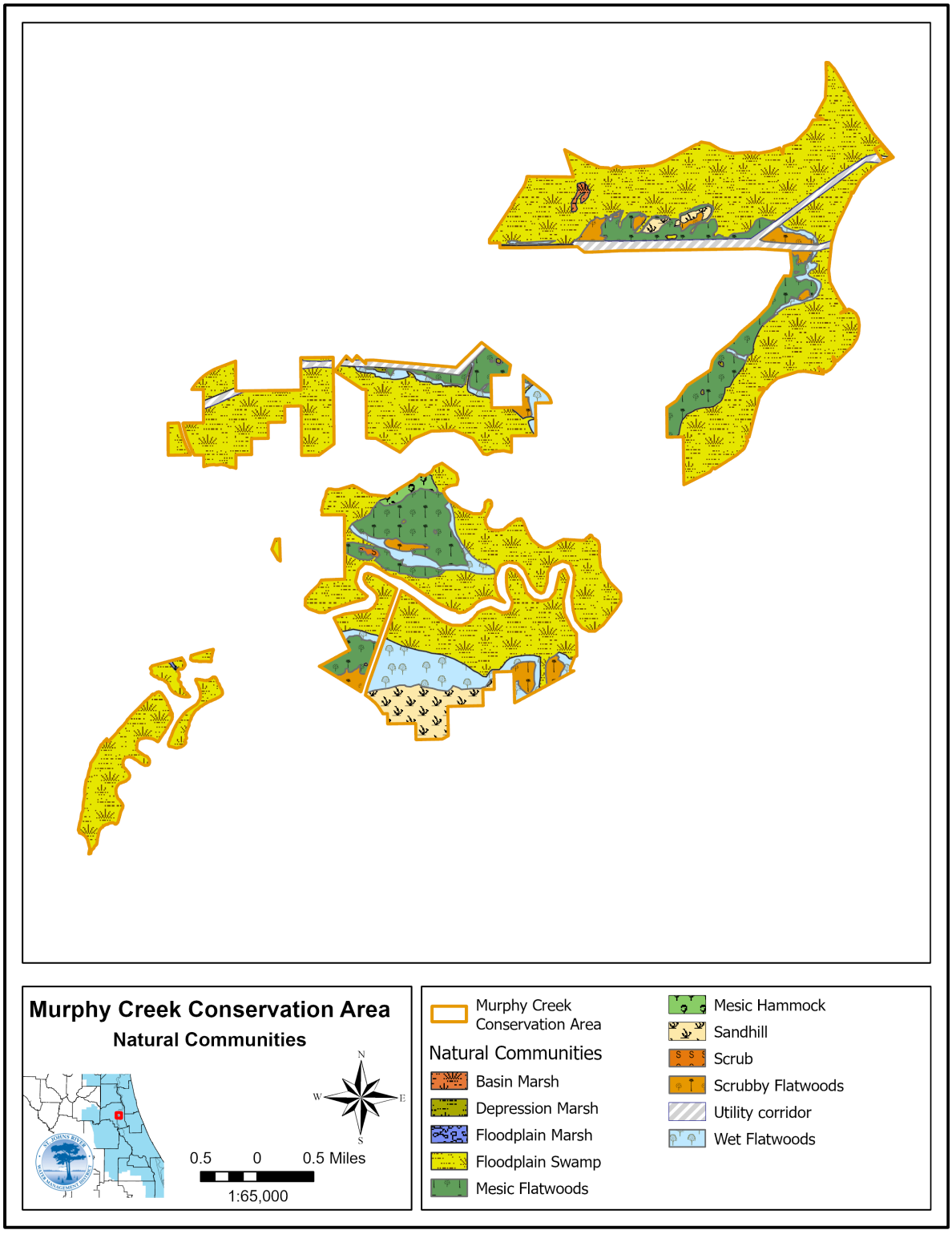

Figure 16: MCCA Natural Communities

SOILS

According to the U.S. Department of Agriculture (USDA) Soil and Conservation Service, 20 different soil types are within the DCCA and 21 different soil types are within the MCCA. The Putnam County Soil Survey (USDA, 2023) provided information used to develop descriptions of the predominant soil series found within the Properties. The soil descriptions are combined for the Properties and found in Appendix A.

CULTURAL AND HISTORICAL RESOURCES

A review of the Department of State Division of Historical Resources does not indicate the presence of any registered cultural sites within the boundaries of the DCCA while there are 16 registered cultural sites on the MCCA. In August 2024, staff from the District and Florida Public Archelogy Network (FPAN) monitored the sites on the MCCA and found many of them in a disturbed but stable condition. A contemporary grave marker was identified on the McMillan parcel of the MCCA but was determined to likely be a memorial for a pet. If additional sites are located, District staff will document and report the sites to the Division of Historical Resources.

IMPLEMENTATION

The following sections outline land management strategies for resource protection, land use, and administration on the Properties for the next 10 years.

RESOURCE PROTECTION AND MANAGEMENT

Water Resources

Goal: Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the natural and restored condition

Strategies:

- Maintain roads and culverts to prevent erosion

While most wetland protection for the Properties was accomplished through acquisition, portions of the wetlands have a history of disturbance. Hydrologic disturbances within the Properties include roads, ditches, and culverts (Figure 17). Regular maintenance occurs on the culverts, ditches, and low water crossings on the Properties. Culverts may be converted to low water crossings, as determined by site conditions and access requirements, to provide for a less restrictive hydrologic flow.

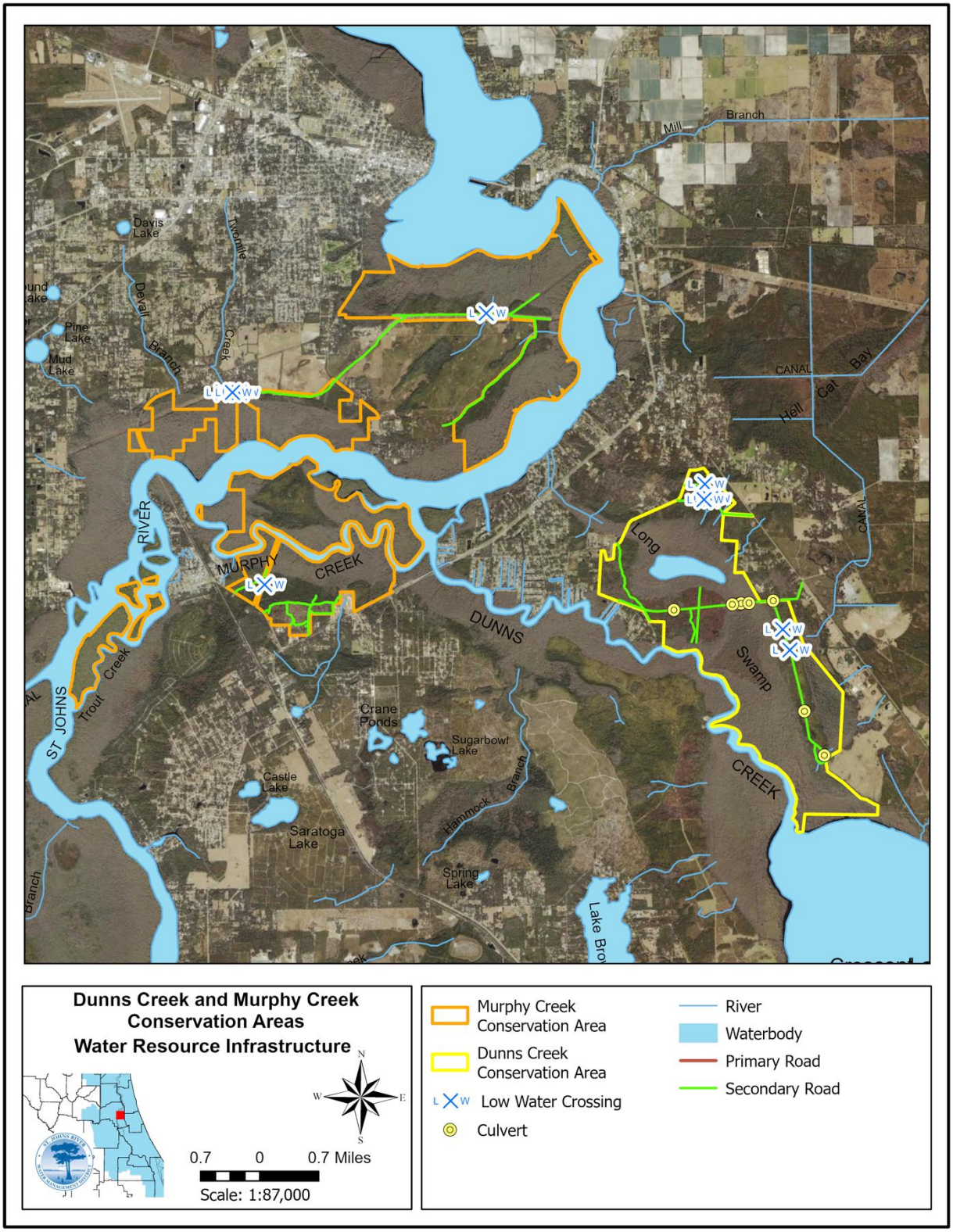

Figure 17: Water Resource Infrastructure

Forest Management

Goal: Maintain, improve, and restore forest resources

Strategies:

- Thin 194 acres of natural pine at DCCA
- Thin 67 acres of pine plantation and reforest 28 acres at MCCA

Section 253.036, F.S., requires the lead agency of state lands to prepare a forest resource analysis, "…which shall contain a component or section…which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel."

The Properties are partitioned into forest management compartments and each compartment is further divided into stands. Management decisions are made on the stand level. Portions of the Properties will receive an annual timber inventory on a small percentage of their area due to the integrated nature of forest management with overarching land management. Stand-level values derived from the inventory include number of trees per acre, basal area, and volume of trees by product type and species. After each inventory cycle, growth and yield projections are calculated on all active plots. The inventory data output is then incorporated into the District's forest management database. Harvest operations and reforestation events that may occur over time are also recorded in the database. This information is used to help land management staff forecast needs and make forest management decisions.

The management objectives of the Properties will require periodic pine thinning to control tree density. Periodic thinning harvest provides some protection against wildfires and pine beetle outbreaks. Clearcut/reforest operations will also be utilized in the scope of this plan for insect or disease control, salvage after overstory has been killed or severely damaged, or species conversion. Forest management activities anticipated during the scope of this plan include timber inventory, thinning, and reforestation operations. Reforestation projects may be preceded by various site preparation techniques including mechanical treatments, such as disc harrowing to remove silvicultural bedding, roller chopping and mowing, herbicide applications, and prescribed fire. These techniques may be used singularly or in combination as site conditions warrant. Figures 18 and 19 depict pine coverage by species across the Properties on silviculturally managed stands.

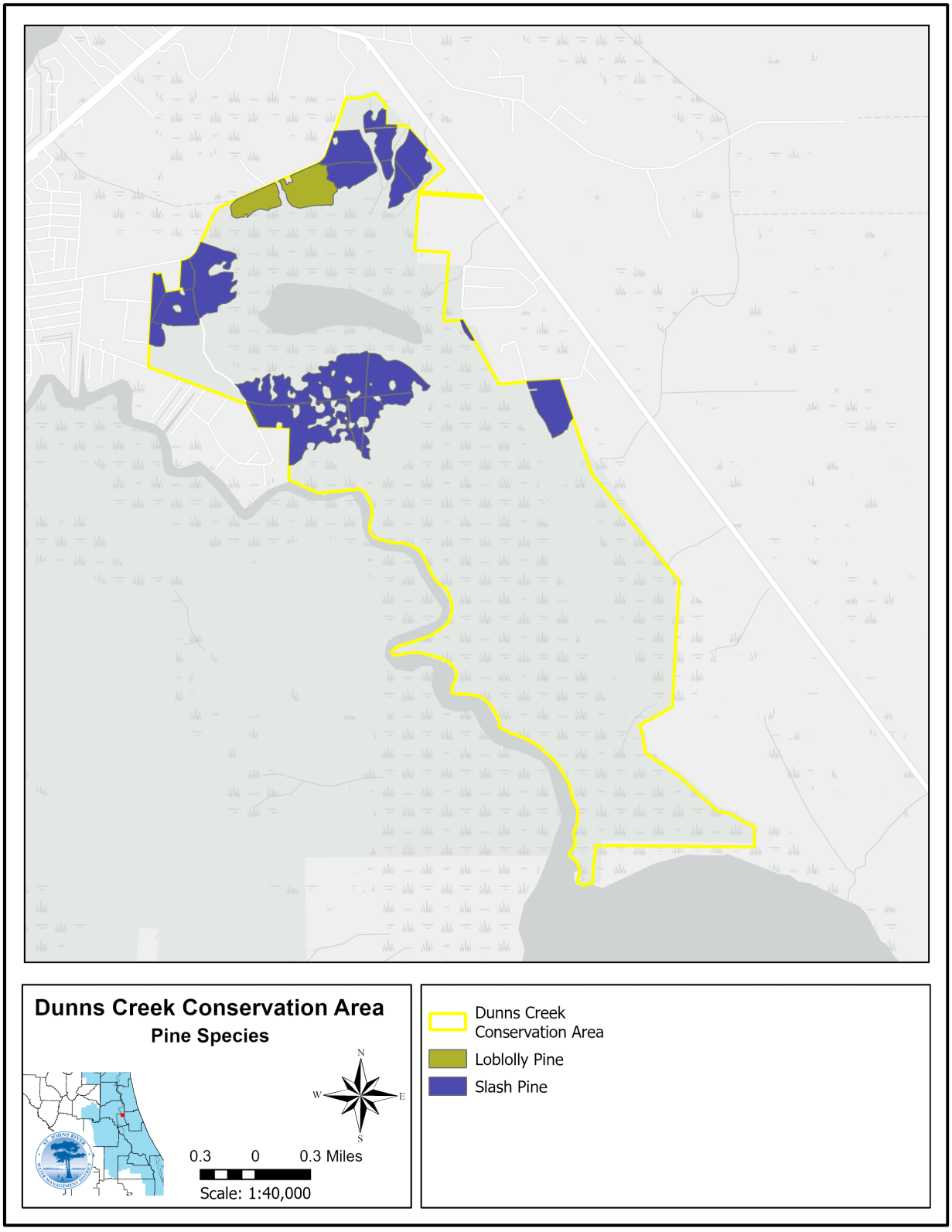

Figure 18: DCCA Pine Coverage by Species

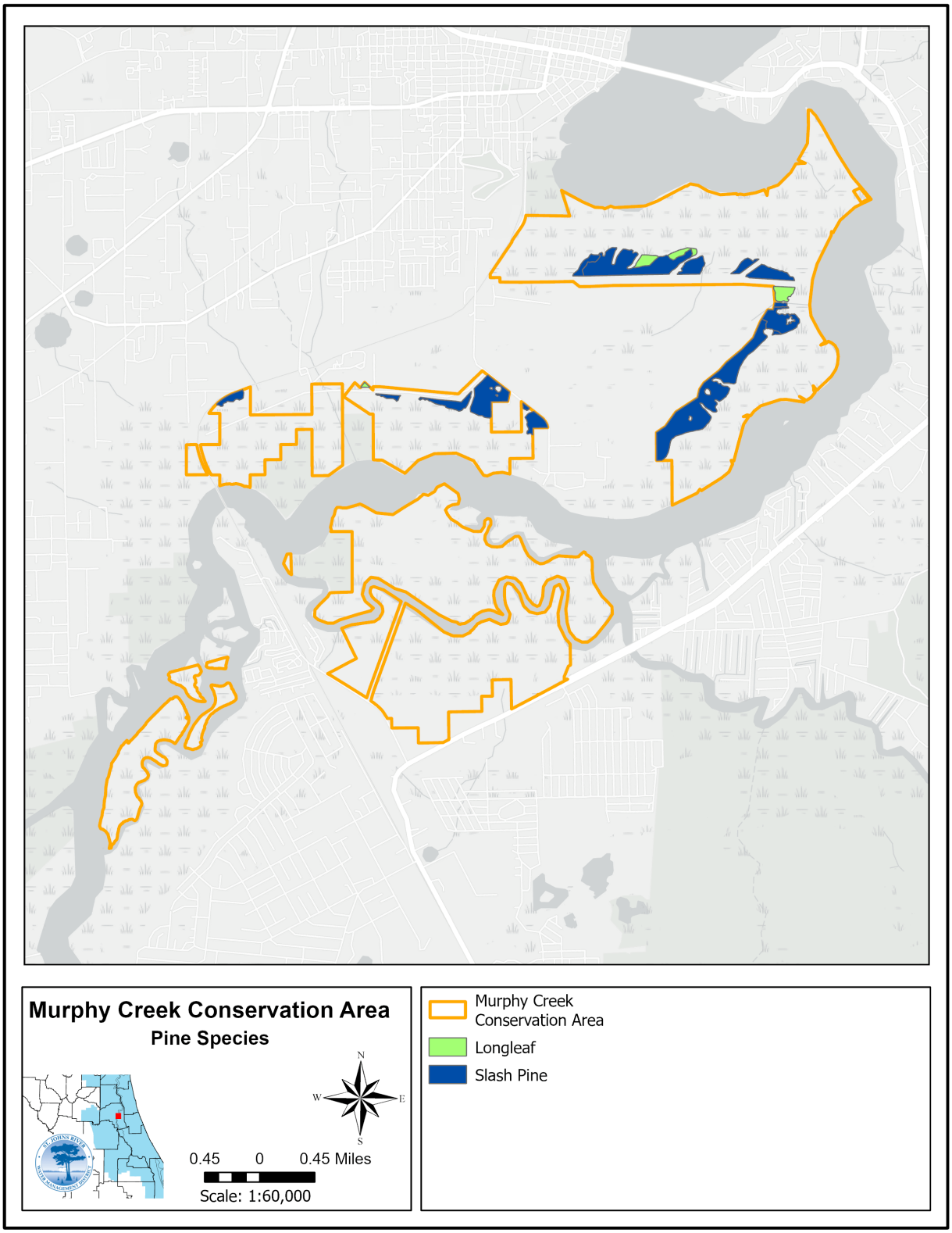

Figure 19: MCCA Pine Coverage by Species

Through periodic thinning, the District will remove the poorest trees to reduce crown density and allow the better trees to develop full, vigorous crowns. Since 2015, a total of 204 acres has been thinned at the MCCA; in 2024, 28 acres were clearcut at the MCCA as part of a post-fire salvage (Figure 20). No forest management operations have occurred on the DCCA since 2015. A 194-acre marked thinning of a natural pine is planned in 2027 at the DCCA (Figure 21). A 67-acre second thinning is planned within the MCCA in 2026. At the MCCA, the 2024 clearcut will be replanted in 2026 (Figure 22). Harvest years are approximate and may change based on market and stand conditions. Additional stands may be added to the forest harvest plan when necessary to restore and/or maintain natural communities.

In addition to planned forest management activities, the District will remove trees as needed in the case of insect infestations, disease, and damage from severe weather, wildfire, or other occurrences that could jeopardize the health of natural communities. The District will abide by Florida Silviculture Best Management Practices, Florida Forestry Wildlife Best Management Practices for State Imperiled Species and will target the achievement of appropriate overstory species in proper stand densities as described in the District Forest Management Plan (Appendix B).

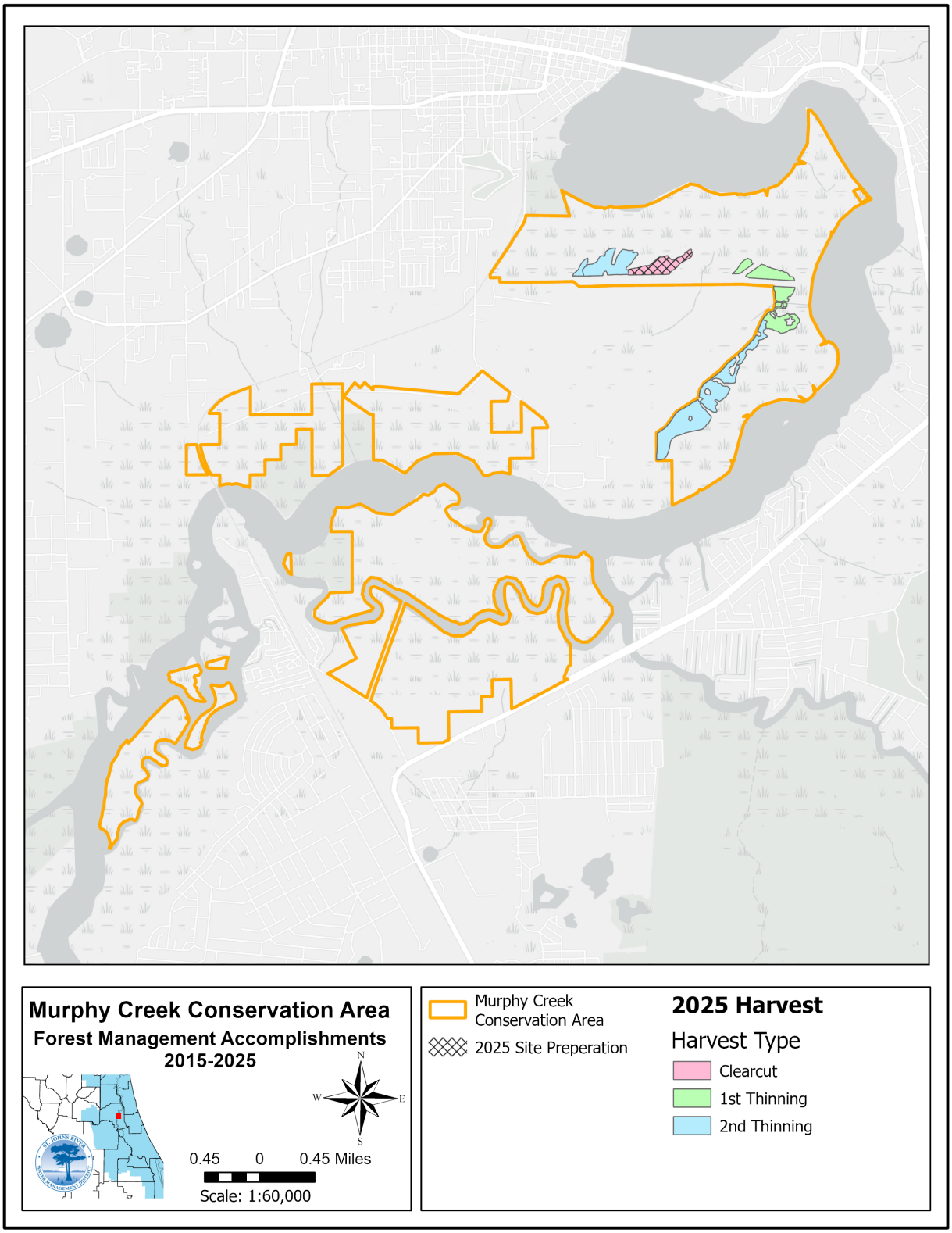

Figure 20: MCCA Forest Management Accomplishments

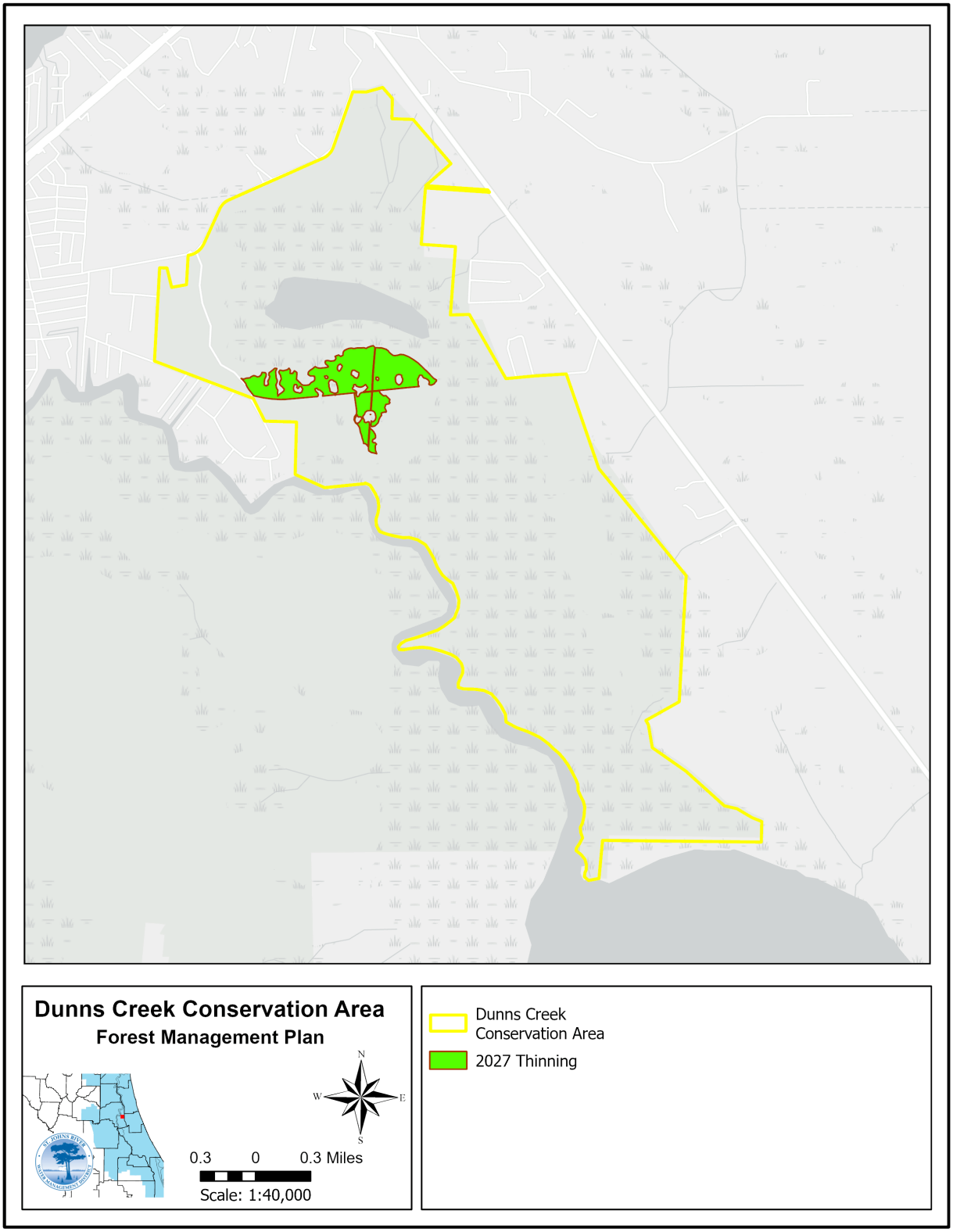

Figure 21: DCCA Forest Management Plan

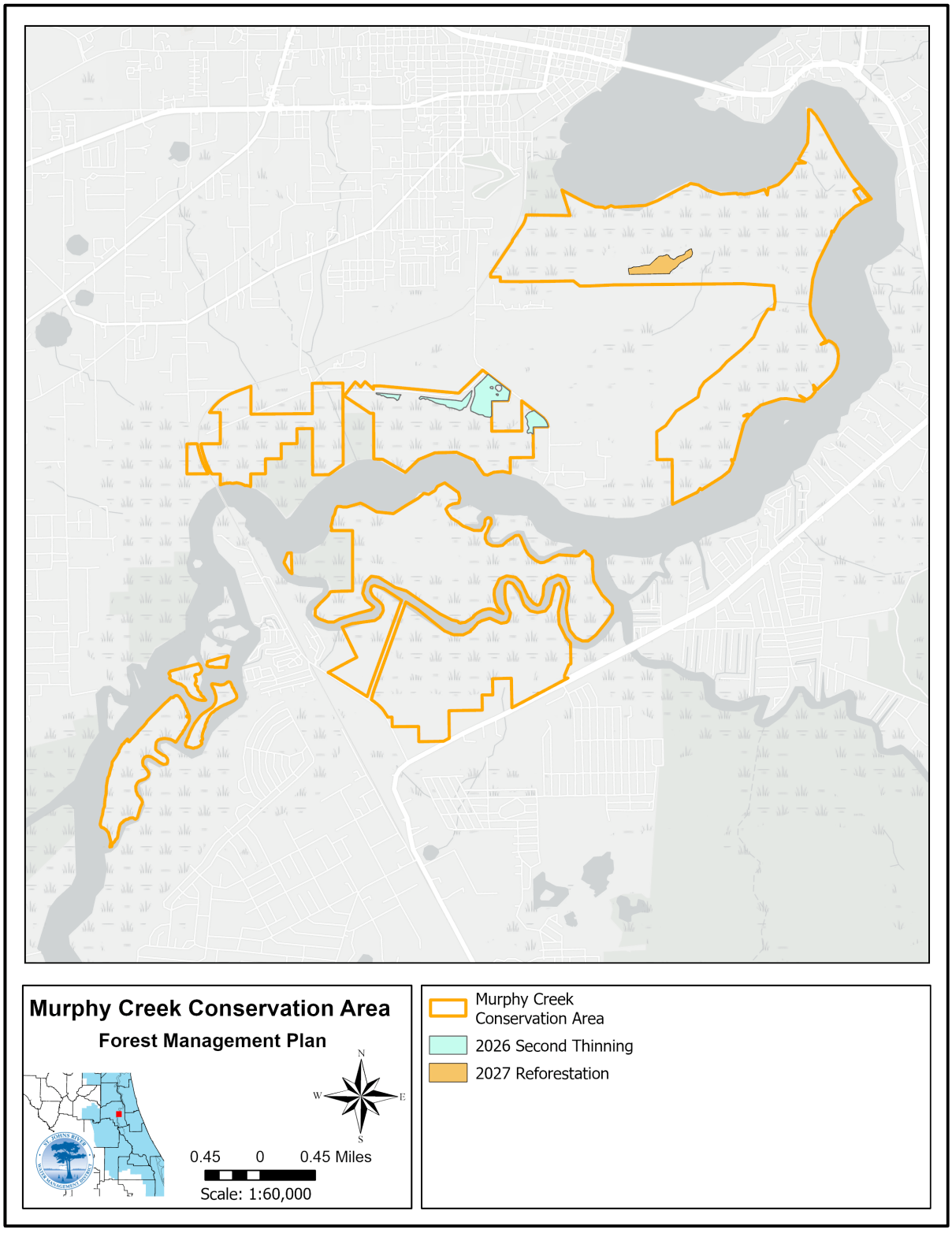

Figure 22: MCCA Forest Management Plan

Fire Management

Goal: Implement a prescribed burning program in accordance with District's Fire Management Plan

Strategies:

- Apply fire to 377 acres across both Properties, on fire-dependent communities annually, averaged over the 10-year planning period
- Focus on conducting dormant season burns in areas of high fuel loading and/or for reintroducing fire into a unit with no recent fire history
- Use mechanical fuel reduction as a fire surrogate in areas where it is difficult to burn due to high fuel loads or smoke management concerns
- Develop annual burn plans and populate the fire management database on an annual basis

Forest and fire management activities within the Properties are critically important and integrally linked. The planning and implementation of forest and fire management activities must be coordinated to achieve restoration and management goals.

Fire is a vital factor in managing the character and composition of vegetation in many of the natural communities in Florida. The District's primary use of fire is to mimic natural fire regimes to encourage the amelioration of native pyric plant communities and dependent wildlife. Additionally, the application of fire aids in the reduction of fuels and minimizes the potential for catastrophic and damaging wildfires. The majority of upland natural communities on the Properties are fire adapted, making prescribed fire an important tool to restore and maintain plant communities within the Properties. Since 2013, approximately 775 acres of the DCCA have received prescribed fire (Figure 23) while approximately 1,160 acres of the MCCA have received prescribed fire (Figure 24).

Historically, most fires occurring on what is now the Properties would have been ignited by lightning during the growing season (April–August). The District intends to utilize growing-season fires where possible, understanding that constraints in some areas such as high fuel loading and proximity to smoke-sensitive areas may predicate the use of dormant season burning.

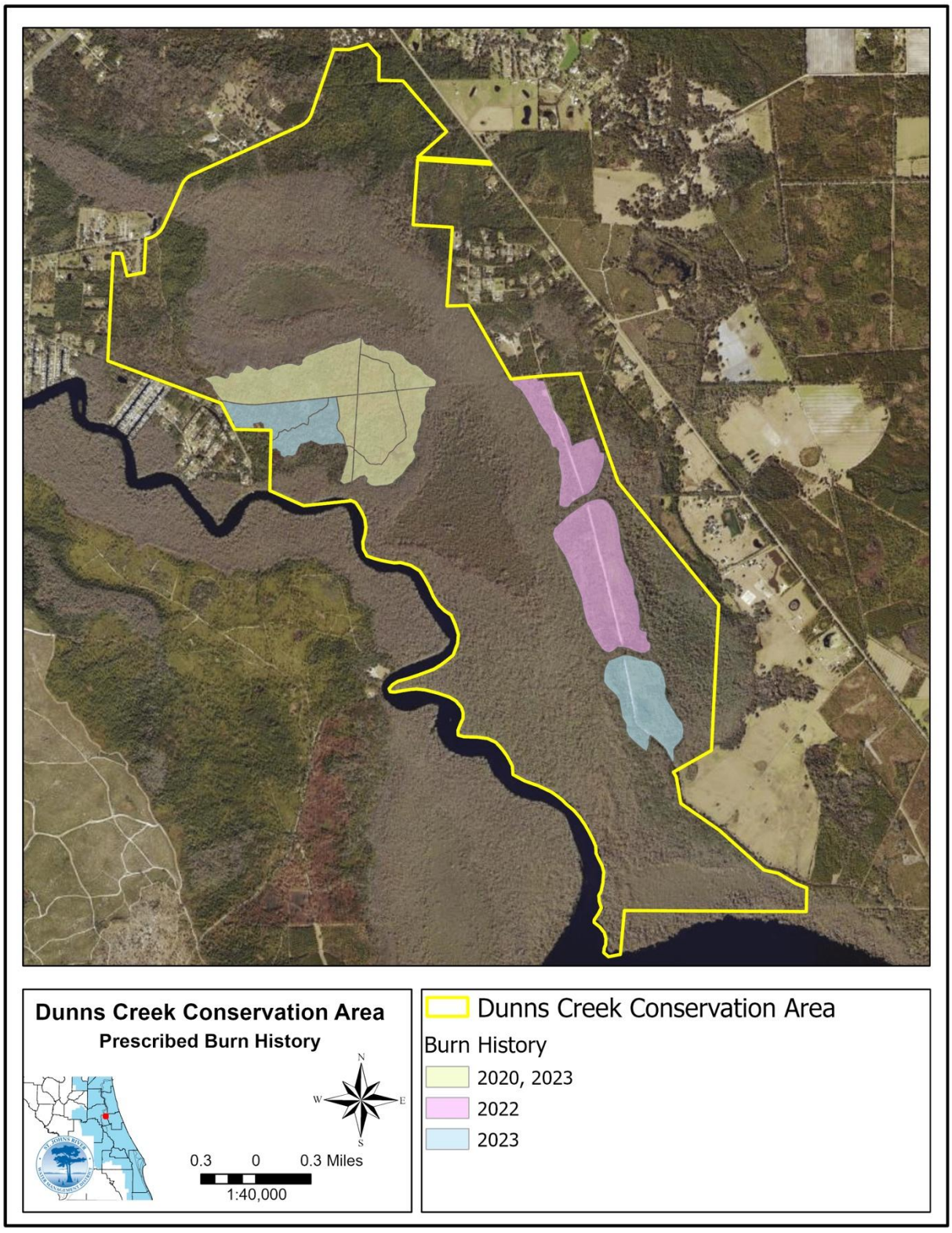

Figure 23: DCCA Prescribed Burn History

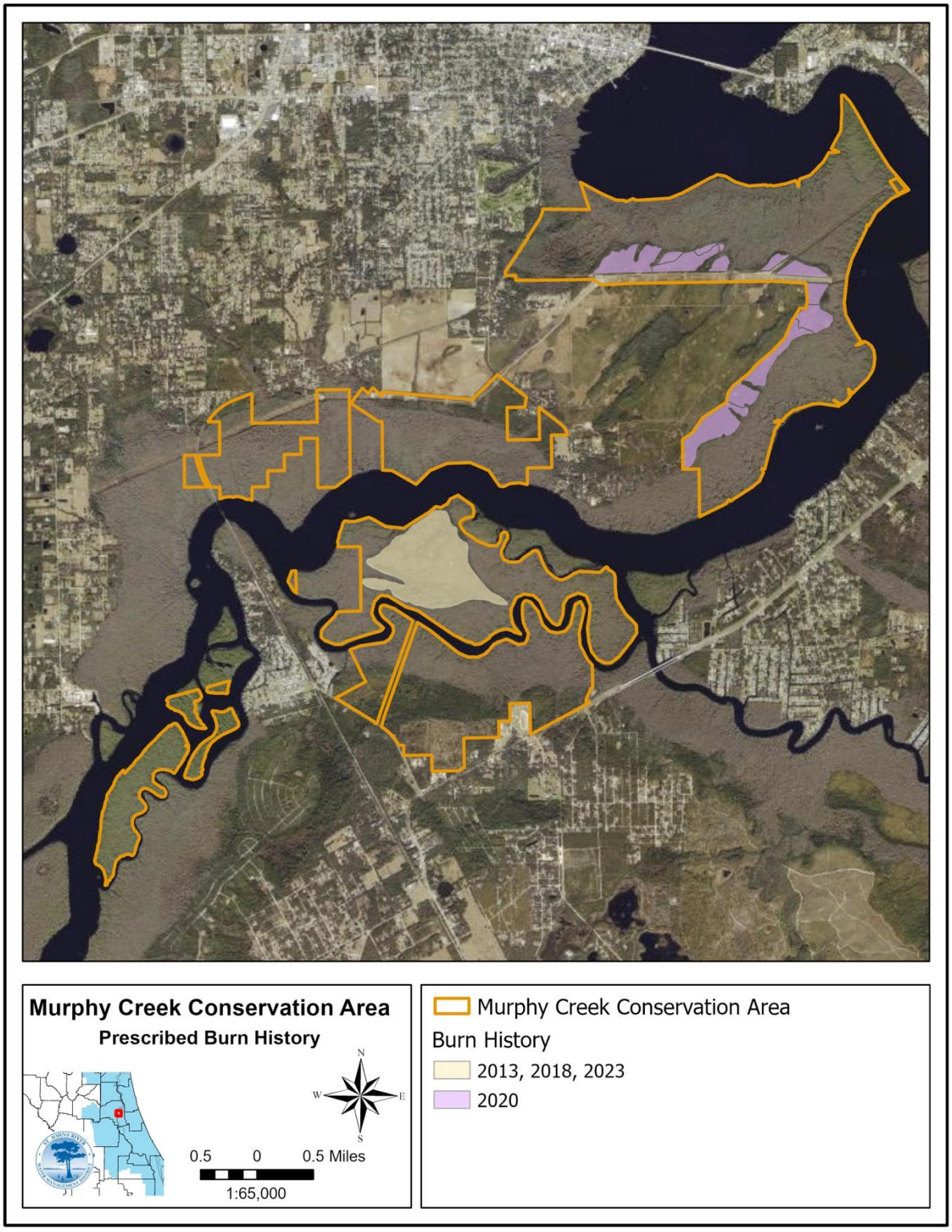

Figure 24: MCCA Prescribed Burn History

Figure 25 shows the approximately 1,218 acres of fire-maintained natural communities within the DCCA (38 percent of DCCA). Figure 26 shows the approximately 1,117 acres of fire-maintained natural communities within the MCCA (23 percent of MCCA). For fire management units (FMUs) that are classified as flatwoods natural communities (which includes scrubby, mesic, and wet), as well as marsh /wet prairie natural communities, a 3-year fire return interval has been established. For fire management units (FMUs) that are classified as sandhills natural communities, a 2-year fire return interval has been established. The annual burn goal for the DCCA, averaged over the 10-year planning period, is 183 acres, which is half the ecological objective of the flatwoods and marsh natural communities at 366 acres annually. The annual burn goal for the MCCA, averaged over the 10-year planning period, is 194 acres, which is half the ecological objective of the flatwoods and sandhill natural communities at 388 acres annually. Using half of the ecological goal for both these properties creates an achievable metric, while maintaining optimal fire return intervals, keeping in mind limited resources and weather opportunities. Once FMUs have two or more burns, including wildfires, applied to them over the next 10 years, timing of future prescribed fires should focus on growing/lightning season (April–August) application but not exclude any opportunity to conduct a prescribed fire during the typical December–August prescribed fire season.

The FMUs on the Properties have a variety of natural communities embedded within them, which may or may not be fire dependent. Prescribed fires that are ignited in the FMUs may result in patchy or mosaic patterns. These results should not be viewed as negative as they mimic what would have occurred in landscape level fires. Emphasis should be placed on post-prescribed fire monitoring as patches of unburned fuels could ignite or portions of the FMU could reburn. In addition, the utilization of natural firebreaks, such as hammocks, wetlands, or drainages warrant additional monitoring as these breaks are heavily moisture-dependent for their efficacy. If a dry period occurs after a fire utilizing such a firebreak, additional resources should be ordered to ensure control and extinguishment along natural firebreaks.

The DCCA has 14 miles and the MCCA has 27 miles of pre-suppression firebreaks to allow for access and control of prescribed fire and wildfires. These breaks are disked or mowed one to two times a year to maintain the footprint of the break and provide a mineral fuel break. Interior roads are also used as firebreaks.

Overall, the Properties' fire-dependent communities have received prescribed fire in the past 10 years. The flatwoods in the northern portion of the DCCA have not received fire within this span but were mowed for fuel reduction in 2024 to prepare for future prescribed fires. The sandhills near Satsuma on the MCCA were mowed for fuels reduction in 2025 for the same purpose. Emphasis will be placed on applying prescribed fire to these sandhills within the next 2 years to capitalize on this project.

While prescribed fire is the preferred tool for restoration and maintenance within the Properties, it may be necessary, under certain circumstances, to implement alternative methods. During periods of extended drought conditions or in areas where implementing prescribed fire is not safely feasible at this time, the District may employ management methods to act as fire surrogates. These methods include selective herbicide treatments, mowing, roller chopping, and

overstory manipulation through timber harvest. These activities change the fuel structure within FMUs thus moderating fire behavior.

Limiting factors narrowing the window of opportunity for the application of prescribed fire on the Properties are the proximity to smoke-sensitive areas, including U.S. Highway 17, SR 100, downstream smoke flows along the St. Johns River, and developed areas such as the city of Palatka. Smoke management is paramount, and any potential burns will be conducted to minimize off-site impacts by maneuvering smoke plumes away from smoke-sensitive areas based on wind direction and speed, as well as by ensuring adequate smoke dispersal based on atmospheric stability and dispersion index values.

All implementation of prescribed fire within the Properties will be conducted in accordance with the District's Fire Management Plan, the Properties Fire Management Plans (Appendix C, and the annual burn plan for the Properties. Prescribed fires and wildfires will be reported in the Prescribed and Wildfire Report in Survey123.

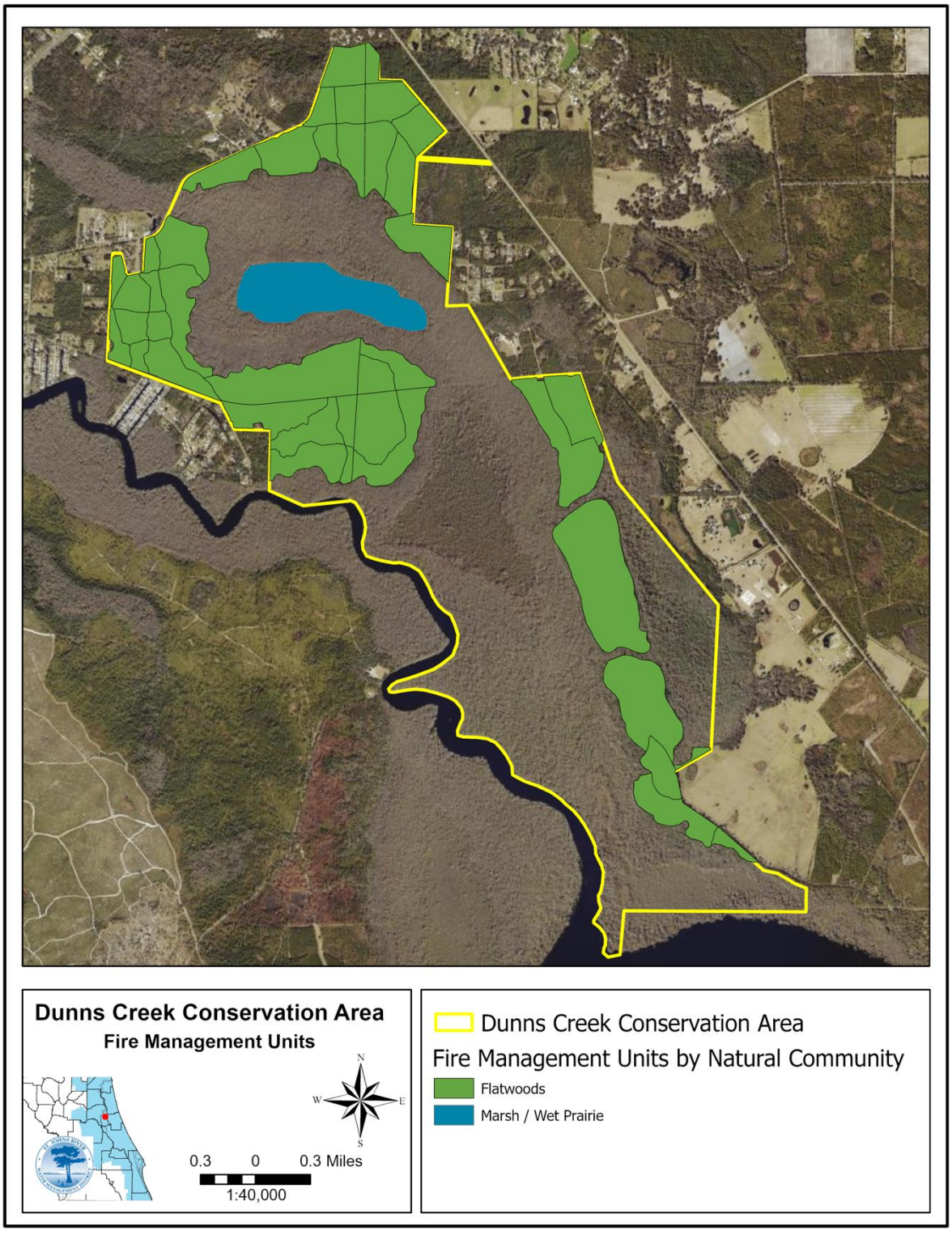

Figure 25: DCCA Fire Management Units

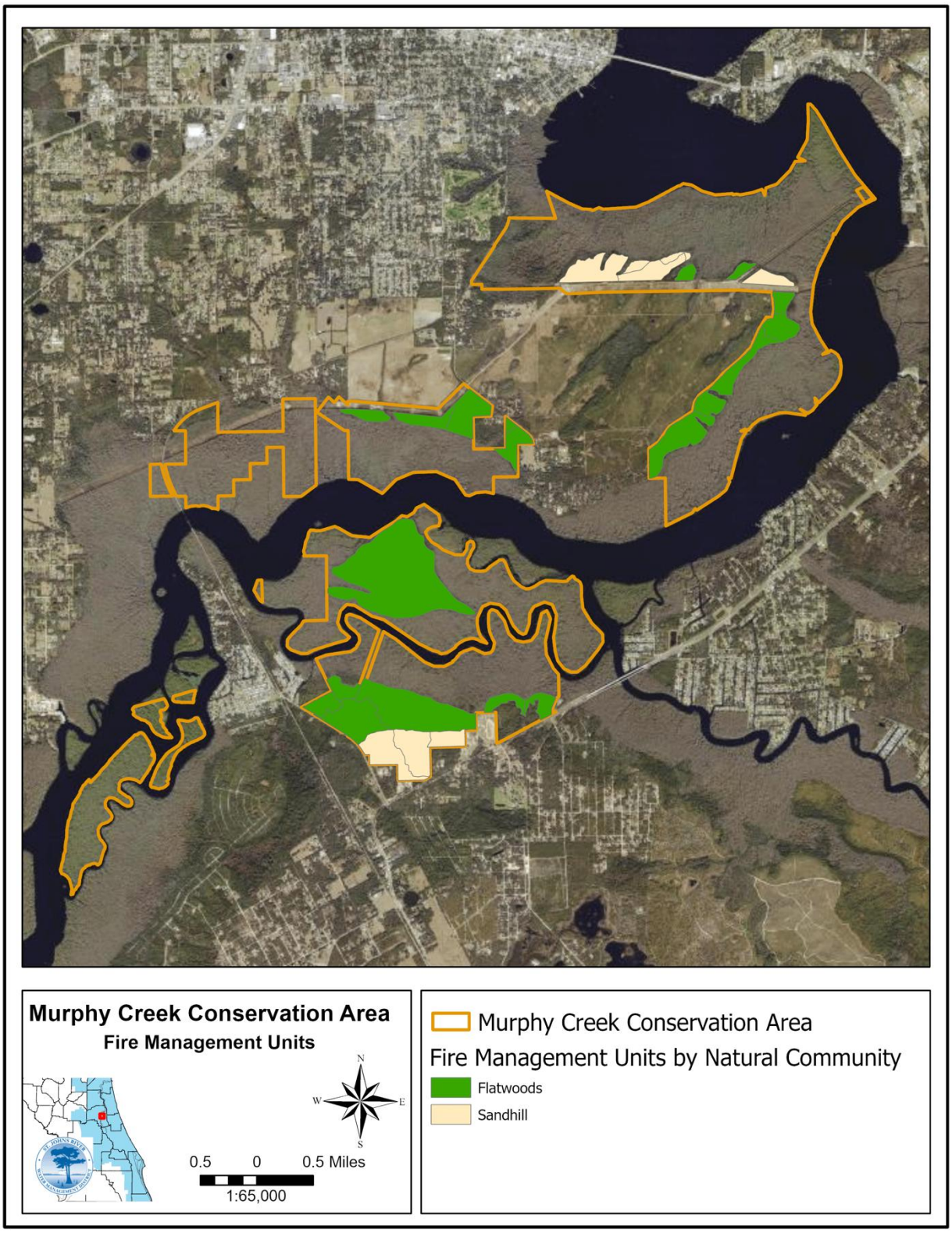

Figure 26: MCCA Fire Management Units

A system of Fire Regime Condition Class measures was originally developed by The Nature Conservancy and the USDA Forest Service in 2003 to assess ecosystem health. The system is based on a relative measure and describes the degree of departure from the historical natural fire regime of a given ecosystem (Hann, et al., 2003). This departure results in changes to one or more of the following ecological components: species composition, structural stages, stand age, canopy closure, or mosaic pattern. The District adopted the system in 2008 to establish a reference for ecosystem health and land management effectiveness. While fire is the preferred disturbance that maintains most natural communities in Florida, other disturbances, such as timber harvest or mechanical fuels treatments, may serve to accomplish or aid in the accomplishment of management objectives.

Annually, each burn zone is assigned a Condition Class score based upon the most recent disturbance and the fire frequency recommended for that plant community by FNAI. If FNAI recommends a fire return interval of 3–5 years, a plant community that has benefited from disturbance in the past 5 years is in Condition Class 1. If it has been more than 5 years but less than 15 years, or three cycles, the zone is in Condition Class 2. If it has been more than three times the fire return interval, but can still be recovered by fire, it would fall into Condition Class 3. If the plant community has gone without disturbance so long that fire alone can no longer restore the area, it is in Condition Class 4.

District staff will make annual condition class assessments and incorporate them into annual burn and work plans. The Condition Class distribution of the DCCA in 2024 was 70 percent Condition Class 1, 6 percent Condition Class 2, 0 percent Condition Class 3, and 24 percent Condition Class 4 (Figure 27). The Condition Class distribution of the MCCA in 2024 was 64 percent Condition Class 1, 5 percent Condition Class 2, 0 percent Condition Class 3, and 31 percent Condition Class 4 (Figure 28). Much of the Condition Class 4 areas within the Properties have been subject to prolonged fire exclusion, often predating District management.

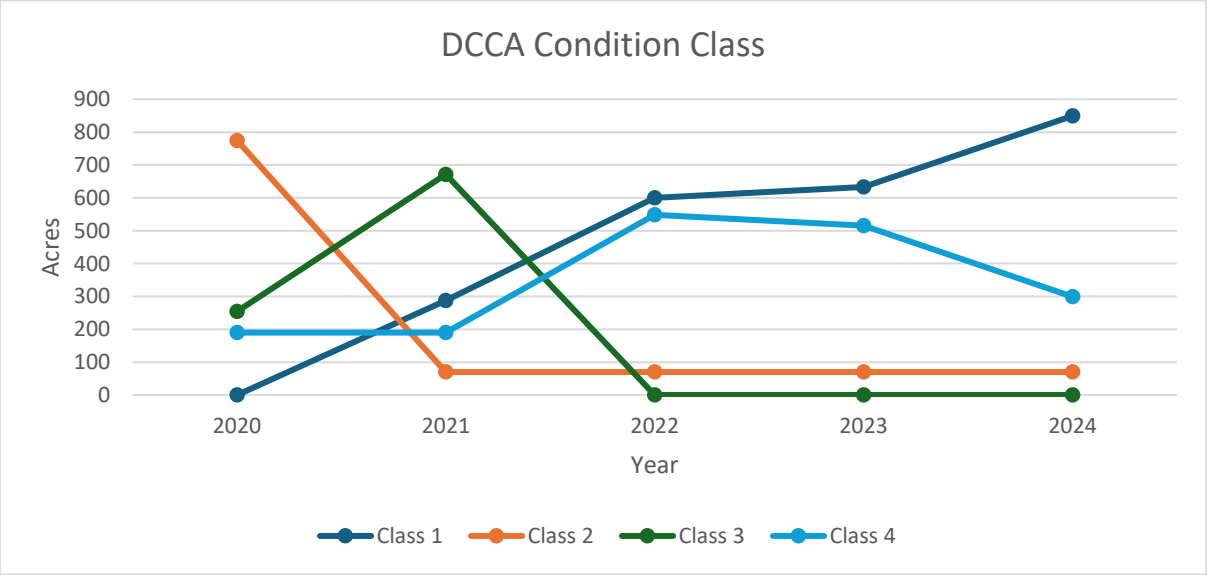

Figure 27: DCCA Condition Classes

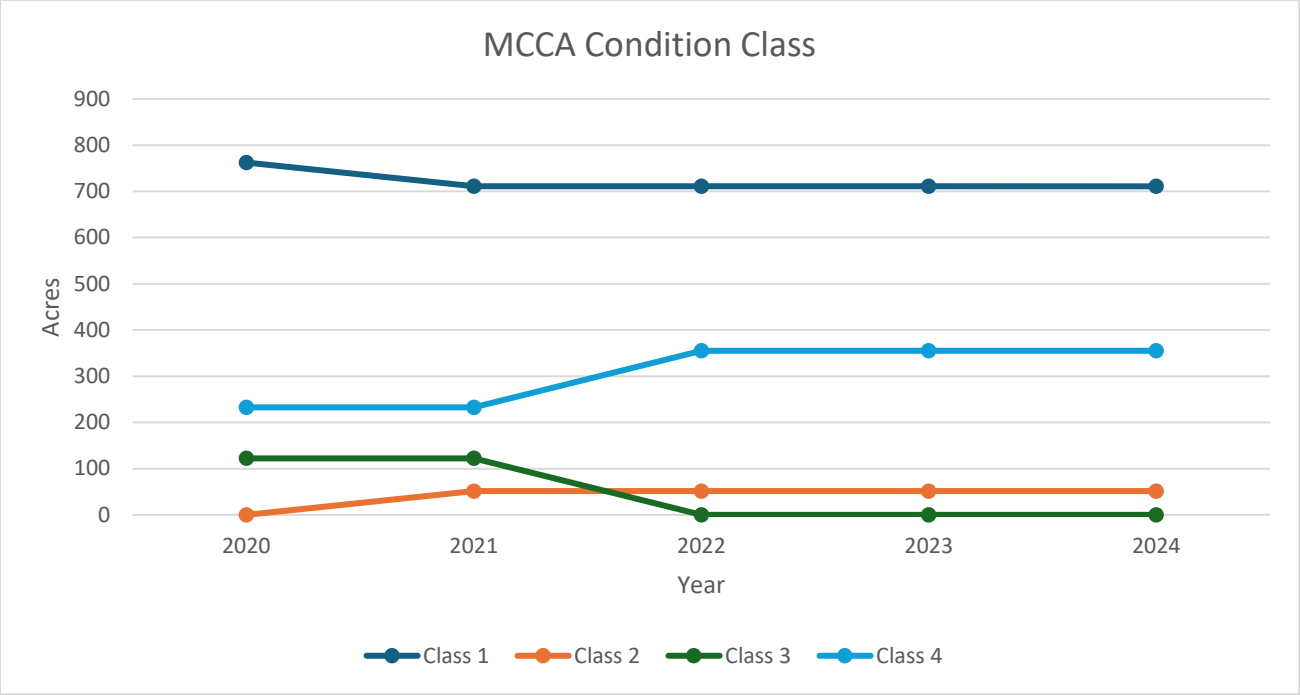

Figure 28: MCCA Condition Class

Flora and Fauna

Goal: Maintain, improve, or restore native and listed species populations

Strategies:

- Conduct plant and wildlife surveys and develop species lists
- Monitor for the presence of listed species and adjust management actions appropriately

The Properties have a diverse assemblage of natural communities providing significant habitat for a variety of floral and faunal species. Plant, insect, and animal lists are contained in Appendix D. Lists were compiled using observations gathered on site visits by District staff, FWC, and FNAI species occurrence data, as well as crowd-sourced biological data websites. The Properties will be managed to improve natural community biodiversity and quality, resulting in diverse wildlife habitat. There are 24 state and/or federally listed plant and animal species found on the Properties. Below are species found on the Properties that require special management considerations for land management practices.

Giant Orchid

Giant orchid *(Orthochilus ecristatus),* a state-threatened plant species, occurs on the Properties. Management recommendations for this species, according to FNAI, include frequent fire. Caution should be taken to avoid potential impacts when using heavy equipment or herbicides in the area. In the areas where giant orchid has been found, the plants seem to respond well after mowing.

Gopher Tortoise

The gopher tortoise (*Gopherus polyphemus*) is a state-listed threatened species that occurs within Properties. This species is typically found in dry upland habitats, such as sandhill, scrub, and pine flatwoods. Gopher tortoises excavate deep burrows and are considered a keystone species because their burrows provide refuge for more than 300 animal species. Management activities within the pine flatwood and sandhill communities of the Properties will focus on restoring species composition and natural fire return intervals, which will benefit gopher tortoise. Any management activities will occur in accordance with the FWC's Gopher Tortoise Management Plan (FWC, 2012).

As part of a sandhill restoration plan, gopher tortoise survey was conducted in 2009 on 24 acres of the sandhills near Satsuma, deemed the most suitable gopher tortoise habitat on the MCCA. A total of 103 burrows were identified (18 of which were abandoned.) Using the contemporary, at the time, method of measuring gopher tortoise population densities, District staff determined a population estimate of ~1.8 tortoises/acre. No additional gopher tortoise surveys conducted by District staff are planned for the MCCA as focus moves to reintroducing fire to these sandhills, thus ensuring the plant communities are receiving their natural disturbance regime, which should increase the gopher tortoise population by providing better quality habitat. If surveys are offered by FWC or FNAI, the District will support their efforts.

Bald Eagle

As of 2025, there are three active and two additional known but not recently surveyed Bald Eagle nests documented on the MCCA, none on the DCCA, and several nests within close proximity to the Properties (Figure 29). These locations are based on publicly available information from Audubon Florida EagleWatch. Should any nests be discovered within the Properties, the District will document the occurrence and incorporate the data into the District's Bald Eagle database with relevant activity status. The District will adhere to the guidelines established in the May 2007 U.S. Fish and Wildlife Service (FWS) *National Bald Eagle Guidelines*. The Bald Eagle continues to receive protection through the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The District will consult with the FWC and/or the FWS as applicable, prior to conducting management activities, such as prescribed fire or timber harvests, within the established management zones that may impact Bald Eagle nesting between the dates of October 1 to May 15. If nests are discovered on the Properties, the District will monitor these nests regularly.

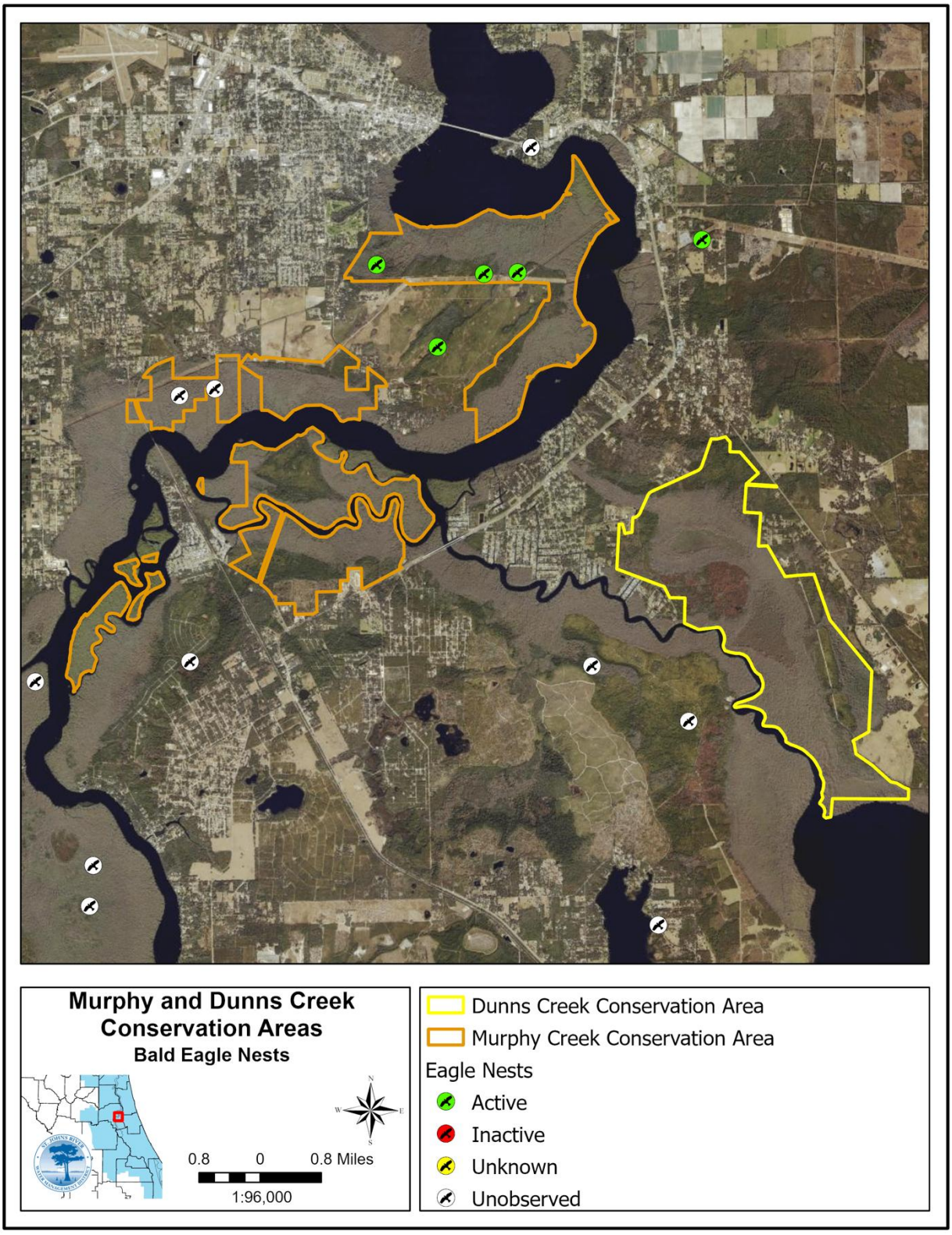

Figure 29: Bald Eagle Nests

Invasive Species Management

Goal: Manage invasive plants and animals

Strategies:

- Scout and treat invasive species annually to maintain coverage of less than 1 percent on DCCA
- Scout and treat invasive species annually to maintain coverage of less than 1 percent on MCCA
- Continue feral hog removal using Special Use Authorizations and WMA hunts
- Locate, map, and treat any new infestations of invasive plant species

Invasive plants known to occur within the Properties include coral ardisia (*Ardisia crenata),* camphor tree (*Cinnamomum camphora*), cogongrass (*Imperata cylindrica*), Chinese tallow tree (*Triadica sebifera*), and natal grass (*Melinis repens*). In addition, encroaching hardwood trees and sabal palmetto beyond their natural distribution have been treated on the sandhills of the MCCA. Invasive species control is necessary to inhibit the continued proliferation of invasive plants and integral in the maintenance and restoration of natural plant communities. The District uses a variety of techniques including fire, mechanical, and chemical treatments. Herbicide, approved for use in Florida by the Florida Department of Agriculture and Consumer Services (DACS), is applied per U.S. Environmental Protection Agency-approved label instructions using the most appropriate method of application for the target species.

While it is unlikely that the District will eradicate invasive plants within the Properties, achieving maintenance control of such species is targeted within the scope of this plan. Invasive plant infestations are light across the Properties, and the Properties are regularly monitored and treated as necessary. All known occurrences of FISC Category I and II invasive plants at the DCCA are currently in a treatment rotation. Since 2017, District staff have scouted and treated approximately 20 acres of invasive vegetation on the DCCA and 139 acres of invasive vegetation on the MCCA. Based on the above total treatment acres, an annual goal of treatments to maintain coverage less than 1 percent of the total acreage of the DCCA and the MCCA will be established. These goals do not include treatments of encroaching hardwood trees or sabal palm.

Invasive wildlife species known to occur within the Properties include feral hogs (*Sus scrofa*), brown anoles (*Anolis sagrei*), and nine-banded armadillos (*Dasypus novemcinctus*). The District currently utilizes feral hog removal agents through a Special Use Authorization (SUA) process to assist in the control of feral hogs. The enrollment of the MCCA into the WMA system will also provide a method of feral hog removal during allowed hunt periods. The District keeps records of hog removal from the Properties. From 2016–2025, feral hog removal agents have removed 153 hogs from the DCCA and 1,079 from the MCCA.

Cultural Resource Protection

Goal: Identify, protect, and maintain any cultural resources found on the Properties

Strategies:

- Monitor the 16 sites on MCCA annually
- Identify and report sites to the Florida Division of Historical Resources (DHR)
- Identify and report any detrimental activities to the sites to the DHR and law enforcement

A review of DHR data indicates no documented Florida Master Site File cultural sites within the DCCA and 16 within the MCCA. If any additional sites are located, District staff will document and report sites to the DHR. District land management activities that may affect or impact these resources will be evaluated and modified to reduce the potential for disturbance of the identified sites. Additionally, detrimental activities discovered on these sites will also be reported to the DHR and appropriate law enforcement agencies. Due to District and State policy, the locations of such cultural sites are not identified on public maps.

LAND USE MANAGEMENT

Access

Goal: Maintain access to and around the Properties to facilitate land management and resource protection

Strategies:

- Maintain, gates, roads, and associated swales/ditches
- Update District database on maintenance of existing infrastructure and creation of new signs, gates, trails, roads, and other related infrastructure

Currently, 10 gates on the DCCA and seven gates on the MCCA provide management access to and across the Properties. These gates are monitored regularly for maintenance and/or repair needs. Approximately 7.9 miles on the DCCA and 9.7 miles of the MCCA of interior management roads traverse the Properties. To manage road maintenance, the District utilizes a roads classification system. This system includes the following classifications:

A. Paved Road – any road that is paved (there are no paved roads on the Properties).
B. Primary Road – any road that requires routine maintenance of any kind
C. Secondary Road – any road that does not require routine maintenance, only periodic or no maintenance

All roads within the Properties are classified as secondary roads, with the majority consisting of grass surface with minimal stabilization material. District staff will update the roads database to reflect changes to the road network within the Properties, as necessary.

Roads will be regularly inspected and receive maintenance and repair as necessary. Figures 30 and 31 depict the locations of the roads and gates on the Properties.

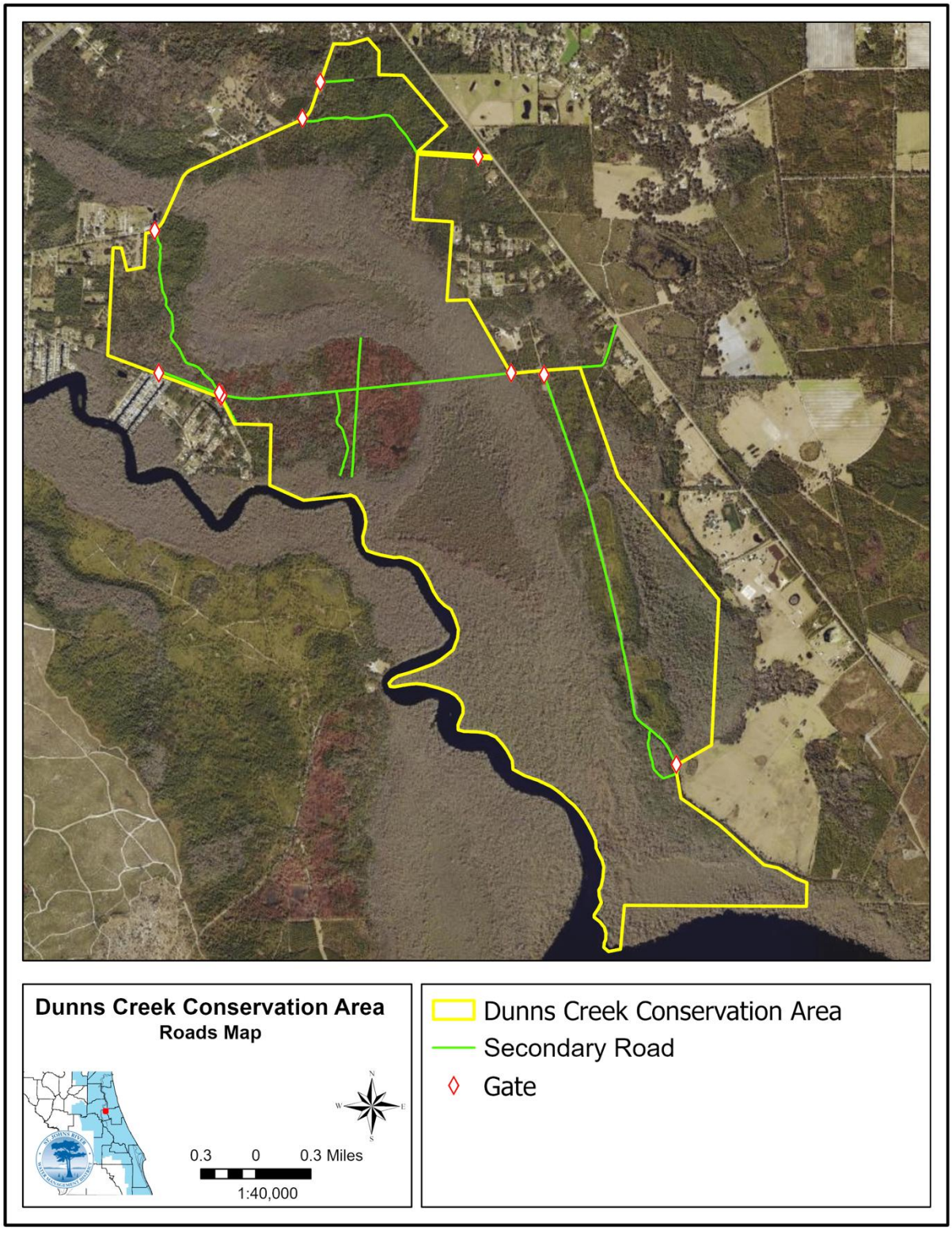

Figure 30: DCCA Road Infrastructure

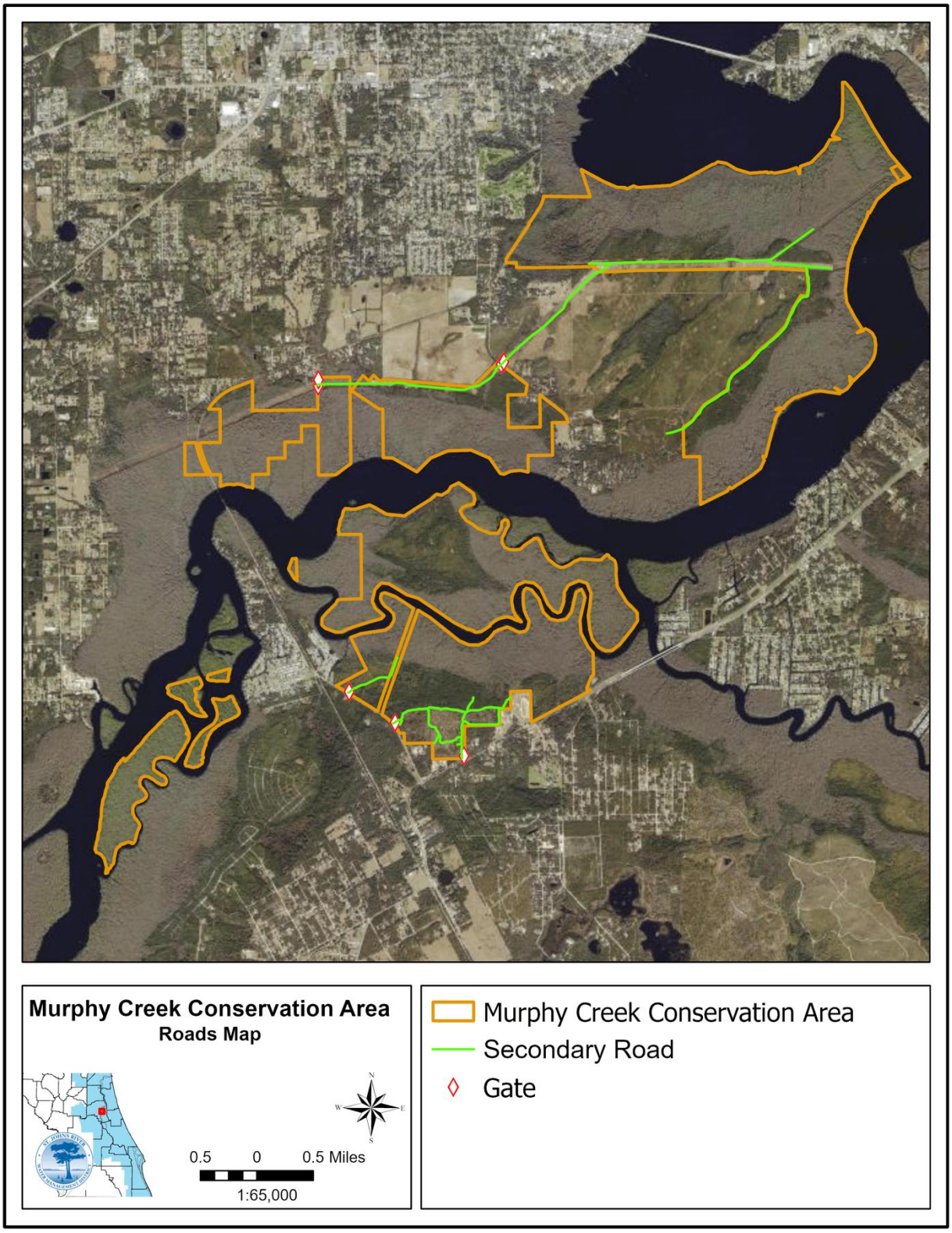

Figure 31: MCCA Road Infrastructure

Recreation

Goal: Provide public recreation opportunities on the Properties

Strategies:

- Maintain 4.8 miles of trails, one campsite, and two parking areas at DCCA
- Maintain 5.2 miles of trails, one campsite, one boat dock, and one parking area at MCCA
- Maintain the existing FWC cooperative management agreement for Dunns Creek Wildlife Management Area (WMA) on DCCA and add in MCCA

Recreation at the Properties includes bicycling, hiking, horseback riding, hunting, and wildlife viewing. Primitive tent-only campsites are available on the Properties and are reservable though the District's website, www.sjrwmd.com. Recreational vehicles, campers, and travel trailers are prohibited at District campsites at all times and are not allowed overnight in District parking areas, per Chapter 40C-9, Florida Administrative Code. The trails and campsites are maintained by a District contractor with staff oversight.

The DCCA features 4.8 miles of multi-use trails and a reservation-only primitive campsite. There are two trailheads and parking areas for the DCCA: one located at the end of Carlin Road off San Mateo Road and another located at the end of Tram Road off of SR 100. The Tram Road entrance provides access to the primitive campsite (Figure 32). Both parking areas are designated entrances for Dunns Creek WMA.

The MCCA features 5.2 miles of multi-use trails and a boat-in access primitive campsite on Murphy Island. There is one trailhead and parking areas for the MCCA located on Buffalo Bluff Road off U.S. Hwy. 17 near Satsuma. The trails and reservation-only campsite on Murphy Island are accessed by a District-maintained boat dock (Figure 33).

Hunting opportunities are provided on the Properties as the Dunns Creek WMA. The WMA is administered by FWC with input from the District. WMA regulations allow for drive-in quota hunts during deer and turkey seasons, while the small game season is walk-in only with no hunter quota. Currently the hunt area is only on the DCCA with hunt access via the parking areas on Carlin and Tram roads. Driving access is limited to the roads indicated as such on the WMA map.

Through consultation with District and FWC staff, the footprint of the WMA will be expanded within the scope of this plan to include the entirety of the MCCA, to be known as the Murphy Creek tract of the Dunns Creek WMA. Access will be by boat or from the parking area on Buffalo Bluff Road. Additional WMA expansions may occur pursuant to Section 379.3001(5), F.S. For specific hunt dates, regulations and maps, access FWC's website, myfwc.com/hunting/regulations/.

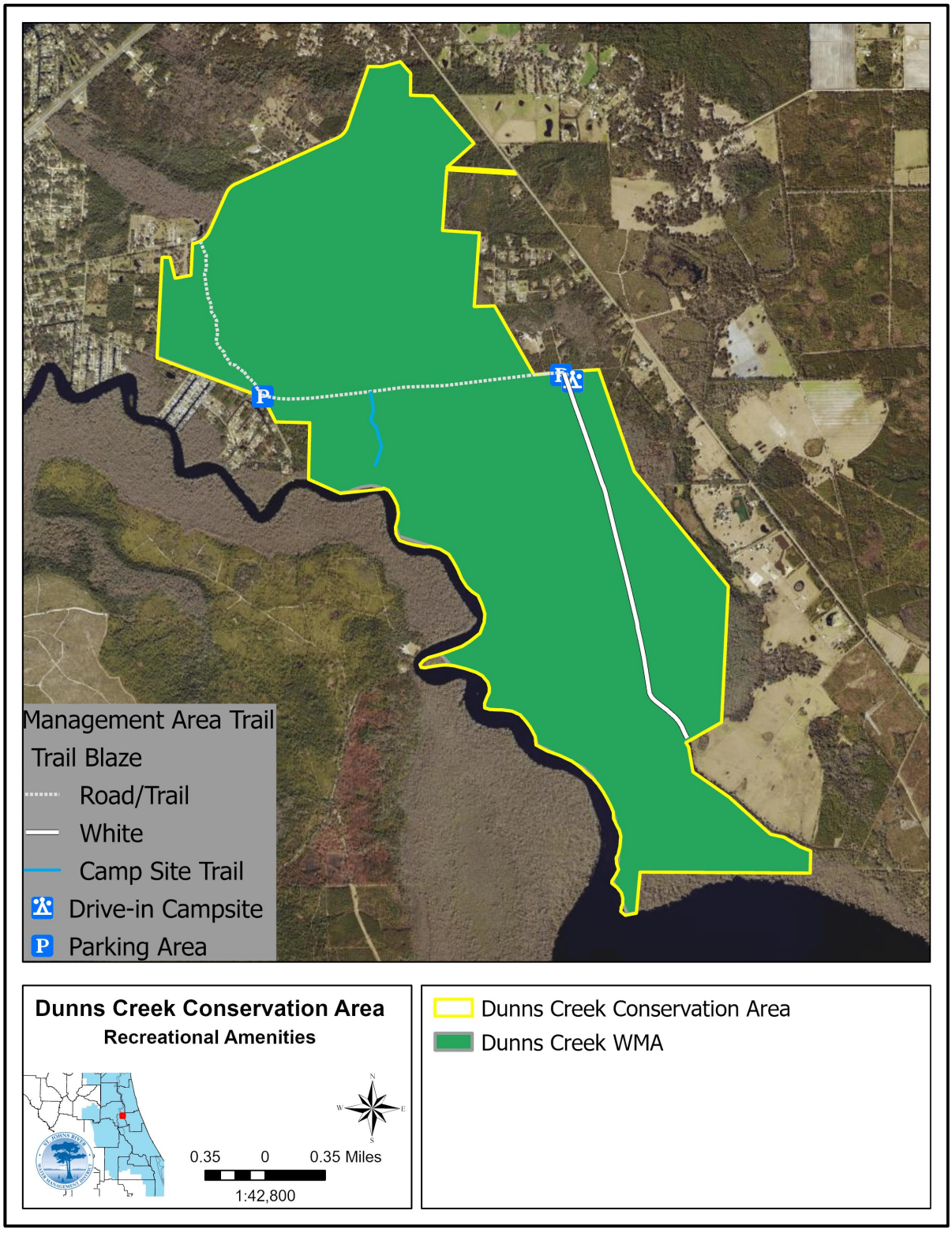

Figure 32: DCCA Recreation Amenities

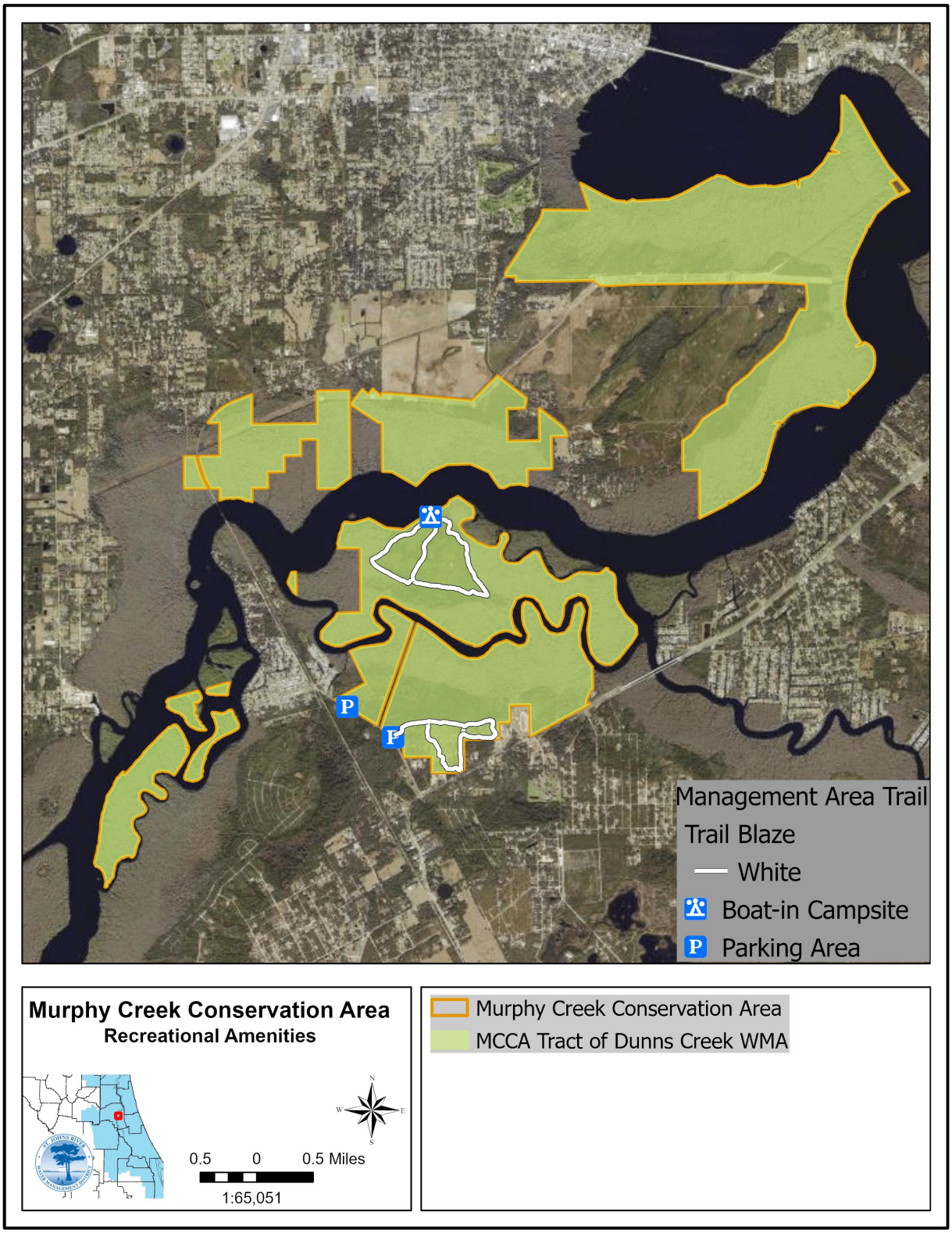

Figure 33:MCCA Recreation Amenities

Security

Goal: Provide and maintain the Properties' security

Strategies:

- Maintain boundary signage, gates, and locks
- Continue coordination with FWC and local law enforcement

Security concerns within the Properties include illegal motorized vehicle access, poaching, and dumping. The District coordinates with FWC and local law enforcement to administer security within the Properties.

ADMINISTRATION

Real Estate Administration

Goal: Explore opportunities for adjacent Properties acquisition, transfer, or surplus

Strategy:

- Evaluate adjacent properties for potential acquisition

A total of 1,565 acres near the DCCA and 3,392 acres near the MCCA have been identified as potential acquisitions (Figures 34 and 35). If these or other neighboring parcels become available, they will be evaluated for acquisition by District staff and subsequent consideration by the Governing Board for purchase based on several factors that include: 1) the parcels increase continuity between the Properties and the surrounding conservation easements, 2) the properties provide additional protection for Dunns Creek and/or the St. Johns River, or 3) acquisition of the parcels allow for restoration of impacted land.

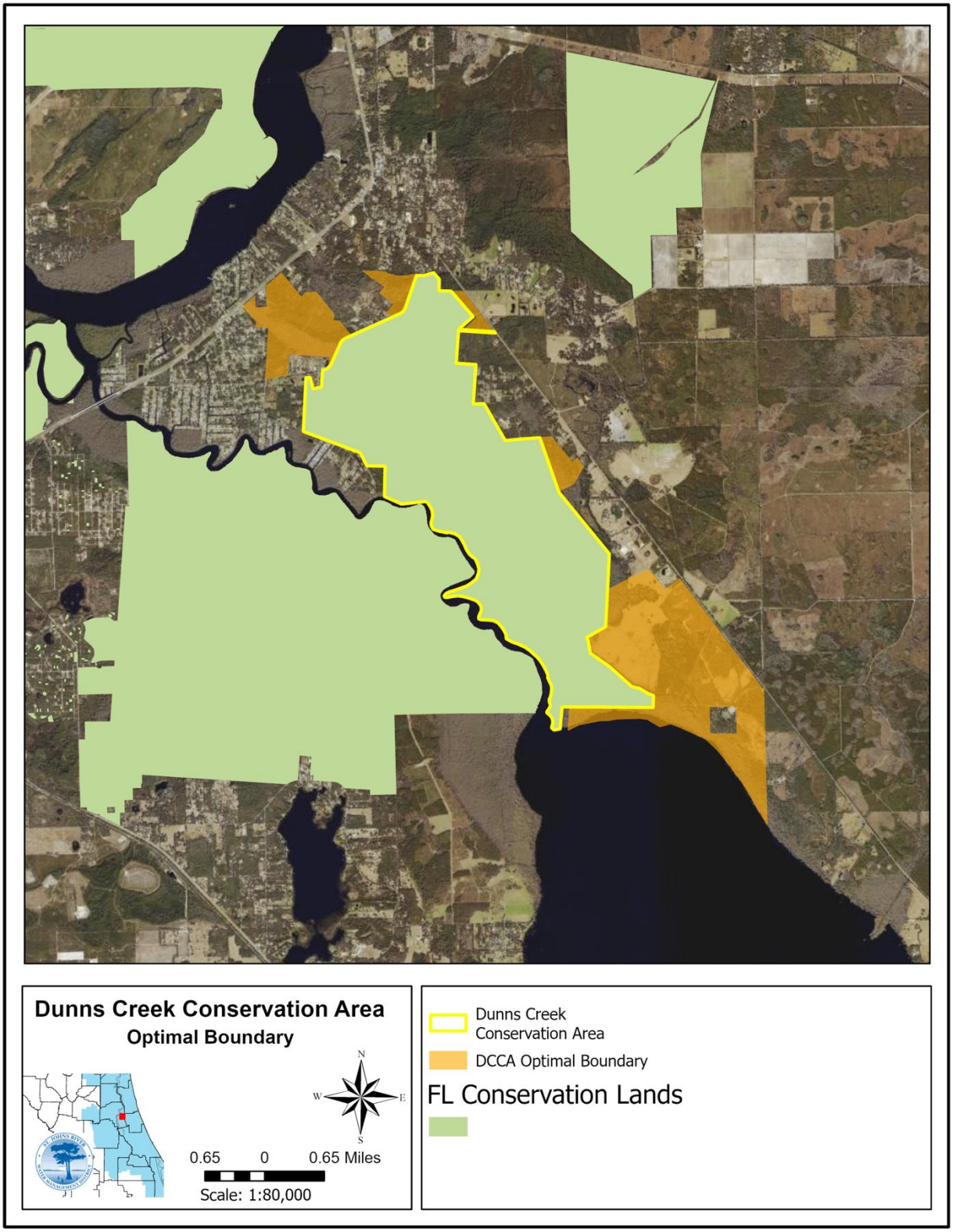

Figure 34: DCCA Optimal Boundary

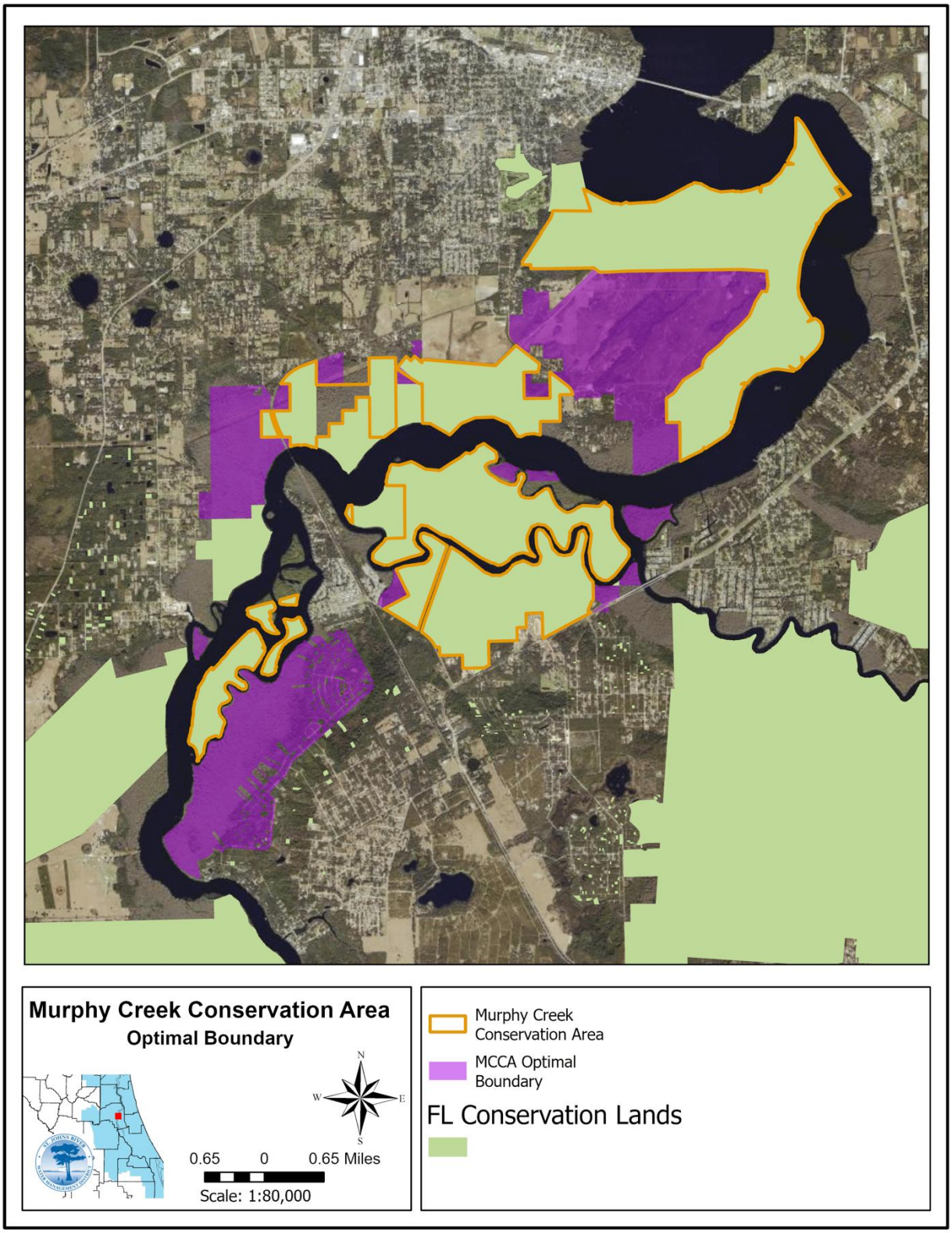

Figure 35: MCCA Optimal Boundary

No parcels have been identified for surplus at the Properties.

Pursuant to Section 373.139, F.S., the District may explore and pursue the surplus of portions of its land. The District's interest in surplusing land may arise from a variety of considerations, including but not limited to:

- A property purchased as part of a larger acquisition and the surplus portion is not needed for District purposes but was included to complete a larger acquisition
- Original project for which a property was purchased was ultimately not built
- A property is part of a patchwork of conservation ownership, managed by another agency or local government and the surplus is to transfer the ownership to the entity managing the properties for conservation purposes
- Actions by adjacent owners that lower a property's conservation value or increases management costs

Any surplus of District-owned property requires the approval of the District's Governing Board. If the property in question was originally purchased for conservation purposes, the Governing Board must determine that the land is no longer needed for conservation purposes, which requires two-thirds vote (§ 373.089, F.S.).

If it is found to be in the public interest and for the public convenience and welfare, the District may also convey land or rights of land owned to any governmental entity. When transferring lands, the District may retain a conservation easement over the property and/or include a reverter provision in the deed. This provides for the future conservation of the property and to ensure the property remains in public ownership.

Cooperative Agreements, Leases, Easements, and SUA

Goal: Evaluate, pursue, and manage cooperative opportunities

Strategies:

- Evaluate future feasibility of a cattle lease on MCCA
- Evaluate new lease and SUA opportunities for compatibility with conservation and management goals
- Continue to cooperate with researchers and universities as appropriate

Section 373.1391, F.S., authorizes and encourages the District to enter into cooperative land management agreements with state agencies or local governments to provide for the coordinated and cost-effective management of lands to which the water management districts, the Florida Board of Trustees of the Internal Improvement Trust Fund (Trustees or TIITF), or local governments hold title. District Policy 820 promotes the District entering into agreements with other agencies and private parties for cooperation and coordination of management of the District's lands. Section 373.093, F.S. states "The governing board of the district may lease any

lands or interest in land… as long as the lease is consistent with the purposes for which the lands or any interest in land was acquired." Rule 40C-9.370, Florida Administrative Code, which implements the statute, provides a "lease may be granted only when the purpose of the lease is consistent with the land management plan for such District Land."

In addition, the District is authorized to enter into cooperative agreements, cooperative management leases, leases, easements, and SUAs to protect the District's water management interests and to enhance the management and public value of the land. Leases can be a useful tool to accomplish land management objectives and will be evaluated and implemented where appropriate. Common examples include cattle grazing and apiaries. The District remains open to considering other types of leases or agreements that help achieve management goals. Table 2 details the agreements, leases, and SUAs in effect during the writing of this plan.

The MCCA currently hosts a revenue-generating District-administered 400-acre cattle lease (Figure 36). The stocking rate is 20 animal units (animal unit defined as cow with calf, dry cow, or bull). The current payment for the lease ending in 2030 is $120 per animal unit for a total annual payment of $2,400. Lease payments can be paid in cash or in-kind services provided by the lessee. These services include land management-related activities such as mowing, fence repair, and invasive species management. The lease includes a feral hog trapping authorization for the lessee and up to six agents. This lease expires Aug. 11, 2030. The District may rebid or terminate the lease after expiration. The District may terminate the lease during its term with 30 days' notice with cause (as defined in the lease) or 6 months' notice without cause.

The Properties also hosted a revenue-generating apiary lease sites; the DCCA hosted one site and the MCCA hosted three sites. The lease was terminated on Aug. 30, 2023. The District intends to rebid this lease in the future.

There is one access easement agreement and one deeded access easement associated with the Properties. The access easement agreement is over private land and provides non-exclusive access for District staff and contractors to the Whitehead tracts of the MCCA. On the DCCA, the District received an access easement through the deed with the purchase. This deeded access easement shares access with other landowners and utilities on Tram Road for the DCCA.

There are three research SUAs, two cooperative agreements, and one hog control SUA on each of the Properties. Past SUAs include trail runs, research, and vegetation harvesting.

Table 2: Cooperative Agreements, Leases, and Special Use Authorizations

Agreement Number	Type/Purpose	Agreement Name	Term
2044	Lease/Cattle	Elliott, Ken	August 2030
2652	Hog Trapping/Removal	USDA APHIS Wildlife Services Hog Control	June 2030

1008	Intergovernmental Agreement/ Wildlife Management Areas	Cooperative Agreement with FWC for WMAs and PSGHA's	May 2034
2585	Intergovernmental Agreement/ Fire Management	FDACS - FFS Wildfire Cooperative Agreement	October 2029 with three, 5-year automatic renewals
2268	SUA/Research	Kent State University District Wide Lobelia and Soil Sampling	September 2026
2281	SUA/Research	FFWCC Lisa Smith Weasel Research	October 2026
2581	SUA/Research	FWC Snail Study	November 2026
2671	SUA/Research	Florida Public Archaeology Network	August 2030

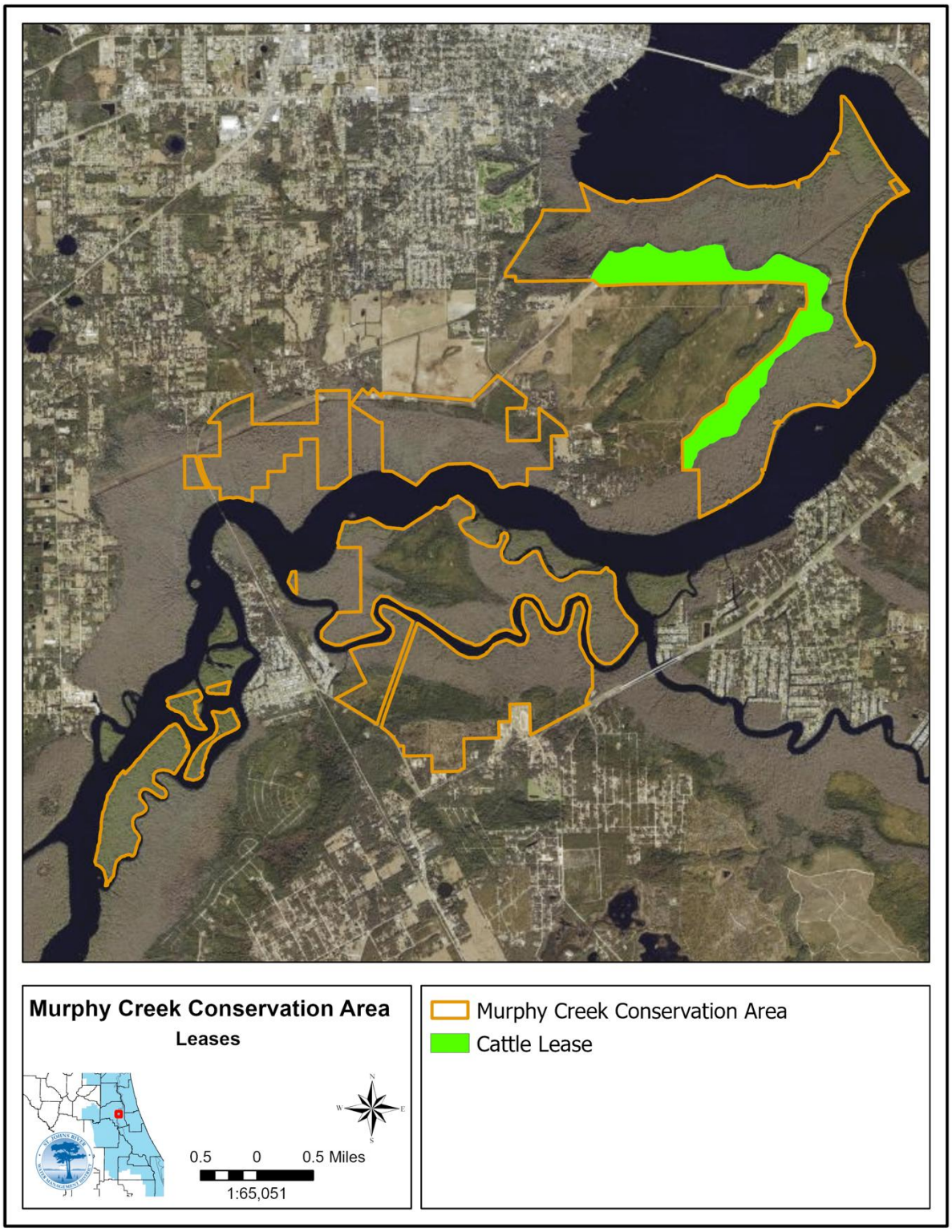

Figure 36: MCCA Cattle Lease

Management Revenues and Costs

Goal: Analyze and report projected and actual costs and revenues

Strategies:
- Analyze and report revenues
- Analyze and report land management costs

This section reviews costs and revenues since the last land management plan update (2010–2025), as well project costs and revenues for the upcoming planning period (2025–2035). All generated revenue will be applied toward the District's land management budget to offset management costs.

Tables 3 and 4 provide the received revenue and land management costs for the Properties since the last land management plan update in 2010. Most revenue was produced by a timber harvest on the MCCA.

Revenues and Cost Since Last Land Management Plan Update (2013 DCCA, 2010 MCCA)

Revenues since the last land management plan update (2010–2025) total $162,019 (Table 3). Costs between 2010 and 2025 totaled $574,324 (Table 4).

Table 3 Revenues from 2010–2025

Activity	Revenue Year	Revenue
MCCA Horseshoe Point timber sale	2024–2025	$136,234
Apiary Lease (both Properties)	2010–2023	$1,685
MCCA Cattle lease	2010–2025	$24,100
Total		**$162,019**

Table 4: Management Costs from 2010 to 2025

Recurring Annual Costs

Activity	Annual Number of Units	Units	Annual Cost	Total Cost (Since 2010)
Staff Time (both Properties)	200	Hour	$5,000	$75,000
DCCA Invasive Species Management	4	Acres	$1,282	$19,230
MCCA Invasive Species Management	53	Acres	$3,618	$54,270
Fireline Disking (both Properties)	41	Miles	$6,150	$92,250
Road Mowing (both Properties)	18	Miles	$2,000	$30,000
Service Mowing (both Properties)	2	Parking areas/6 times a year	$600	$9,000
Road Maintenance (both Properties)	18	Mile	$1,800	$27,000
Trail Maintenance (both Properties)	5	Miles/6 times a year	$1,530	$22,950
Murphy Island Recreation Maintenance (barge in equipment)	6	Miles of trail and one campsite	$900	$13,500
Total Annual Costs 2010–2025				*$343,200*

One-Time Activity Cost

Activity	Total Number of Units	Units	Total
2013 MCCA Prescribed Fire	50	Acres	$1,585
2014 MCCA Forest Inventory	19	Plots	$358
2016 DCCA Forest Inventory	8	Plots	$151
2018 MCCA Prescribed Fire	75	Acres	$2,665
2019 DCCA Forest Inventory	23	Plots	$591
2019 MCCA Forest Inventory	9	Plots	$213
2020 MCCA Prescribed Fire	288	Acres	$15,863
2020 DCCA Prescribed Fire	219	Acres	$7,332
2020 DCCA Forest Inventory	6	Plots	$142
2020 MCCA Forest Inventory	30	Plots	$635
2020 MCCA Hardwood Reduction Herbicide Treatment	57	Acres	$10,003
2022 DCCA Prescribed Fire	210	Acres	$5,937
2022 MCCA Forest Inventory	37	Plots	$756

2023 MCCA Prescribed Fire	292	Acres	$8,430
2023 DCCA Prescribed Fire	379	Acres	$10,973
2023 MCCA Hardwood Reduction Herbicide Treatment	110	Acres	$38,085
2023 DCCA Fuel Reduction Mulching	171	Acres	$62,887
2024 DCCA Forest Inventory	23	Plots	$470
2024 MCCA Forest Inventory	42	Plots	$858
2024 MCCA Fuel Reduction Mulching	53	Acres	$33,975
2024 DCCA Walkway Removal And Replacement	200	Linear Feet	$21,978
2024 Reforestation Site Preparation	29	Acres	$9,900
2025 MCCA Parking Area Board Fence Replacement	430	Linear Feet	$7,340
Total One-Time Activity Cost 2010–2023			*$241,127*
Total Cost Since 2010			**$584,327**

Projected Land Management Revenues and Costs (2025–2035)

Costs and revenues for the Properties are projected into the future. However, prices of timber fluctuate depending on market forces. Projected revenue generated by timber sales, shown in Table 5, is an estimate based on 2025 market prices.

The projected revenues from the cattle lease and timber harvest at the Properties between 2025–2035 are $171,000 (Table 5). Cattle lease revenues are not projected beyond 2030 lease expiration; the District may rebid this lease. All revenue generated from District lands are applied toward the District's land management budget to offset management costs. Projected management costs for the Properties from 2025–2035 are $696,249 (Table 6). Years in which activities take place are estimated.

Table 5: Projected Revenues between 2025 to 2035

Activity	Year	Revenue
Cattle lease	2025–2030	$12,000
DCCA Timber harvest	2026	$94,000
MCCA Timber harvest	2026	$65,000
Total		**$171,000**

Projected Management Costs

Table 6: Projected Management Costs from 2025–2035

Activity	Number of Units (annual)	Units	Annual Cost	10 Year Total Cost
Staff Time (both Properties)	200	Hours	$5,600	$56,000
Invasives (both Properties)	50	Acres	$5,000	$50,000
Rx Fire (both Properties)	377	Acres	$22,839	$228,389
Fireline Disking (both Properties)	41	Miles	$8,200	$82,000
Road Mowing (both Properties)	18	Miles	$3,300	$33,000
Service Mowing (both Properties)	2	Parking areas/6 times a year	$1,350	$13,500
Recreation Maintenance (both Properties)	10	10 miles of trail /8 times a year	$4,160	$41,600
Murphy Island Recreation Maintenance (Barge In Equipment)	6	Miles of trail and one campsite	$8,000	$80,000
One-Time Cost				
Activity	**Total Number of Units**	**Units**	**Cost**	**Total**
2026 Reforestation	29	Acres	$183	$5,320
2026 Reforestation Site Preparation	67	Acres	$343	$23,000
2027 Reforestation	67	Acres	$186	$12,500
2029 Forest Inventory Plots	42	Plots	$14	$940
2030 Fuels Reduction Mowing	200	Acres	$350	$70,000
Total cost over 10 years				**$696,249**

LAND MANAGEMENT PLAN IMPLEMENTATION SCHEDULE

Table 7: Land Management Plan Implementation Schedule

RESOURCE PROTECTION AND MANAGEMENT

Water Resources

Goal	Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition	Measure	Planning Period
Strategy A	Maintain roads and culverts to prevent erosion	Roads and culverts maintained	Ongoing

Forest Management and Restoration

Goal	Maintain, improve, and restore forest resources	Measure	Planning Period
Strategy A	Thin 194 acres of natural pine at DCCA	Sale completed	1–5 Years
Strategy B	Second thin 67 acres and reforest 28 acres at MCCA	Sale completed	1–5 Years

Fire Management

Goal	Implement a prescribed burning program in accordance with District's Fire Management Plan	Measure	Planning Period
Strategy A	Apply fire to 377 acres annually, averaged over the 10-year planning period	Number of acres burned	10 Years
Strategy B	Focus on conducting dormant season burns in areas of high fuel loading and/or for reintroducing fire into a unit with no recent burn history	Acres burned in dormant season	Ongoing
Strategy C	Use mechanical fuel reduction as a fire surrogate on approximately 200 acres in areas where it is difficult to burn due to high fuel loads	Number of acres mowed or roller chopped	5–10 Years
Strategy D	Develop annual burn plans and populate the fire management database on an annual basis	Burn plan and reports	Annually by September

Flora and Fauna

Goal	Maintain, improve, or restore native and listed species populations	Measure	Planning Period
Strategy A	Conduct plant and wildlife surveys and develop species lists	Updates to species list	Ongoing
Strategy B	Monitor the presence of listed species and adjust management actions appropriately	Updates to species list and adjusted management actions	Ongoing

Invasive Species Management

Goal	Manage invasive plants and animals	Measure	Planning Period
Strategy A	Scout and treat invasive species annually to maintain coverage less than 1 percent on DCCA and MCCA	Acres treated	Annually by September
Strategy B	Continue feral hog removal	Number of hogs removed	Annually by September
Strategy C	Locate, map, and treat any new infestations of invasive plant species	Mapping and treatment of new infestations	Ongoing

Cultural Resource Protection

Goal	Identify, protect, and maintain any cultural resources found on the Properties	Measure	Planning Period
Strategy A	Identify and report sites to the Florida Division of Historical Resources (DHR)	Sites identified and reported	Ongoing
Strategy B	Identify and report any detrimental activities to the sites to the DHR and law enforcement	Sites identified and reported	Ongoing

LAND USE MANAGEMENT

Access

Goal	Maintain access to and around the Properties to facilitate land management and resource protection	Measure	Planning Period
Strategy A	Maintain, gates, roads, and associated swales/ditches	Gates, roads and swales/ditches maintained	Ongoing
Strategy B	Update District database on maintenance of existing and creation of new signs, gates, trails, and roads	Database updated	Ongoing

Recreation

Goal	Provide public recreation opportunities on the Properties		
Strategy A	Maintain 4.8 miles of trails, one campsite, and two parking areas at DCCA	Miles maintained	Annual, ongoing
Strategy B	Maintain 5.2 miles of trails, one campsite, one boat dock, and one parking area at MCCA	Miles maintained	Annual, ongoing
Strategy C	Maintain the existing FWC cooperative management agreement for Dunns Creek Wildlife Management Area (WMA) on DCCA and expand to MCCA	Agreement maintained	Annual, ongoing

Security

Goal	Provide and maintain the site's security	Measure	Planning Period
Strategy A	Maintain boundary signage, gates, and locks	Signs, fences, gates, and locks maintained	Ongoing
Strategy B	Continue coordination with onsite security resident, FWC, and local law enforcement	Secure Properties	Ongoing

ADMINISTRATION

Real Estate Administration

Goal	Explore opportunities for adjacent Properties acquisition	Measure	Planning Period

Strategy A	Evaluate adjacent properties for potential acquisition	Properties evaluated	Annually by September

Cooperative Agreements, Leases, Easements, and Special Use Authorizations (SUA)

Goal	**Evaluate, pursue, and manage cooperative opportunities**	**Measure**	**Planning Period**
Strategy A	Evaluate future feasibility of cattle lease on MCCA	Lease evaluated	1–5 years
Strategy B	Evaluate new lease and Special Use Authorization opportunities for compatibility with conservation and management goals	Leases evaluated	Ongoing
Strategy C	Continue to cooperate with researchers and universities as appropriate	Research requests received	Ongoing

Management Revenues and Costs

Goal	**Analyze and report projected and actual costs and revenues**	**Measure**	**Planning Period**
Strategy A	Analyze and report revenues	Annual report	Annually by November
Strategy B	Analyze and report land management costs	Annual report	Annually by November

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APPENDIX A: COMBINED CONSERVATION AREA SOILS

Below are the USDA (2023) description of the soils and an accompanying map at the DCCA (Figure 1) and at the MCCA (Figure 2).

Adamsville
Adamsville fine sand consists of very deep, somewhat poorly drained, rapidly permeable soils on broad flats, low knolls, and lower side slopes. They formed in thick sandy marine or eolian sediments in central and southern Florida. Natural vegetation consists of pines, laurel, and water oaks with a ground cover of saw palmetto, pineland threeawn, Indiangrass, bluestem grasses, and several low panicums.

Astatula
Astatula sand consists of very deep, excessively drained, very rapidly permeable soils on uplands. They formed in eolian and marine sands. Natural vegetation consists of bluejack, blackjack, turkey oaks, longleaf pine, sand pine, and an understory of rosemary, pineland threeawn, bluestem, paspalum, lopsided Indiangrass, and panicum.

Bluff
Bluff sandy clay is very deep, very poorly drained, slowly permeable soils in marshes and on broad low terraces along rivers. They formed in thick beds of alkaline loamy marine sediments. The native vegetation consists of swamp white oak, tupelo gum, swamp maple, cypress, and palm, with scattered loblolly pine in some areas. The understory vegetation consists of several bluestem species, hairy panicum, longleaf uniola, vines, and forbs.

Cassia
Cassia sand consists of very deep, somewhat poorly drained soils that formed in sandy marine deposits. Cassia soils are on low ridges and knolls on scrubby flatwoods. Potential native vegetation consists of scattered slash pine, longleaf pine, and saw palmetto. The understory vegetation consists of splitbeard bluestem, broomsedge bluestem, creeping bluestem, low panicum, lopsided Indiangrass, pineland threeawn, paspalum, switchgrass, runner oak, and saw palmetto.

Electra
Electra fine sands consist of somewhat poorly drained soils formed in sandy and loamy marine sediments. These soils are typically found on slight ridges in the flatwoods areas. Native vegetation may include dwarf live oak, longleaf pine, sand pine, runner oak, saw palmetto, and blueberry. Lopsided Indiangrass, wiregrass, and numerous forbs are common in the understory.

Holopaw
Holopaw loamy sand is a very deep, very poorly drained sand common in flats, depressions, and drainage-ways. Native vegetation includes scattered slash and pond pine, cabbage palm, saw palmetto, and scattered cypress.

Immokalee
Immokalee fine sands consist of very deep, very poorly and poorly drained soils that formed in sandy marine sediments. Immokalee soils are on flatwoods and low broad flats on marine terraces. Under natural conditions Immokalee soils are used for water quality, forestry, and wildlife habitat. Potential native vegetation consists of longleaf and slash pine with an undergrowth of saw palmetto, gallberry, wax myrtle and pineland threeawn. In depressions, water tolerant plants such as cypress, loblolly bay gorodonia, red maple, sweetbay, maidencane, blue maidencane, chalky bluestem, sand cordgrass and bluejoint panicum are more common.

Malabar
Malabar sand consists of very deep, very poorly and poorly drained, slowly permeable soils in sloughs, shallow depressions and along flood plains. They formed in sandy and loamy marine sediments. Native vegetation consists of scattered slash pine, cypress wax myrtle, cabbage palm, pineland threeawn, and maidencane. In depressions, the vegetation is dominantly St. Johnswort or maidencane.

Millhopper
Millhopper sand consists of very deep, moderately well drained, moderately permeable soils that formed in thick beds of sandy and loamy marine sediments. Native vegetation consists of live oak, laurel oak, post oak, water oak, sweetgum, cherry laurel, few hickory, and slash and longleaf pine. The understory is chiefly lopsided Indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, chalky and creeping bluestems, and pineland threeawn.

Myakka
Myakka sand consists of very deep, very poorly or poorly drained, moderately rapid or moderately permeable soils that occur primarily in mesic flatwoods of peninsular Florida. They formed in sandy marine deposits. Native vegetation includes longleaf and slash pine with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

Narcoossee
Narcoossee fine sand consists of very deep, somewhat poorly drained soils that formed in thick sandy sediments of marine origin. Native vegetation is dominantly water oak, willow oak, live oak, laurel oak, longleaf pine, slash pine, greenbrier, saw palmetto, pineland threeawn, creeping bluestem, panicum, purple lovegrass, and lopsided Indiangrass.

Newnan
Newnan sand consists of somewhat poorly drained soils that formed in thick beds of sandy and loamy marine sediments of slight ridges in the flatwoods areas of central and southern Florida. Most areas remain in native vegetation consisting of slash and longleaf pine and scattered live and laurel oaks. A few turkey or water oaks are in some areas. The understory is chiefly huckleberry, blueberry, gallberry, running oak, brackenfern, bluestems, paspalums, pineland threeawn, saw palmetto, greenbrier, lovegrass, and lopsided Indiangrass.

Orsino
Orsino fine sand consists of very deep, moderately well drained, very rapidly permeable soils that formed in thick beds of sandy marine or aeolian deposits. Native vegetation consists primarily of scrub vegetation with sand live oak, Chapman oak, myrtle oak, and scrub hickory. Scattered sand, slash, and longleaf pines and scattered bluejack, turkey, and post oak are found with a sparse understory.

Paisley
Paisley loamy fine sand consists of deep, poorly drained, slowly permeable soils that formed in clayey marine sediments influenced by underlying calcareous materials. Native vegetation consists of slash, longleaf, and loblolly pine, swamp white oak, swamp maple, and sweetgum with an understory of wax myrtle, cabbage palmetto, bluestem, and native grasses.

Palmetto
Palmetto sands consist of deep, poorly drained, moderately slowly permeable soils that formed in unconsolidated marine sandy and loamy materials. They occur in sloughs, depressions, and poorly defined drainageways in the flatwoods in peninsular Florida. Most areas of this soil are in natural vegetation. Some areas are used for improved pasture. In the sloughs natural vegetation is chalky bluestem, blue maidencane, sand cordgrass, pineland threeawn, low panicums, and scattered slash pines and scattered clumps of saw palmetto. In depressions native vegetation is sawgrass, maidencane, arrowhead, cattail, spikerush, St. Johnswort, bluestem, bay and cypress in places.

Placid
Placid fine sands are very deep, poorly drained soils typically associated with flats, depressions, and drainage-ways. Native vegetation includes pond pine, cypress, blackgum, bays, and a variety of other water-tolerant plants.

Pomona
Pomona sands consist of very deep, poorly drained soils that typically occur on broad low ridges. They formed in sandy and loamy marine sediments. The native overstory species often include slash and longleaf pine while the understory may contain saw palmetto, wax myrtle, gallberry, a variety of Andropogon spp., and wiregrass.

Pompano
Pompano fine sand consists of very deep, very poorly, and poorly drained soils that formed in thick beds of sandy marine sediments. Pompano soils are on flatwoods, in low broad flats, and to a lesser extent, depressions, drainageways, and floodplains, on marine terraces. Native vegetation of flatwoods consists of slash pine, south Florida slash pine, saw palmetto, gallberry, wax myrtle, chalky bluestem, and pineland threeawn. Forested depressions are dominated by bald and pond cypress, black gum, and red maple. Herbaceous depressions are dominated by sedges, rushes, and sawgrass.

Riviera
Riviera sand consists of very deep, poorly drained, very slowly permeable soils on broad, low flats, flatwoods and in depressions. They formed in stratified sandy and loamy marine sediments.

Native vegetation consists of slash pine, cabbage, and saw palmetto, scattered cypress, maidencane, and pineland threeawn.

Samsula
Samsula muck consists of very deep, very poorly drained, rapidly permeable soils that formed in moderately thick beds of hydrophytic plant remains and are underlain by sandy marine sediments. These soils are in swamps, poorly defined drainageways and flood plains. Natural vegetation is loblolly bay with scattered cypress, maple, gum, and pine trees with a ground cover of greenbriers, ferns, and other aquatic plants.

Sparr
Sparr fine sands consists of very deep, somewhat poorly drained, moderately slowly to slowly permeable soils on uplands of the coastal plain. They formed in thick beds of sandy and loamy marine sediments. Native vegetation consists of longleaf pine, slash pine, loblolly pine, magnolia, dogwood, hickory, and live oak, laurel oak, and water oak.

St. Johns
St. Johns sand consists of very deep, very poorly or poorly drained, moderately permeable soils on broad flats and depressional areas of the lower Coastal Plain. They formed in sandy marine sediments. Principal vegetation of the forested areas is longleaf pine, slash pine, and pond pine with an undergrowth of saw palmetto, gallberry, wax myrtle, huckleberry, and pineland threeawn. Some areas that have adequate water control are used for citrus, improved pasture, and special crops.

Tavares
Tavares sand consists of very deep, moderately well drained soils that formed in sandy marine or eolian deposits. Natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak with an undercover of pineland threeawn. In some places natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine.

Terra Ceia
Terra Ceia mucky soils consist of very deep, very poorly drained organic soils and are most commonly associated with freshwater marshes, depressional areas within flatwoods, and floodplains. Sawgrass, sedges, reeds, maidencane, and other water tolerant grasses are commonly found in these soils. Cypress, black gum, red maple, and pond pine are common in wooded areas.

Tomoka
Tomoka mucky soils are deep, very poorly drained soils that formed in decomposed organic material underlain by sand and loam. These soils can be found on flats, in freshwater marshes, and in swamps. Native vegetation includes pond pine, cypress, maple, and a variety of water-tolerant grasses and forbs.

Wabasso

Wabasso fine sand consists of very deep, very poorly and poorly drained, that formed in sandy and loamy marine sediments. The natural vegetation consists of longleaf pine, slash pine, cabbage palm, live oak, with an understory of saw palmetto, laurel oak, wax myrtle, chalky bluestem, creeping bluestem, Indiangrass, little bluestem, Florida paspalum, running oak, south Florida slash pine and pineland threeawn.

Wauchula
Wauchula sandy over loamy soils consist of very deep, very poorly or poorly drained, moderately slow or slowly permeable soils on flatwoods on the lower coastal plains. They formed in sandy and loamy marine sediments. The natural vegetation consists of longleaf pine, slash pine, saw palmetto, with an understory of inkberry, fetter, southern bayberry, and pineland threeawn.

Winder
Winder fine sand consists of very deep, poorly drained, slowly to very slowly permeable soils on broad, low flats and depressional areas. They formed in loamy marine sediments on the Lower Coastal Plain. Natural vegetation consists of cordgrass, maidencane, cabbage palmetto, saw palmetto, and pineland threeawn.

Zolfo
Zolfo fine sand consists of very deep, somewhat poorly drained soils that formed in sandy marine sediments. Zolfo soils are on ridges, rises, and knolls on adjacent flatwoods on marine terraces. Native vegetation consists of scattered turkey, laurel, or water oaks; long leaf or slash pine with an undercover of pineland threeawn, bluestem, lopsided Indiangrass, gallberry, native weeds and saw palmetto.

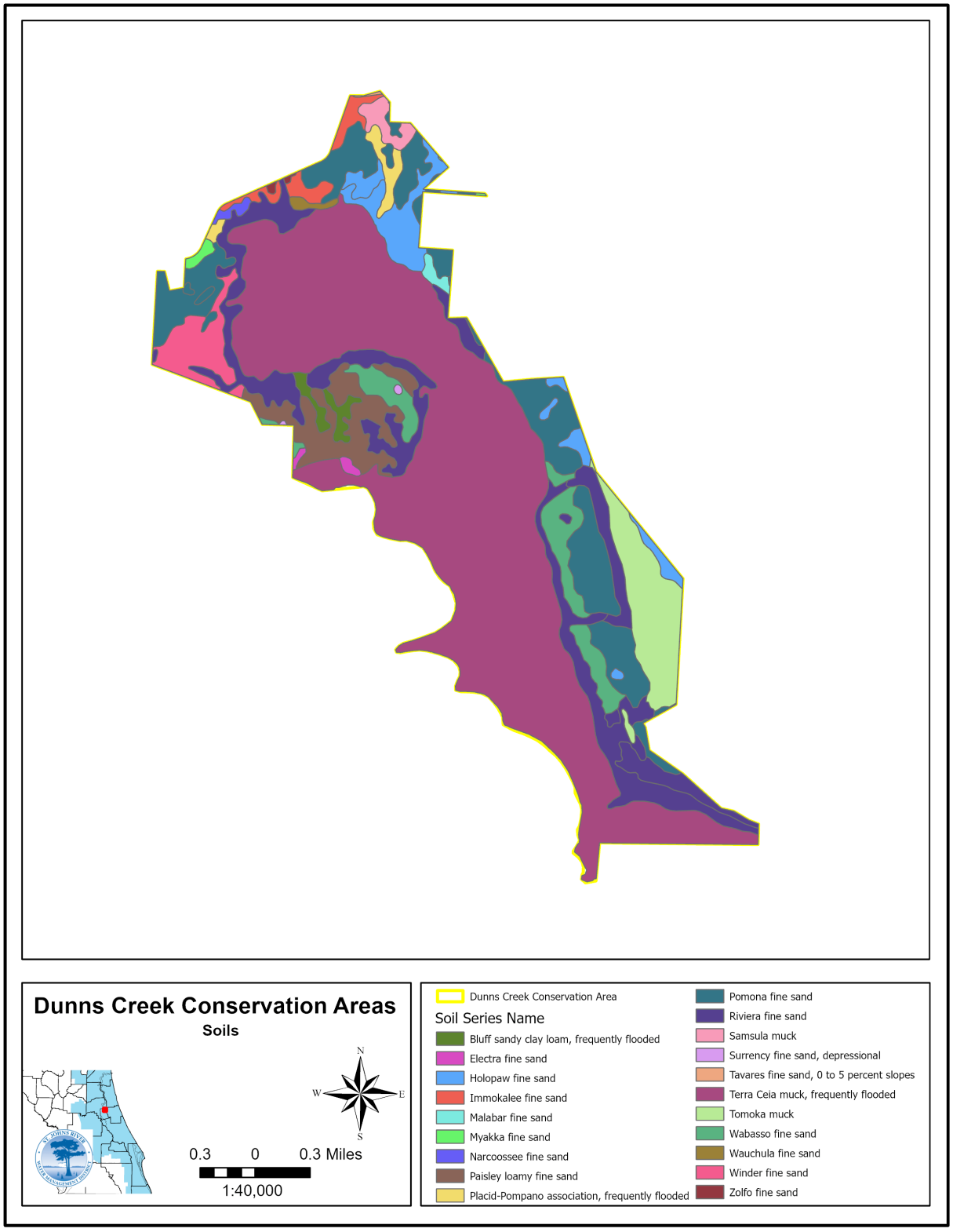

Figure 1: Soil types at Dunns Creek Conservation Area.

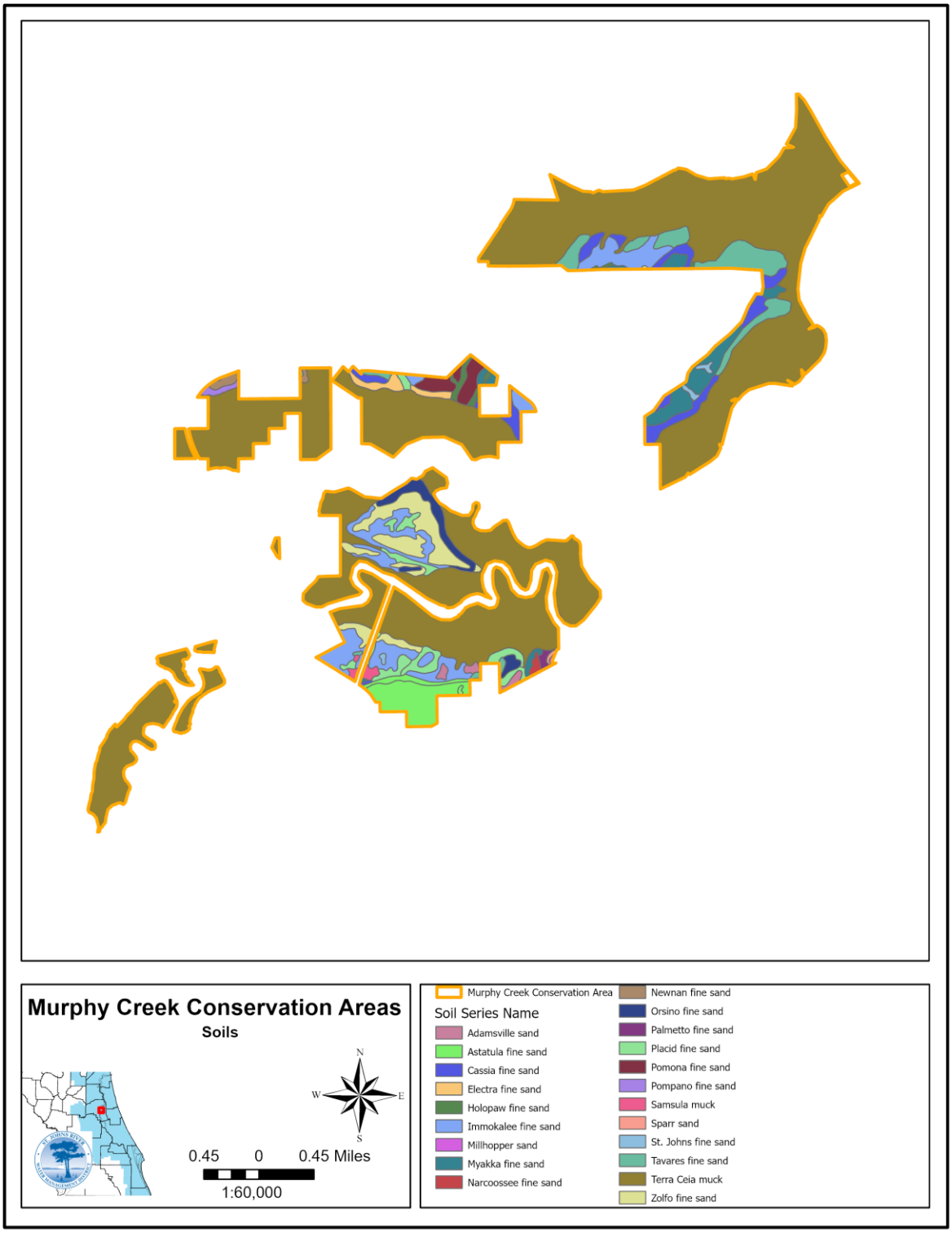

Figure 2: Soil types at Murphy Creek Conservation Area.

APPENDIX B: DISTRICT FOREST MANAGEMENT PLAN

In 1999, the Florida Legislature under Section 373.1391Florida Statutes authorized the water management districts to manage forest resources on the lands they have acquired. To date, the St. Johns River Water Management District (District) has acquired over 775,000 acres of land. Approximately 43 percent of these acres are forested. Prior to 2000, no overall long-term plan existed to provide guidance and coordination for the management of the District's forest resources. This plan will provide that guidance and continuity.

Timber sales began in 1991 with a salvage sale at Lake George Conservation Area following a wildfire. From 1991-2025, over 200 timber sales have been completed.

PURPOSE OF FOREST MANAGEMENT

The District manages forest resources for the:

1) Restoration of natural communities.
2) Maintenance of the health and vigor of natural communities.
3) Generation of revenues to counterbalance the cost of land management activities.

Restoring Natural Communities

The District acquires its land from a variety of private owners, and each owner had their own vision for the land. Many times, in fulfilling their vision, private owners altered the natural communities by clearing for agricultural purposes or for planting trees. Whenever practicable, the District is charged with maintaining and/or restoring the land to its natural state and condition.

Thinning, clearcutting, and planting are all tools used to restore natural communities, but in almost all cases they are used in conjunction with fire. The combinations of overstory control and fire management are the primary restoration tools in forested communities.

In forested communities, controlling or manipulating the overstory serves as the primary tool to maintain or restore the natural community. The density of the overstory dictates the health and diversity of understory species. If the overstory becomes too dense, both the overstory and understory species begin to suffer. In cases where the overstory remains crowded too long, individual understory plants begin to disappear. Often, seeds of these plants will remain dormant in the soil. Thinning individual trees from an overcrowded stand allows more light, moisture and nutrients to be available for groundcover plants. This allows dormant plants to reoccupy their former sites, thereby restoring the natural state and condition.

In some cases, private owners planted a species of tree that did not naturally occupy the site. In these cases, the District will clearcut the undesired tree species and replant with the more appropriate species.

In cases where the previous owner cleared the site, the District will prepare the site and plant the appropriate tree species. Since longleaf pine occupies approximately 5 percent of the area it did in 1900, and since longleaf offers a suite of wildlife benefits greater than most other pine species, the District will emphasize planting of longleaf on all sites where longleaf is suited for the site.

Maintenance of the Health and Vigor of the Natural Communities

The health or quality of a forested natural community is maintained by three primary factors: 1) the availability of water, 2) the frequency of fire, and 3) the density and species composition of the overstory.

In few cases do the activities of the District affect the availability of water on District forestlands. One exception is where sites are restored through the plugging of ditches or rehydration of historically wetland systems. Weather is the primary factor influencing the availability of water.

Fire influences the health of forested communities by altering the process of succession. Fire holds natural communities in an intermediate stage of succession that is referred to as a fire climax community. If fire is removed, these natural communities follow the path of succession to become some other community. In Florida, most natural communities historically experienced fire on a frequent basis. In fact, most communities are dependent upon frequent fire for their continued existence. Because of its importance as a management tool, fire is addressed in detail in the District's Fire Management Plan.

The third factor influencing the health and/or quality of forested natural communities is the overstory density and species composition. In a truly natural system, wildfire, climatic disturbances, along with insects and diseases, combined to control the composition of the overstory, which in turn controls the composition of the understory. Wildfire, insects and disease kill trees as individuals or groups, which reduces the density of the overstory and alters the species composition. These events or outbreaks would often impact large areas, especially areas where the stand density was high, weakening the overstory trees and increasing their susceptibility to pathogens. Prior to human intervention, there were huge expanses of natural land that could easily absorb large-scale alterations of the overstory so that no plant or animal species could be extirpated. Today, Florida is fast approaching a condition where natural areas are becoming islands. Plants and animals have fewer areas to populate, and it is more difficult to transfer their genetic material between isolated areas of ideal habitat. Therefore, we can no longer rely entirely on large-scale disturbances to control overstory density and species composition. By managing the overstory with selective harvesting, the density and species composition can be controlled to maintain a healthy natural community while minimizing the potential for large-scale impacts.

As land managers, the District also has an obligation to protect neighboring landowners from any large-scale wildfire, insect or disease outbreaks that may originate on District land and spread to adjacent lands. This obligation prohibits the District from employing a truly natural management system to control overstory species, density, and composition and requires the District to utilize a more interactive management program.

Generation of Revenues

The District generates revenue when implementing sound overstory management practices to maintain the health of the natural community. These practices include but are not limited to thinning operations, removal of undesired species (clearcuts), and salvage cuts to remove trees damaged from wildfires, insect infestations and/or disease outbreaks. The revenue generated from these operations can be used to fund restoration and other land management activities.

FOREST RESOURCES INVENTORY

Following Section 373.1391, Florida Statutes and seeking to keep its land management efficient, the District has sought management partners. The following chart illustrates the lead manager status of District-owned lands (Figure 1).

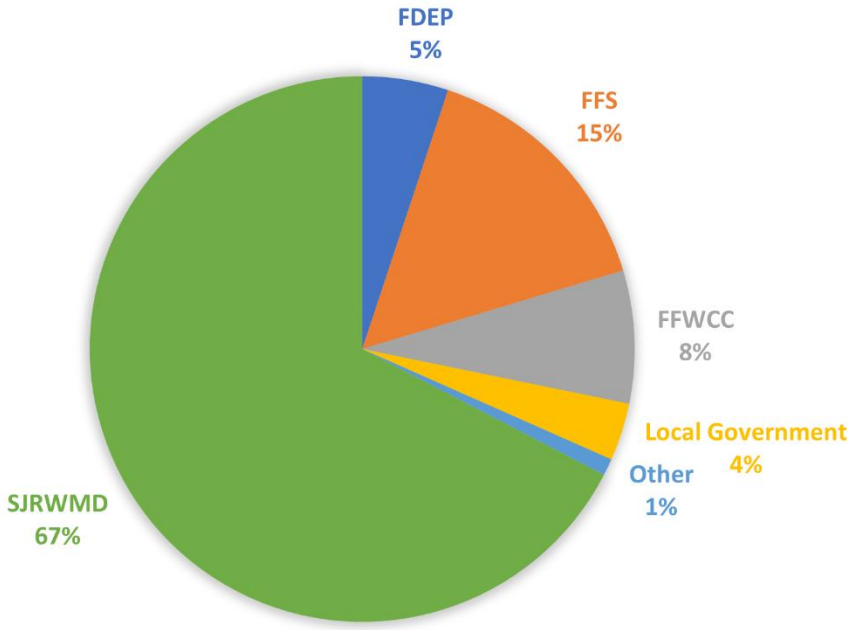

Figure 1: District Owned Land by Lead Manager. Updated January 2020

The District's Land Management Rule, agreements and philosophy call for the lead manager's rules and policies to direct the management of the affected lands, therefore this plan will be focused on the lands where the District is identified as the lead manager. The District serves as the lead manager on 430,000 acres. These acres managed by the District are broken down as follows (Figure 2).

Twenty-seven percent of the District Managed Lands are forested, with 12 percent being forested uplands and 15 percent forested wetlands.

OBJECTIVES OF FOREST MANAGEMENT

The District's forest management objectives are to:

- Maintain the health and diversity of forested communities on District lands.
- Provide for older aged forest conditions. As public landowners we have the opportunity to provide habitat for species requiring older age classed trees.
- Provide for an array of forest stand structures and age classes. Each species of plant and animal has an age-class of forest stand that is most desirable. By providing the array of structures and age-classes, the District can provide habitat for a wide variety of species.

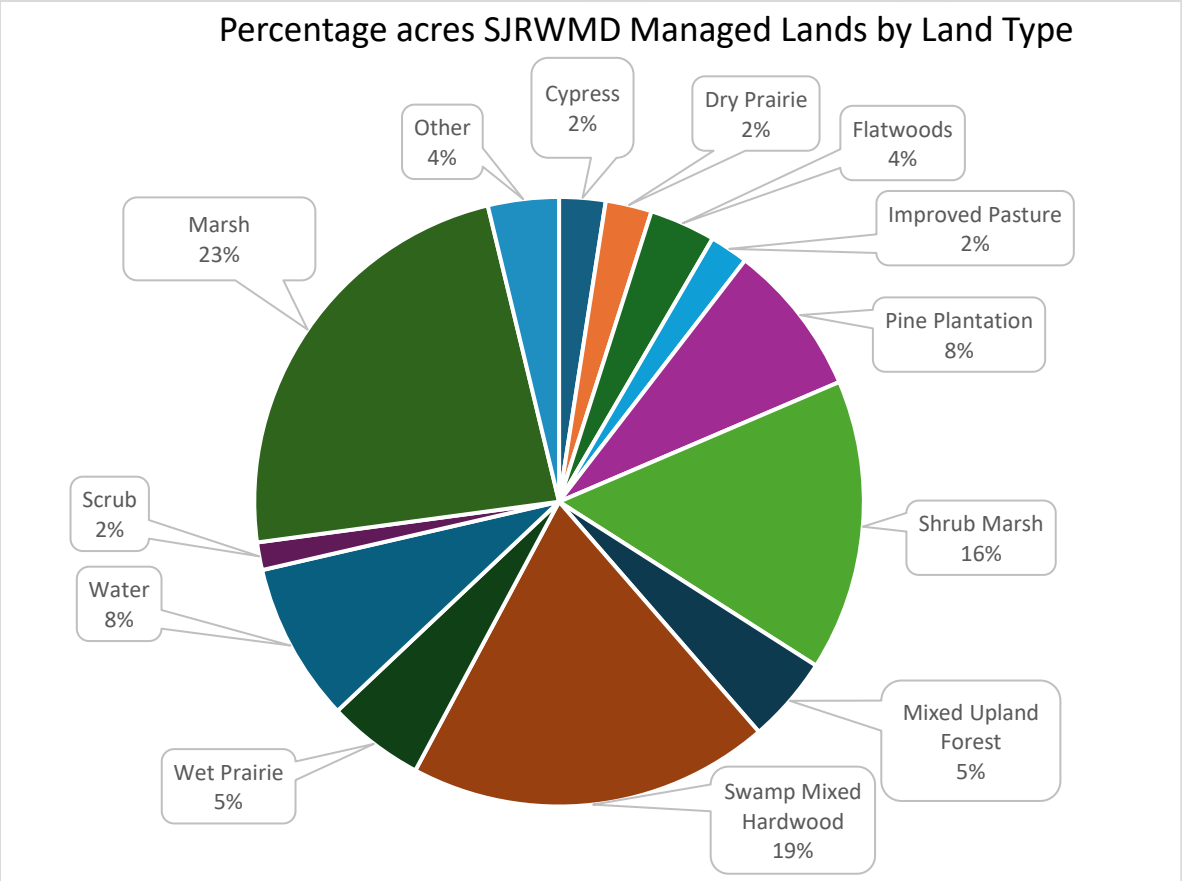

Figure 2: Percentage acres SJRWMD Managed Lands by Land Type. Updated January 2020

Techniques of Forest Management

Inventory

The District is currently developing a timber management database that will directly link timber volume information with the GIS lands database. The database will incorporate inventory data collected at acquisition and track changes overtime. Changes resulting from harvests, wildfires, insect infestations, disease outbreaks and reforestation efforts can be updated quickly and easily. Periodic updates of volume and growth information will be scheduled and incorporated into the database. The database links will aid in determining natural community needs along with geographic distribution and appropriate management techniques to implement. The database will be an integral part in managing community health and in developing future land management workplans.

Harvesting

To accomplish its goals the District will employ a suite of harvesting systems.

Clearcutting is a silvicultural operation used to remove the entire overstory at one time. This tool will be used with limited application dependent upon the specific management needs. Those needs may include:

1. Insect or disease control. Forest pests occur naturally at low population densities and are a vital part of the forested community. When population densities reach epidemic levels, control measures to remove the host and adjacent trees must be implemented to protect the remainder of the stand.
2. Salvage. If the overstory has been killed or severely damaged, removing (salvaging) the overstory will recover some financial value of the timber and will allow the District access necessary to replant the site.
3. Species conversion. If offsite species exist, clearcutting enables the District to replace the offsite species with one that is appropriate.

Thinning is a silvicultural operation where selected individual trees are removed from the stand to reduce the density of overstory trees to improve growing conditions for the remaining overstory trees and the understory plants. This method is not applied with a goal of establishing regeneration.

The seed tree system is a silvicultural operation where the entire overstory except 10-15 prime trees per acre are harvested at one time. These 10-15 trees serve as the seed source for the next generation. This technique is seldom used by the District. While the seed tree system is effective, it creates major change in the stand condition both visually to the public and biologically to the plants and animals in the stand.

Shelterwood is a silvicultural operation in which the overstory is removed in phases. When it is time to regenerate the stand, approximately 60-70 percent of the stand is removed either in one or two harvests. Again, the older trees serve as the seed source for the next generation. Once the younger trees are established the original overstory trees can be removed or they can remain on

site and be subject to thinning at the same time as the younger generation. The major benefit of this system is it results in a more gradual change from the mature trees to the next generation both visually to the public and biologically to the plants and animals.

A new modification of the shelterwood called an irregular shelterwood has recently been developed and may become the primary silvicultural system employed by the District. An irregular shelterwood begins the same as shelterwood but portions of the original overstory remain on site. When the second-generation trees are thinned, a few of the first-generation trees are also thinned. When it is time for the third generation to be established both the first- and second-generation trees are reduced to 30-40 square feet of basal area to make room for the third-generation trees. Once the third-generation trees are established the site has few first-generation trees, some second-generation trees and many third-generation trees. This provides for a variety of age classes in a single stand but is much easier to apply and should require much less staff time than uneven-aged selection management.

Uneven-aged selection is a silvicultural operation in which trees, either as individuals or in small half-acre groups are harvested from throughout the stand every five to 10 years. The holes left by the removal of these trees are filled with seedlings from adjacent trees thereby creating a patchwork stand composed of trees of all ages. While this system offers the greatest distribution of age within a stand, truly an uneven aged condition which some scientists feel is best for wildlife, it also requires significant staff inputs and to date appears too labor intensive to employ on a large scale.

Site Preparation

When it is necessary to establish regeneration, either naturally or artificially, the District may employ one or more of the site preparation techniques described below.

Herbicide will be used when staff has determined that it is the most effective means to control the competing vegetation. Herbicides will not be used if it adversely affects the desirable understory species within the planting site. The use of herbicide is necessary when attempting to restore native trees and groundcover to areas of improved pasture. Herbicide can be applied with hand sprayers, tank sprayers, or aerially from a helicopter, depending upon the species to be treated and site conditions.

Disking/Scalping techniques are most useful when trees are being planted in areas of improved pasture. Both techniques protect the seedlings from grass competition but offer no benefit to groundcover restoration.

Drum Chopping is effective at reducing competition from shrub species, especially saw palmetto. If properly applied grasses within the treatment area will survive chopping and will often benefit from the choppers effect on the shrubs.

Bedding is a technique where a small ridge of surface soil is formed to provide an elevated planting or seedbed. It is used primarily in wet areas to improve soil drainage and aeration for seedlings. This type of site preparation technique has not been utilized by the District because of the adverse effects it has on groundcover and sheet flow. Therefore, the District's planting costs

are often higher than private industry's because without bedding several plantings are often necessary to establish seedlings on wet sites.

Regeneration

Emphasis will be placed on natural regeneration to the extent practicable. In cases where species conversion is required or where no overstory exists to provide natural seed fall, planting will be necessary.

Hand planting is primarily method used by the District, because it offers the following benefits:

1. Trees can be placed on the best microsites (i.e., highest ground in wet areas, areas with the least competition).
2. Groundcover disturbance is minimized.
3. Seedlings can be randomly spaced or planted in clusters to provide for a more natural appearance.

Machine planting is used primarily in old field conditions where scalping is employed and rows are suitable.

OVERALL METHODOLOGY

Forested natural communities can be lumped into three different groups with regards to forest management. These include Pine Forests, Upland Hardwoods, and Wetland Hardwood/Cypress. The management of each will differ and be described separately.

Pine Forests

Pine forests include flatwoods, plantations, sandhills and sand pine scrub. With the exception of sand pine scrub pine forests will be managed through thinning. Once the stand is established and trees have reached merchantable size (five inches at diameter breast height) at approximately 15-20 years of age depending on tree species and sites, thinning will begin. Stands will be thinned as necessary to maintain an overstory basal area range of 60 to 90 square feet per acre. This range promotes good growth of understory plants and provides good habitat for most wildlife using forested natural communities. To maintain this basal area range harvests will occur in each stand approximately every 10 years, depending on growth rates of the trees. Great care will be exercised during harvesting operations to minimize disturbance of the soil and groundcover. When properly performed, harvesting actually benefits groundcover regeneration by reducing shrub species and improving growing conditions.

The need for regeneration will be determined by an inventory of the health, vigor, and species composition for the trees in each stand. Once the conditions of the overstory trees indicate the need, a regeneration harvest will be scheduled employing the appropriate silvicultural system described previously. Emphasis will be placed on making the most seamless transition from one generation to the next. The irregular shelterwood will be employed frequently in loblolly, slash and longleaf pine stands.

Emphasis will be placed on having a wide array of age classes between stands and an array of different aged trees within stands. Included in the desired array of ages will be trees and stands significantly older than those typically found on private lands.

To ensure the wide array of age classes is met, the District will separate pine stands into four different types based upon general age and condition. These four types include:

1. Regeneration (age 0-10): The site is occupied primarily by tree seedlings and saplings, herbs and shrubs. Competition from the trees has not yet resulted in any reduction in herb or shrub layer. This type begins at planting and continues until crown closure. Herbs, shrubs and grasses occupy 20%-80% of the ground. This type offers benefits to early successional wildlife species such as quail, rabbits, gopher tortoises, deer, turkeys and their predators.
2. Closed Canopy (age 11-20): Trees fully occupy the site and form a single, main canopy layer. There is little understory development due to the lack of light passing through the canopy. Where understory exists it is dominated frequently by palmetto and/or gallberry. This type benefits fewer wildlife species but does offer bear and deer good escape cover.
3. Understory (age 21-60): The overstory density has been reduced through thinning and the understory is beginning to reinitiate. Adequate light is again available to the forest floor. Groundcover plant species and wildlife both begin to flourish again. Wildlife benefiting from this stand type include deer, turkey, quail, and gopher tortoises.
4. Older Forest Structure (age 60+): This stand type begins to develop a layered overstory. Trees are large, with diameters >12 inches. Snags will begin to appear and should be protected. The understory is diverse and healthy. Wildlife benefiting from this stand are fox squirrels, great horned owl, southeastern kestrel, turkeys, quail, gopher tortoises, red cockaded woodpeckers, eagles, and ospreys (nesting trees).

The District will strive to keep 10-15 percent of its pine forests in type 1; 10-15 percent in type 2; 30-40 percent in type 3; and 40 percent in type 4. The present condition is shown below (Figure 3):

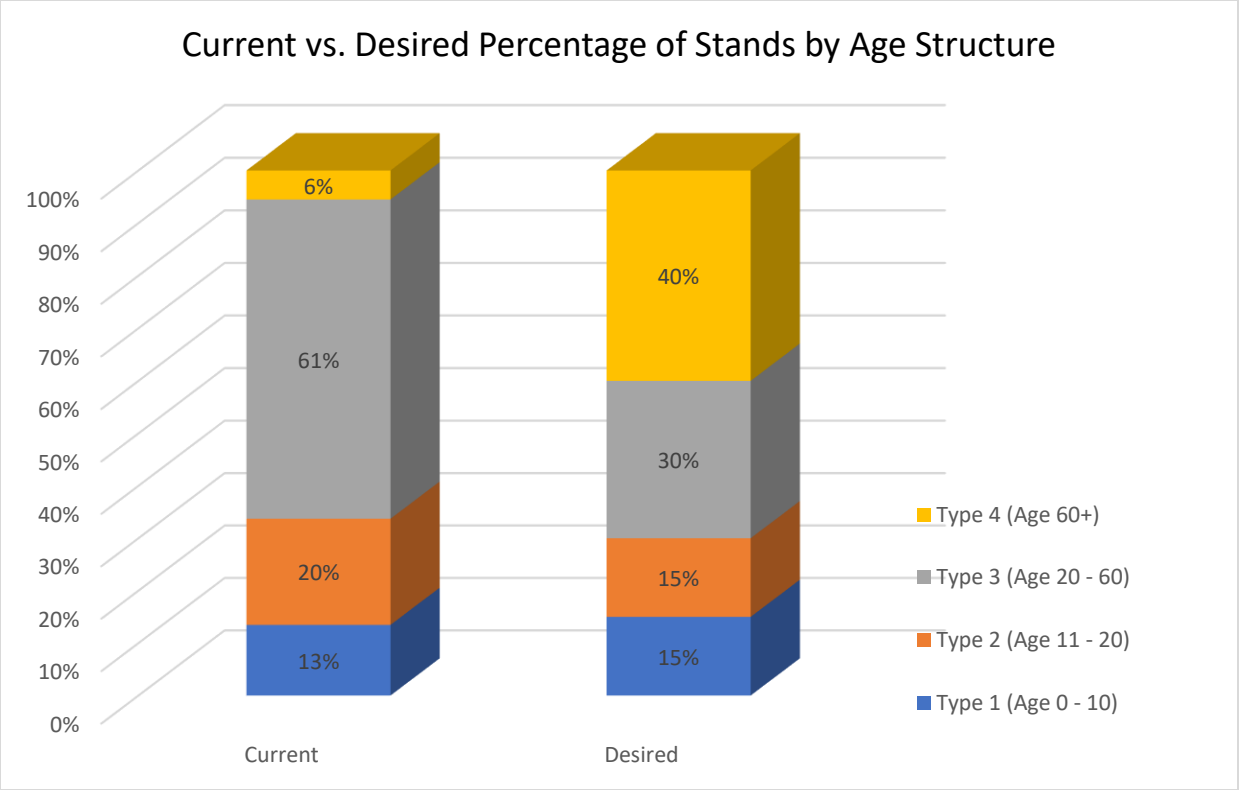

Figure 3: Current vs. Desired Percentage of Stands by Type. Updated January 2020

Sand pine management will differ from other pine types because it is adapted to an even aged environment. Sand pine characteristically grows in dense, even-aged, pure stands, which originated as a direct result of catastrophic fires or similar events. When a killing fire sweeps through a stand of cone-bearing trees, the serotinous cones (which remain tightly closed for many years unless opened by heat) open and release large quantities of seeds to naturally regenerate the area. These catastrophic fires are difficult to mimic with prescribed fire since they are difficult to control. Complete stand removal (clearcutting) is the preferred method available to mimic the natures stand replacing events. The natural cycle for stand replacing events are from 20–60 years. Sand pine stand will therefore be clearcut and regenerated on a similar cycle.

The primary forest management activities of the District will be within these pine stands.

UPLAND HARDWOODS

Currently upland hardwoods constitute 2 percent of District-managed lands. Typically, they are mesic and xeric hammocks with the dominant species being live oak. There is no ecological need for harvesting within these communities and no commercial value to be derived from harvesting live oak.

Limited areas of upland hardwoods have developed on former sand hills and flatwoods due to a lack of fire or other ownership priorities prior to acquisition. These areas can be returned to their original natural community by harvesting the overstory and planting the original specie appropriate to the site. Hardwood species encountered on such site include turkey oak, laurel oak, bays, and sweetgum.

WETLAND HARDWOODS AND CYPRESS

As with State Forests, the District has no plans to harvest timber from the swamps. However, the following may be situations where limited harvesting would offer the District benefits.

Following a catastrophic outbreak of insects, disease or wildfire harvesting the dead timber can create the growing space for the next generation. Most swamp species reproduce from both seed and sprouting. Removing the dead overstory will reduce the hazard from trees falling on people and young trees.

Twenty to 30 years following some catastrophic event the District may choose to selectively thin the hardwoods and cypress to accelerate the process of developing old-growth conditions. In a truly natural setting, the development of old-growth conditions will take 75-100 years since the trees compete with one another until the weaker individuals die. Through thinning, the number of trees can be reduced, and the growth concentrated on the remaining trees so that they become larger faster and old-growth habitat can be created earlier.

The sensitivity required to log wetland systems cannot be overly stressed. Any harvesting performed in wetlands must be carried out under the most stringent conditions to avoid damage to the site. Harvesting can only be done when rutting and damage to residual trees can be minimized. Harvesting must be closely monitored and shut down if conditions deteriorate.

This plan was approved by the Governing Board in February 2000 with charts updated January 2020

APPENDIX C: DUNNS CREEK / MURPHY CREEK CONSERVATION AREAS FIRE MANAGEMENT PLAN

The District Fire Management Plan provides general fire management information relative to policy, procedure, and reporting. This document provides the guidelines for the implementation of prescribed fire activities on the Dunns Creek (DCCA) and Murphy Creek Conservation Areas (MCCA). When referring to both, they will be termed as Properties.

Introduction and Objectives

The DCCA encompasses approximately 3,182 acres in Putnam County. The DCCA includes two parcels in numerous sections of Townships 10 and 11 South of Range 27 East.

The DCCA is located west of State Road (SR) 100 near the unincorporated town of San Mateo. The DCCA includes frontage on Dunns Creek along the western boundary.

The MCCA encompasses approximately 4,828 acres in Putnam County. The MCCA includes eight parcels in numerous sections of Townships 10 and 11 of Range 26 East and Townships 10 South of Range 27 East.

The MCCA is located south of the city of Palatka along the St. Johns River as well as a tract near the unincorporated town of Satsuma.

Historically, fires have played a vital role in the shaping and maintenance of many of the natural communities in Florida. As such, most vegetative communities and associated wildlife are fire adapted and, in many instances, fire dependent. Conversely, the exclusion of fire from an area allows for successional changes within the natural community. Fire exclusion leads to the excessive accumulation of fuel loads, which increases the risk for catastrophic wildfires. The goals for the implementation of fire management activities within the Properties include:

- Reduction of fuel loads through the application of dormant season burns to decrease potential risk of damaging wildfires
- Introduction of growing season burns (April to August) to encourage the perpetuation of native fire adapted ground cover species
- Mitigation of smoke management issues
- Restoration and maintenance of a mosaic of natural plant communities and ecological diversity
- Maintenance and restoration of ecotonal areas
- Utilize fire surrogates, such as mechanical or chemical treatments, in areas of limited fire history to facilitate future application of prescribed fire

The achievement of these goals requires that the Properties be partitioned into manageable burn units prior, termed fire management units (FMUs), to the application of prescribed fire within those units. The following sections summarize the considerations necessary for the safe and effective use of prescribed fire as a land management tool within the Properties.

Fire Return Interval

The general frequency to which fire returns to a community type is termed as its fire return interval. Some communities require frequent pyric disturbances to perpetuate themselves while others are not fire adapted and subsequently do not require fire to maintain their characteristics. The following discussion of native plant communities occurring on the Properties and optimal fire return intervals was characterized in part using information from the 2010 Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida* (Table 1).

Natural Community Type	FNAI Fire Return Interval
Mesic Flatwoods	2–4 years
Wet Flatwoods	1–3 years in grass dominated systems; 5–7 years in shrubbier systems; 2–4 year average
Sandhill	1–3 years
Scrubby Flatwoods	5–15 years, will be burned in conjunction with the surrounding mesic flatwoods on a 2–4 year interval
Depression Marsh	2–7 years; frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas.
Dome Swamp	3–5 years along the outer edges (or as adjacent communities burn); 100–150 years interior.
Wet Prairie	2–3 years, burned in conjunction with neighboring natural communities
Basin Marsh	Infrequent; may burn with adjacent pyric plant communities.
Scrub	8–10 years
Floodplain Marsh	Periodic; no established return interval
Floodplain Swamp	This is not a fire-adapted community.
Successional Hardwood Forest	This is not a fire-adapted community.
Xeric Hammock	This is not a fire-adapted community.
Mesic Hammock	This is not a fire-adapted community.

The above referenced fire return intervals relate to high quality natural communities. The fire return interval within degraded systems is variable. Prescribed fire will be applied as necessary to achieve restoration and management goals.

Mesic, scrubby and wet flatwoods are the most prevalent fire-adapted natural community types found within the Properties. Due to the embedded nature of these three natural communities, they will be burned in conjunction with each other and not broken into individual FMUs by natural communities. The fire return interval goal for these combined flatwoods will be 2–4 years, acknowledging that the burn pattern may be patchy, particularly in the scrubby flatwoods. Several timber stands within these flatwoods are slated for thinning in the near term or have recently received mechanical fuels treatments. These sites where disturbance has recently occurred will be the priority for upcoming prescribed fires. Initially, dormant season prescribed fires should be the

focus to reduce the standing fuel loads and minimize temperature stress to the overstory pines, while not ignoring the entirety of the November–August prescribed fire season seen in north Florida.

Sandhill is only found on the MCCA and, overall, is in degraded condition. The target fire return interval is 1–3 years. Some areas of sandhill are imbedded within mesic or scrubby flatwoods and will be burned in conjunction with those natural communities. The larger area of sandhill is located near Satsuma off Buffalo Bluff Road. This area has not received fire since District ownership. It has received fuels treatments including sand pine harvesting, herbicide treatments, and mulch mowing of encroaching hardwoods and sabal palms. This area is a priority for prescribed fire application to capitalize upon these efforts.

Floodplain marsh, only found significantly on the DCCA, is mainly driven by water level fluctuations though fire does play a role in its maintenance. The floodplain marsh is embedded within the non-pyric floodplain swamp in the northern portions of the DCCA and is heavily encroached by coastal plain willow and other woody species. It is believed that this example floodplain marsh was historically dominated by sawgrass, as a highly suppressed remnant coverage of this species remains scattered throughout the marsh. This community may be burned aerially when a nearby aerial burn is being conducted.

Fire management within the remaining pyric plant communities (below) will be in conjunction with the associated mesic flatwoods, scrubby flatwoods, wet flatwoods, or sandhill. These plant communities will burn as site conditions permit during the implementation of prescribed fires in adjacent plant communities. Additionally, these areas will not be excluded from fire activities unless warranted by safety or smoke management issues.

Depression marsh is a fire-adapted community. Though fire may not carry entirely through each marsh during every burn, it is an important factor in the maintenance and serves to restrict encroachment of woody plant species. Natural fire regime coincides with that of the adjacent habitat. Approximately 9 acres of depression marshes are adjacent to the uplands within the Properties. In general, depression marsh fires are carried through the herbaceous layer. Many of these marshy areas have been disturbed by past land use, but all still occupy an important niche in providing habitat for numerous species of wildlife. Fire may be applied to these marshes any time the surrounding natural communities are burned.

Four acres of dome swamps are scattered throughout the Properties. As site conditions and safety permits, fire will be allowed to burn into the domes to maintain the characteristic open edges of the domes while preventing excessive peat accumulation. Checking the soil moisture within and along the edge of the swamps should be conducted prior to prescribed fire operations to limit the chance of smoldering ignition.

There is a small portion of scrub (4 acres) on Murphy Island. Scrub has a longer fire return interval compared to the nearby flatwoods, being 8–10 years. This results in acceptably patchy burns on this natural community when it is burned in conjunction with the rest of the island.

Seasonality and Type of Fire
Historically, most fires in Florida occurred in what is commonly referred to as the "growing season." The growing season usually spans from April through August. Fires during the growing season generally have significant ecological benefits as most fire-adapted flora is perpetuated by fire. Mimicking lightning ignited natural fires by implementing prescribed fire during the growing season provides benefits to natural systems by controlling shrub layers and encouraging diversity in groundcover species.

Dormant season burns, conducted from late November through mid-March, help to reduce fuel loads in overgrown areas or in areas of newly planted pines. Cooler conditions associated with dormant season burning are a consideration in areas of high fuel loads and where only minimal pine mortality is acceptable. Additionally, dormant season burning may result in fewer safety and smoke management issues due to higher fuel moisture and more consistent winds. District staff will continue to work to maintain fire return frequencies that are consistent with those identified by FNAI for the various communities within the Properties.

In many cases, fire management units with similar fire management needs may be burned simultaneously, either with crews igniting the areas by hand from the ground, or with the aid of aircraft. Because the Properties are large and currently have an ample smoke shed, they are a candidate for implementing prescribed fire with the use of a helicopter. Aerial ignition allows District staff to ignite fire management units quickly, which results in faster burnout and reduces smoke management concerns. Additionally, convection produced by igniting an area can help move the smoke up and away more quickly. Aerial ignition also allows staff to introduce fire into areas that may be inaccessible from the ground, ensuring that prescribed fire is introduced into even the most remote areas within the fire management units. Aerial ignition allows staff to burn more acres in a shorter period, which in time will aid District staff in maintaining optimal fire return frequencies. An aerial burn safety plan (Exhibit 1) will accompany the individual burn prescriptions and be onsite and on the ground the day of any aerial burn. In the past, the trailhead parking lot was utilized as a helicopter landing zone for aerial operations.

Wildfire Policy
In the event of a wildfire, if conditions permit, suppression strategies will utilize existing fuel breaks to contain the wildfire. These fuel breaks may include previously burned areas, existing roads, trails, fire lines, wetlands and other water bodies. This is only possible with the agreement of local fire rescue, Florida Forest Service, District staff, and when all the following conditions are met:

1) Fuels within the area have been managed.
2) No extreme weather conditions are present or expected.
3) There are no other wildfires that may require action.
4) Sufficient resources are available to manage the fire to containment.
5) The fire and the resulting smoke will not impact neighbors or smoke-sensitive areas.

If any of these conditions are not met, direct suppression action will be taken.

As soon as possible following a fire in which fire lines are plowed, a plan for fireline rehabilitation shall be developed and implemented.

Persons discovering arson or wildfires on the Properties should report them to the Florida Forest Service, the District, or by dialing 911.

Post Burn Reports
Survey 123 burn reports must be completed after each prescribed burn or wildfire. These reports include detailed information regarding the acreage, fuel models, staff and equipment hours, cooperator hours, contractor hours, as well as a notes section that can include information on weather (forecasted and observed), and fire behavior. The timely completion of these reports is necessary for the compilation of information relative to the entire District burn program. Additionally, these reports provide a documented account of site-specific conditions, which are helpful in the planning of future burns.

Smoke Management
A significant challenge to the implementation of any prescribed burn program is smoke management (Figure 1). Fuel loads across the Properties are moderate to high. Accumulated fuels have the potential to produce a tremendous amount of smoke as areas are burned. As the surrounding areas become increasingly urbanized, smoke management concerns will increase in magnitude, as there become fewer acceptable places to maneuver a smoke column from a prescribed fire.

While the Properties currently has an acceptable smoke shed in which to place a smoke column from a prescribed fire, there are smoke-sensitive areas that surround the Properties and may affect the smoke management of each burn unit. Smoke management is a limiting factor in the application of prescribed fire within the Properties. Figures 1and 2 illustrate the smoke management area for the Properties. As development increases in the area, smoke management will become more difficult. Proximity to the city of Palatka as well as increasing daily traffic on U.S. 17 , SR 100, and other area roadways may further impair the District's ability to implement prescribed burns at the appropriate fire return intervals within the Properties. Currently, the Properties still have an acceptable smokeshed, using areas within the Properties themselves, nearby conservation land and the St. Johns River in which to place a smoke column from a prescribed fire.

Depending on the arrangement and composition of fuels, fire spread will be through grasses and/or needle litter, the shrub layer, or logging slash. Areas within the Properties having heavier shrub and mid-story fuel accumulation or logging slash can burn for long periods of time, causing additional smoke management issues.

A fire weather forecast is obtained and evaluated for suitable burning conditions and smoke management objectives. A wind direction is chosen that will transport smoke away from urbanized areas and/or pose the least possible impact on smoke-sensitive areas. When possible, the smoke plume from burns should be directed back through the Properties. Smoke can then mix

and loft into the atmosphere over uninhabited or rural land adequately enough to minimize off-site impacts.

On burn day, the ability of smoke to mix and disperse into the atmosphere should be good. The dispersion index is a value that indicates the atmosphere's ability to "absorb and disperse" smoke. The higher the index value, the more the smoke dissipates. Dispersion indices should be above 30. Dispersions of greater than 75 will not be utilized unless other weather and site conditions mitigate expected fire behavior, such as relative humidity no lower than 50% throughout the burn period or recent burn adjacent to the fire management unit. Forecast mixing heights should be above 1,700 feet. Transport winds should be at least 9 mph to effectively minimize residual smoke. Lower transport wind speeds can be utilized if dispersion index and mixing heights are above average. Burns will be conducted with a carefully plotted wind direction to limit and/or eliminate negative impacts from smoke to neighbors and urbanized areas. Land management program managers must be consulted in planning of burns that vary from the aforementioned parameters.

Fire Surrogates

Short- and long-term weather conditions and a fire management unit's proximity to urban areas become increasingly important when implementing a prescribed fire program. Should drought conditions become severe, or if smoke management becomes an insurmountable problem, the District may use fire surrogates, such as mechanical or chemical, as alternatives to prescribed fire. These surrogates can also be used to facilitate the reintroduction of prescribed fire in areas of heavy fuel loading from lack of contemporary fire history

Some of the pyric plant communities within the Properties are dominated by pine plantations. An integral component to the implementation of a successful prescribed fire program within the Properties is the harvesting of planted pine. Harvesting of pine trees will provide safer conditions for prescribed fire staff and decrease the potential for fire related mortality to the remaining pines and other desirable vegetation.

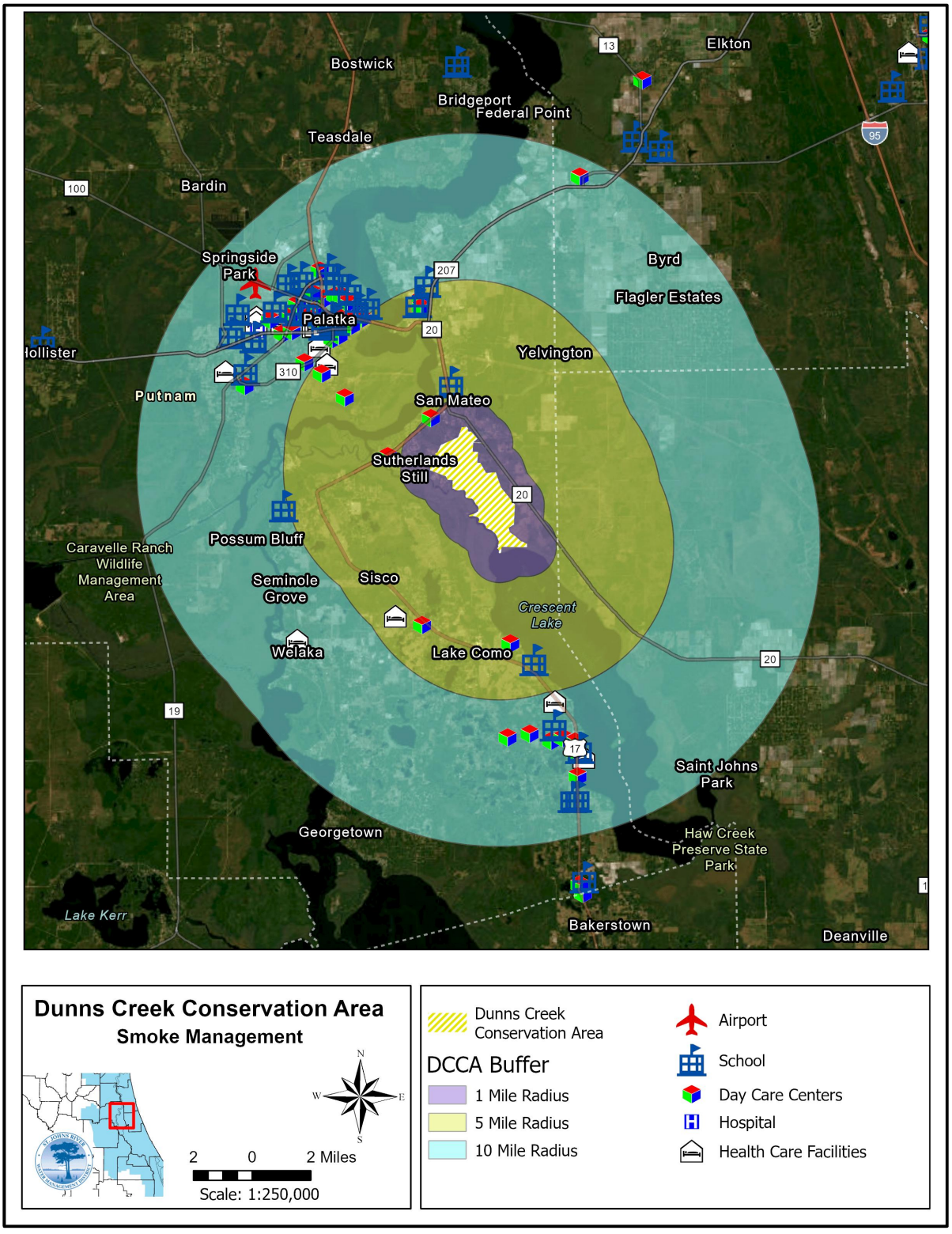

Figure 1: Fire management – DCCA smoke-sensitive areas

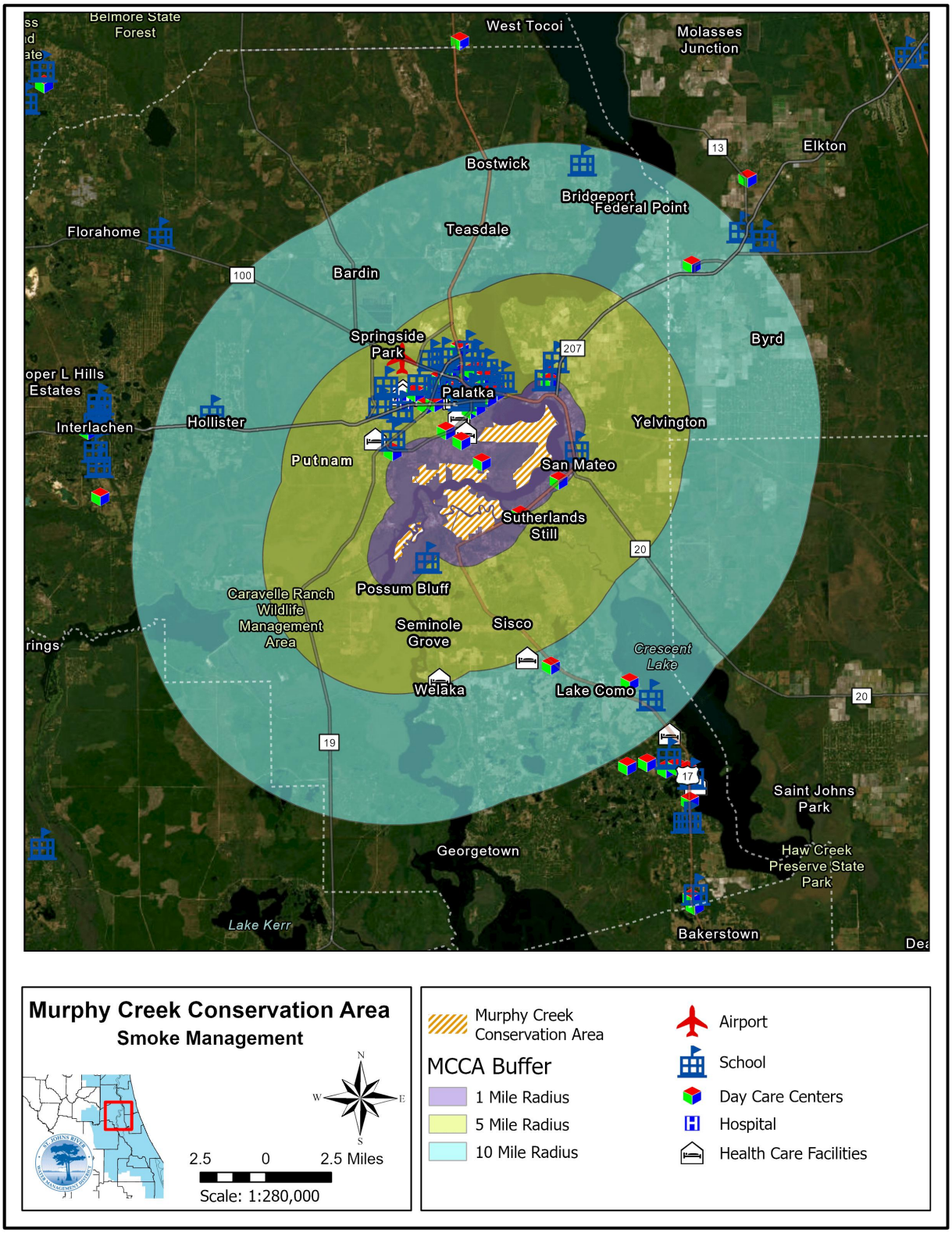

Figure 2: Fire management – MCCA smoke-sensitive areas

Hazards
Common hazards include heat stress, venomous snakes, trip hazards, or falling trees. Individual prescriptions address the hazards to consider when burning each unit and are discussed during the pre-burn briefing.

Legal Considerations
Only burn managers certified by Florida Forest Service will approve the unit prescriptions and must be on site while the burn is being conducted. Certified burn managers adhering to the requirements of Section 590.125, Florida Statutes, are protected from liability for damage or injury caused by fire or resulting smoke, unless gross negligence is proven.

Fire Management Units
Fire management units (FMUs) have been delineated on the Properties. Where logical, the District used existing roads and landscape features to delineate fire management units. Occasionally, multiple FMUs with similar fire needs will be burned simultaneously, and roads and natural landscape features provide a break in fuels so that staff may burn smaller areas than initially planned if needed.

Ideally, District staff thoroughly address and describe each fire management unit in terms of its fire management needs. All FMUs are categorized into one of several fuel model (FM) descriptions. The 13 standard fuel models (as described in Hal E. Anderson's *Aids to Determining Fuel Models for Estimating Fire Behavior*) were used as a basis for this categorization. The factors considered in determining each FM are amount, composition and arrangement of available fuels within units, predicted fire behavior within each unit (under conditions acceptable to implement a prescribed burn), and resources necessary to regain management of a fire in extenuating circumstances. District staff anticipates the change of vegetative assemblages over time due to growth and/or restoration and understand that fuel characteristics, models, and resulting fire behavior will also change.

Exhibit 1
Aerial Burn Safety Plan
Dunns Creek or Murphy Creek Conservation Areas

The hazards associated with this type of burning are related to working with the helicopter, the sphere dispenser, and dealing with active fire. All helicopter safety procedures and all District fireline policies and procedures will be followed.

1. **BRIEFING –** During the operational briefing, the safety plan will be reviewed with all personnel on the burn.
2. **HELICOPTER SAFETY –** The pilot will give a helicopter safety briefing at the morning operational briefing.
3. **AIDS SAFETY –** The operator will review the operation and cleaning procedures for the dispenser at the morning briefing.
4. **PERSONAL PROTECTIVE EQUIPMENT –** The incident commander will ensure that all personnel have the required Personal Protective Equipment (PPE).
5. **HIGH HAZARD AREAS –** All high hazard areas such as power lines shall be designated on the map and attached to the burn plan.
6. **EMERGENCY LANDING ZONES –** These should be confirmed with the pilot and indicated on the burn map.

Helispot: **Kay Larkin Airport**
Latitude 29° 39' 47" N **Longitude 81° 41 22" W**

Crash Rescue Plan

In the event of an accident involving the helicopter the following procedures will be followed.

INCIDENT COMMANDER or BURN BOSS

1. **Notify 911**
2. Notify Putnam County Fire Rescue (386) 313-4200
3. Notify Putnam Sheriff's Office (386) 313-4911
4. Assume responsibility of the Rescue Operation
5. Notify National Transportation Safety Board (NTSB) (305) 957-4610 or (404) 462-1666
6. Delegate responsibility of fire control to the second in command or the most qualified

SECOND IN COMMAND

1. Assume responsibility of the burn
2. Assist the Incident Commander (IC) or Burn Boss with resource and personnel needs for the rescue operation
3. If the IC is in the helicopter, second in command will assume rescue operation responsibilities and assign the most qualified to fire control

Emergency Phone Numbers
AIR RESCUE UNITS

1. Orlando Regional Medical Center
Air Services (**407) 843-5783 or (800) 895-4615**

BURN UNIT LOCATIONS

1. Orlando Regional Medical Center – Burn Unit (**407) 237-6398**

FLORIDA FOREST SERVICE

1. Bunnell District Dispatch (**386) 585-6151**

NTSB

1. Southeast Regional Office (**305) 957-4610**
2. Southeast Field Office (**404) 462-1666**

APPENDIX D: COMBINED CONSERVATION AREA SPECIES LIST

Plants

Scientific Name	Common Name	DCCA	MCCA	Both	Species Status		
					USFWS	FWC	FNAI
Acer rubrum	red maple			X			
Acrostichum danaeifolium	giant leather fern		X				
Aesculus pavia	red buckeye			X			
Agalinis setacea	threadleaf false foxglove		X				
Alternanthera philoxeroides	alligatorweed		X				
Amorpha fruticosa	false indigo bush		X				
Ampelaster carolinianus	climbing aster			X			
Amphicarpum muhlenbergianum	blue maidencane	X					
Andropogon capillipes	chalky bluestem	X					
Andropogon cretaceus	purple bluestem	X					
Andropogon glomeratus	bushy bluestem	X					
Aristida purpurascens	arrowfeather threeawn	X					
Aristida spiciformis	bottlebrush threeawn			X			
Aristida stricta	wiregrass	X					
Asclepias curassavica	tropical milkweed		X				
Asclepias lanceolata	fewflower milkweed			X			
Asclepias pedicellata	savannah milkweed			X			
Asclepias perennis	aquatic milkweed	X					
Asemeia grandiflora	showy milkwort		X				

Asimina incana	woolly pawpaw		X				
Asimina parviflora	small-flower pawpaw		X				
Aster sp.	aster	X					
Azolla caroliniana	eastern mosquito fern		X				
Bejaria racemosa	tarflower		X				
Bidens laevis	smooth beggarticks		X				
Boehmeria cylindrica	false nettle		X				
Callicarpa americana	American beautyberry		X				
Campsis radicans	American trumpet vine	X					
Castanea pumila	Allegheny chinquapin		X				
Celtis laevigata	sugar hackberry		X				
Centella erecta	American coinwort	X					
Centrosema virginianum	butterfly pea		X				
Chamaecrista fasciculata	partridge pea		X				
Chaptalia tomentosa	pineland daisy	X					
Chasmanthium nitidum	shiny woodoats		X				
Christella dentata	soft fern		X				
Cladium jamaicense	sawgrass	X					
Clematis baldwinii	Baldwin's clematis	X					
Clematis crispa	swamp leatherflower		X				
Colocasia esculenta	taro		X				
Conradina cygniflora	swanflower false rosemary			X			

Cornus foemina	stiff dogwood			X			
Crinum americanum	southern swamp crinum		X				
Crocanthemum corymbosum	pine barren frostweed		X				
Croptilon divaricatum	slender scratch daisy		X				
Crotalaria spectabilis	showy rattlebox		X				
Cyclosorus interruptus	swamp shield-fern	X					
Desmodium incanum	creeping beggarweed		X				
Dichanthelium commutatum	variable witchgrass		X				
Dichanthelium patulum	hemlock witchgrass	X					
Dichanthelium scabriusculum	woolly witchgrass	X					
Diodia harperi	Harper's buttonweed	X					
Diospyros virginiana	common persimmon		X				
Distimake dissectus	alamo vine		X				
Drosera brevifolia	dwarf sundew		X				
Drosera capillaris	pink sundew		X				
Echinochloa muricata	rough barnyard grass		X				
Epidendrum conopseum	greenfly orchid		X				
Erechtites hieraciifolius	American burnweed	X					
Erigeron quercifolius	oakleaf fleabane	X					
Eryngium aromaticum	fragrant eryngo		X				
Eubotrys racemosa	fetterbush	X					
Eupatorium compositifolium	coastal dog fennel		X				

Eustachys neglecta	fourspike fingergrass		X				
Froelichia floridana	plains snakecotton		X				
Gaillardia pulchella	firewheel	X					
Garberia heterophylla	garberia		X				
Gordonia lasianthus	loblolly bay		X				
Gratiola ramosa	branched hedge-hyssop	X					
Habenaria floribunda	toothpetal false reinorchid		X				
Hamamelis virginiana	common witch-hazel		X				
Hamelia patens	firebush		X				
Helenium pinnatifidum	southeastern sneezeweed	X					
Houstonia procumbens	roundleaf bluet		X				
Hydrocotyle umbellata	manyflower marshpenny wort	X					
Hydrocotyle verticillata	whorled pennywort	X					
Hydrolea corymbosa	skyflower	X					
Hypericum cistifolium	roundpod St. John's-wort		X				
Hypericum hypericoides	St. Andrew’s cross		X				
Hypericum myrtifolium	myrtleleaf St. John's-wort	X					
Hypericum tetrapetalum	fourpetal St. John’s-wort	X					
Hypoxis juncea	fringed star grass	X					
Ilex cassine	dahoon holly			X			
Ilex glabra	gallberry	X					
Ilex vomitoria	yaupon holly		X				

Ipomoea alba	moonflower		X				
Iris virginica	southern blue flag			X			
Itea virginica	Virginia sweetspire	X					
Juncus effusus	soft rush	X					
Juncus megacephalus	bighead rush	X					
Juncus scirpoides	needlepod rush		X				
Juniperus virginiana	eastern red cedar	X					
Kosteletzkya pentacarpos	saltmarsh mallow		X				
Lechea sessiliflora	pineland pinweed		X				
Lespedeza hirta	hairy lespedeza		X				
Limnobium spongia	American frogbit	X					
Lindernia monticola	flatrock pimpernel	X					
Liquidambar styraciflua	American sweetgum	X					
Lobelia paludosa	white lobelia	X					
Lonicera sempervirens sempervirens	trumpet honeysuckle		X				
Ludwigia octovalvis	Mexican primrose-willow	X					
Lupinus villosus	lady lupine		X				
Lyonia lucida	fetterbush lyonia	X					
Magnolia virginiana	sweetbay magnolia			X			
Melanthera nivea	snow squarestem		X				
Monarda punctata	spotted horsemint		X				
Monotropa uniflora	ghost pipe		X				

Morella cerifera	southern wax myrtle			X			
Nuphar advena	spatterdock	X					
Nuphar lutea	yellow water-lily	X					
Nyssa biflora	swamp tupelo	X					
Odontonema tubaeforme	firespike		X				
Opuntia mesacantha	southeastern pricklypear		X				
Orthochilus ecristatus	giant orchid			X	N	T	G4/S4
Osmunda spectabilis	American royal fern	X					
Osmundastrum cinnamomeum	cinnamon fern	X					
Oxalis debilis	largeflower pink-sorrel		X				
Paepalanthus beyrichianus	southern bogbutton		X				
Palafoxia integrifolia	coastalplain palafox		X				
Panicum hemitomon	maidencane	X					
Panicum repens	torpedo grass		X				
Panicum virgatum	switchgrass	X					
Parthenocissus quinquefolia	Virginia creeper	X					
Passiflora incarnata	purple passionflower		X				
Persea borbonia	redbay		X				
Persea palustris	swamp bay	X					
Persicaria glabra	dense-flowered smartweed		X				
Phanopyrum gymnocarpon	cottonmouth grass		X				
Phlox drummondii	Drummond's phlox		X				

Phyla nodiflora	turkey tangle frogfruit		X				
Physostegia leptophylla	slenderleaf false dragonhead		X				
Physostegia purpurea	false dragonhead	X					
Pilea microphylla	artillery plant		X				
Pinguicula caerulea	blue butterwort		X				
Pinguicula pumila	small butterwort			X			
Pinus elliottii	slash pine			X			
Pinus palustris	longleaf pine			X			
Pinus serotina	pond pine			X			
Pinus taeda	loblolly pine	X					
Pinus taedea	loblolly pine		X				
Platanthera cristata	orange crested orchid		X				
Pluchea longifolia	longleaf camphorweed		X				
Polygonella gracilis	tall jointweed		X				
Pontederia cordata	pickerelweed	X					
Pontederia crassipes	common water hyacinth		X				
Quercus geminata	sand live oak		X				
Quercus hemisphaerica	laurel oak			X			
Quercus incana	bluejack oak		X				
Quercus laevis	turkey oak		X				
Quercus laurifolia	swamp laurel oak			X			
Quercus margaretiae	sand post oak		X				
Quercus myrtifolia	myrtle oak		X				

Quercus nigra	water oak			X			
Quercus virginiana	live oak	X					
Rhapidophyllum hystrix	needle palm		X				
Rhexia nashii	maid marian	X					
Rhynchospora megalocarpa	sandyfield beaksedge		X				
Rhynchospora miliacea	millet beaksedge			X			
Rhynchospora plumosa	plumed beaksedge		X				
Rosa palustris	swamp rose		X				
Sabal minor	dwarf palmetto	X					
Sabal palmetto	cabbage palm	X					
Sabatia calycina	coastal rose gentian			X			
Salvia lyrata	lyreleaf sage		X				
Salvinia minima	water spangles	X					
Samolus parviflorus	seaside brookweed		X				
Sanicula canadensis canadensis	short-styled black snakeroot	X					
Sarracenia minor	hooded pitcher plant			X	N	T	G4T4/ S4
Saururus cernuus	lizard's tail	X					
Scleria triglomerata	whip nutrush		X				
Scutellaria integrifolia	helmet skullcap	X					
Senega incarnata	pink milkwort		X				
Senega lutea	orange milkwort		X				
Senega nana	candyroot			X			
Serenoa repens	saw palmetto			X			
Seymeria pectinata	combleaf blacksenna		X				

Smilax bona-nox	saw greenbrier			X			
Solidago chapmanii	Chapman's goldenrod		X				
Sphagneticola trilobata	trailing daisy		X				
Spiranthes praecox	grass-leaved ladies' tresses			X			
Stachys floridana	Florida hedgenettle	X					
Stokesia laevis	Stokes' aster		X				
Stylisma angustifolia	narrowleaf coastalplain dawnflower		X				
Syngonanthus flavidulus	yellow hatpins	X					
Tamala humilis	scrub-bay			X			
Taxodium acendens	pond cypress			X			
Taxodium distichum	bald cypress			X			
Telmatoblechnum serrulatum	toothed midsorus fern	X					
Thelypteris palustris pubescens	eastern American marsh fern	X					
Tillandsia bartramii	Bartram's airplant	X					
Tillandsia utriculata	giant airplant		X				
Trichostema dichotomum	blue curls		X				
Tridens flavus	purpletop tridens		X				
Triodanis perfoliata	clasping Venus' looking-glass	X					
Utricularia foliosa	leafy bladderwort	X					
Utricularia purpurea	purple bladderwort	X					

Utricularia subulata	zigzag bladderwort		X				
Vaccinium arboreum	sparkleberry	X					
Vernonia gigantea	tall ironweed		X				
Vicia acutifolia	fourleaf vetch	X					
Vittaria lineata	shoestring fern	X					
Woodwardia areolata	netted chain fern	X					
Woodwardia virginica	Virginia chainfern	X					
Xyris brevifolia	shortleaf yellow-eyed grass	X					
Xyris caroliniana	Carolina yellow-eyed grass		X				
Xyris platylepis	tall yellow-eyed grass		X				
Youngia japonica	Oriental false hawksbeard		X				
Zephyranthes atamasco	atamasco lily	X					
Zeuxine strateumatica	centipede grass orchid		X				

Invasive Plants

Includes both Florida Invasive Species Council (FISC) Category I (natural community altering) and Category II (significant population expansion but not yet natural community altering) plants for both Properties.

Scientific Name	**Common Name**
Cinnamomum camphora	camphortree
Commelina communis	Asiatic dayflower
Imperata cylindrica	cogongrass
Indigofera hirsuta	hairy indigo
Lantana camara	lantana; shrub verbena
Lygodium japonicum	Japanese climbing fern
Lygodium microphyllum	old world climbing fern

Melinis repens	natal grass
Panicum repens	torpedo grass
Paspalum notatum	bahiagrass
Ruellia simplex	Mexican ruellia
Sapium sebiferum	popcorntree; Chinese tallowtree
Solanum viarum	tropical soda apple
Triadica sebifera	Chinese tallow
Urena lobata	caesarweed

Birds

Scientific Name	Common Name	DCCA	MCCA	Both	Species Status		
					USFWS	FWC	FNAI
Accipiter striatus	Sharp-shinned Hawk		X				
Agelaius phoeniceus	Red-winged Blackbird		X				
Aix sponsa	Wood Duck			X			
Ammodramus savannarum	Grasshopper Sparrow		X				
Ammospiza leconteii	LeConte's Sparrow		X				
Anas crecca	Green-winged Teal		X				
Anas fulvigula	Mottled Duck		X				
Anas platyrhynchos	Mallard		X				
Anhinga anhinga	Anhinga			X			
Anthus rubescens	American Pipit		X				
Antigone canadensis	Sandhill Crane			X	N	ST	G5T2/S2
Antrostomus carolinensis	Chuck-will's-widow			X			
Antrostomus vociferus	Eastern Whip-poor-will		X				
Aramus guarauna	Limpkin		X				

Archilochus colubris	Ruby-throated Hummingbird			X			
Ardea alba	Great Egret			X			
Ardea herodias	Great Blue Heron			X			
Ardea ibis	Western Cattle-Egret			X			
Arenaria interpres	Ruddy Turnstone		X				
Astur cooperii	Cooper's Hawk		X				
Aythya affinis	Lesser Scaup		X				
Aythya americana	Redhead		X				
Aythya collaris	Ring-necked Duck		X				
Aythya valisineria	Canvasback		X				
Baeolophus bicolor	Tufted Titmouse			X			
Bartramia longicauda	Upland Sandpiper		X				
Bombycilla cedrorum	Cedar Waxwing		X				
Botaurus exilis	Least Bittern		X				
Botaurus lentiginosus	American Bittern		X				
Branta canadensis	Canada Goose		X				
Bubo virginianus	Great Horned Owl		X				
Bucephala albeola	Bufflehead		X				
Bucephala clangula	Common Goldeneye		X				
Buteo brachyurus	Short-tailed Hawk			X			
Buteo jamaicensis	Red-tailed Hawk			X			
Buteo lineatus	Red-shouldered Hawk			X			

Butorides virescens	Green Heron		X				
Calidris alpina	Dunlin		X				
Cardellina canadensis	Canada Warbler		X				
Cardinalis cardinalis	Northern Cardinal			X			
Cathartes aura	Turkey Vulture			X			
Catharus fuscescens	Veery		X				
Catharus guttatus	Hermit Thrush		X				
Catharus minimus	Gray-cheeked Thrush		X				
Catharus ustulatus	Swainson's Thrush		X				
Centronyx henslowii	Henslow's Sparrow		X				
Chaetura pelagica	Chimney Swift			X			
Charadrius vociferus	Killdeer		X				
Chondestes grammacus	Lark Sparrow		X				
Chordeiles minor	Common Nighthawk		X				
Chroicocephalus philadelphia	Bonaparte's Gull		X				
Chroicocephalus ridibundus	Black-headed Gull		X				
Circus hudsonius	Northern Harrier		X				
Cistothorus palustris	Marsh Wren		X				
Cistothorus stellaris	Sedge Wren		X				
Coccyzus americanus	Yellow-billed Cuckoo			X			
Colaptes auratus	Northern Flicker		X				
Colinus virginianus	Northern Bobwhite			X			

Columba livia	Rock Pigeon		X				
Columbina passerina	Common Ground Dove			X			
Contopus virens	Eastern Wood-Pewee		X				
Coragyps atratus	Black Vulture			X			
Corthylio calendula	Ruby-crowned Kinglet		X				
Corvus brachyrhynchos	American Crow			X			
Corvus ossifragus	Fish Crow		X				
Cyanocitta cristata	Blue Jay			X			
Dendrocygna autumnalis	Black-bellied Whistling-Duck			X			
Dolichonyx oryzivorus	Bobolink		X				
Dryobates pubescens	Downy Woodpecker			X			
Dryobates villosus	Hairy Woodpecker		X				
Dryocopus pileatus	Pileated Woodpecker			X			
Dumetella carolinensis	Gray Catbird			X			
Egretta caerulea	Little Blue Heron			X	N	ST	G5/S4
Egretta thula	Snowy Egret			X	N	N	G5/S3
Egretta tricolor	Tricolored Heron			X	N	ST	G5/S4
Elanoides forficatus	Swallow-tailed Kite			X	N	N	G5/S2
Elanus leucurus	White-tailed Kite		X		N	N	G5/S1
Empidonax virescens	Acadian Flycatcher			X			
Eudocimus albus	White Ibis			X	N	N	G5/S4
Euphagus carolinus	Rusty Blackbird		X				

Falco columbarius	Merlin		X		N	N	G5/S2
Falco sparverius	American Kestrel		X		N	ST	G4G5/S1
Fulica americana	American Coot		X				
Gallinago delicata	Wilson's Snipe		X				
Gallinula galeata	Common Gallinule		X				
Geothlypis formosa	Kentucky Warbler		X				
Geothlypis trichas	Common Yellowthroat			X			
Haemorhous mexicanus	House Finch		X				
Haemorhous purpureus	Purple Finch		X				
Haliaeetus leucocephalus	Bald Eagle			X			
Helmitheros vermivorum	Worm-eating Warbler		X				
Hirundo rustica	Barn Swallow		X				
Hydroprogne caspia	Caspian Tern		X				
Hylocichla mustelina	Wood Thrush		X				
Icteria virens	Yellow-breasted Chat		X				
Icterus galbula	Baltimore Oriole		X				
Ictinia mississippiensis	Mississippi Kite			X			
Junco hyemalis	Dark-eyed Junco		X				
Lanius ludovicianus	Loggerhead Shrike		X				
Leiothlypis celata	Orange-crowned Warbler		X				
Leiothlypis peregrina	Tennessee Warbler		X				

Leiothlypis ruficapilla	Nashville Warbler		X				
Leucophaeus atricilla	Laughing Gull		X				
Leucophaeus pipixcan	Franklin's Gull		X				
Limnodromus scolopaceus	Long-billed Dowitcher		X				
Limosa fedoa	Marbled Godwit		X				
Lophodytes cucullatus	Hooded Merganser		X				
Mareca americana	American Wigeon		X				
Megaceryle alcyon	Belted Kingfisher		X				
Megascops asio	Eastern Screech-Owl		X				
Melanerpes carolinus	Red-bellied Woodpecker			X			
Melanerpes erythrocephalus	Red-headed Woodpecker		X				
Melanitta perspicillata	Surf Scoter		X				
Meleagris gallopavo	Wild Turkey			X			
Melospiza georgiana	Swamp Sparrow		X				
Melospiza lincolnii	Lincoln's Sparrow		X				
Melospiza melodia	Song Sparrow		X				
Mergus serrator	Red-breasted Merganser		X				
Mimus polyglottos	Northern Mockingbird			X			
Mniotilta varia	Black-and-white Warbler			X			
Molothrus ater	Brown-headed Cowbird		X				

Mycteria americana	Wood Stork		X		T, PDL	FT	G4 S2
Myiarchus cinerascens	Ash-throated Flycatcher		X				
Myiarchus crinitus	Great Crested Flycatcher			X			
Nannopterum auritum	Double-crested Cormorant		X				
Nyctanassa violacea	Yellow-crowned Night Heron			X	N	N	G5/S3
Nycticorax nycticorax	Black-crowned Night Heron		X		N	N	G5/S3
Oxyura jamaicensis	Ruddy Duck		X				
Pandion haliaetus	Osprey			X	N	N	G5/S3S4
Parkesia motacilla	Louisiana Waterthrush		X				
Parkesia noveboracensis	Northern Waterthrush		X				
Passer domesticus	House Sparrow		X				
Passerculus sandwichensis	Savannah Sparrow		X				
Passerella iliaca	Fox Sparrow		X				
Passerina caerulea	Blue Grosbeak		X				
Passerina cyanea	Indigo Bunting			X			
Pavo cristatus	Indian Peafowl		X				
Peucaea aestivalis	Bachman's Sparrow		X		N	N	G3/S3
Pheucticus ludovicianus	Rose-breasted Grosbeak		X				
Pipilo erythrophthalmus	Eastern Towhee			X			
Piranga olivacea	Scarlet Tanager		X				

Piranga rubra	Summer Tanager		X				
Platalea ajaja	Roseate Spoonbill		X		N	ST	G5/S2
Plegadis falcinellus	Glossy Ibis		X		N	N	G5/S3
Pluvialis squatarola	Black-bellied Plover		X				
Podiceps auritus	Horned Grebe		X				
Podilymbus podiceps	Pied-billed Grebe		X				
Poecile carolinensis	Carolina Chickadee			X			
Polioptila caerulea	Blue-gray Gnatcatcher			X			
Pooecetes gramineus	Vesper Sparrow		X				
Porphyrio martinica	Purple Gallinule		X				
Porzana carolina	Sora		X				
Progne subis	Purple Martin		X				
Protonotaria citrea	Prothonotary Warbler			X			
Quiscalus major	Boat-tailed Grackle		X				
Quiscalus quiscula	Common Grackle			X			
Rallus elegans	King Rail		X				
Rallus limicola	Virginia Rail		X				
Recurvirostra americana	American Avocet		X		N	N	G5/S2
Regulus satrapa	Golden-crowned Kinglet		X				
Riparia riparia	Bank Swallow		X				
Rynchops niger	Black Skimmer		X				
Sayornis phoebe	Eastern Phoebe		X				

Scolopax minor	American Woodcock		X				
Seiurus aurocapilla	Ovenbird		X				
Setophaga americana	Northern Parula			X			
Setophaga caerulescens	Black-throated Blue Warbler		X				
Setophaga castanea	Bay-breasted Warbler		X				
Setophaga citrina	Hooded Warbler			X			
Setophaga coronata	Yellow-rumped Warbler		X				
Setophaga discolor	Prairie Warbler			X			
Setophaga dominica	Yellow-throated Warbler		X				
Setophaga fusca	Blackburnian Warbler		X				
Setophaga magnolia	Magnolia Warbler		X				
Setophaga palmarum	Palm Warbler		X				
Setophaga pensylvanica	Chestnut-sided Warbler			X			
Setophaga petechia	Yellow Warbler		X				
Setophaga pinus	Pine Warbler			X			
Setophaga ruticilla	American Redstart		X				
Setophaga striata	Blackpoll Warbler		X				
Setophaga tigrina	Cape May Warbler		X				
Setophaga virens	Black-throated Green Warbler		X				

Sialia sialis	Eastern Bluebird			X			
Sitta canadensis	Red-breasted Nuthatch		X				
Sitta pusilla	Brown-headed Nuthatch			X			
Spatula clypeata	Northern Shoveler		X				
Spatula discors	Blue-winged Teal		X				
Sphyrapicus varius	Yellow-bellied Sapsucker			X			
Spinus pinus	Pine Siskin		X				
Spinus tristis	American Goldfinch		X				
Spizella passerina	Chipping Sparrow		X				
Spizella pusilla	Field Sparrow		X				
Stelgidopteryx serripennis	Northern Rough-winged Swallow		X				
Sterna forsteri	Forster's Tern			X			
Sterna hirundo	Common Tern		X				
Sternula antillarum	Least Tern		X				
Streptopelia decaocto	Eurasian Collared-Dove		X				
Strix varia	Barred Owl			X			
Sturnella magna	Eastern Meadowlark		X				
Sturnus vulgaris	European Starling			X			
Tachycineta bicolor	Tree Swallow		X				
Thalasseus maximus	Royal Tern		X				

Thalasseus sandvicensis	Sandwich Tern		X				
Thryothorus ludovicianus	Carolina Wren			X			
Toxostoma rufum	Brown Thrasher			X			
Tringa flavipes	Lesser Yellowlegs		X				
Tringa melanoleuca	Greater Yellowlegs		X				
Tringa semipalmata	Willet		X				
Troglodytes aedon	Northern House Wren		X				
Troglodytes hiemalis	Winter Wren		X				
Turdus migratorius	American Robin		X				
Tyrannus dominicensis	Gray Kingbird		X				
Tyrannus tyrannus	Eastern Kingbird		X				
Tyto furcata	American Barn Owl		X				
Vermivora chrysoptera	Golden-winged Warbler		X				
Vermivora cyanoptera	Blue-winged Warbler		X				
Vireo flavifrons	Yellow-throated Vireo		X				
Vireo griseus	White-eyed Vireo			X			
Vireo olivaceus	Red-eyed Vireo			X			
Vireo philadelphicus	Philadelphia Vireo		X				
Vireo solitarius	Blue-headed Vireo		X				
Zenaida asiatica	White-winged Dove		X				

Zenaida macroura	Mourning Dove			X			
Zonotrichia albicollis	White-throated Sparrow		X				
Zonotrichia leucophrys	White-crowned Sparrow		X				

Reptiles
All species occur on both Properties

Scientific Name	**Common Name**	**Species Status**		
		USFWS	**FWC**	**FNAI**
Agkistrodon conanti	Florida cottonmouth			
Alligator mississippiensis	American alligator	SAT	FT(S/A)	S4/G5
Anolis carolinensis	Green anole			
Anolis sagrei	Brown anole			
Apalone ferox	Florida softshell turtle			
Aspidoscelis sexlineatus	Six-lined racerunner (MCCA)			
Chelydra serpentina	Common snapping turtle			
Coluber constrictor	Black racer			
Crotalus adamanteus	Eastern diamondback rattlesnake	UR	N	S3/G3
Deirochelys reticularia	Chicken turtle			
Farancia abacura abacura	Eastern mudsnake			
Gopherus polyphemus	Gopher tortoise	N	ST	S3/G3
Kinosternon baurii	Three-striped mud turtle			
Micrurus fulvius	Harlequin coral snake			
Nerodia fasciata pictiventris	Florida watersnake			
Ophisaurus ventralis	Eastern glass lizard			
Pantherophis guttata	Corn snake			

Pantherophis alleghaniensis	Eastern rat snake			
Pseduemys nelsoni	Florida redbelly turtle			
Pseduemys peninsularis	Peninsula cooter			
Scincella lateralis	Little brown skink			
Sistrurus miliarius barbouri	Dusky pygmy rattlesnake			
Sternotherus odoratus	Common musk turtle			
Terrapene carolina bauri	Florida box turtle			
Thamnophis sirtalis sirtalis	Eastern garter snake			

Amphibians

Scientific Name	**Common Name**	**Species Status**		
		USFWS	**FWC**	**FNAI**
Acris gryllus	Southern cricket frog			
Anaxyrus quercicus	Oak toad			
Anaxyrus terrestris	Southern toad			
Hyla cinerea	Green treefrog			
Hyla crucifer	Spring peeper			
Hyla femoralis	Pinewoods treefrog			
Hyla gratiosa	Barking treefrog			
Hyla squirella	Squirrel treefrog			
Lithobates sphenocephalus	Southern leopard frog			
Pseudacris ocularis	Little grass frog			
Rana catesbeiana	Bullfrog			
Rana grylio	Pig frog			

Mammals

Scientific Name	**Common Name**	**Species Status**		
		USFWS	**FWC**	**FNAI**
Dasypus novemcinctus	Nine-banded armadillo			
Dedelphis virginiana	Opossum			
Lynx rufus	Bobcat			
Odocoileus virginianus	White-tailed deer			
Procyon lotor	Racoon			

Ursus americanus floridanus	Florida black bear			
Sciurus carolinensis	Eastern gray squirrel			
Sus scrofa	Feral hog			
Sylvilagus floridanus	Eastern cottontail rabbit			

Invertebrates

Scientific Name	**Common Name**	**Species Status**		
		USFWS	**FWC**	**FNAI**
Allograpta obliqua	Oblique streaktail			
Anartia jatrophae	White peacock			
Apis mellifera	Western honey bee			
Argyrostrotis quadrifilaris	Four-lined chocolate moth			
Battus philenor	Pipevine swallowtail			
Bombus impatiens	Common eastern bumble bee			
Calycopis cecrops	Red-banded hairstreak			
Chauliognathus marginatus	Margined leatherwing beetle			
Choranthus capucinus	Monk skipper			
Coryphaeschna ingens	Regal darner			
Danaus plexippus	Monarch			
Diceroprocta olympusa	Olympic scrub cicada			
Dione vanillae	Gulf fritillary			
Dytiscidae	Predaceous diving beetle			
Enallagma signatum	Orange bluet			
Epargyreus clarus	Silver-spotted skipper			
Erastria coloraria	Broad-lined Erastria moth			
Erynnis zarucco	Zarucco duskywing			
Erythemis simplicicollis	Eastern pondhawk			
Erythrodiplax minuscula	Little blue dragonlet			
Eurycotis floridana	Florida woods cockroach			
Gyrinidae	Whirligig beetles			
Heliconius charithonia	Zebra longwing			
Laphria saffrana	Robber fly			
Leptoglossus phyllopus	Eastern leaf-footed bug			
Leucochrysa pavida	Lichen-carrying green lacewing			
Libellula incesta	Slaty skimmer			
Libellula needhami	Needham's skimmer			

Liriomyza schmidti	Leaf miner			
Oligoria maculata	Twin-spot skipper			
Ormenaria rufifascia	Palm flatid planthopper			
Orthemis ferruginea	Roseate skimmer			
Pachydiplax longipennis	Blue dasher			
Papilio palamedes	Palamedes swallowtail			
Peltotrupes profundus	Florida deep-digger scarab			
Perithemis tenera	Eastern amberwing			
Phyciodes phaon	Phaon crescent			
Plecia nearctica	Common lovebug			
Pogonomyrmex badius	Florida harvester ant			
Polistes dorsalis	Hunter's little paper wasp			
Polites vibex	Whirlabout			
Procambarus alleni	Everglades crayfish			
Pygodasis quadrimaculata	Large four-spotted scoliid wasp			
Romalea microptera	Eastern lubber grasshopper			
Typocerus zebra	Zebra longhorn			
Urbanus proteus	Long-tailed skipper			
Utetheisa ornatrix	Ornate bella moth			
Xylocopa virginica	Eastern carpenter bee			

FNAI GLOBAL RANKING
G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6–20 occurrences or less than 3,000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = Either very rare and local throughout its range (21–100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).

FNAI STATE RANKING
S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1,000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

S2 = Imperiled in Florida because of rarity (6–20 occurrences or less than 3,000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21–100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.

FEDERAL LEGAL STATUS
C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.
E = Endangered: species in danger of extinction throughout all or a significant portion of its range.
T = Threatened: species likely to become Endangered within the foreseeable future throughout all or
a significant portion of its range.
SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.
PE = Proposed for listing as Endangered species.
PT = Proposed for listing as Threatened species.
PDL = Potential De-listing
SC = Not currently listed but considered a "species of concern" to USFWS.
N = Not currently listed, nor currently being considered for listing as Endangered or Threatened.

STATE LEGAL STATUS
Animals:
FT(S/A) = Threatened due to similarity of appearance
FEL = Listed as Endangered Species at the Federal level by the USFWS
FT = Listed as Threatened Species at the Federal level by the USFWS
ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
SSC = Listed as a Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.
N = Not currently listed, nor currently being considered for listing.
Plants:
E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.

T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.
N = Not currently listed, nor currently being considered for listing.