July 2017

Brownie Wise Park
at
Tupperware Island Conservation Area
Land Management Plan

Prepared For:

Osceola County Parks

LAND MANAGEMENT PLAN
Brownie Wise Park at Tupperware Island Conservation Area
Osceola County, Florida

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1.0 INTRODUCTION

Brownie Wise Park at Tupperware Island Conservation Area (TICA) consists of two contiguous parcels located within the northeastern corner of Lake Tohopekaliga in Osceola County, Florida (**Figure 1**). TICA is approximately 25 acres in size and is historically known as Candella Island (parcels: 26-25-29-0000-0200-0000 Gov. Lot 6 (24.62 acres) and 26-25-29-5183-0001-00E0 Sunset Pointe PG 7 – Tract E (0.80 acres)), **Figure 2**. The TICA was recorded by Osceola County (County), in December 2014. In 2016, the County received a donation of $200,000.00 from Tupperware to help establish the Brownie Wise Park (BWP) at TICA.

2.0 AREA OVERVIEW

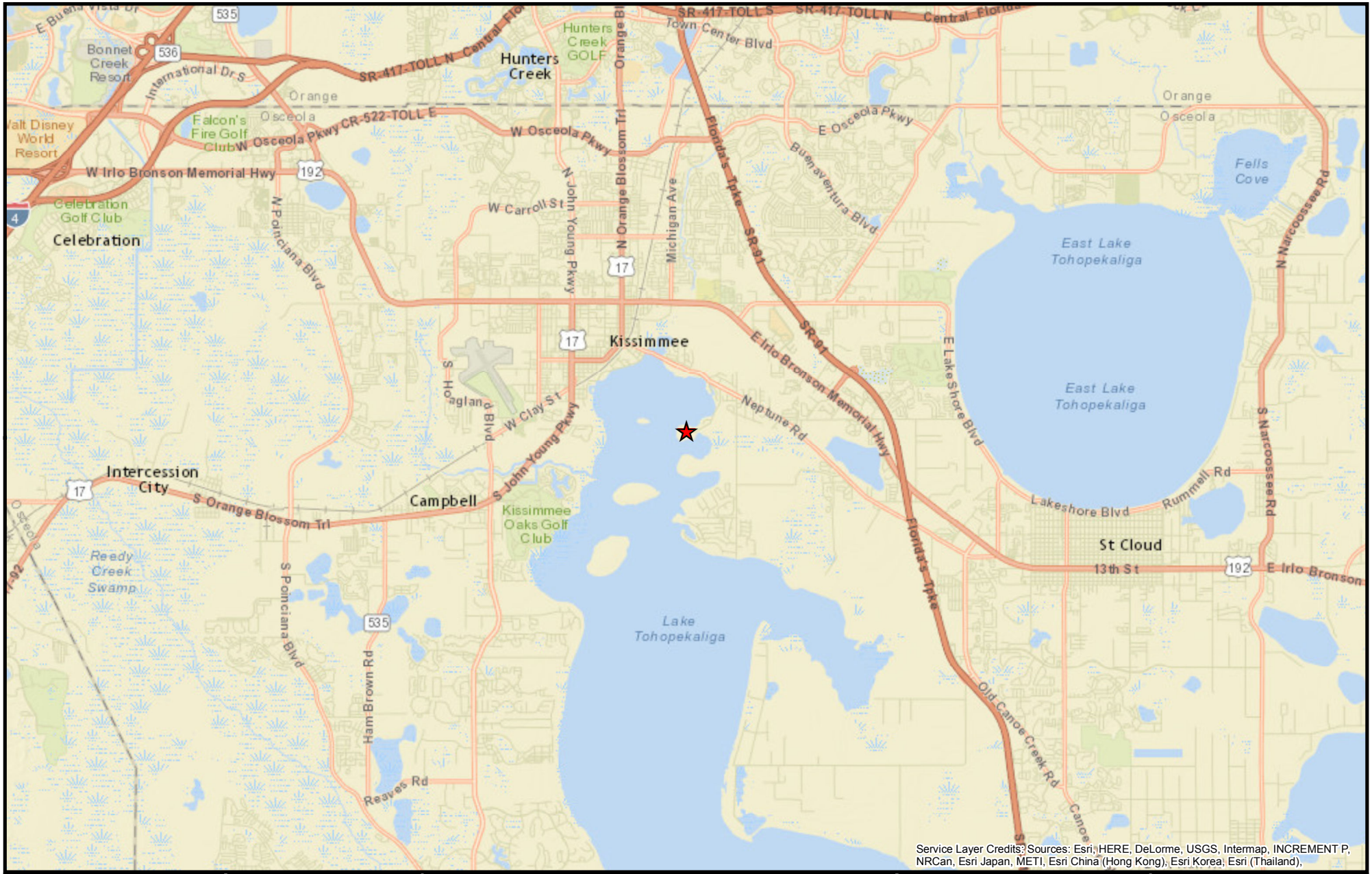
The TICA is an approximate 25 acre peninsula located in the northeast portion of Lake Tohopekaliga, in Kissimmee, Florida, and is the location of Osceola County's BWP. A large majority of BWP consists of upland sandy soil types that were historically utilized for agricultural purposes (1944 Flight 6C aerial – **Figure 3**), and later as the Tupperware Jubilee recreational spot selected by Ms. Brownie Wise. The outer fringe of the parcels supports a cypress canopy, with a native and non-native vegetative understory. A majority of the area surrounding BWP consists of shrubby shoreline vegetation and fresh water features of Lake Tohopekaliga. Elements of downtown Kissimmee, including the courthouse can be observed from the northwest-western shoreline, while medium to low density urban development exists to the northeast and improved pasture due east.

2.1 Location

TICA is located along the northwestern shoreline of Lake Tohopekaliga, which is geographically situated in the northcentral portion of the County (Figure 1), within the County's Urban Growth Boundary. Access to BWP is by use of Aultman Road, which can be easily accessed from Neptune Road in Kissimmee, Florida. Once completed, TICA will add to the growing number of County owned and managed parks that are situated along the shoreline of Lake Tohopekaliga (**Figure 4**). TICA is approximately 1.7 miles southeast of the City of Kissimmee, in Section 26, Township 25 South, Range 29 East, in Osceola County, Florida.

2.2 Acquisition

In 2014, Osceola County purchased TICA from Candella Island, Inc. (Phillip Charles Owen and Marian Louise Owen, a Florida Corporation, 1130 East Donegan Avenue, Kissimmee, Florida 34744 (**Appendix A** – Warranty Deed)). Since its acquisition, TICA was incorporated as part of Osceola County's Parks program which manages properties throughout the County for water resource protection, wildlife habitat utilization, public green space and passive recreation. In 2016, the County received a donation to



Location Map
Brownie Wise Park at Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

★ Park Location

Figure 1

N

1 in = 2 miles

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Brownie Wise Park at Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

Park Boundary Parcel

Park Boundary Parcel

Figure 2

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1 in = 1,000 feet

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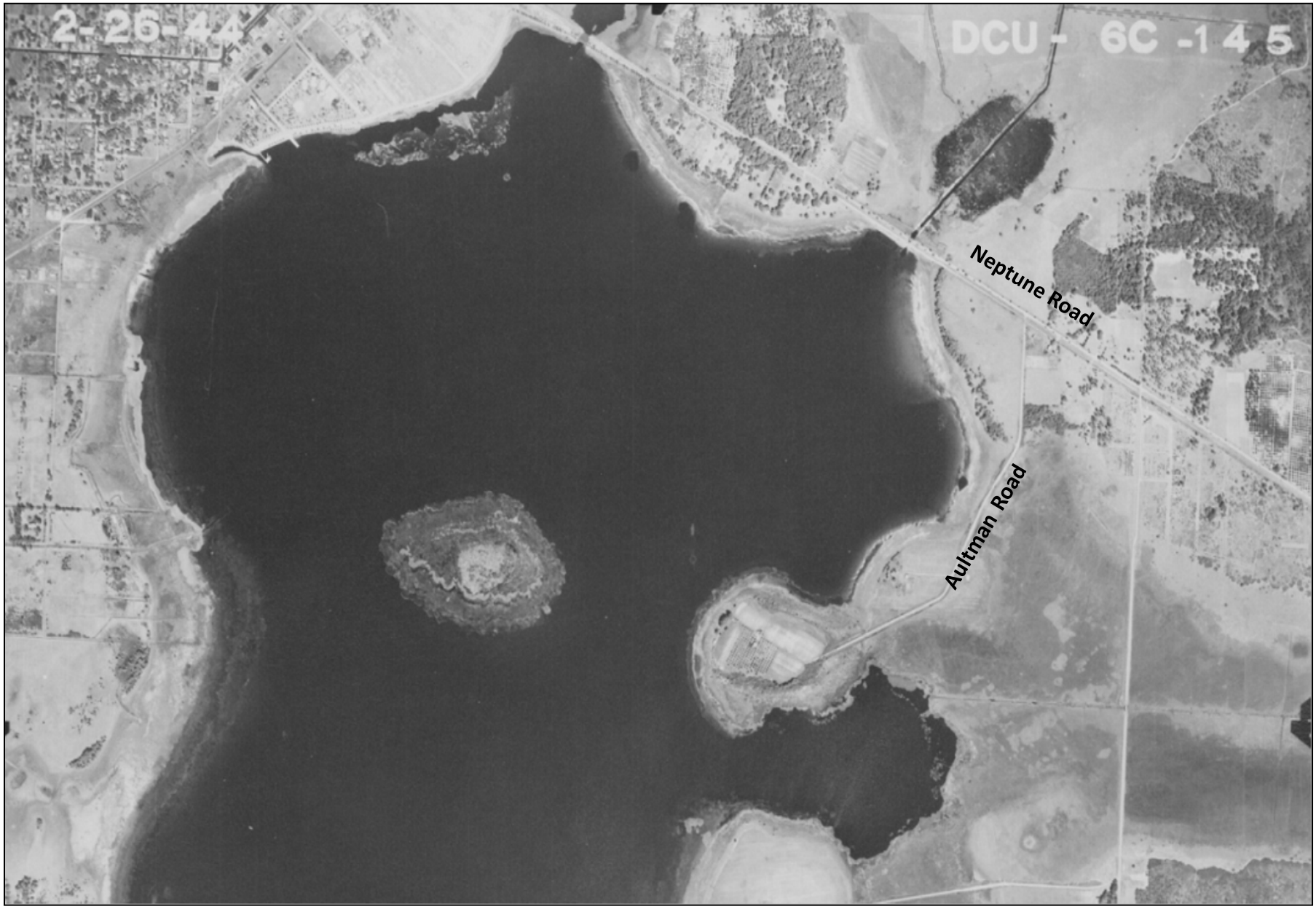
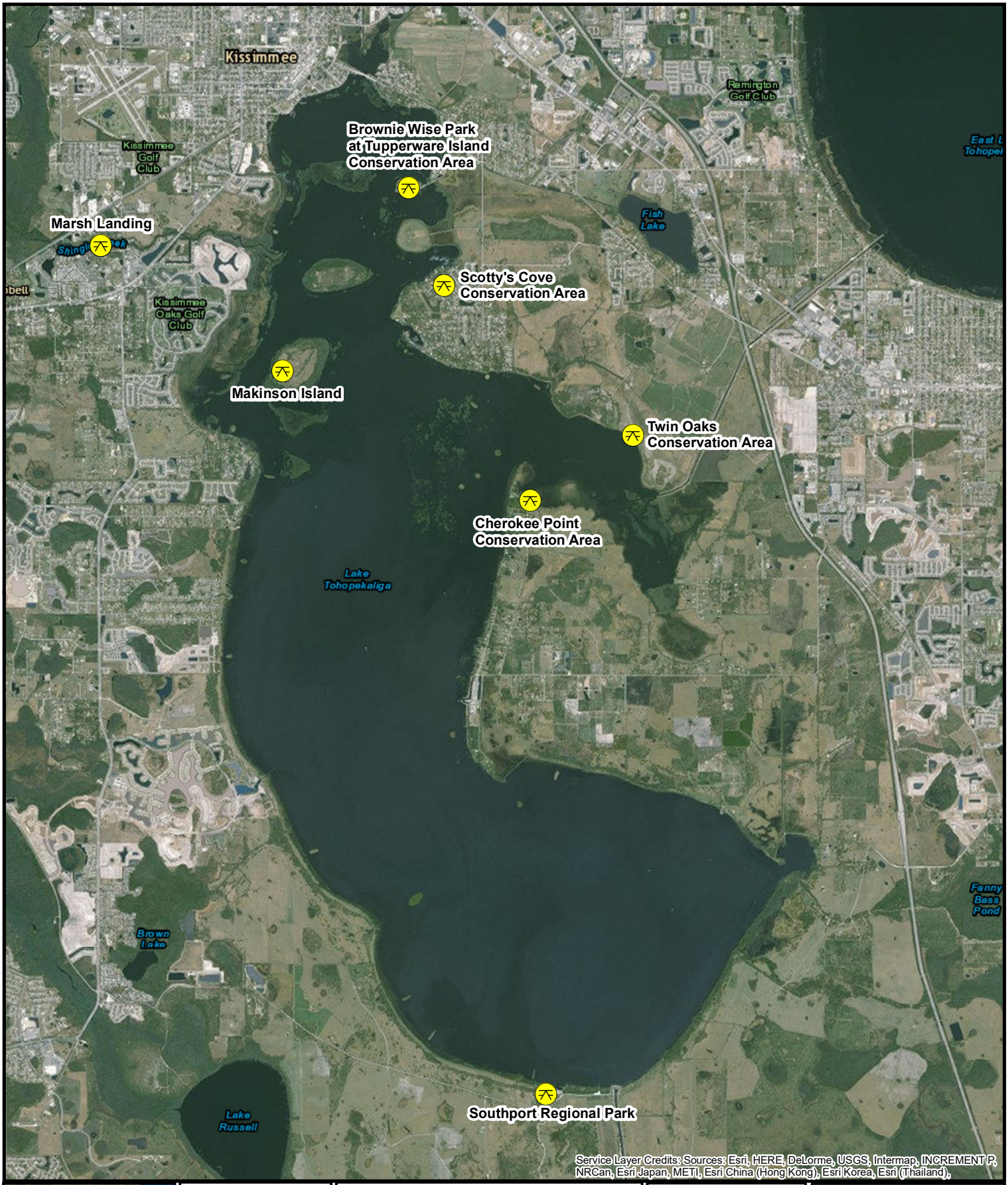
Figure 3. 1944 Flight 6C Aerial of Brownie Wise Park at Tupperware Island Conservation Area





Osceola County Parks and Conservation Areas on Lake Tohopekaliga Osceola County, Florida

County Parks

Figure 4

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1 in = 7,000 feet

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establish a park in the name of Ms. Brownie Wise. The donation will assist the County in transforming TICA with activities consistent with the County Parks Program such as: canoe and kayak launching, dock area for wildlife viewing and fishing, picnic pavilions with tables, and a walking trail.

2.3 Land Use and Vegetative Communities

The land use and habitat types at TICA were assigned according to the dominant species for the most relevant vegetative stratum. Habitat types are based on the SFWMD (2008) Florida Land Use and Cover Classification System (FLUCCS) and are depicted in **Figure 5**. The land use and habitat boundaries were determined by interpretation of the aerial photographic signatures and verified through ground truthing. A summary of the major FLUCCS types occurring at and adjacent to TICA, and a brief description of each, is provided below.

Residential – Fixed Single Family Units (1110) – 0.54 acres

This classification type encompasses approximately 0.54 acres of TICA, which includes adjacent ornamental plantings, a stormwater pond structure, and roadway features. Vegetation within this area consisted of bahiagrass (*Paspalum notatum*) and ornamental plantings such as viburnum (*Virburnum sp*.).

Improved Pastures – (2110) – 22.95 acres

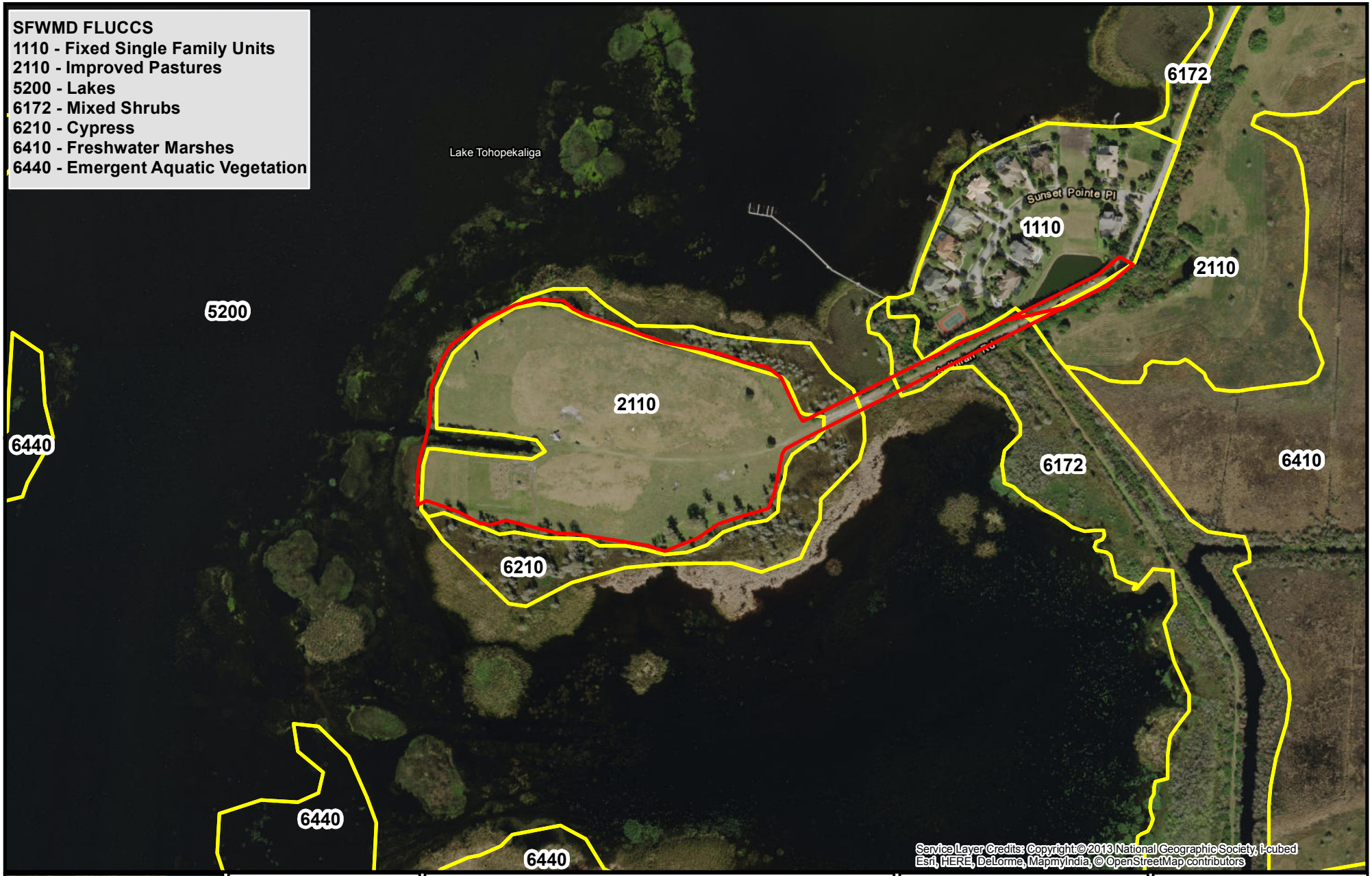
The improved pasture category includes areas that are composed of maintained land that has been cleared, tilled, and/or reseeded with non-native or specific types of grass, which best describes this dominant and most extensive land use on the site, covering 22.95 acres. Dominant vegetation in this area is most commonly comprised of bahiagrass, Bermuda grass (*Cynodon dactylon*), crabgrass (*Digitaria* spp.), with scattered clumps of Guinea grass (*Panicum maximum*), tropical soda apple (*Solanum viarum*), and cogon grass (*Imperata cylindrica*).

Lakes (5200) – 0.80 acres

This land unit is made up of Lake Tohopekaliga, which surrounds TICA on the northern, western and southern property limits. Approximately 0.80 acres is included within the property limits, which can be further classified as an existing (approximately 450 feet in length and 35 feet in width) canal feature on the western property boundary of TICA.

Mixed Shrubs (6172) – 1.13 acres

This category is reserved for those wetland communities which are composed of a large variety of shrub species tolerant of hydric conditions yet exhibit an ill-defined mixture of species. Approximately 1.13 acres of mixed shrub wetland habitat occurs along the eastern portion of the park and continues south along the eastern shoreline of Lake Tohopekaliga. Vegetative species occurring within this area include: red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), cypress (*Taxodium* sp.), broomsedge (*Andropogon* spp.), primrose willow (*Ludwigia* spp.), Brazilian pepper (*Schinus terebinthifolius*), Carolina willow (*Salix caroliniana*), salt bush (*Baccharis halimifolia*) and wax myrtle (*Morella cerifera*). Typically these systems contain diverse plant species that may be considered upland species that are tolerant to wet conditions.



SFWMD Land Use Map
Brownie Wise Park at
Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

Park Boundary

Figure 5

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1 in = 500 feet

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Cypress (6210) – 9.30 acres

This land cover classification is composed predominantly of cypress and red maple and contains an understory of vegetative species that includes maidencane (*Panicum hemitomon*), torpedograss (*Panicum repens*), cogon grass, Brazilian pepper, and primrose willow, that is adjacent to the property limits. Although this land classification is not within the TICA property limits, approximately 9.30 acres exists along the northern, eastern and southern shorelines.

In summary, the approximate acreage and percentage of coverage for the identified FLUCCS areas within TICA are identified below, **Table 1**.

Table 1. BWP FLUCCS Acreages and Percentages

Habitat	Acreage	Percentage
Residential – Fixed Single Family Units (1110)	0.54	2.1
Improved Pastures – (2110)	22.95	90.3
Lakes - (5200)	0.80	3.2
Mixed Shrubs - (6172)	1.13	4.4
Property Limit Total Acreage	**25.42**	**100.0**
Cypress – (6210) Waters of the State – Jursidictional Land	**9.30**	**-**

2.4 Soils

Four separate soil map units as identified by the National Resource Conservation Service (NRCS) Soil Survey for Osceola County are present within TICA **(Figure 6)**. The most dominant soil type onsite is *Placid fine sand* (9.65 acres). This map unit is listed as soils in depressions, low flats, and poorly defined drainage ways, which is consistent with the existing facultative and obligate wetland vegetative structure that exists along the shoreline of TICA. The second soil classification is *Hontoon muck* (1.13 acres) soils that typically occur in depressions, freshwater marshes, swamps and drainage ways. This series occurs adjacent to the TICA access road and portions of the eastern shoreline. The remaining soil classifications include *Adamsville sand* (6.76 acres) and *Basinger fine sand* (7.88 acres). These two soil classifications may contain fill components and occur within the middle and western shoreline of TICA.

Soil classifications are broadly utilized; however it is likely that natural hydrological processes have been significantly altered within several locations. A description of each map unit, hydrologic characteristics and typically associated ecosystems is detailed below. This information is derived from data included in the Soil Survey for Osceola County and by an examination of onsite and adjacent, natural communities.

NRCS Soils Map
Brownie Wise Park at Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

Park Boundary

Figure 6

N

1 in = 500 feet

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Adamsville sand (map unit 1) – 6.76 acres

The Adamsville series consists of deep, somewhat poorly drained, rapidly permeable soils on broad flats, and lower side slopes. Slopes range from 0 to 5 percent and many areas are used for citrus and improved pastures. Natural vegetation consists of pines (*Pinus spp*.) and water oaks (*Quercus nigra*) with a ground cover of saw palmetto (*Serenoa repens*), bluestem grasses, and several low panicums.

Basinger fine sand (map unit 5) – 7.81acres

The Basinger series consist of very deep, very poorly and poorly drained, rapidly permeable soil in low flats, sloughs, depressions and poorly defined drainage ways. Most areas of Basinger soils have been cleared and are used for improved pasture and rangeland. The natural vegetation consists of scattered pines and cypress with an understory typically dominated by gallberry (*Ilex glabra*), cabbage palm (*Sabal palmetto*), scattered saw palmetto, low panicum, wax-myrtle and sand cordgrass (*Spartina bakeri*).

Hontoon Muck (map unit 15) – 1.13 acres

This series consists of deep, very poorly drained, rapidly permeable organic soils that occur in fresh water swamps and marshes. Hontoon soils can be found in swamps and poorly defined drainage ways. They have formed in moderately thick beds of hydrophytic non-woody plant remains. Most hontoon soils are found in native vegetation and used for water storage and as wildlife habitat. Typical native vegetation associated with Hontoon soils include: bays, red maple, black gum, and scattered cypress trees with a ground cover of greenbriers (*Smilax* spp.), and other aquatic plants. Hontoon soils are distributed throughout central and southern portions of Florida

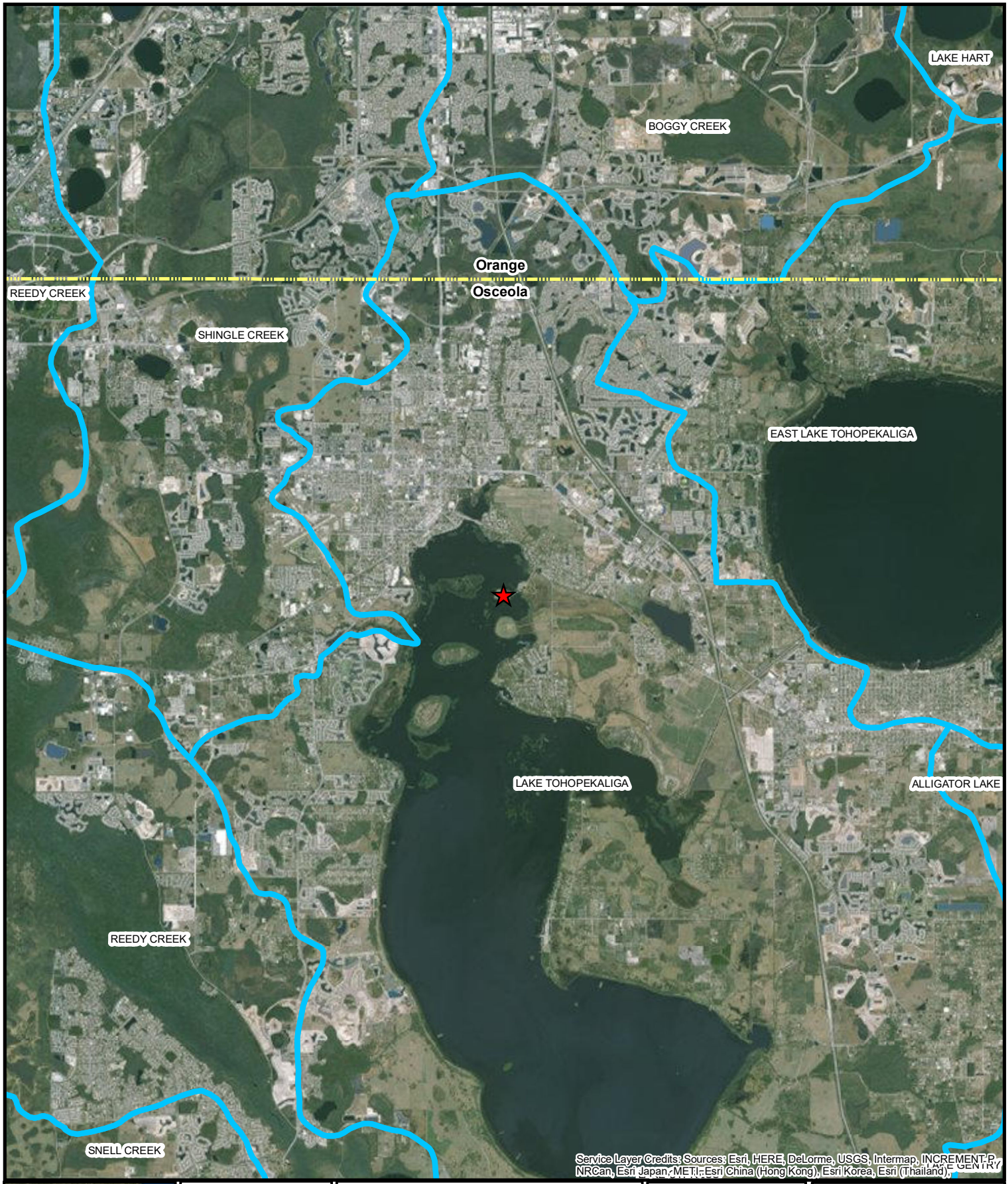
Placid fine sand (map unit 32) – 9.65 acres

This series consists of very deep, very poorly drained, rapidly permeable soils on low flats, depressions, poorly defined drainage ways on uplands and flood plains. Placid soils are used mainly for range and forest, with a small acreage that has been drained and is used for truck crops, citrus, and pasture. Natural vegetation consists of pine, bay (*Persea* spp.), cypress, black gum pickerel weed (*Pontederia cordata*), and coarse grasses. Depth to the water table ranges from 0 to 6 inches for more than 2 months in most years.

In summary, the approximate acreage and percentage of coverage for the identified NRCS Soil Classifications within TICA are identified in **Table 2**.

2.5 Topography and Hydrology

A majority of the topography within the TICA property limits is generally flat, consisting of upland habitat, entirely surrounded by Lake Tohopekaliga except for the access road (associated with Aultman Road) located on the eastern edge of the property. A small wetland forested fringe does exist, however a majority of this wetland habitat is located adjacent to the property limits, which extends out into Lake Tohopekaliga. A small canal exists along the western shoreline of TICA, which allows direct access to Lake Tohopekaliga for canoe and kayak launching. TICA is located within the Lake Tohopekaliga Drainage Basin, which comprises a portion of the upper (northern) reach of the Kissimmee River Watershed (**Figure 7**). Surface water flow in this 2940 square-mile basin is generally to the south,



Lake Tohopekaliga and Adjacent Drainage Basins Osceola County, Florida

★ Brownie Wise Park

Figure 7

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1 in = 2 miles

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into Lake Okeechobee. The basin is approximately 105 miles long, with a maximum width of 35 miles, and represents the largest source of surface water for Lake Okeechobee. The Northern portion of the basin, termed "Chain of Lakes", comprises numerous lakes, some of which have been interconnected by canals, in similar fashion to the C-31canal connection between East Lake Tohopekaliga and Lake Tohopekaliga. The Chain of lakes terminates at State Road 60, where the largest lake in the Chain, Lake Kissimmee, flows south into the Kissimmee River. The southern portion of the basin includes the Lake Wales Ridge lakes, the Kissimmee River, and its tributary watersheds, including flow from the Lake Istokpoga Watershed. Based on available topographic information, the general elevation of the site appears to be at 58 feet National Geodetic Vertical Datum (NGVD) of 1929, (**Figure 8**).

Table 2. BWP NRCS Soil Classification Acreages and Percentages

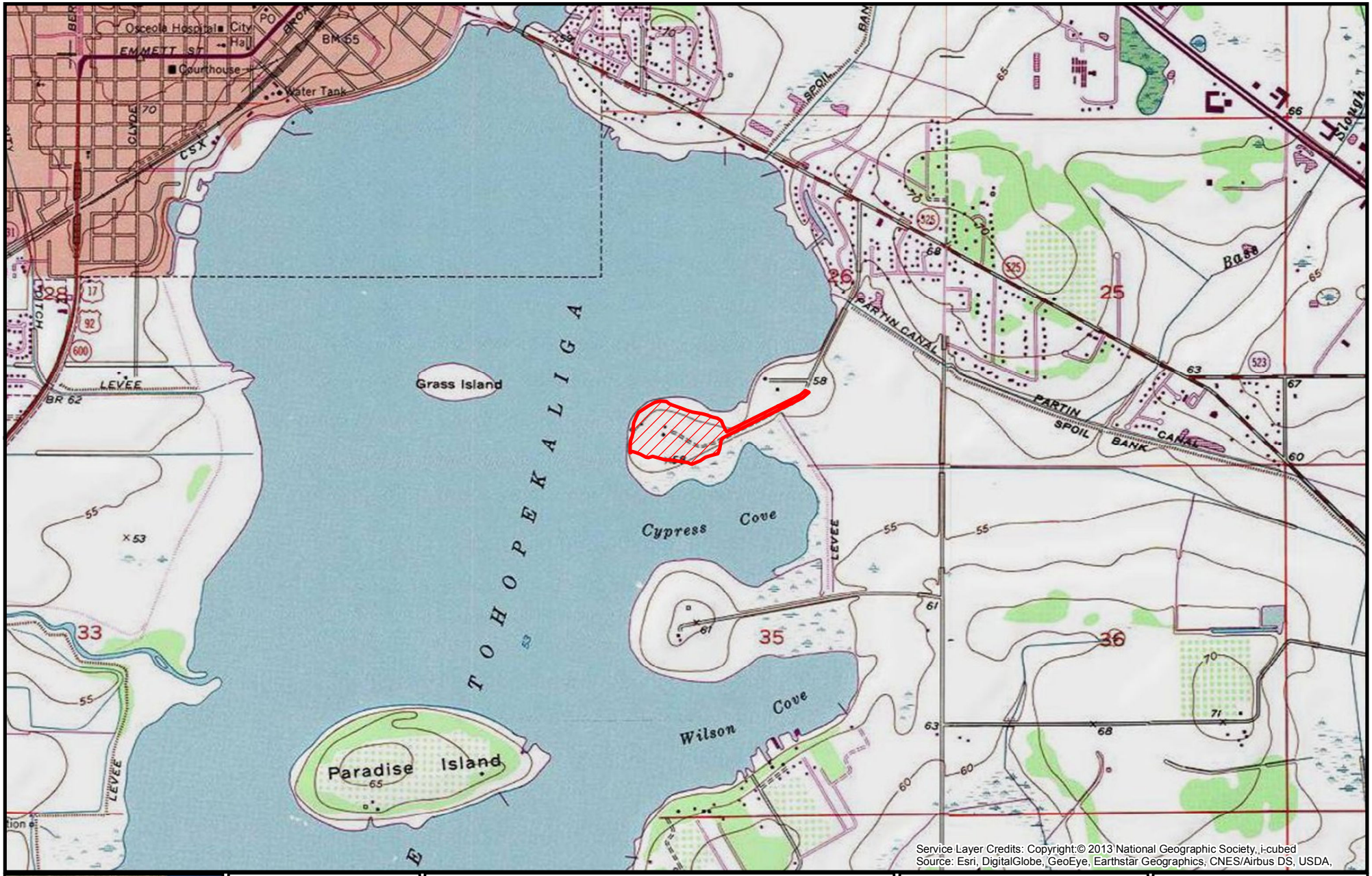
Soil Classification	Acreage	Percentage
Adamsville sand (map unit 1)	6.76	26.6
Basinger fine sand (map unit 5)	7.88	31.0
Hontoon Muck (map unit 15)	1.13	4.4
Placid fine sand (map unit 32)	9.65	38.0
TOTAL	**25.42**	**100.0**

2.6 Plant and Wildlife Species and Associated Habitats

Fauna Assemblages

To determine presence, or potential presence, of species listed as protected by the Florida Department of Agriculture and Consumer Services (FDACS), Florida Fish and Wildlife Conservation Commission (FWC) and the U.S. Fish and Wildlife Service (FWS), it is recommended that on-site surveys, in accordance with FWC Wildlife Methodology Guidelines, be continued.

Lake Tohopekaliga, which nearly encompasses TICA, is an approximate 18,000-22,000 acre (low pool to high pool), lake that is hydrologically regulated by the US Army Corps of Engineers (ACOE) and the South Florida Water Management District (SFWMD) between 52 and 55 feet (NGVD, 1929). Lake Tohopekaliga is a designated Fish Management Area for the enhancement of largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), redear sunfish (*Lepomis microlophus*) and warmouth (*Lepomis gulosus*) fisheries, as well as a popular



USGS Topographic Map
Brownie Wise Park at Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

Park Boundary

Figure 8

N

1 in = 2,000 feet

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bird watching destination (part of the Great Florida Birding and Wildlife Trail). The Lake has become a popular nesting and foraging area for many federally and state listed avian species such as the snail kite (*Rostrhamus sociabilis plumbeus*), which are often spotted soaring over TICA and/or nesting/roosting in the vegetation near the property limits (**Figure 9**).

In addition to snail kites, TICA provides a perfect location to observe a variety of avian species that include wading birds, water fowl, bald eagles (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) that not only utilize the Lake system, but also utilizes TICA for foraging/loafing and nesting opportunities, **Figure 10**. Additional listed species that have been encountered at TICA includes: little blue herons *(Egretta caerulea*), Florida sandhill cranes (*Grus canadensis*), limpkins (*Aramus guarauna*), and wood storks (*Mycteria americana*).

No formal faunal survey was conducted on TICA during the site review; however observations during the reviews and County staff documented occurrences indicate that the site and the surrounding area has a high probability of supporting a variety of listed and non-listed species. The habitat requirements for potentially-occurring listed and non-listed wildlife are relevant to the Desired Future Conditions (DFCs), which influenced the specific approach to management. In many instances, coordination with state and federal wildlife permitting agencies (FWC and / or USFWS), as discussed below, may be required in order to implement future or expanded park amenities and management goals. A list of potentially occurring wildlife species for Osceola County is provided within **Appendix B**.

Agency Coordination

An active bald eagle nest has been identified near the entrance of TICA (Figure 10). Bald eagles are protected under the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the FWC Bald Eagle Rule (Florida Administrative Act (FAC) 68A-16.002). In 2008, the FWC adopted the Bald Eagle Management Plan (**Appendix C**) that outlines the permitting framework.

The FWC Bald Eagle Management Plan (Plan) provides permitting guidelines for activities near an active or alternate nest to minimize and/or avoid disturbance. Under the Plan, bald eagle nests are protected by a 660 and a 330 foot buffer. Activities that occur outside of the 660 foot buffer do not require a permit, while permanent/temporary activities within the 660 foot to 330 foot buffer requires either implementing Plan guidelines or submittal of a permit application to take the nest (depending on the type of activity). Activities within the 330 foot buffer are not permitted. A portion of the anticipated BWP activities (detailed in 3.0) will occur outside the initial 660 foot buffer, see Figure 9. While no activities will occur within the 330 foot buffer, passive recreational activities may occur within the 660 to 330 foot buffer protection area. Consultation with the FWC Bald Eagle Coordinator was initiated by County staff, in 2016 (**Appendix C**). In discussions with FWC, the activities planned for TICA fit into the Plan guideline Category F: *Non-motorized Recreational and Human Entry (e.g., Hiking, Camping, Birding, Fishing, Hunting, or Canoeing.* Under this category, a buffer would not be necessary

Everglades Snail Kite Nest Locations (2016) Brownie Wise Park at Tupperware Island Conservation Area Osceola County Parks Osceola County, Florida

Snail Kite Nests

Park Boundary

Figure 9

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1 in = 750 feet

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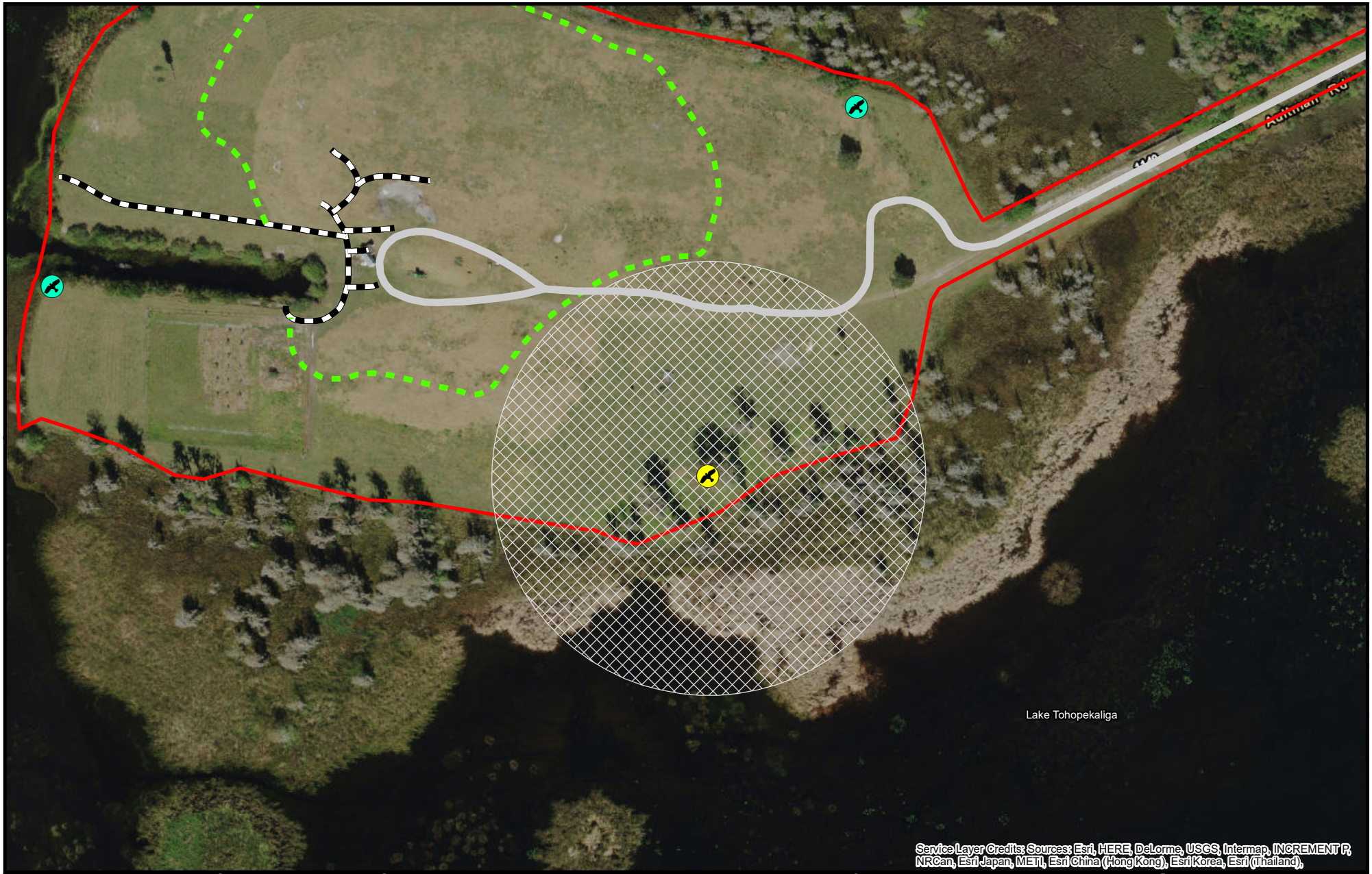

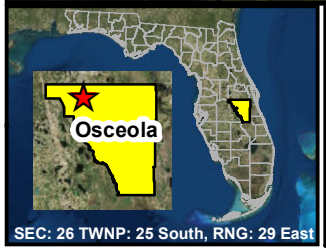

Bald Eagle Nest and Osprey Platform Locations Brownie Wise Park at Tupperware Island Conservation Area Osceola County Parks Osceola County, Florida

- Eagle Nest
- 330 Foot Buffer
- Osprey Platforms
- Existing Entrance Drive
- Grass Trail
- Improved Trail
- Park Boundary

Figure 10

N

1 in = 200 feet

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outside the nesting season (October 1st to May 15th). However, activities visible or highly audible from the nest should not occur within 330 feet of the nest during the nesting season. FWC provided the following additional recommendations:

- Plantings of pine and cypress for future nest and roost trees.
- Use of native vegetation to provide visual screening between the nest tree and new activities.
- Educational signs by the FWC, to advise visitors on "Eagle Watching Etiquette". (**Appendix C**)
- Land management practices to reduce/remove nuisance and exotic vegetative species within the nest tree buffer zone should be conducted outside the nesting season and care should be taken to avoid impacts to the nest tree.

Flora Assemblages

The landscape at TICA is characterized a by large open central area of upland, non-native grasses such as bahia, Bermuda, Paragrass (*Urochloa mutica*) and crabgrass, which transitions to a more facultative vegetative structure towards the water's edge. This area includes shrubby/marsh vegetation such as: Brazilian pepper, evening primrose, paragrass, Caesarweed (*Urena lobata*), maidencane, cogongrass, sand cordgrass (*Spartina bakeri*), softrush (*Juncus effuses*), Fackahatchee grass (*Tripsacum floridanu*), buttonbush (*Cephalanthus occidentalis*), and cattails (*Typha* sp.). Along the northern and southern property limits, a cypress canopy can be found extending out into the lake from the shoreline. Canopy species within this area are predominately cypress, however it also supports sweet bay (*Magnolia virginiana*), red maple, and dahoon holy (*Ilex cassine*) growth. As previously discussed, it is recommended that on-site quantitative surveys in accordance with FWC Wildlife Methodology Guidelines be performed for a comprehensive plant list to be drafted. A list of potentially occurring state and federally listed floral species for Osceola County is provided within Appendix B.

Nuisance and Exotic Vegetative Species

Several nuisance and/or exotic vegetative species were identified at TICA, though coverage by such vegetation is primarily located along the edge of the property limits and contain between 20 to 30 percent of the total coverage. This estimated coverage includes highly invasive or noxious vegetation as listed by the Florida Exotic Pest Plant Council (FLEPPC, 2017), Florida Department of Agriculture and Consumer Services (FDACS) or the United States Department of Agriculture. It does not include all non-native vegetation, such as widespread improved pasture grasses, but does include species such as cogon grass , Guinea grass, paragrass, Peruvian primrose willow (*L. peruviana*), Brazilian pepper, balsam apple (*Momordica balsamina*), Caesarweed , wild taro (*Colocasia esculenta*), and other species as noted in **Figure 11**.


Peruvian Primrose Willow
(Ludwigia peruviana)


Guinea-grass
(Panicum maximum)


Ear Tree
(Enterolobium cyclocarpum)


Brazilian Pepper
(Schinus terebinthifolius)


Guava
(Psidium guajava)


Praxelis
(Praxelis clematida)


Cogon-grass
(Imperata cylindrica)


Wild Taro
(Colocasia esculenta)


Balsam Apple
(Momordica charantia)

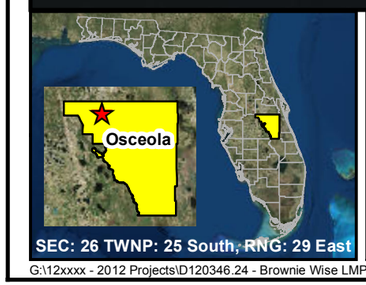

Castorbean
(Ricinus communis)


Para-grass
(Urochloa mutica)


Tropical Soda Apple
(Solanum viarum)


Caesarweed
(Urena lobata)


Rattle Bush
(Sesbania spp.)



SEC: 26 TWNP: 25 South, RNG: 29 East

Nuisance and Exotic Vegetation
Brownie Wise Park at
Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

Nuisance and Exotic Vegetation

Park Boundary

Figure 11

N

1 in = 400 feet

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2.7 Historical, Cultural and Archaeological Resources

A search of the Florida Master Site File, Division of Historical Resources, lists no archeological sites or other cultural resources found within TICA. The response letter and map from the March 28, 2017 inquiry can be found in **Appendix D**.

2.8 Regional Significance

TICA provides natural resource protection and additional wildlife viewing opportunities for the public within the northern section of Lake Tohopekaliga. The property provides habitats for many wildlife species, including listed species such as the snail kite, Florida sandhill crane and wood stork, and provides stop-over habitat for migratory birds, including a nesting pair of bald eagles and osprey near the entrance of the property. TICA is situated within the Kissimmee River Drainage Basin, which covers 2,940 square miles through the central part of the Florida Peninsula. Predominantly rural, the Kissimmee River Drainage Basin lies at the northern end of the Everglades ecosystem. Natural areas dominate portions of this basin, which includes three state parks, two state forests, and the Disney Wilderness Preserve.

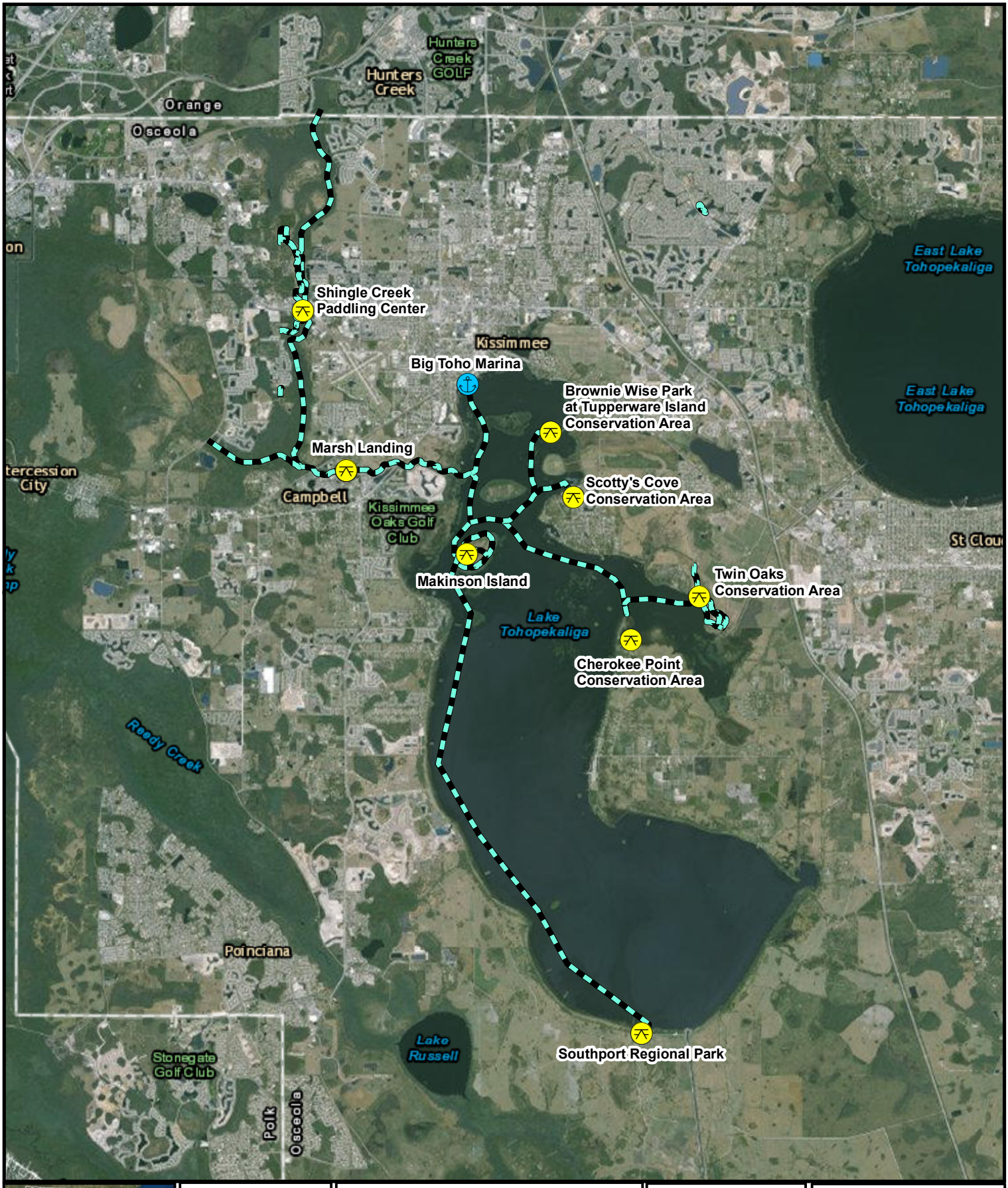
The Kissimmee River Watershed is an important component of the Upper Kissimmee River Watershed (UKRW). The UKRW is an integral part of the Kissimmee River Restoration Project (KRRP), of which the Kissimmee River Headwaters Restoration Project (KRHRP) has been designed to provide sufficient storage in the headwaters lakes in the Upper Kissimmee Basin to allow water regulation to approximate historical flow and volume characteristics in the Kissimmee River. This is also anticipated to improve the quantity and quality of lake littoral zone habitat in the Upper Kissimmee Basin.

Lake Tohopekaliga is a popular sport fishing destination in Florida and a popular site for eco-tourism. Several certified, record-sized large-mouth bass have been produced from the lake over the years. FWC currently lists Lake Tohopekaliga as one of the top fishing locations in Florida for bass, crappie and sunfish (bream) species. The protection and enhancements to the shoreline of Lake Tohopekaliga along the property boundary will preserve and enhance the existing sport fishery of the lake. In addition to the benefits to fish, wildlife and natural resources, TICA will also serve as an additional public resource that will assist in providing greater acreage of public lands the area. The property will eventually serve as a link for future acquisitions in the watershed and County, and will also act as an additional launch/waypoint for the State of Florida designated Shingle Creek Paddling Trail (**Figure 12).**

3.0 LAND MANAGEMENT GOALS AND OBJECTIVES

Osceola County Government has taken steps to preserve the natural beauty of the county and to ensure that there will be natural lands and water resources for future generations. A large majority of TICA is considered upland habitat that has been heavily impacted by anthropogenic activities. The County's purpose in acquiring the property includes three (3) primary goals;

1) Provide resource protection;



State of Florida Designated Shingle Creek Paddling Trail Osceola County, Florida

Paddling Trail
County Parks
Big Toho Marina

Figure 12

N

1 in = 2 miles

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2) Restoration, enhancement and maintenance of aquatic, wetland and upland habitats to support fish and other wildlife; and
3) Support for passive public recreation and educational opportunities.

To best facilitate the integration of these 3 goals, the land management strategy will be scheduled into 3 phases, the goals and objectives of each phase to be discussed independently:

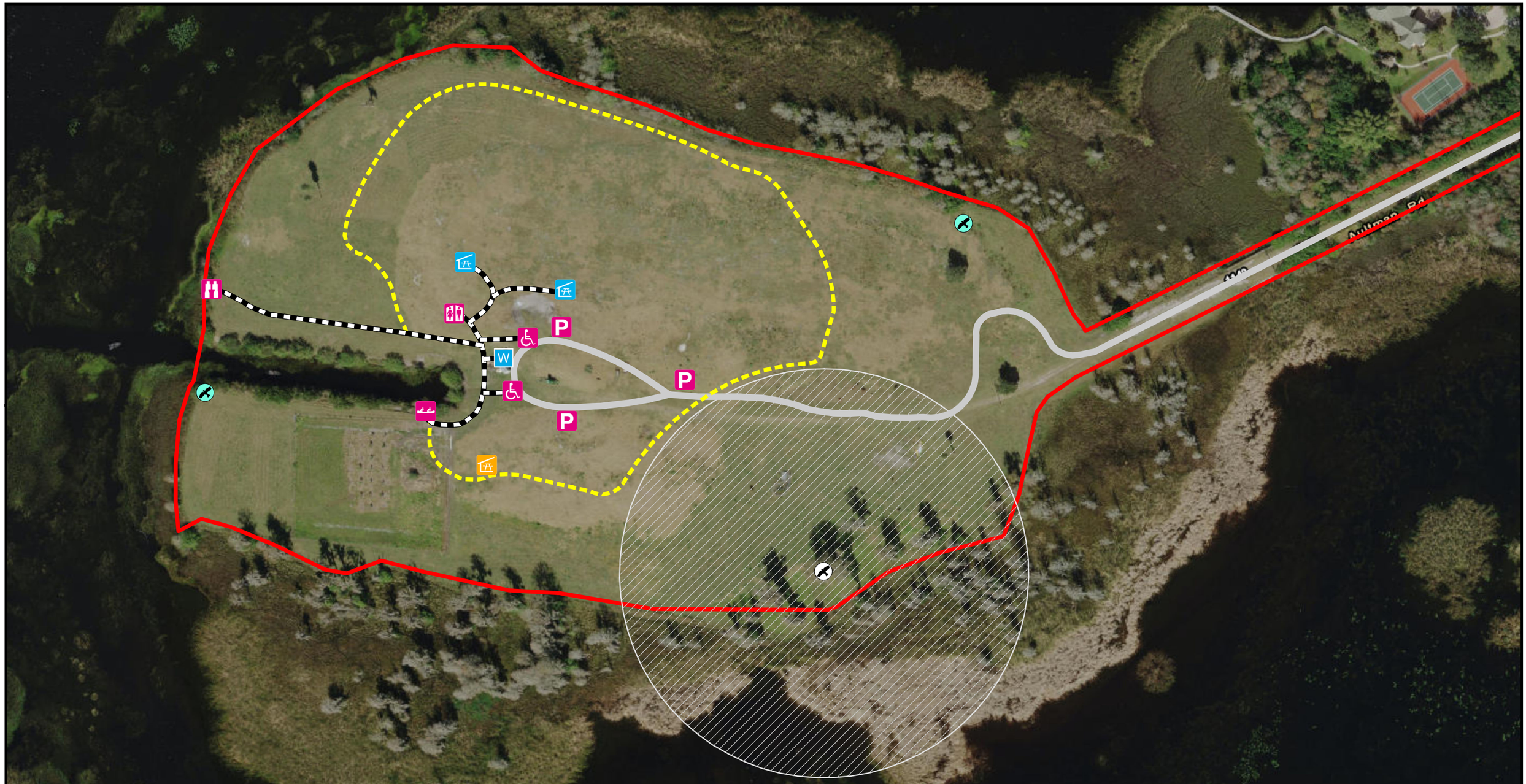
- ❖ Phase I: Public Access, Facilities, and Amenities
- ❖ Phase II: Habitat Restoration and Implementation of Land Management Activities
- ❖ Phase II: Perpetual Management and Maintenance of Natural Areas and Facilities

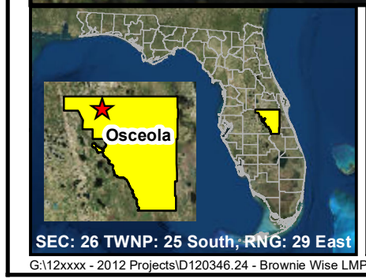
Figure 13: **TICA Amenities**, provides a depiction of the location of the park facilities and amenities for recreational enjoyment. Also depicted are the locations of the habitat restoration areas that will be present in the post-restoration state.

3.1 Phase I – Public Access, Facilities, and Amenities

Phase I will allow for public access to TICA and will provide opportunities for shore based fishing, hiking, canoe/kayaking, picnicking and wildlife viewing opportunities within Lake Tohopekaliga. This includes the selection of appropriate recreational elements and their approval within TICA. Recreation amenities include pavilions with grills, an observation deck, and a launch area for canoes / kayaks (Figure 13). Access to TICA amenities will be restricted to pedestrian use on a designated upland hiking trail. The hiking trail access points will have entrance features and / or signage designed to prevent vehicular or all-terrain vehicle (ATV) access, limiting use to accommodate only pedestrians. Although a majority of the hiking trail will incorporate the existing ground elevation and soil structure, portions of the trial that allow access to the park amenities have been stabilized with crushed rock substrate; in accordance with the Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) guidelines. Due to the presence of a bald eagles nest, the hiking trail has been designed to maintain a buffer distance of 330 feet from the nest tree. The hiking trail will be clearly marked to identify the corridor. The entrances to the trail will have signage and an information kiosk on trail length, view sheds and points of interest to inform the public users. Educational signs will also be posted within the park in order to provide guidance and general information regarding TICA/BWP history and wildlife viewing information regarding bald eagle facts and protection guidelines.

Limited public and handicapped parking will be provided, as well as the installation of a self-contained / self-composting bathroom facility. Also provided for public utilization is access to a water fountain that will be located near the parking area, Figure 13.





Park Amenities
Brownie Wise Park at
Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

- Pavilion
- Parking
- Handicap Parking
- Restroom
- Observation Deck
- Canoe Landing
- Well Head
- Proposed Pavilion
- Improved Trail
- Grass Trail
- Entrance Drive
- Park Boundary
- Eagle Nest
- 330 Foot Buffer
- Osprey Platforms

Figure 13

N

1 in = 150 feet

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The primary goals for Phase I include:

- **Entrance Drive Enhancement**: Stabilize existing drive structure, install guard rails over existing culverts, install bollards, and provide general and handicap parking areas.
- **Parking and Bathroom Facilities:** Installation of basic public facilities including parking areas, a composting bathroom facility and a water fountain.
- **Construction of Park Amenities**: Placement and construction of the TICA amenities which will include: three picnic pavilions with grills, an observation deck, a hiking trail, kiosk and educational signage, and a kayak and canoe launching area.

Goal Objectives

#	OBJECTIVE DETAILS	COMPLETION DATE
1.	Coordinate with County permitting and regulatory agencies, submit necessary permit applications for TICA improvements and appropriate park amenities.	YEAR 1
2.	Coordinate with wildlife agencies for the installation park amenities, improvements, and maintenance, as necessary.	ONGOING
3.	Improve and stabilize existing entrance drive feature / construct parking.	YEAR 1
4.	Install guardrails over existing culverts per Florida Department of Transportation (FDOT) guidelines	YEAR 1
5.	Design and delineate at-grade hiking trail, trial markers and kiosks.	YEAR 1
6.	Stabilize portions of the trail that provide access to TICA amenities, including the hiking trail head, canoe/kayak launching area, observation deck, bathroom facilities and the pavilions. Crushed shell or appropriate substrate should be used for ADA and ABA compliance.	YEAR 1
7.	Install/construct pavilions, well head, compost toilets, and observation deck, per regulatory and local permit requirements.	YEAR 1
8.	Delineate and stabilize kayak / canoe launching area	YEAR 1
9.	Identify additional source funding for perpetual management of TICA	ONGOING

3.2 Phase II: Habitat Restoration and Implementation of Land Management Activities

Habitat restoration includes vegetative enhancement for wetland community types that surround TICA (cypress dominated community with wetland shrub and herbaceous species such as: button bush, flat top

golden rod, soft rush, pickerelweed and duck potato) and the creation of upland/mesic community types (longleaf pine dominated community with a variety of sub-canopy and herbaceous species including: saw palmetto, cabbage palm, eastern red cedar and a variety of oak species) and native grass habitats (broomsedge (*Andropogon* spp.) and sand cord grass) that are historically significant within the immediate area. Upland/mesic creation areas are also designated in order to provide buffer plantings for the active avian nests (bald eagle and osprey) within TICA and to provide future canopy species for potential wildlife utilization (**Figure 14**, Habitat Restoration Areas and View Sheds and **Figure 15**, Detailed Restoration Plan, Phase II). Initial wetland plantings have been installed by the County, along the access road on the eastern side of TICA. These initial plantings included the installation of cypress trees, and a variety of wetland grass species. **Table 3**, below includes a list of vegetative species that have either been installed, scheduled for installation, or are suggested species for supplemental plantings, some of which are identified in Figure 14. A large portion of the upland area of TICA will need to be stabilized with bahia, especially in areas designated as heavily traversed areas and in areas adjacent to / or surrounding BWP facilities, such as the drive road, bathrooms, and pavilions. It is anticipated that all planting events will be scheduled concurrent or proceeding land management activities to reduce noxious vegetation in order to encourage natural recruitment of native species and the establishment of the planted specimens.

Table 3. TICA Planting List

Common Name	***Scientific Name***	**Suggested Installation Size**	**Habitat Type**
Marsh Mallow	*Althaea offficinalis*	1 or 3 gallon	Wetland
Swamp fern	*Blechnum serrulatum*	1 or 3 gallon	Wetland
Canna lily	*Canna flaccida*	BR, 1 or 3 gallon	Wetland
Button bush	*Cephalanthus occidentalis*	3 or 7 gallon	Wetland
Sweet bay magnolia	*Magnolia virginiana*	7 or 10 gallon	Wetland
Flat-top goldenrod	*Euthamia graminifolia*	BR, 1 or 3 gallon	Mesic – Wetland
Soft rush	*Juncus effsus*	BR or 3 gallon	Mesic – Wetland
Shiny lyonia	*Lyonia lucida*	3, 7 or 10 gallon	Mesic - Wetland
Goldenrod	*Solidago spp.*	BR – 1 galon	Mesic – Wetland
Bald cypress	*Taxodium distichum*	10 – 12 feet	Mesic – Wetland
Fakahatchee grass	*Tripsacum floridanum*	3 gallon	Mesic – Wetland
Highbush blueberry	*Vaccinium corymbosum*	1 or 3 gallon	Mesic – Wetland
Large leaf gallberry	*Ilex coriacea*	3, 7, or 10 gallon	Mesic
Eastern red cedar	*Juniperus virginiana*	8 – 10 feet	Upland – Mesic
Water oak	*Quercus nigra*	10 – 12 feet	Upland – Mesic
Cabbage palm	*Sabal palmetto*	8 – 10 feet	Upland - Mesic


Buttonbush
(Cephalanthus occidentalis)


Fakahatchee-grass
(Tripsacum dactyloides)


Yellow Canna
(Canna flaccida)


Broomsedge
(Andropogon virginicus)


Bald Cypress
(Taxodium distichum)


Sand Cordgrass
(Spartina bakeri)


Longleaf Pine
(Pinus palustris)


Saw Palmetto
(Serenoa repens)

Aulman Rd

SEC: 26 TWNP: 25 South, RNG: 29 East

Habitat Restoration with View Sheds
Brownie Wise Park at
Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

- Mesic Herbaceous Creation
- Mesic Forested Creation
- Upland Creation
- Wetland Restoration
- Improved Trail
- Grass Trail
- Entrance Drive
- Restroom
- Pavilion
- Proposed Pavilion
- Observation Deck
- Handicap Parking
- Canoe Landing
- Well Head
- Eagle Nest
- Osprey Platforms

Figure 14

N

1 in = 125 feet

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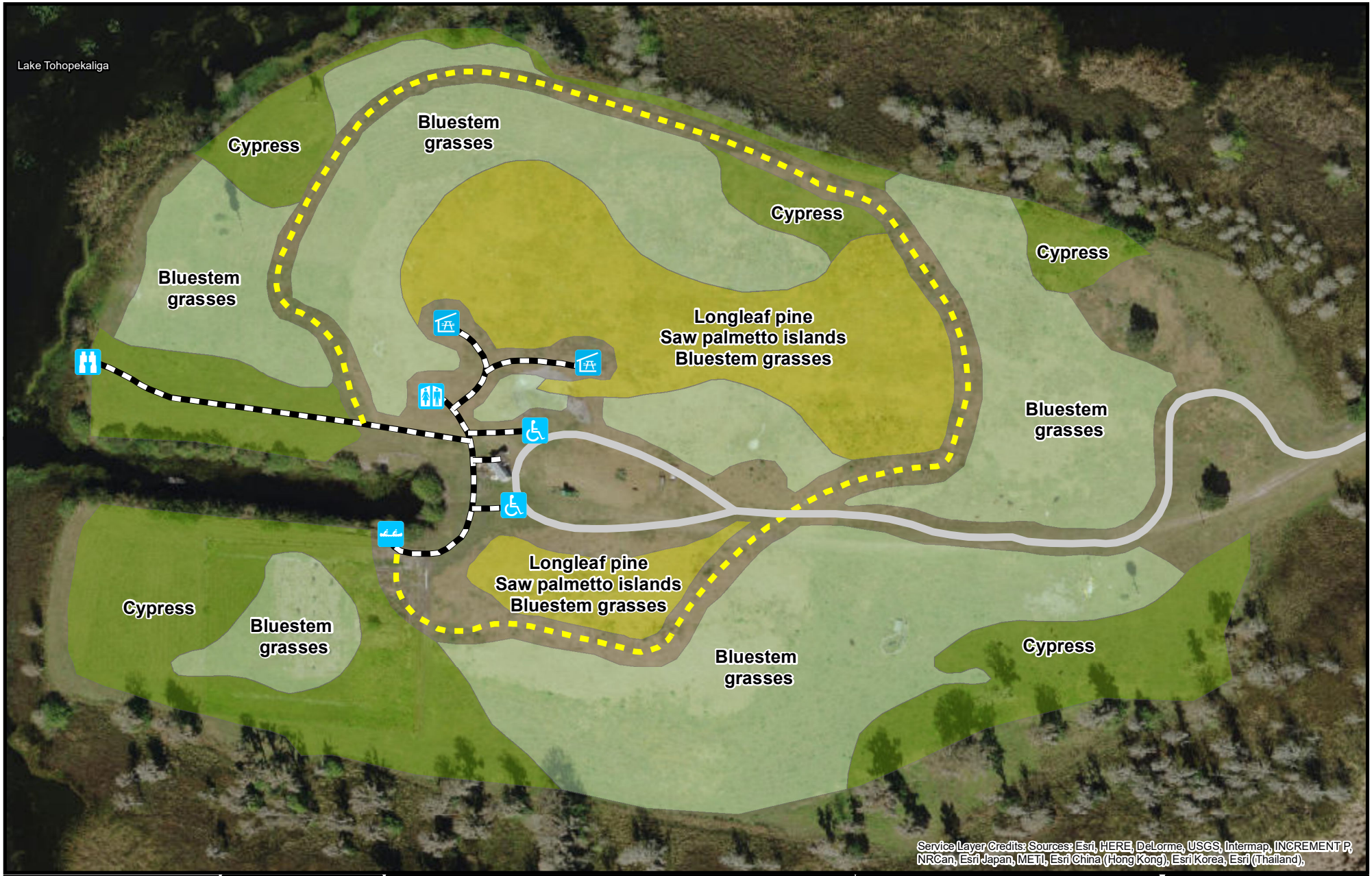

Restoration Plan (Phase II)
Brownie Wise Park at
Tupperware Island Conservation Area
Osceola County Parks
Osceola County, Florida

- Mesic Creation
- Upland Creation
- Wetland Enhancement
- Entrance Drive
- Grass Trail
- Improved Trail
- Handicap Parking
- Pavilion
- Observation Deck
- Restroom
- Canoe Landing

Figure 15

N

1 in = 150 feet

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Exhibit Date: 02.15.2017

Common Name	Scientific Name	Suggested Installation Size	Habitat Type
Sand cordgrass	*Spartina bakeri*	3 gallon	Upland – Mesic
Southern magnolia	*Magnolia grandiflora*	7 or 10 gallon	Upland
Longleaf pine	*Pinus palustris*	10 – 12 feet	Upland
Live oak	*Quercus virginiana*	10 – 12 feet	Upland
Saw palmetto	*Serenoa repens*	3, 7 or 10 gallon	Upland
Walter viburnum	*Viburnum obovatum*	3, 7 or 10 gallon	Upland
Coontie palm	*Zamia integrifolia*	3, 7 or 10 gallon	Upland

The elements of the land management program involves the implementation of a maintenance and management program in upland and wetland habitats to: reduce the on-site spread of nuisance and exotic plant species, provide areas for the natural recruitment of native, beneficial vegetation, and provide safe and clear access of the TICA recreational elements. The proposed land management activities at TICA include vegetative management through manual removal, mechanical applications and/or through the use of state approved herbicide applications. At this time, vegetative control utilizing prescribed fire is not recommended due to the lack of naturally existing habitats that can support a typical fire regime. However, should the County continue to improve upon the habitat enhancement and creation areas, fire may eventually become an additional management tool used to reduce nuisance and exotic vegetative growth.

Nuisance and exotic plant control will be necessary to preserve, enhance, and restore the natural communities on site. Exotic species infestations will be prioritized for treatment, depending on funding availability and species' aggressiveness. Data collected by ongoing site investigations may be compiled in a Geographical Information System (GIS) relational database that could include species name, Florida Exotic Plant Pest Council (FLEPPC) category, treatment date and method(s), chemical usage, GPS location, infestation extent, and cost. Pre- and post-treatment data and monitoring are important to determine the success of exotic control; site specific photography functions well and is cost-effective. At this time, a majority of the nuisance and exotic vegetation is located along the entire TICA shoreline (Figure 11).

Chemical treatments will typically be the primary means of control, but other methods (mechanical, hand removal, seed collection) may be used at the discretion of the County. Treatment method will be driven by its effectiveness and efficiency to control the infestation, given ambient conditions and infestation response. Time of year, vegetation targeted, type of herbicide, and the application rate should be considered when utilizing chemical control as a management tool. Herbicide applications should be applied to targeted vegetation when they are most vulnerable (example: cogon grass – requires early spring treatments). Routine patrols by staff should occur in order to monitor for incipient or reoccurring infestations. All exotic occurrences should be treated immediately and monitored for treatment success

frequently thereafter. Decontamination and monitoring protocols will be contingent upon potential on-/off-site contamination and infestation treatment. All staff and contractor vehicles, including mowing equipment and spray rigs travelling through known exotic infestations shall be required to pressure wash/remove mud, vegetation, and seeds from the vehicles before and after entering TICA. Herbicides utilized over open water must have an aquatic label for use in Florida and approved by the Florida Department of Environmental Protection (FDEP). Due to the ability of specific herbicides to move within the soil matrix, special care must be taken when applying herbicides to targeted vegetation that is adjacent or abutting private lands, including area residences. Monitoring of known infestations and project boundaries should occur semi-annually with new infestations and recent treatments monitored quarterly until treatment success is established. **Table 4**, below offers suggestive management techniques for TICA species, targeted for control.

Table 4. Treatment Recommendations for Current Nuisance and Exotic Vegetative Growth

Common Name	Targeted Species	Morphology	Seeds	Best Time to Control	Treatment Methodology	Comments
Balsam apple	*Momordica charanthia*	Annual	Spring / Summer	Spring	Hand or Chemical (2, 4-D, Triclopyr, Glyphosate)	
Brazilian pepper	*Schinus terebenthifolius*	Evergreen / Perennial	Spring / Summer	Winter	Mechanical – Chemical (Triclopyr with surfactant) – foliar applications for seedlings	Do not burn green growth, known to cause skin irritation when handling
Caesarweed	*Urena lobata*	Annual / Perennial	Summer / Fall	Spring / Summer	Mechanical – Herbicide (Triclopyr)	Mow old growth, chemically treat new growth
Castorbean	*Ricinus communis*	Annual / Perennial	Year Round	Year Round	Mechanical and Chemical (Triclopyr, Glyphosate, 2, 4-D)	
Cogon grass	**Imperata clyndrica*	Perennial	**Spring	Spring – Mow old growth, chemically treat new growth	Mechanical – Herbicides (Glyphosate, *Imazapyr)	Stimulated by mowing – will seed shortly after a mowing event
Ear tree	*Enterolobium cyclocarpum*	Perennial	Summer	Spring - Summer	Mechanical – Chemical (Triclopyr)	
Guava	*Psidium guajava*	Perennial	Spring, Summer, Fall, and Winter	Year Round	Mechanical – Chemical (Triclopyr with surfactant) – foliar applications	Seeds can remain viable for many months

Common Name	Targeted Species	Morphology	Seeds	Best Time to Control	Treatment Methodology	Comments
Guinea grass	*Panicum maximum*	Perennial	Blooms Year Round / Rhizomes	Spring - Summer	Herbicide (Glyphosate, *Imazapyr)	
Natal grass	*Melinis repens*	Annual/ Perennial	Spring, Summer and Fall	Year Round	Chemical (Imazapyr, Glyphosate)	
Para grass	*Urochloa mutica*	Perennial	Fall and Winter / Fragmen-tation	Spring and Summer	Chemical (Imazapyr, Glyphosate)	
Peruvian primrose willow	*Ludwigia peruviana*	Perennial	Summer	Spring	Mechanical – Herbicide (2, 4-D, Triclopyr)	
Praxelis	*Praxelis clemtida*	Perennial	Year Round	Year Round	Chemical (Imazapyr, Glyphosate, 2, 4-D)	
Rattle bush	*Sesbania spp.*	Annul	Summer, Fall	Mid to Late Spring	Mechanical or Chemical (2, 4-D)	
Tropical Soda Apple	*Solanum viarum*	Perennial	Fall, Winter, Spring	Year Round	Mechanical and Chemical (Triclopyr, Glyphosate / 2, 4-D mix)	
Wild Taro	*Colocasia esculentum*	Perennial	N/A Fragmenta tion and Rhizomes	Year Round	Hand or Herbicide (Glyphosate, 2, 4-D with Surfactant)	Be sure to use a good polymer or sticker

*Applications of Imazapyr can move within the soil substrate, killing non targeted vegetation (canopy, shrub and herbaceous species). Read the manufactures label carefully.

** In areas that are within the 330 foot eagle nest tree buffer (refer to Figure 12) protection zone, maintenance should not occur until the fledglings have left the nest or until May 15th, whichever occurs first.

Although herbicides can be very effective, in some instances, routine mowing can provide the most cost effective and fastest form of vegetation management, especially when dealing with nuisance and exotic annual vegetation. In these instances, it is recommended that in natural areas, the mowing deck be placed at the highest level prior to the mowing event. Sodded areas of TICA should be managed for broad leaf weed control through routine mowing cycles and / or applications of pre-emergent broadleaf herbicides.

Site preparation should be consideration prior to the installation of vegetative species in order to enhance the success and growth rate of the planted vegetation. In particular, it is suggested that the delineated planting areas as indicated in Figure 15 be managed for nuisance and exotic vegetative species for several vegetative cycles to reduce noxious vegetative seed source, encourage natural recruitment of beneficial species, and to protect supplemental plantings.

Additional vegetation management may include periodic removal of deadfall of limbs from the onsite canopy specimens. Snags and standing dead limbs will be left in place, provided they do not present a safety hazard to park patrons. Deadfall will be removed as necessary.

The primary goals for Phase II include:

- **Soil Stabilization**: Placement of sod for in heavily traversed and other identified areas throughout TICA and BWP facilities.
- **Upland Creation**: Placement of appropriate upland and mesic vegetative specimens throughout designated areas of TICA to encourage wildlife utilization and the enhancement of naturally occurring habitats within the area.
- **Wetland Restoration:** Installation of appropriate wetland vegetation to enhance the existing habitat.
- **Land Management Activities**: implementation of a vegetative maintenance and monitoring program to reduce nuisance and exotic vegetative species within TICA.

Goal Objectives

#	OBJECTIVE DETAILS	COMPLETION DATE
1.	Installation of sod for soil stability.	YEAR 1
2.	Design upland and wetland creation/restoration areas	YEAR 1
3.	Initiate land management activities such as herbicide applications and mowing events to remove / reduce nuisance and exotic vegetation, within both upland and wetland vegetative communities.	YEAR 1 and YEAR 2
4.	Initiate vegetative maintenance within upland areas including tree trimming, deadfall removal, and irritant (poison ivy) clearing, if needed.	YEAR 1 and YEAR 2
5.	Initiate upland creation areas and eagle nest tree buffer plantings.	YEAR 1 and YEAR 2
6.	Initiate wetland enhancement plantings.	YEAR 1 and YEAR 2
7.	Supplemental upland and wetland plantings	ONGOING

3.3 Phase III - Perpetual Management and Maintenance of Natural Areas and Facilities

A majority of TICA is considered upland habitat. A portion of the site will be restored with upland and mesic vegetative species, while the wetland areas will receive enhancement plantings. The TICA trail corridor will be maintained by the County through mowing activities, minimizing maintenance activities. The trail corridor will be monitored and trail markers will be replaced, as required. Trail safety guidelines will be in effect to provide safe use by pedestrians. In addition, educational signage for the bald eagle and osprey nests will also be maintained along the trail corridor.

The initiation of land management activities including mowing and herbicide applications to remove nuisance and exotic vegetative species should continue on a quarterly basis of treatment for the first two years, and semi-annual treatments thereafter. Treatment cycles within all natural areas and modified habitats should be scheduled based on applying maintenance activities, prior to seeding of the targeted vegetation, if possible (see Table 4). It should be noted that mowing events will stimulate seeding in vegetative species, and in particular certain nuisance and exotic grasses. Mowing, when applied appropriately as a tool for vegetation management can significantly reduce annual noxious vegetation such as dogfennel (*Eupatorium capillifolium)*) and rattle bush (*Sesbania spp.*), however when applied to areas with cogon grass infestations should be scheduled in conjunction with herbicide treatments at least two weeks after the mowing event which will target new growth and prevent seeding opportunities. In addition to maintaining the natural habitat areas, vegetative maintenance should also focus on keeping the kayak/canoe launching area and canal clear of aquatic vegetative growth for easy access to Lake Tohopekaliga.

The County will provide appropriate security for TICA through boundary/internal signage, entrance gate, and periodic patrols by County Staff and if warranted, Osceola County Sheriff Office (OCSO) and/or Florida Fish and Wildlife Conservation Commission (FWC). Consistent with the mission of Osceola County Parks, resource-based recreation will be encouraged in so far as it does not conflict with County code, state and/or federal law, or site-specific restrictions to protect natural resources and listed species.

The primary goals for Phase III include:

- **Natural Area Maintenance and Management**: Manage natural communities and modified habitats to protect and enhance water, flora, and fauna resources.
- **Public Use**: Provide safe, resource-based public use opportunities and education.
- **Facilities**: Maintain TICA/BWP infrastructure and facilities.

Goal Objectives

#	OBJECTIVE DETAILS	COMPLETION DATE
1.	Open park and monitor and maintain public access area and constructed recreational elements	YEAR 1 - ONGOING
2.	Monitor and maintain safe and stable trail corridor	ONGOING
3.	Remove vegetation from the public access areas.	ONGOING
4.	Provide safe, resource based public use and education	ONGOING
5.	Routinely update and maintain information kiosks	ONGOING
6.	Maintain TICA nuisance and exotic species management in natural habitat and constructed areas utilizing appropriate land management activities.	ONGOING
7.	Conduct biannual inspection of fence, gates, locks, trail markings and signage	ONGOING
8.	Replace and/or repair gates, locks, and signage as needed	ONGOING
9.	Collaborate regularly with law enforcement to maintain and enhance security	ONGOING
10.	Document security problems to foster solutions and provide ongoing data for law enforcement	ONGOING

4.0 RESOURCE PROTECTION AND MANAGEMENT

As described in **Section 3.0** (Land Management Goals and Objectives), the proposed land management activities at TICA/BWP consist of 3 primary components: 1) providing public access, facilities and amenities, 2) restoring and enhancing surrounding vegetative habitats through land management activities, and 3) perpetual site management and site security. A fundamental goal of this plan is to facilitate effective security for park patrons, while managing the natural resources onsite for the perpetuation of fish and wildlife, with an emphasis on threatened or endangered species. This is best accomplished through a combination of resource protection and management which is detailed in this section.

4.1 Resource and Site Protection

Security concerns within TICA include illegal motorized vehicle access (including illegal mooring by motorized water craft), dumping, vandalism of gates, fences, and conservation signage, and poaching. The County, primarily through boundary/internal signage, entrance way fencing, and periodic patrols by County staff, Osceola County Sheriff's Office (OCSO), FWC, and/or contractors will administer security for the property.

Consistent with the mission of Osceola County Parks, resource-based recreation will be encouraged in so far as it does not conflict with County code, state and/or federal law, or site-specific restrictions to protect natural resources and listed species. FWC officers provide protection to residents and visitors who enjoy Florida's natural resources, while enforcing resource protection. FWC officers have full police authority and statewide jurisdiction. The officers are cross-deputized to enforce federal marine fisheries and wildlife laws, thus ensuring state and federal consistency in resource-protection efforts. The following site-specific security measures will be implemented at TICA to protect on-site natural, cultural, water resource, and recreational resources:

1. Conduct biannual inspection of fence, gates, locks, and signage;
2. Collaborate regularly with law enforcement to maintain and enhance security;
3. Replace and/or repair entrance gates, locks, and signage as needed;
4. Document security problems to foster solutions and provide ongoing data for law enforcement;
5. Report harassment of protected species to FWC.

A prominent rod iron and brick gate feature currently exists at the main entrance to TICA, however additional fencing may be required to secure the site and provide for controlled site access. Boundary signage will be posted at reasonable intervals along the property footprint. The signage will contain clear, enforceable language and referenced County code or State statute to aid in enforcement.

Gate maintenance will be comprised of periodic/semi-annual review for integrity and signage replacement; it will also provide an opportunity to inspect for unauthorized access or activity and vandalism along the project perimeter. The gate and locks can be routinely inspected and maintained with usage and repaired/replaced as necessary. Gates and mutually shared combinations/keys (with FWC) are recommended for management and operational access.

4.2 Resource Management

There are a number of land management actions that can be accomplished at TICA to provide the resource protection, habitat management, and public recreation desired by the County for its Parks program. Those actions are discussed in this section.

Debris Removal:

Structural debris, including domestic trash, will be removed from the site, and legally disposed at an appropriate facility. Vegetative debris will be collected from the public access area and removed from site.

Natural Areas Management:

The fundamental goals of natural areas management are to maintain healthy vegetative density and structure and preserve and promote upland and wetland habitats for associated wildlife. To meet these goals at TICA the following actions will be implemented:

1. Protection of mature trees;
2. Installation of appropriate upland and wetland species for restoration and enhancement of habitat
3. Documentation and protection of known nesting/roosting trees;
4. Inspect canopy species annually for possible pruning, disease, and safety considerations;
5. Provide routine maintenance events to reduce noxious vegetation
6. Locate listed species nest trees and restrict human access to those locations

TICA contains mature trees and established nesting sites of both listed (i.e. bald eagle, sand hill crane and osprey) and non-listed avian species. Introduction of passive recreation to the site will be conducted in accordance with all rules and regulations and will assure that impacts to the established communities are minimal. The existing natural community at TICA may be susceptible to tree fall during severe winds or storms (fallen trees and branches). Dead and severely damaged trees will be removed, fallen branches will be collected, and branches will be trimmed, as necessary for safety, accessibility, and aesthetics.

In the absence of fire, DFCs for the existing habitats can be attained through ecologically sensitive equipment (low-ground pressure harvesters/mowers), hand removal and/or routine herbicide applications to achieve appropriate vegetative cover.

Prescribed Fire:

Implementing a prescribed fire program at TICA is not practical, at this time, based on the lack of a vegetative understory in the natural areas that would support fire implementation. The existing vegetative understory contains a large amount of noxious species which prescribed fire, alone will not "control". A primary example is cogon grass. Thick cogon thatches can be burned to remove old growth; however management should include tilling (if applicable) and herbicide applications to new growth, after the introduction of fire.

Noxious Species Control:

During the site evaluation, exotic and nuisance species were observed at TICA, as previously discussed. Management of TICA will require implementation of timely land management activities to reduce nuisance/exotic species growth to assure the highest quality habitats can be achieved. The implementation

of a Nuisance and Exotic Vegetative Management Plan (NEVMP) can help to achieve DFC's within TICA. The NEVMP should include:

1. Maintenance of coverage of noxious species below acceptable thresholds;
2. Documentation of location and extent of noxious species occurrence;
3. Treatment of noxious species with methods that are sensitive to listed species, water resources, and native vegetation;
4. Minimization of the spread of noxious seeds through reasonable decontamination procedures;
5. Quarterly inspections of the project perimeter and other areas susceptible to infestation;
6. GPS documentation of new infestations/occurrences;
7. Rapid response control and treatment to prevent and reduce maintenance costs;
8. Prioritization of Category I exotics for treatment, with Category II treatment as funding allows;
9. Monitoring to determine effectiveness and re-treatment needs.

Table 5 below, lists the exotic and nuisance species observed (or likely), their Florida Exotic Pest Plant Council (FLEPPC - 2017) ranking and the communities in which they were observed.

Table 5. FLEPPC Species Observed at TICA.

Scientific Name	Common Name/s	FLEPPC Ranking	Community
Abrus precatorius	Rosary pea, crab's eye, prayer bead, coral bead	I	Upland
Colocasia esculenta	Wild taro	I	Mesic / Wetlands
Eichhornia crassipes	Water-hyacinth	I	Aquatic
Imperata cylindrica	Cogon grass	I	Upland / Mesic
Lantana camara (= *L. strigocamara*)	Lantana	I	Upland
Ludwigia peruviana	Peruvian primrose willow	I	Mesic/Wetlands
Nephrolepis brownii (= *N. multiflora)*	Asian sword fern	I	Mixed wetland hardwoods
Paederia foetida	Skunk vine	I	All Communities - Vine
Panicum repens	Torpedo grass	I	Aquatic / Mesic
Pennisetum purpureum	Napier grass, elephant grass	I	Mesic / Upland
Sapium sebiferum (*Triadica sebifera)*	popcorn tree, Chinese tallow tree	I	Mesic / Upland
Schinus terebinthifolius	Brazilian pepper	I	Mesic
Solanum viarum	Tropical soda apple	I	Mesic / Upland

Scientific Name	Common Name/s	FLEPPC Ranking	Community
Urena lobata	Caesar weed	I	Mesic
Urochloa mutica	Para grass	I	All Communities
Melia azedarach	Chinaberry	II	Mesic / Uplands
Momordica charantia	Balsam apple	II	All Communities - Vine
Panicum maximum (= Urochloa maxima)	Guinea grass	II	Upland
Praxelis clematidea	Praxelis	II	Mesic / Upland

FLEPPC Rank: ***I = Displace native plants, alter community structures or functions, hybridize with natives***
II = Very abundant/frequent but do not alter communities to extent shown by Cat. I

4.3 Water Resources

TICA is located within the SFWMD Lake Tohopekaliga Basin and Kissimmee River Watershed. The site is hydrologically connected to Lake Tohopekaliga. Due to the location of TICA, the water levels onsite are influenced by several factors including SFWMD driven elevations of Lake Tohopekaliga, drainage from adjacent open land and development, climatic variations, and modifications to storage capacity in the drainage basin. The water level within Lake Tohopekaliga is regulated between 52 feet NGVD to 55 feet NGVD. The regulated water levels have an influence on the groundwater littoral zone areas along TICA, potentially drawing down the water table and surface water levels during low water elevation regulation cycles. As a result of the artificial water level manipulation, the littoral wetland fringe of the TICA experiences a more static water level environment. Although the water regulations of the lake cannot be altered, mechanical or herbicidal control along shoreline can be implemented to re-create a more diverse wetland habitat for both flora and fauna. Proposed improvements to TICA/BWP may require permits from the SFWMD should improvements and / or amenities impact jurisdictional wetlands or waterbodies.

4.4 Wildlife and Listed Species

A primary objective in the stewardship of TICA is to promote and maintain healthy fish and wildlife populations. Wildlife management will be directed toward production of native species diversity consistent with the biological community types present. Wildlife and listed species management will be accomplished by:

1. Performing land management activities that maintain and/or improve native wildlife habitat;
2. Conducting specific management beneficial to protected species;
3. Conducting wildlife inventories through the FWC in areas where management activities have the potential to impact listed species;
4. Following management guidelines for listed species protection as determined by the *Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida, Volume 1,* (U.S. Fish and Wildlife Service. 1998) and its amendments;
5. Reducing non-native wildlife species populations where appropriate;
6. Maintaining a master file of confirmed and potential wildlife species;

7. Protecting the existing listed wildlife species onsite;
8. Cooperating with the FWC and FWS on wildlife management issues, including wildlife inventories and evaluating management actions.

Threatened and Endangered Species (Including Species of Special Concern - SSC)

Several listed wildlife species are present or have been observed historically within the TICA. Impacts to listed species from planned land management and recreational activities are of special concern. Activities that might jeopardize the well-being of these species may be altered or cancelled. Land management activities that include: restoration and enhancement of onsite habitats, and noxious vegetative control, improves natural environmental characteristics that benefit listed species as well as a variety of other indigenous wildlife. At this time, management emphasis concerning listed or protected wildlife species within TICA should be concentrated on:

- Wood storks – *Mycteria americana*
- Southern bald eagles – *Haliaeetus leucocephalus*
- Florida Sandhill cranes – *Antigone Canadensis pratensis*
- Everglades snail kites – *Rostrhamus sociabilis*
- American Alligator – *Alligator mississippiensis*
- Ospreys – *Pandion haliaetus*

A brief description of agency requirements for the wood stork, Southern bald eagle, Florida sand hill crane, and the Everglades snail kite, is listed below. In addition, TICA and the surrounding open water and marsh/forested landscapes provide significant nesting opportunities for osprey and stopover habitat for migratory birds and waterfowl.

American Wood Stork – *Threatened*

Wood storks were observed flying over or foraging within TICA boundary during the field inspection of the property conducted in March 2017. TICA does exist within a core a core foraging area, however, no wood stork colonies are located within, or immediately adjacent to the subject property. Of particular foraging use for wood storks is the expanse of littoral marsh and cypress fringe surrounding TICA, which supports significant habitat for aquatic vertebrates and invertebrates. These shallow areas of surface water create attractive feeding areas for wood storks and other wading birds. These areas do provide potential roost or nest sites for the species. Current regulations restrict human activity that should be no closer than 300 to 750 feet from feeding sites when storks are present. For nesting colonies, a primary zone must extend between 1000 and 1500 feet in all directions from the colony boundaries and a secondary zone to 2500 feet is also applied. Within these zones, human activities should not occur within 500-1000 feet of a roost site, 24 hours a day, between February 15 and August 15. Closure dates established in the rule were determined based on the breeding and nesting season, and sought to provide a temporal buffer to permit wood storks begin nest building as well as to allow chicks extra time to successfully fledge. Should wood storks develop a rookery within

TICA these required measures, or the most current regulations and management guidelines, will be strictly followed.

Southern Bald Eagle – *Managed*

FWS removed the bald eagle from Endangered Species Act listing in 2007. However, eagles, their nests, or eggs are still afforded protection from hunting, killing, selling or otherwise harming under both the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Since de-listing, USFWS has developed categorical guidelines to minimize human disturbance to roosting, nesting and foraging sites of bald eagles. Activities proposed within BWP/TICA are encompassed in Category F (Non-motorized recreation and human entry; hiking, camping, fishing, hunting, birdwatching, kayaking, canoeing) of the FWS National Bald Eagle Management Guidelines. The bald eagle is an extensive user of the habitats found within and surrounding BWP. Lake Tohopekaliga provides an excellent foraging area and hosts many ideal nesting areas. During the field investigation of the subject property one or more bald eagles was observed foraging near the island within the lake or flying/transitioning in the vicinity. One nesting pair (which produced two fledglings during the 2016 – 2017 nesting season) has been identified on site and consultation with FWC has occurred which includes the implementation of FWS management guidelines to lessen human disturbance in the area (please refer to Section 2.6, Agency Coordination and Figure 10).

Florida Sandhill Crane - *Threatened*

Existing TICA vegetation supports sand hill crane nesting and foraging habitats. Sandhill cranes are routinely observed in areas along the shore of Lake Tohopekaliga and the abundant freshwater marshes flanked by open upland grassland habitats are all very good for the breeding and nesting requirements of the species. The following management guidelines will be implemented to protect the species and conserve existing breeding, nesting and foraging habitats at TICA.

1. Known nests will be protected by a 400 foot buffer to reduce the likelihood of disturbance by human activities.
2. Seasonality of human operated wetland management activities will avoid flooding existing nests or detrimentally impacting foraging habitat.

3. Prescribed burning will be used (see Section 4.3; Fire Management) to maintain upland habitats in suitable conditions for use by Florida sandhill cranes.

Everglades Snail Kite - *Endangered*

During the field investigation snail kites were observed foraging along the shoreline and transitioning from one location to another, throughout Lake Tohopekaliga. The littoral wetland areas surrounding TICA provides excellent foraging, breeding and nesting opportunities for the snail kite (Figure 9). All recreational, habitat restoration or land management activities posed within, or near to, key areas of snail kite habitat will be conducted as using the following conservation measures (directly adapted from USFWS Snail Kite Management Guidelines);

1. FWS and FWC will be provided notification of nest sites during the nesting season (generally December 1 to July 31, but including all periods when active nests are known), locations of all known snail kite nests, including maps and coordinates of nest sites, kite protection buffers, and priority kite management zones will be provided by the land manager.

2. Two buffer zones will be established around every active snail kite nest. This includes all nests reported and any unreported nest that is encountered during other activities. These buffer zones will be in effect from when kites begin nest building through the time when breeding activity is no longer observed at the site. Buffer zones may remain in place past the time when fledglings leave the area if adult kites continue to show breeding activity, including courtship, in the general area.

    A. No-entry Buffer Zones - A 500-foot (ft) (~150 meter) radius no-entry buffer zone will be established around all active nests that are discovered. The purpose of this buffer zone is to protect kites from direct disturbance that may affect the outcome of nesting. Personnel, pedestrians, horses, bicycles, vehicles, airboats, helicopters, other equipment and activity must stay outside of these areas at all times when kite breeding activity is occurring.

    B. Limited Activity Buffer Zones - A 1,640 ft (500 meter) radius limited-activity buffer zone will be established around all active kite nests. This buffer zone is intended to maintain and protect foraging opportunities and habitat conditions around each nest to allow the nest to succeed. The goal is to maintain habitat conditions for the entire nesting period similar to those that were present when the birds selected the site.

    Personnel, pedestrians, horses, bicycles, vehicles, airboats, helicopters, drones and other equipment and activity must stay outside of this buffer when possible, and activity within the buffer should be limited to the minimum time necessary to complete appropriate management activities.

• Only management activities that are expected to maintain or improve the existing kite foraging and nesting habitat within these areas will occur while there is evidence of kite breeding activity;

• Exotic and invasive plant control efforts, including water hyacinth, water lettuce, hydrilla and similar invasive species that may rapidly encroach on native vegetation communities may be treated within limited-activity buffer zones during kite breeding, so long as treatments are not expected to result in impacts to vegetation species that contribute to snail kite and apple snail habitat.

• Herbicide or other land management activities expected to result in changes > 10 percent in the cover or occurrence of native vegetation species including spikerushes, bulrushes, maidencane and other emergent vegetation will be avoided.

• Treatments of invasive and undesirable woody plants, cattails and other similar vegetation will not occur within these buffer zones during kite nesting.

5.0 LAND USE MANAGEMENT

5.1 Public Access

Vehicular public access will be provided via utilization of Aultman Road, in Kissimmee, Florida. Limited public parking within TICA will be provided. A launching area for kayak and canoe recreation will be provided as TICA provides direct access to Lake Tohopekaliga and will eventually serve as an additional waypoint for the Shingle Creek Paddling Trail. Passive amenities / facilities will be contained within the upland components of TICA. Informational kiosks will be located along the walking path and fencing / gates may be installed to provide security and management options. Use of the trail will be limited to pedestrian public access only.

Access Maintenance and Management Strategies

- Maintain signs, gates, fencing, and trail
- Clearly identify trailhead
- Monitor and replace trail markers and educational kiosks (as required)

5.2 Recreation and Access Management

Osceola County Government has taken steps to preserve the natural beauty of the county and to ensure that there will be natural lands and water resources for future generations. TICA, although not large in area, offers a blend of passive recreational activities due to its location. BWP/TICA will include a walking trail, covered pavilions, kayak / canoe launching area, an observation deck, educational and informational signage, and bathroom and parking facilities. The facilities will be maintained by the County.

Recreational Use Management Strategies

- Maintain signage and trail.
- Maintain current information in recreation guide, trail guides, kiosk, and County website
- Maintain observation platform, kayak / canoe launching areas and pavilions
- Maintain bathrooms, well head, parking areas, entrance road and gate structures

5.3 Trail Maintenance

The walking trail and informational signage / kiosks will be maintained by the County. The walking trail will consist of a mowed path through the upland areas of TICA. The trail is anticipated to require minimal maintenance activities. Trail safety guidelines will be followed to the greatest extent practicable.

Trail Maintenance and Management Strategies

- Clearing or mowing trails up to 12 times yearly
- Trail blazing and trimming of overhanging branches as needed
- Trail and trailhead maintenance as needed

5.4 Park Facilities and Amenities

As part of Phase I, discussed in Section 3.1, TICA will offer a number of park amenities and facilities. TICA amenities will include shore based fishing in designated areas, hiking, canoe/kayaking, picnicking and wildlife viewing opportunities. The park facilities will include stabilized parking, handicapped parking, restrooms, a water fountain and a well head. In addition, two pavilions, an observation deck and a stabilized kayak/canoe launching area has been constructed as part of the Phase I – Land Management Goals and Objectives for Year 1 (Section 3.0). Based on the 5 Year Schedule of Implementation Actions (**Table 6**) below, it is anticipated that a third pavilion may be constructed during Year 2 of implementation.

5.5 Restrictions

Security concerns include illegal motorized vehicle access, dumping, vandalism of gates and fences, and poaching. The County, primarily in coordination with FWC and local law enforcement, will administer law enforcement for the property.

6.0 RULES AND REGULATIONS

The rule that governs the use of this property is set forth in Osceola County Ordinance Part II, Chapter 16 Parks and Recreation. Activities proposed would be subject to relevant Florida Statutes and rules of Chapter 40-4, Florida Administrative Code, Environmental Resource Permits, regulated in this location by the SFWMD, and Section 404 of the Clean Water Act, regulated by the ACOE. Any impacts, alterations or habitat restoration for listed species would require coordination with the FWC and/or the FWS. In addition, if any of the activities proposed within this management plan uncovers historical or archeological resources on the property or immediately adjacent to TICA, management of the activity will require coordination with the Division of Historical Resources (DHR), Florida Department of State.

7.0 FIVE YEAR SCHEDULE OF IMPLEMENTATION

The schedule of implementation for TICA actions is included in this section. The majority of actions will occur within the first two years, with a transition from implementation to maintenance at the end of year 2. The schedule includes management actions through Year 5, and is intended to be updated and refined at the beginning of each year and is provided in Table 6.

Table 6. 5 Year Schedule of Implementation

YEAR	MANAGEMENT ACTION	COMPLETION
1	Identify appropriate recreational elements within TICA/BWP that would provide a public passive recreation	Year 1
	Stabilize the existing entrance drive feature	Year 1
	Install guardrails over existing culverts along the entrance drive	Year 1
	Stabilize areas that are denuded and/or will be heavily traversed areas with sod	Year 1
	Construct parking area, drinking fountain and bathroom facility	Year 1
1 - 2	Remove noxious macrophytic aquatic vegetation within and around the kayak and canoe launching area	Years – 1 and 2

YEAR	MANAGEMENT ACTION	COMPLETION
	Identify and construct walking trail and access area that are suitable within BWP/TICA	Year 1
	Identify and construct observation deck	Year 1
	Construct pavilions, picnic tables and well head	Year 1
	Initiate upland restoration and buffer plantings	Year 1
	Initiate wetland / mesic restoration plantings	Year 1
1 - 5	Initiate land management activities such as herbicide applications to remove / reduce nuisance and exotic vegetation	Years 1 - 5
	Install information kiosk and educational signage	Year 1
	Initial maintenance of the trail corridor	Year 1
2	Continue supplemental plantings for upland restoration and buffer plantings	Year 2
	Continue supplemental plantings for wetland and mesic enhancement plantings	Year 2
	Construct third pavilion (optional)	Year 2
	Maintain existing and created upland and wetland communities through land management activities including mowing and herbicide applications	Year 2
	Maintain kayak and canoe launching area free of noxious vegetation	Year 2
	Maintain safe and stable trail corridor	Year 2
	Maintain public access areas and constructed recreational elements	Year 2
	Maintain free and open access areas, free of deadfall	Year 2
	Conduct wildlife inventories	Year 2
	Conduct biannual inspection of fence, gates, locks, trail markings and signage and replace as needed	Year 2

YEAR	MANAGEMENT ACTION	COMPLETION
3	Continue supplemental plantings for upland restoration and buffer plantings	Year 3
	Continue supplemental plantings for wetland and mesic enhancement plantings	Year 3
	Maintain existing and created upland and wetland communities through land management activities including mowing and herbicide applications	Year 3
	Maintain kayak and canoe launching area free of noxious vegetation	Year 3
	Maintain safe and stable trail corridor	Year 3
	Maintain public access areas and constructed recreational elements	Year 3
	Maintain free and open access areas, free of deadfall	Year 3
	Conduct wildlife inventories	Year 3
	Conduct biannual inspection of fence, gates, locks, trail markings and signage and replace as needed	Year 3
4	Maintain existing and created upland and wetland communities through land management activities including mowing and herbicide applications	Year 4
	Maintain kayak and canoe launching area free of noxious vegetation	Year 4
	Maintain safe and stable trail corridor	Year 4
	Maintain public access areas and constructed recreational elements	Year 4
	Maintain free and open access areas, free of deadfall	Year 4
	Conduct wildlife inventories	Year 4
	Conduct biannual inspection of fence, gates, locks, trail markings and signage and replace as needed	Year 4

YEAR	MANAGEMENT ACTION	COMPLETION
5	Maintain existing and created upland and wetland communities through land management activities including mowing and herbicide applications	Year 5
	Maintain kayak and canoe launching area free of noxious vegetation	Year 5
	Maintain safe and stable trail corridor	Year 5
	Maintain public access areas and constructed recreational elements	Year 5
	Maintain free and open access areas, free of deadfall	Year 5
	Conduct wildlife inventories	Year 5
	Conduct biannual inspection of fence, gates, locks, trail markings and signage and replace as needed	Year 5

8.0 BUDGETARY CONSIDERATIONS

The budgetary considerations for the implementation and management of BWP/TICA represent a significant investment by Osceola County. This investment was acknowledged when the property was acquired. Cost estimates have been included to reflect the implementation of the park amenities and management actions in this Land Management Plan and are included in **Appendix E**.

9.0 REFERENCES

Ewel, K.C. 1990. Swamps in *Ecosystems of Florida*, R.L. Myers and J.J. Ewel (eds.). University of Central Florida Press, Orlando, FL.

Florida Department of Transportation. 1999, *Florida Land Use Cover and Forms Classification System.* Handbook. Department of Transportation, Survey and Mapping, Geographic Mapping Section. 95 pp. http://www.dot.state.fl.us/surveyingandmapping/Manuals/fluccmanual.pdf

Kushlan, J.A. 1990. Freshwater marshes. *Ecosystems of Florida*, R.L. Myers and J.J. Ewel (eds.), University of Central Florida Press, Orlando FL.

Florida Natural Areas Inventory. 2010 ed. *Guide to the Natural Communities of Florida*. Florida Natural Areas Inventory and the Florida Department of Natural Resources. 228 pp.

Readle, E. L., et al. 1979. *Soil survey of Osceola County area, Florida*. U.S. Dept. Agric. Soil Conservation Serv. 151 pp. plus maps.
http://soils.usda.gov/survey/online_surveys/florida/osceola/fl_osceola.pdf

U.S. Fish and Wildlife Service. 1999. South Florida Multi-species Recovery: a species plan…an ecosystem approach. U.S Fish and Wildlife Service, Atlanta, GA. 2179 pp.
http://verobeach.fws.gov/Programs/Recovery/vbms5.html

Appendices

ESA

Appendix A
Warranty Deed

After Recording Return to:
Jami Maxson
Stewart Title Company
1201 Emmett Street
Kissimmee, FL 34741

This Instrument Prepared by:
Jami Maxson
Stewart Title Company
1201 Emmett Street
Kissimmee, FL 34741
as a necessary incident to the fulfillment of conditions
contained in a title insurance commitment issued by it.

Property Appraisers Parcel I.D. (Folio) Number(s):
R262529-000002000000 and R262529-5183000100E0
File No.: 01206-30747

WARRANTY DEED

This Warranty Deed, Made the 18th day of December, 2014, by **Candella Island, Inc, Phillip Charles Owen, and Marian Louise Owen, husband and wife**, a Florida Corporation, having its place of business at **1130 East Donegan Avenue, Kissimmee, FL 34744**, hereinafter called the "Grantor",

to **Osceola County,**
whose post office address is: **1 Courthouse Square, Kissimmee, FL 34741**, hereinafter called the "Grantee".

WITNESSETH: That said Grantor, for and in consideration of the sum of **Three Million Eight Hundred Fifty Thousand Dollars and No Cents ($3,850,000.00)** and other valuable considerations, receipt whereof is hereby acknowledged, by these presents grants, bargains, sells, aliens, remises, releases, conveys and confirms unto the Grantee, all that certain land situate in **Osceola** County, Florida, to wit:

SEE EXHIBIT "A" ATTACHED HERETO

TOGETHER with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining.
To Have and to Hold, the same in fee simple forever.
And the Grantor hereby covenants with said Grantee that the Grantor is lawfully seized of said land in fee simple; that the Grantor has good right and lawful authority to sell and convey said land; that the Grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except taxes accruing subsequent to 12/31/2014, reservations, restrictions and easements of record, if any.
(Wherever used herein the terms "Grantor" and "Grantee" included all the parties to this instrument and the heirs, legal representatives and assigns of the individuals, and the successors and assigns of the grantor.)

IN WITNESS WHEREOF, Grantor has caused these presents to be executed in its name, and its corporate seal to be hereunto affixed, by its proper officers thereunto duly authorized, the day and year first above written.

SIGNED IN THE PRESENCE OF THE FOLLOWING WITNESSES
TWO SEPARATE DISINTERESTED WITNESSES REQUIRED

ATTEST: _____
Secretary

CANDELLA ISLAND, INC

Witness Signature: Nancy L. Evans
Printed Name: Nancy L. Evans

Phillip C. Owen
President

Witness Signature: _____
Printed Name: _____

State of Florida
County of Osceola

The foregoing instrument was acknowledged before me this 18th day of December, 2014 by Philip C. Owen as President of Candella Island, Inc., on behalf of the the grantor.. He/She is personally known to me or has produced driver license(s) as identification.

Nancy L. Evans
Notary Public Signature
Printed Name: Nancy L. Evans

My Commission Expires: 8-16-18
(SEAL)

NANCY L. EVANS
Notary Public - State of Florida
My Comm. Expires Aug 16, 2018
Commission # FF 125014

Recorded in Osceola County, FL ARMANDO RAMIREZ, CLERK OF COURT 12/22/2014 03:09:45 PM RECEIPT # 1695345
Rec Fees 27.00 DEED DOC 26,950.00 EXTRA NAMES
CFN# 2014185662 BK 4712 PG 836 PAGE 1 OF 3

NOTARY PUBLIC ACKNOWLEDGEMENT ADDENDUM

TWO SEPARATE DISINTERESTED WITNESSES REQUIRED

Witness Signature: Nancy L. Evans
Printed Name: Nancy L. Evans

Phillip Charles Owen

Witness Signature: _____
Printed Name: _____

State of Florida
County of Osceola

The foregoing instrument was acknowledged before me this 18th day of December, 2014 by Phillip Charles Owen who is personally known to me or has/have produced drivers license (s) as identification.

Nancy L. Evans
Notary Public Signature
Printed Name: ~~Jami Maxson~~ Nancy L. Evans

My Commission Expires: 8-16-18
(SEAL)

NANCY L. EVANS
Notary Public - State of Florida
My Comm. Expires Aug 16, 2018
Commission # FF 125014

TWO SEPARATE DISINTERESTED WITNESSES REQUIRED

Witness Signature: _____
Printed Name: _____

Marian Louise Owen

Witness Signature: _____
Printed Name: _____

State of Florida
County of Osceola

The foregoing instrument was acknowledged before me this 18th day of December, 2014 by Marian Louise Owen who is personally known to me or has/have produced drivers license (s) as identification.

Nancy L. Evans
Notary Public Signature
Printed Name: ~~Jami Maxson~~ Nancy L. Evans

My Commission Expires: 8-16-18
(SEAL)

NANCY L. EVANS
Notary Public - State of Florida
My Comm. Expires Aug 16, 2018
Commission # FF 125014

EXHIBIT "A"
LEGAL DESCRIPTION

That certain piece, parcel and tract of land located in Osceola County, Florida, described as follows:

That part of Government Lot 6 in Section 26, Township 25 South, Range 29 East, Osceola County, Florida, known as Aultman's Island.

AND

One parcel of filled, formerly submerged land lying in Section 26, Township 25 South, Range 29 East, Osceola County, Florida, more particularly described as follows:

Parcel B:

Commence at the Southeast corner of the Southwest 1/4 of the Northeast 1/4 of Section 26, Township 25 South, Range 29 East, Osceola County, Florida; thence S 89°17'52" W, along the South line of said Southwest 1/4 of the Northeast 1/4, 56.60 feet to a point on the centerline of Aultman Road as shown on the plat of Cypress Shores Replat recorded in Plat Book 1, Page 387 of the Public Records of aforesaid Osceola County; thence along the centerline of said Aultman Road, the following calls: S 23°56'48" W, 235.49 feet; S 32°36'14" W, 489.57 feet; S 22°26'31" W, 1005.72 feet; S 50°40'35" W, 122.58 feet; S 63° 10'08" W, 285.58 feet, more or less, to the ordinary high water line of Lake Tohopekaliga and the Point of Beginning; thence N 78°15'48" E, along said ordinary high water line, 115.20 feet, more or less, to a point 30 feet Southerly of the centerline of aforesaid Aultman Road; thence S 63°10'08" W, parallel to and 30 feet Southerly of said centerline, 687.42 feet, more or less; thence S 63°36'41" W, parallel to and 30 feet Southerly of said centerline, 585.43 feet, more or less, to the ordinary high water line of Lake Tohopekaliga at Aultman's Island; thence N 09°52'12" E, along said ordinary high water line, 74.40 feet to a point 30 feet Northerly of the centerline of said Aultman Road; thence N 63°36'41" E, parallel to and 30 feet Northerly of said centerline 541.25 feet, more or less, thence N 63°10'08" E, parallel to and 30 feet Northerly of said centerline, 464.74 feet, more or less, to the ordinary high water line of Lake Tohopekaliga; thence N 78°15'48" E, along said ordinary high water line, 115.20 feet, more or less, to the Point of Beginning.

Less and Except any of the above described parcels of land which are or may hereafter become located waterward of the line of ordinary high water of Lake Tohopekaliga.

AND

Tract E, SUNSET POINTE, according to the Plat thereof, as recorded in Plat Book 7, Pages 178 and 179 of the Public Records of Osceola County, Florida.

Appendix B
Florida Natural Areas Inventory

FNAI tracking list

OSCEOLA COUNTY

100 Total Elements Found

Last Updated: April 2017

KEY

Scientific Name is linked to the FNAI Online Field Guides when available.

- links to **NatureServe Explorer**, an online encyclopedia of more than 55,000 plants, animals, and natural communities in North America, compiled by the **NatureServe** network of natural heritage programs, of which the Florida Natural Areas Inventory is a member.

- links to a species distribution map (**Adobe SVG viewer** required). If your browser does not support Adobe SVG, try this **link**

SEARCH RESULTS

NOTE: This is not a comprehensive list of all species and natural communities occurring in the location searched. Only elements documented in the FNAI database are included and occurrences of natural communities are excluded. Please see FNAI Land Cover information or Reference Natural Community map for more information on communities.

Plants and Lichens

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Andropogon arctatus	Pine-woods Bluestem	G3	S3		T
Boamia grandiflora	Florida Bonamia	G3	S3	T	E
Nemastylis floridana	Celestial Lily	G2	S2		E
Nolina atopocarpa	Florida Beargrass	G2	S2		E
Nolina brittoniana	Britton's Beargrass	G3	S3	E	E
Pecluma ptilodon	Swamp Plume Polypody	G5?	S2		E
Polygala lewtonii	Lewton's Polygala	G2G3	S2S3	E	E
Polygonella myriophyllia	Small's Jointweed	G3	S3	E	E
Pteroglossaspis ecristata	Giant Orchd	G2G3	S2		T

Clams and Mussels

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Villosa amygdala	Florida Rainbow	G3	S3		N

Mayflies

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Stenacron floridense	A Mayfly	G3G4	S3S4		N

Dragonflies and Damselflies

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Dromogomphus armatus	Southeastern Spinylea	G	S3		Y
Hetaeria americana	American Rubyspot	GS	S2		N

Beetles

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Aphodius troglodytes	Gopher Tortoise Aphodius Beetle	G2G3	S2		N
Bolbocerosoma hamatum	Bicolored Burrowing Scarab Beetle	G3G4	S3		N
Copris howdeni	Howden's Copris Beetle	G3?	S1S2		N
Peltotrupes profundus	Florida Deepdigger Sarab Beetle	G3	S3		N
Selonodon floridensis	Florida Cebrionid Beetle	G2G4	S2S4		N

Trox howelli	Caracara Commensal Scarab Beetle	GU	SI	N

Caddisflies

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Cernotina truncona	Florida Cernotinan Caddisfly	G4	S3		N
Chimarra florida	Floridian Finger-net Caddisfly	G4	S3S4		N
Nectopsyche tavara	Tavares White Miller Caddisfly	G3	S3		N
Oecetis parva	Little Oecetis Longhorned Caddisfly	G2	S2		N
Oxyethira pescadori	Pescador's Bottle-Cased Caddisfly	G3G4	S3		N
Triaenodes furcellus	Little-fork Triaenode Caddisfly	G3	S3		N

Butterflies and Moths

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Atytone arogos arogos	Arogos Skipper	G3T1T2	S1		N
Atytonopsis loammi	Loammi Skipper	G1	S1		N
Euphyes berryi	Berry's Skipper	G2	S2		N
Hesperia attalus slossoae	Seminole Skipper	G3G4T3	S3		N
Hesperia meskei straton	Eastern Meske's Skipper	G3G4T3	S2S3		N
Polites origenes	Crossline Skipper	G4G5 T3	S3		N

Amphibians

EXPLANATIQN

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Lithobates capito	Gopher Frog	G3	S3		N
Notophthalmus perstriatus	Striped Newt	G2G3	S2	C	N

Reptiles

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Alligator mississippiesis	American Alligator	G5	S4	SAT	FT(S/A)
Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3		N
Drymarchon couperi	Eastern Indigo Snake	G3Q	S3	T	FT
Gopherus polyphemus	Gopher Tortoise	G3	S3	C	ST
Lampropeltis calligaster	Mole Kingsnake	G5	S2S3		N
Lampropeltis getula	Common Kingsnake	G5	S2S3		N

Birds

EXPLANATION

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Antigon Canadensis pratensis	Florida Sandhill Crane	G3T2T3	S2S3		ST
Aramus guarauna	Limpkin	G3	S3		N
Buteo brachyurus	Short-tailed Hawk	G3	S3	C	ST
Caracara cheriway	Crested Caracara	G5	S2	T	FT
Egretta caerulea	Little Blue Heron	G5	S4		ST
Egretta thula	Snowy Egret	G3	S3		N

Egretta tricolor	Tricolored Heron	G5	S4		ST
Elanoides forficatus	Swallow-tailed Kite	G5	S2		N
Elanus leucurus	White-tailed Kite	G5	S1		N
Eudocimus albus	White Ibis	G5	S4		N
Falco columbarius	Merlin	G5	S2		N
Falco peregrinus	Peregrine Falcon	G4	S2		N
Falco sparverius Paulus	Southeastern American Kestrel	G5T4	S3		ST
Grus americana	Whooping Crane	G1	SNR	E,XN	FXN
Haliaeetus leucocephalus	Bald Eagle	G5	S3		N
Laterallus jamaicensis	Black Rail	G3G4	S2		N
Mycteria americana	Wood Stork	G4	S2	T	FT
Nyctanassa violacea	Yellow-crowned Night Heron	G5	S3		N
Nycticorax nycticorax	Black-crowned Night Heron	G5	S3		N
Pandion halliaetus	Osprey	G5	S3S4		SSC*
Peucaea aestivalis	Bachman's Sparrow	G3	S3		N
Picoides villosus	Hairy Woodpecker	G5	S3		N
Plegadis falcinellus	Glossy Ibis	G5	S3		N
Rostrhamus sociabilis	Snail Kite	G4G5	S2	E	N

Mammals

EXPLANATIQN

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
Corynorthinus rafinesquii	Rafinesque's Big-eared Bat	G3G4	S2		N

Eumops floridanus	Florida Bonneted Bat	G1	S1	E	FE
Mustela frenata peninsulae	Florida Long-tailed Weasel	G5T3	S3		N
Neofiber alleni	Round-tailed Muskrat	G3	S3		N
Podmys flordanus	Florida Mouse	G3	S3		N

Appendix C
FWC Eagle Information and Eagle Watching Etiquette

NATIONAL BALD EAGLE MANAGEMENT GUIDELINES

U.S. Fish and Wildlife Service

May 2007

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INTRODUCTION

The bald eagle (*Haliaeetus leucocephalus*) is protected by the Bald and Golden Eagle Protection Act (Eagle Act) and the Migratory Bird Treaty Act (MBTA). The MBTA and the Eagle Act protect bald eagles from a variety of harmful actions and impacts. The U.S. Fish and Wildlife Service (Service) developed these National Bald Eagle Management Guidelines to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Eagle Act may apply to their activities. A variety of human activities can potentially interfere with bald eagles, affecting their ability to forage, nest, roost, breed, or raise young. The Guidelines are intended to help people minimize such impacts to bald eagles, particularly where they may constitute "disturbance," which is prohibited by the Eagle Act.

The Guidelines are intended to:

(1) Publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,

(2) Advise landowners, land managers and the general public of the potential for various human activities to disturb bald eagles, and

(3) Encourage additional nonbinding land management practices that benefit bald eagles (see Additional Recommendations section).

While the Guidelines include general recommendations for land management practices that will benefit bald eagles, the document is intended primarily as a tool for landowners and planners who seek information and recommendations regarding how to avoid disturbing bald eagles. Many States and some tribal entities have developed state-specific management plans, regulations, and/or guidance for landowners and land managers to protect and enhance bald eagle habitat, and we encourage the continued development and use of these planning tools to benefit bald eagles.

Adherence to the Guidelines herein will benefit individuals, agencies, organizations, and companies by helping them avoid violations of the law. However, the Guidelines themselves are not law. Rather, they are recommendations based on several decades of behavioral observations, science, and conservation measures to avoid or minimize adverse impacts to bald eagles.

The U.S. Fish and Wildlife Service strongly encourages adherence to these guidelines to ensure that bald and golden eagle populations will continue to be sustained. The Service realizes there may be impacts to some birds even if all reasonable measures are taken to avoid such impacts. Although it is not possible to absolve individuals and entities from liability under the Eagle Act or the MBTA, the Service exercises enforcement discretion to focus on those individuals, companies, or agencies that take migratory birds without regard for the consequences of their actions and the law, especially when conservation measures, such as these Guidelines, are available, but have not been implemented. The Service will prioritize its enforcement efforts to focus on those individuals or entities who take bald eagles or their parts, eggs, or nests without implementing appropriate measures recommended by the Guidelines.

The Service intends to pursue the development of regulations that would authorize, under limited circumstances, the use of permits if “take” of an eagle is anticipated but unavoidable. Additionally, if the bald eagle is delisted, the Service intends to provide a regulatory mechanism to honor existing (take) authorizations under the Endangered Species Act (ESA).

During the interim period until the Service completes a rulemaking for permits under the Eagle Act, the Service does not intend to refer for prosecution the incidental “*take*” of any bald eagle under the MBTA or Eagle Act, if such take is in full compliance with the terms and conditions of an incidental take statement issued to the action agency or applicant under the authority of section 7(b)(4) of the ESA or a permit issued under the authority of section 10(a)(1)(B) of the ESA.

The Guidelines are applicable throughout the United States, including Alaska. The primary purpose of these Guidelines is to provide information that will minimize or prevent violations only of *Federal* laws governing bald eagles. In addition to Federal laws, many states and some smaller jurisdictions and tribes have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines. If you are planning activities that may affect bald eagles, we therefore recommend that you contact both your nearest U.S. Fish and Wildlife Service Field Office (see the contact information on p.16) and your state wildlife agency for assistance.

LEGAL PROTECTIONS FOR THE BALD EAGLE

The Bald and Golden Eagle Protection Act

The Eagle Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. The Act provides criminal and civil penalties for persons who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof.” The Act defines “take” as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb.” “Disturb’’ means:

> "Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A violation of the Act can result in a criminal fine of $100,000 ($200,000 for organizations), imprisonment for one year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of this Act is a felony.

The Migratory Bird Treaty Act
The MBTA (16 U.S.C. 703-712), prohibits the taking of any migratory bird or any part, nest, or egg, except as permitted by regulation. The MBTA was enacted in 1918; a 1972 agreement supplementing one of the bilateral treaties underlying the MBTA had the effect of expanding the scope of the Act to cover bald eagles and other raptors. Implementing regulations define "take" under the MBTA as "pursue, hunt, shoot, wound, kill, trap, capture, possess, or collect."

Copies of the Eagle Act and the MBTA are available at: http://permits.fws.gov/ltr/ltr.shtml.

State laws and regulations
Most states have their own regulations and/or guidelines for bald eagle management. Some states may continue to list the bald eagle as endangered, threatened, or of special concern. If you plan activities that may affect bald eagles, we urge you to familiarize yourself with the regulations and/or guidelines that apply to bald eagles in your state. Your adherence to the Guidelines herein does not ensure that you are in compliance with state laws and regulations because state regulations can be more specific and/or restrictive than these Guidelines.

NATURAL HISTORY OF THE BALD EAGLE

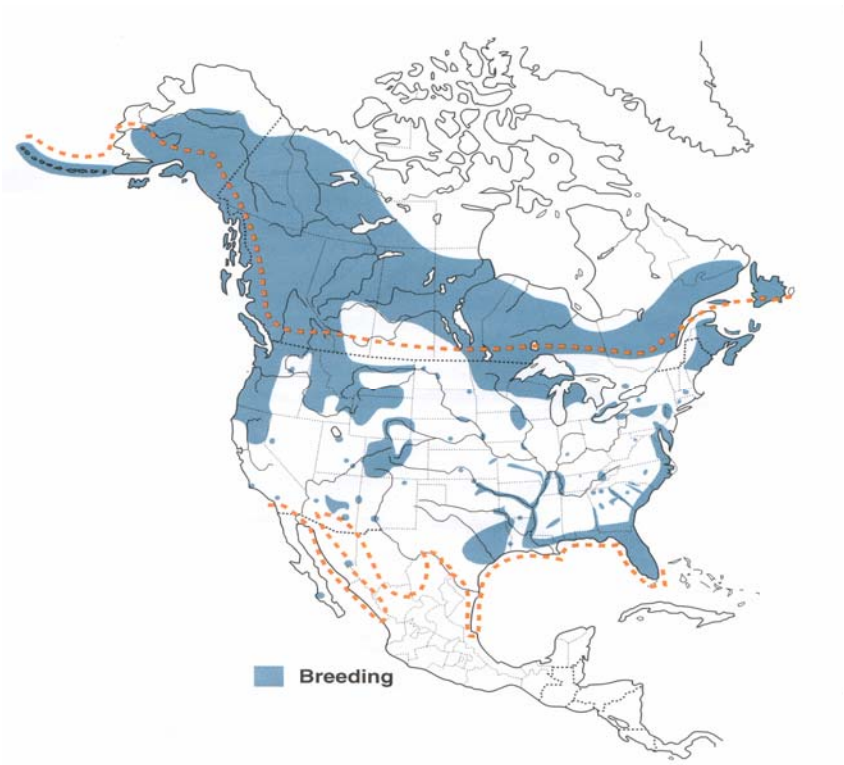
Bald eagles are a North American species that historically occurred throughout the contiguous United States and Alaska. After severely declining in the lower 48 States between the 1870s and the 1970s, bald eagles have rebounded and re-established breeding territories in each of the lower 48 states. The largest North American breeding populations are in Alaska and Canada, but there are also significant bald eagle populations in Florida, the Pacific Northwest, the Greater Yellowstone area, the Great Lakes states, and the Chesapeake Bay region. Bald eagle distribution varies seasonally. Bald eagles that nest in southern latitudes frequently move northward in late spring and early summer, often summering as far north as Canada. Most eagles that breed at northern latitudes migrate southward during winter, or to coastal areas where waters remain unfrozen. Migrants frequently concentrate in large numbers at sites where food is abundant and they often roost together communally. In some cases, concentration areas are used year-round: in summer by southern eagles and in winter by northern eagles.

Juvenile bald eagles have mottled brown and white plumage, gradually acquiring their dark brown body and distinctive white head and tail as they mature. Bald eagles generally attain adult plumage by 5 years of age. Most are capable of breeding at 4 or 5 years of age, but in healthy populations they may not start breeding until much older. Bald eagles may live 15 to 25 years in the wild. Adults weigh 8 to 14 pounds (occasionally reaching 16 pounds in Alaska) and have wingspans of 5 to 8 feet. Those in the northern range are larger than those in the south, and females are larger than males.

Where do bald eagles nest?

Breeding bald eagles occupy "territories," areas they will typically defend against intrusion by other eagles. In addition to the active nest, a territory may include one or more alternate nests (nests built or maintained by the eagles but not used for nesting in a given year). The Eagle Act prohibits removal or destruction of both active and alternate bald eagle nests. Bald eagles exhibit high nest site fidelity and nesting territories are often used year after year. Some territories are known to have been used continually for over half a century.

Bald eagles generally nest near coastlines, rivers, large lakes or streams that support an adequate food supply. They often nest in mature or old-growth trees; snags (dead trees); cliffs; rock promontories; rarely on the ground; and with increasing frequency on human-made structures such as power poles and communication towers. In forested areas, bald eagles often select the tallest trees with limbs strong enough to support a nest that can weigh more than 1,000 pounds. Nest sites typically include at least one perch with a clear view of the water where the eagles usually forage. Shoreline trees or snags located in reservoirs provide the visibility and accessibility needed to locate aquatic prey. Eagle nests are constructed with large sticks, and may be lined with moss, grass, plant stalks, lichens, seaweed, or sod. Nests are usually about 4-6 feet in diameter and 3 feet deep, although larger nests exist.



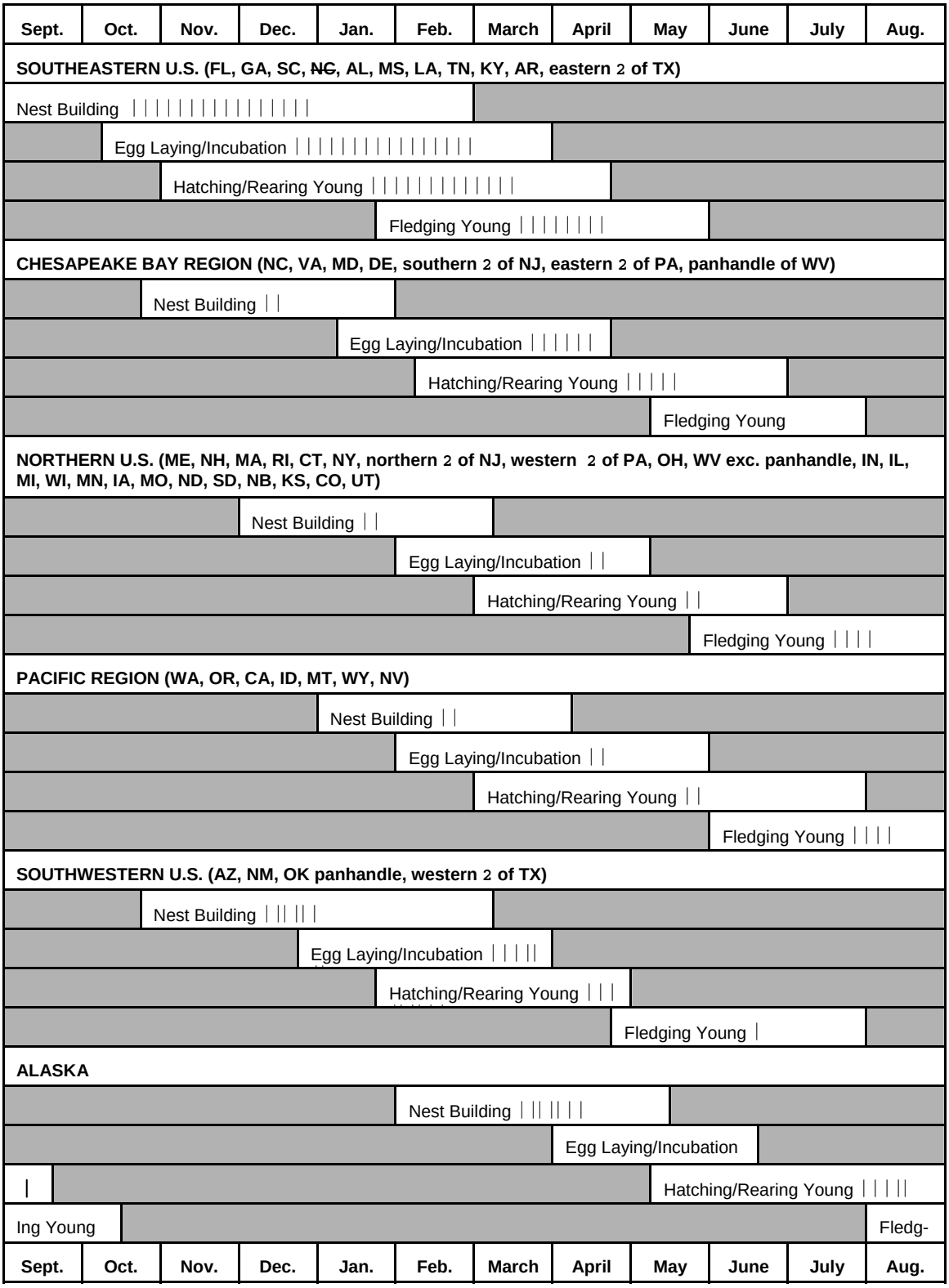
The range of breeding bald eagles in 2000 (shaded areas). This map shows only the larger concentrations of nests; eagles have continued to expand into additional nesting territories in many states. The dotted line represents the bald eagle's wintering range.

When do bald eagles nest?

Nesting activity begins several months before egg-laying. Egg-laying dates vary throughout the U.S., ranging from October in Florida, to late April or even early May in the northern United States. Incubation typically lasts 33-35 days, but can be as long as 40 days. Eaglets make their first unsteady flights about 10 to 12 weeks after hatching, and fledge (leave their nests) within a few days after that first flight. However, young birds usually remain in the vicinity of the nest for several weeks after fledging because they are almost completely dependent on their parents for food until they disperse from the nesting territory approximately 6 weeks later.

The bald eagle breeding season tends to be longer in the southern U.S., and re-nesting following an unsuccessful first nesting attempt is more common there as well. The following table shows the timing of bald eagle breeding seasons in different regions of the country. The table represents the range of time within which the majority of nesting activities occur in each region and does not apply to any specific nesting pair. Because the timing of nesting activities may vary within a given region, you should contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16) and/or your state wildlife conservation agency for more specific information on nesting chronology in your area.

Chronology of typical reproductive activities of bald eagles in the United States.



How many chicks do bald eagles raise?
The number of eagle eggs laid will vary from 1-3, with 1-2 eggs being the most common. Only one eagle egg is laid per day, although not always on successive days. Hatching of young occurs on different days with the result that chicks in the same nest are sometimes of unequal size. The overall national fledging rate is approximately one chick per nest, annually, which results in a healthy expanding population.

What do bald eagles eat?
Bald eagles are opportunistic feeders. Fish comprise much of their diet, but they also eat waterfowl, shorebirds/colonial waterbirds, small mammals, turtles, and carrion. Because they are visual hunters, eagles typically locate their prey from a conspicuous perch, or soaring flight, then swoop down and strike. Wintering bald eagles often congregate in large numbers along streams to feed on spawning salmon or other fish species, and often gather in large numbers in areas below reservoirs, especially hydropower dams, where fish are abundant. Wintering eagles also take birds from rafts of ducks at reservoirs and rivers, and congregate on melting ice shelves to scavenge dead fish from the current or the soft melting ice. Bald eagles will also feed on carcasses along roads, in landfills, and at feedlots.

During the breeding season, adults carry prey to the nest to feed the young. Adults feed their chicks by tearing off pieces of food and holding them to the beaks of the eaglets. After fledging, immature eagles are slow to develop hunting skills, and must learn to locate reliable food sources and master feeding techniques. Young eagles will congregate together, often feeding upon easily acquired food such as carrion and fish found in abundance at the mouths of streams and shallow bays and at landfills.

The impact of human activity on nesting bald eagles
During the breeding season, bald eagles are sensitive to a variety of human activities. However, not all bald eagle pairs react to human activities in the same way. Some pairs nest successfully just dozens of yards from human activity, while others abandon nest sites in response to activities much farther away. This variability may be related to a number of factors, including visibility, duration, noise levels, extent of the area affected by the activity, prior experiences with humans, and tolerance of the individual nesting pair. The relative sensitivity of bald eagles during various stages of the breeding season is outlined in the following table.

Nesting Bald Eagle Sensitivity to Human Activities

Phase	Activity	Sensitivity to Human Activity	Comments
I	Courtship and Nest Building	Most sensitive period; likely to respond negatively	Most critical time period. Disturbance is manifested in nest abandonment. Bald eagles in newly established territories are more prone to abandon nest sites.
II	Egg laying	Very sensitive period	Human activity of even limited duration may cause nest desertion and abandonment of territory for the breeding season.
III	Incubation and early nestling period (up to 4 weeks)	Very sensitive period	Adults are less likely to abandon the nest near and after hatching. However, flushed adults leave eggs and young unattended; eggs are susceptible to cooling, loss of moisture, overheating, and predation; young are vulnerable to elements.
IV	Nestling period, 4 to 8 weeks	Moderately sensitive period	Likelihood of nest abandonment and vulnerability of the nestlings to elements somewhat decreases. However, nestlings may miss feedings, affecting their survival.
V	Nestlings 8 weeks through fledging	Very sensitive period	Gaining flight capability, nestlings 8 weeks and older may flush from the nest prematurely due to disruption and die.

If agitated by human activities, eagles may inadequately construct or repair their nest, may expend energy defending the nest rather than tending to their young, or may abandon the nest altogether. Activities that cause prolonged absences of adults from their nests can jeopardize eggs or young. Depending on weather conditions, eggs may overheat or cool too much and fail to hatch. Unattended eggs and nestlings are subject to predation. Young nestlings are particularly vulnerable because they rely on their parents to provide warmth or shade, without which they may die as a result of hypothermia or heat stress. If food delivery schedules are interrupted, the young may not develop healthy plumage, which can affect their survival. In addition, adults startled while incubating or brooding young may damage eggs or injure their young as they abruptly leave the nest. Older nestlings no longer require constant attention from the adults, but they may be startled by loud or intrusive human activities and prematurely jump from the nest before they are able to fly or care for themselves. Once fledged, juveniles range up to ¼ mile from the nest site, often to a site with minimal human activity. During this period, until about six weeks after departure from the nest, the juveniles still depend on the adults to feed them.

The impact of human activity on foraging and roosting bald eagles

Disruption, destruction, or obstruction of roosting and foraging areas can also negatively affect bald eagles. Disruptive activities in or near eagle foraging areas can interfere with feeding, reducing chances of survival. Interference with feeding can also result in reduced productivity (number of young successfully fledged). Migrating and wintering bald eagles often congregate at specific sites for purposes of feeding and sheltering. Bald eagles rely on established roost sites because of their proximity to sufficient food sources. Roost sites are usually in mature trees where the eagles are somewhat sheltered from the wind and weather. Human activities near or within communal roost sites may prevent eagles

from feeding or taking shelter, especially if there are not other undisturbed and productive feeding and roosting sites available. Activities that permanently alter communal roost sites and important foraging areas can altogether eliminate the elements that are essential for feeding and sheltering eagles.

Where a human activity agitates or bothers roosting or foraging bald eagles to the degree that causes injury or substantially interferes with breeding, feeding, or sheltering behavior and causes, or is likely to cause, a loss of productivity or nest abandonment, the conduct of the activity constitutes a violation of the Eagle Act's prohibition against disturbing eagles. The circumstances that might result in such an outcome are difficult to predict without detailed site-specific information. If your activities may disturb roosting or foraging bald eagles, you should contact your local Fish and Wildlife Service Field Office (see page 16) for advice and recommendations for how to avoid such disturbance.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT NEST SITES

In developing these Guidelines, we relied on existing state and regional bald eagle guidelines, scientific literature on bald eagle disturbance, and recommendations of state and Federal biologists who monitor the impacts of human activity on eagles. Despite these resources, uncertainties remain regarding the effects of many activities on eagles and how eagles in different situations may or may not respond to certain human activities. The Service recognizes this uncertainty and views the collection of better biological data on the response of eagles to disturbance as a high priority. To the extent that resources allow, the Service will continue to collect data on responses of bald eagles to human activities conducted according to the recommendations within these Guidelines to ensure that adequate protection from disturbance is being afforded, and to identify circumstances where the Guidelines might be modified. These data will be used to make future adjustments to the Guidelines.

To avoid disturbing nesting bald eagles, we recommend (1) keeping a distance between the activity and the nest (distance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities during the breeding season. The buffer areas serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees.

The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there are little or no forested or topographical buffers, such as in many western states, distance alone must serve as the buffer. Consequently, in open areas, the distance between the activity and the nest may need to be larger than the distances recommended under Categories A and B of these guidelines (pg. 12) if no landscape buffers are present. The height of the nest above the ground may also ameliorate effects of human activities; eagles at higher nests may be less prone to disturbance.

In addition to the physical features of the landscape and nest site, the appropriate size for the distance buffer may vary according to the historical tolerances of eagles to human activities in particular localities, and may also depend on the location of the nest in relation

to feeding and roosting areas used by the eagles. Increased competition for nest sites may lead bald eagles to nest closer to human activity (and other eagles).

Seasonal restrictions can prevent the potential impacts of many shorter-term, obtrusive activities that do not entail landscape alterations (e.g. fireworks, outdoor concerts). In proximity to the nest, these kinds of activities should be conducted only outside the breeding season. For activities that entail both short-term, obtrusive characteristics and more permanent impacts (e.g., building construction), we recommend a combination of both approaches: retaining a landscape buffer *and* observing seasonal restrictions.

For assistance in determining the appropriate size and configuration of buffers or the timing of activities in the vicinity of a bald eagle nest, we encourage you to contact the nearest U.S. Fish and Wildlife Service Field Office (see page 16).

Existing Uses

Eagles are unlikely to be disturbed by routine use of roads, homes, and other facilities where such use pre-dates the eagles' successful nesting activity in a given area. Therefore, in most cases *ongoing* existing uses may proceed with the same intensity with little risk of disturbing bald eagles. However, some *intermittent, occasional, or irregular* uses that pre-date eagle nesting in an area may disturb bald eagles. For example: a pair of eagles may begin nesting in an area and subsequently be disturbed by activities associated with an annual outdoor flea market, even though the flea market has been held annually at the same location. In such situations, human activity should be adjusted or relocated to minimize potential impacts on the nesting pair.

ACTIVITY-SPECIFIC GUIDELINES

The following section provides the Service=s management recommendations for avoiding bald eagle disturbance as a result of new or intermittent activities proposed in the vicinity of bald eagle nests. Activities are separated into 8 categories (A – H) based on the nature and magnitude of impacts to bald eagles that usually result from the type of activity. Activities with similar or comparable impacts are grouped together.

In most cases, impacts will vary based on the visibility of the activity from the eagle nest and the degree to which similar activities are already occurring in proximity to the nest site. Visibility is a factor because, in general, eagles are more prone to disturbance when an activity occurs in full view. For this reason, we recommend that people locate activities farther from the nest structure in areas with open vistas, in contrast to areas where the view is shielded by rolling topography, trees, or other screening factors. The recommendations also take into account the existence of similar activities in the area because the continued presence of nesting bald eagles in the vicinity of the existing activities indicates that the eagles in that area can tolerate a greater degree of human activity than we can generally expect from eagles in areas that experience fewer human impacts. To illustrate how these factors affect the likelihood of disturbing eagles, we have incorporated the recommendations for some activities into a table (categories A and B).

First, determine which category your activity falls into (between categories A – H). If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity represented.

If your activity is under A or B, our recommendations are in table form. The vertical axis shows the degree of visibility of the activity from the nest. The horizontal axis (header row) represents the degree to which similar activities are ongoing in the vicinity of the nest. Locate the row that best describes how visible your activity will be from the eagle nest. Then, choose the column that best describes the degree to which similar activities are ongoing in the vicinity of the eagle nest. The box where the column and row come together contains our management recommendations for how far you should locate your activity from the nest to avoid disturbing the eagles. The numerical distances shown in the tables are the closest the activity should be conducted relative to the nest. In some cases we have included additional recommendations (other than recommended *distance* from the nest) you should follow to help ensure that your activity will not disturb the eagles.

Alternate nests

For activities that entail permanent landscape alterations that may result in bald eagle disturbance, these recommendations apply to both active and alternate bald eagle nests. Disturbance becomes an issue with regard to alternate nests if eagles return for breeding purposes and react to land use changes that occurred while the nest was inactive. The likelihood that an alternate nest will again become active decreases the longer it goes unused. If you plan activities in the vicinity of an alternate bald eagle nest and have information to show that the nest has not been active during the preceding 5 breeding seasons, the recommendations provided in these guidelines for avoiding disturbance around the nest site may no longer be warranted. The nest itself remains protected by other provisions of the Eagle Act, however, and may not be destroyed.

If special circumstances exist that make it unlikely an inactive nest will be reused before 5 years of disuse have passed, and you believe that the probability of reuse is low enough to warrant disregarding the recommendations for avoiding disturbance, you should be prepared to provide all the reasons for your conclusion, including information regarding past use of the nest site. Without sufficient documentation, you should continue to follow these guidelines when conducting activities around the nest site. If we are able to determine that it is unlikely the nest will be reused, we may advise you that the recommendations provided in these guidelines for avoiding disturbance are no longer necessary around that nest site.

This guidance is intended to minimize disturbance, as defined by Federal regulation. In addition to Federal laws, most states and some tribes and smaller jurisdictions have additional laws and regulations protecting bald eagles. In some cases those laws and regulations may be more protective (restrictive) than these Federal guidelines.

Temporary Impacts

For activities that have temporary impacts, such as the use of loud machinery, fireworks displays, or summer boating activities, we recommend seasonal restrictions. These types of activities can generally be carried out outside of the breeding season without causing disturbance. The recommended restrictions for these types of activities can be lifted for alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched (depending on the distance between the alternate nest and the active nest).

In general, activities should be kept as far away from nest trees as possible; loud and disruptive activities should be conducted when eagles are not nesting; and activity between the nest and the nearest foraging area should be minimized. If the activity you plan to undertake is not specifically addressed in these guidelines, follow the recommendations for the most similar activity addressed, or contact your local U.S. Fish and Wildlife Service Field Office for additional guidance.

If you believe that special circumstances apply to your situation that increase or diminish the likelihood of bald eagle disturbance, or if it is not possible to adhere to the guidelines, you should contact your local Service Field Office for further guidance.

Category A:
Building construction, 1 or 2 story, with project footprint of ½ acre or less.
Construction of roads, trails, canals, power lines, and other linear utilities.
Agriculture and aquaculture – new or expanded operations.
Alteration of shorelines or wetlands.
Installation of docks or moorings.
Water impoundment.

Category B:
Building construction, 3 or more stories.
Building construction, 1 or 2 story, with project footprint of more than ½ acre.
Installation or expansion of marinas with a capacity of 6 or more boats.
Mining and associated activities.
Oil and natural gas drilling and refining and associated activities.

	If there is no similar activity within 1 mile of the nest	***If there is similar activity closer than 1 mile from the nest***
If the activity will be visible from the nest	660 feet. Landscape buffers are recommended.	660 feet, or as close as existing tolerated activity of similar scope. Landscape buffers are recommended.
If the activity will not be visible from the nest	Category A: 330 feet. Clearing, external construction, and landscaping between 330 feet and 660 feet should be done outside breeding season. Category B: 660 feet.	330 feet, or as close as existing tolerated activity of similar scope. Clearing, external construction and landscaping within 660 feet should be done outside breeding season.

The numerical distances shown in the table are the closest the activity should be conducted relative to the nest.

Category C. Timber Operations and Forestry Practices

- Avoid clear cutting or removal of overstory trees within 330 feet of the nest at any time.

- Avoid timber harvesting operations, including road construction and chain saw and yarding operations, during the breeding season within 660 feet of the nest. The distance may be decreased to 330 feet around alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched.

- Selective thinning and other silviculture management practices designed to conserve or enhance habitat, including prescribed burning close to the nest tree, should be undertaken outside the breeding season. Precautions such as raking leaves and woody debris from around the nest tree should be taken to prevent crown fire or fire climbing the nest tree. If it is determined that a burn during the breeding season would be beneficial, then, to ensure that no take or disturbance will occur, these activities should be conducted only when neither adult eagles nor young are present at the nest tree (i.e., at the beginning of, or end of, the breeding season, either before the particular nest is active or after the young have fledged from that nest). Appropriate Federal and state biologists should be consulted before any prescribed burning is conducted during the breeding season.

- Avoid construction of log transfer facilities and in-water log storage areas within 330 feet of the nest.

Category D. Off-road vehicle use (including snowmobiles). No buffer is necessary around nest sites outside the breeding season. During the breeding season, do not operate off-road vehicles within 330 feet of the nest. In open areas, where there is increased visibility and exposure to noise, this distance should be extended to 660 feet.

Category E. Motorized Watercraft use (including jet skis/personal watercraft). No buffer is necessary around nest sites outside the breeding season. During the breeding season, within 330 feet of the nest, (1) do not operate jet skis (personal watercraft), and (2) avoid concentrations of noisy vessels (e.g., commercial fishing boats and tour boats), except where eagles have demonstrated tolerance for such activity. Other motorized boat traffic passing within 330 feet of the nest should attempt to minimize trips and avoid stopping in the area where feasible, particularly where eagles are unaccustomed to boat traffic. Buffers for airboats should be larger than 330 feet due to the increased noise they generate, combined with their speed, maneuverability, and visibility.

Category F. Non-motorized recreation and human entry (e.g., hiking, camping, fishing, hunting, birdwatching, kayaking, canoeing). No buffer is necessary around nest sites outside the breeding season. If the activity will be visible or highly audible from the nest, maintain a 330-foot buffer during the breeding season, particularly where eagles are unaccustomed to such activity.

Category G. Helicopters and fixed-wing aircraft.
Except for authorized biologists trained in survey techniques, avoid operating aircraft within 1,000 feet of the nest during the breeding season, except where eagles have demonstrated tolerance for such activity.

Category H. Blasting and other loud, intermittent noises.
Avoid blasting and other activities that produce extremely loud noises within 1/2 mile of active nests, unless greater tolerance to the activity (or similar activity) has been demonstrated by the eagles in the nesting area. This recommendation applies to the use of fireworks classified by the Federal Department of Transportation as Class B explosives, which includes the larger fireworks that are intended for licensed public display.

RECOMMENDATIONS FOR AVOIDING DISTURBANCE AT FORAGING AREAS AND COMMUNAL ROOST SITES

1. Minimize potentially disruptive activities and development in the eagles' direct flight path between their nest and roost sites and important foraging areas.

2. Locate long-term and permanent water-dependent facilities, such as boat ramps and marinas, away from important eagle foraging areas.

3. Avoid recreational and commercial boating and fishing near critical eagle foraging areas during peak feeding times (usually early to mid-morning and late afternoon), except where eagles have demonstrated tolerance to such activity.

4. Do not use explosives within ½ mile (or within 1 mile in open areas) of communal roosts when eagles are congregating, without prior coordination with the U.S. Fish and Wildlife Service and your state wildlife agency.

5. Locate aircraft corridors no closer than 1,000 feet vertical or horizontal distance from communal roost sites.

ADDITIONAL RECOMMENDATIONS TO BENEFIT BALD EAGLES

The following are additional management practices that landowners and planners can exercise for added benefit to bald eagles.

1. Protect and preserve potential roost and nest sites by retaining mature trees and old growth stands, particularly within ½ mile from water.

2. Where nests are blown from trees during storms or are otherwise destroyed by the elements, continue to protect the site in the absence of the nest for up to three (3) complete breeding seasons. Many eagles will rebuild the nest and reoccupy the site.

3. To avoid collisions, site wind turbines, communication towers, and high voltage transmission power lines away from nests, foraging areas, and communal roost sites.

4. Employ industry-accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers, and poles. If possible, bury utility lines in important eagle areas.

5. Where bald eagles are likely to nest in human-made structures (e.g., cell phone towers) and such use could impede operation or maintenance of the structures or jeopardize the safety of the eagles, equip the structures with either (1) devices engineered to discourage bald eagles from building nests, or (2) nesting platforms that will safely accommodate bald eagle nests without interfering with structure performance.

6. Immediately cover carcasses of euthanized animals at landfills to protect eagles from being poisoned.

7. Do not intentionally feed bald eagles. Artificially feeding bald eagles can disrupt their essential behavioral patterns and put them at increased risk from power lines, collision with windows and cars, and other mortality factors.

8. Use pesticides, herbicides, fertilizers, and other chemicals only in accordance with Federal and state laws.

9. Monitor and minimize dispersal of contaminants associated with hazardous waste sites (legal or illegal), permitted releases, and runoff from agricultural areas, especially within watersheds where eagles have shown poor reproduction or where bioaccumulating contaminants have been documented. These factors present a risk of contamination to eagles and their food sources.

CONTACTS

The following U.S. Fish and Wildlife Service Field Offices provide technical assistance on bald eagle management:

Alabama	Daphne	(251) 441-5181
Alaska	Anchorage	(907) 271-2888
	Fairbanks	(907) 456-0203
	Juneau	(907) 780-1160
Arizona	Phoenix	(602) 242-0210
Arkansas	Conway	(501) 513-4470
California	Arcata	(707) 822-7201
	Barstow	(760) 255-8852
	Carlsbad	(760) 431-9440
	Red Bluff	(530) 527-3043
	Sacramento	(916) 414-6000
	Stockton	(209) 946-6400
	Ventura	(805) 644-1766
	Yreka	(530) 842-5763
Colorado	Lakewood	(303) 275-2370
	Grand Junction	(970) 243-2778
Connecticut	(See New Hampshire)	
Delaware	(See Maryland)	
Florida	Panama City	(850) 769-0552
	Vero Beach	(772) 562-3909
	Jacksonville	(904) 232-2580
Georgia	Athens	(706) 613-9493
	Brunswick	(912) 265-9336
	Columbus	(706) 544-6428
Idaho	Boise	(208) 378-5243
	Chubbuck	(208) 237-6975
Illinois/Iowa	Rock Island	(309) 757-5800
Indiana	Bloomington	(812) 334-4261
Kansas	Manhattan	(785) 539-3474
Kentucky	Frankfort	(502) 695-0468
Louisiana	Lafayette	(337) 291-3100
Maine	Old Town	(207) 827-5938
Maryland	Annapolis	(410) 573-4573
Massachusetts	(See New Hampshire)	
Michigan	East Lansing	(517) 351-2555
Minnesota	Bloomington	(612) 725-3548
Mississippi	Jackson	(601) 965-4900
Missouri	Columbia	(573) 234-2132
Montana	Helena	(405) 449-5225
Nebraska	Grand Island	(308) 382-6468
Nevada	Las Vegas	(702) 515-5230
	Reno	(775) 861-6300
New Hampshire	Concord	(603) 223-2541
New Jersey	Pleasantville	(609) 646-9310
New Mexico	Albuquerque	(505) 346-2525
New York	Cortland	(607) 753-9334
	Long Island	(631) 776-1401
North Carolina	Raleigh	(919) 856-4520
	Asheville	(828) 258-3939
North Dakota	Bismarck	(701) 250-4481
Ohio	Reynoldsburg	(614) 469-6923
Oklahoma	Tulsa	(918) 581-7458
Oregon	Bend	(541) 383-7146
	Klamath Falls	(541) 885-8481
	La Grande	(541) 962-8584
	Newport	(541) 867-4558
	Portland	(503) 231-6179
	Roseburg	(541) 957-3474
Pennsylvania	State College	(814) 234-4090
Rhode Island	(See New Hampshire)	
South Carolina	Charleston	(843) 727-4707
South Dakota	Pierre	(605) 224-8693
Tennessee	Cookeville	(931) 528-6481
Texas	Clear Lake	(281) 286-8282
Utah	West Valley City	(801) 975-3330
Vermont	(See New Hampshire)	
Virginia	Gloucester	(804) 693-6694
Washington	Lacey	(306) 753-9440
	Spokane	(509) 891-6839
	Wenatchee	(509) 665-3508
West Virginia	Elkins	(304) 636-6586
Wisconsin	New Franken	(920) 866-1725
Wyoming	Cheyenne	(307) 772-2374
	Cody	(307) 578-5939

National Office
U.S. Fish and Wildlife Service
Division of Migratory Bird Management
4401 North Fairfax Drive, MBSP-4107
Arlington, VA 22203-1610
(703) 358-1714
http://www.fws.gov/migratorybirds

State Agencies

To contact a state wildlife agency, visit the Association of Fish & Wildlife Agencies' website at http://www.fishwildlife.org/where_us.html

GLOSSARY

The definitions below apply to these National Bald Eagle Management Guidelines:

Communal roost sites – Areas where bald eagles gather and perch overnight – and sometimes during the day in the event of inclement weather. Communal roost sites are usually in large trees (live or dead) that are relatively sheltered from wind and are generally in close proximity to foraging areas. These roosts may also serve a social purpose for pair bond formation and communication among eagles. Many roost sites are used year after year.

Disturb – To agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle=s return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

Fledge – To leave the nest and begin flying. For bald eagles, this normally occurs at 10-12 weeks of age.

Fledgling – A juvenile bald eagle that has taken the first flight from the nest but is not yet independent.

Foraging area – An area where eagles feed, typically near open water such as rivers, lakes, reservoirs, and bays where fish and waterfowl are abundant, or in areas with little or no water (i.e., rangelands, barren land, tundra, suburban areas, etc.) where other prey species (e.g., rabbit, rodents) or carrion (such as at landfills) are abundant.

Landscape buffer – A natural or human-made landscape feature that screens eagles from human activity (e.g., strip of trees, hill, cliff, berm, sound wall).

Nest – A structure built, maintained, or used by bald eagles for the purpose of reproduction. An **active** nest is a nest that is attended (built, maintained or used) by a pair of bald eagles during a given breeding season, whether or not eggs are laid. An **alternate** nest is a nest that is not used for breeding by eagles during a given breeding season.

Nest abandonment – Nest abandonment occurs when adult eagles desert or stop attending a nest and do not subsequently return and successfully raise young in that nest for the duration of a breeding season. Nest abandonment can be caused by altering habitat near a nest, even if the alteration occurs prior to the breeding season. Whether the eagles migrate during the non-breeding season, or remain in the area throughout the non-breeding season, nest abandonment can occur at any point between the time the eagles return to the nesting site for the breeding season and the time when all progeny from the breeding season have

dispersed.

Project footprint – The area of land (and water) that will be permanently altered for a development project, including access roads.

Similar scope – In the vicinity of a bald eagle nest, an existing activity is of similar scope to a new activity where the types of impacts to bald eagles are similar in nature, and the impacts of the existing activity are of the same or greater magnitude than the impacts of the potential new activity. Examples: (1) An existing single-story home 200 feet from a nest is similar in scope to an additional single-story home 200 feet from the nest; (2) An existing multi-story, multi-family dwelling 150 feet from a nest has impacts of a greater magnitude than a potential new single-family home 200 feet from the nest; (3) One existing single-family home 200 feet from the nest has impacts of a lesser magnitude than three single-family homes 200 feet from the nest; (4) an existing single-family home 200 feet from a communal roost has impacts of a lesser magnitude than a single-family home 300 feet from the roost but 40 feet from the eagles' foraging area. The existing activities in examples (1) and (2) are of similar scope, while the existing activities in example (3) and (4) are not.

Vegetative buffer – An area surrounding a bald eagle nest that is wholly or largely covered by forest, vegetation, or other natural ecological characteristics, and separates the nest from human activities.

RELATED LITERATURE

Andrew, J.M. and J.A. Mosher. 1981. Bald eagle nest site selection and nesting habitat in Maryland. Journal of Wildlife Management 46:382-390.

Anonymous. 1977. Bald Eagle Habitat Management Guidelines, Forest Service – California Region. U.S Forest Service, San Francisco, CA.

Anthony, R.G. 2001. Low productivity of bald eagles on Prince of Wales Island, southeast Alaska. Journal of Raptor Research 35:1-8.

Anthony, R.G., R.W. Frenzel, F.B. Isaacs, and M.G. Garrett. 1994. Probable causes of nesting failures in Oregon's bald eagle population. Wildlife Society Bulletin 22:576-582.

Anthony, R.G. and F.B. Isaacs. 1989. Characteristics of bald eagle nest sites in Oregon. Journal of Wildlife Management 53:148-158.

Arizona Game and Fish Department. 1999. Bald Eagle Conservation Assessment and Strategy (draft).

Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute, Raptor Research Foundation, Washington, D.C.

Bangs, E.E., T.N. Bailey and V.D. Berns. Ecology of nesting bald eagles on the Kenai National Wildlife Refuge, Alaska. (USFWS staff)

Becker, J.M. 2002. Response of wintering bald eagles to industrial construction in southeastern Washington. Wildlife Society Bulletin 30:875-878.

Brauning, D.W. and J.D. Hassinger. 2000. Pennsylvania Recovery and Management Plan for the Bald Eagle (draft). Pennsylvania Game Commission. Harrisburg, PA.

Brown, B.T., G.S. Mills, C. Powels, W.A. Russell, G.D. Therres and J.J. Pottie. 1999. The influence of weapons-testing noise on bald eagle behavior. Journal of Raptor Research 33:227-232.

Brown, B.T. and L.E. Stevens. 1997. Winter bald eagle distribution is inversely correlated with human activity along the Colorado River, Arizona. Journal of Raptor Research31:7-10.

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*). *In* The Birds of North America, No. 506 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Buehler, D.A., T.J. Mersmann, J.D. Fraser, and J.K.D. Seegar. 1991. Effects of human activity on bald eagle distribution on the northern Chesapeake Bay. Journal of Wildlife Management 55:282-290.

Buehler, D.A., T.J. Mersmann, J.D. Fraser, and J.K.D. Seegar. 1991. Nonbreeding bald eagle communal and solitary roosting behavior and roost habitat on the northern Chesapeake Bay. Journal of Wildlife Management 55:273-281.

Chandler, SK., J.D. Fraser, D.A. Buehler and J.K.D. Seegar. 1995. Perch trees and shoreline development as predictors of bald eagle distribution on the Chesapeake Bay. Journal of Wildlife Management 59:325-332.

Cline, K. 1985. Bald Eagles in the Chesapeake: A Management Guide for Landowners. National Wildlife Federation. Washington, D.C.

Dell, D.D. and P.J. Zwank. 1986. Impact of a high-voltage transmission line on a nesting pair of southern bald eagles in southeast Louisiana. Journal of Raptor Research 20(3/4):117-119.

Dunwiddie, P.W. and R.C. Kuntz. 2001. Long-term trends of bald eagles in winter on the Skagit River, Washington. Journal of Wildlife Management 65(2):290-299.

Fletcher, R.J. et. al. 1999. Effects of recreational trails on wintering diurnal raptors along riparian corridors in a Colorado grassland. Journal of Raptor Research 33(3):233-239.

Fraser, J.D. 1981. The breeding biology and status of the bald eagle on the Chippewa National Forest. PhD. Dissertation, University of Minnesota.

Fraser, J.D., LD. Frenzel and J.E. Mathisen. 1985. The impact of human activities on breeding bald eagles in north-central Minnesota. Journal of Wildlife Management 49(3):585-592.

Garrett, M.G., J.W. Watson, and R.G. Anthony. 1993. Bald eagle home range and habitat use in the Columbia River Estuary. Journal of Wildlife Management 57(1):19-27.

Gerrard J.M. and G.R. Bortolotti. 1988. The Bald Eagle: Haunts and Habits of a Wilderness Monarch. Smithsonian Institution Press. Washington, D.C.

Grier, J.W. 1969. Bald eagle behavior and productivity responses to climbing to nests. Journal of Wildlife Management 33:961-966.

Grier, J.W. and J.E. Guinn. 2003. Bald eagle habitats and responses to human disturbance in Minnesota. Report to the Minnesota Department of Natural Resources.

Grubb, T.G. 1976. Survey and analysis of bald eagle nesting in western Washington. M.S. thesis, Univ. of Washington, Seattle.

Grubb, T.G. and R.M. King. 1991. Assessing human disturbance of breeding bald eagles with classification tree models. Journal of Wildlife Management 55:500-511.

Grubb, T.G., W.L. Robinson and W.W. Bowerman. 2002. Effects of watercraft on bald eagles nesting in Voyagers National Park, Minnesota. Wildlife Society Bulletin 30:156-161.

Grubb, T.G. and W.W. Bowerman. 1997. Variations in breeding bald eagle response to jets, light planes and helicopters. Journal of Raptor Research 31:213-222.

Grubb, T.G., W.W. Bowerman, A.J. Bath, J.P. Giesy, D.V.C. Weseloh. 2003. Evaluating Great Lakes bald eagle nesting habitat with Bayesian inference. RMRS-RP-45. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO, 10 pp.

Hansen, J.A. 1977. Population dynamics and night roost requirements of bald eagles wintering in the Nooksack River Valley, WA. Huxley College of Environmental Studies, Western Washington State College, Bellingham, WA. (Problem Series)

Hansen, J.A., M.V. Stalmaster and J.R. Newman. 1980. Habitat characteristics, function, and destruction of bald eagle communal roosts in western Washington. Huxley college of Environmental Studies, Western Washington University.

Hunt, W.G., D.E. Driscoll, E.W. Bianchi, and R.E. Jackman. 1992. Ecology of bald eagles in Arizona. Report to U.S. Bureau of Reclamation, Contract 6-CS-30-04470. BioSystems Analysis Inc., Santa Cruz, California.

Isaacs, F.B and R.G. Anthony. 1987. Abundance, foraging, and roosting of bald eagles wintering in the Harney Basin, Oregon. Northwest Science 61(2), pp. 114-121.

Juenemann, B.G. 1973. Habitat evaluations of selected bald eagle nest sites on the Chippewa National Forest. M.S. thesis, University of Minnesota, Minneapolis.

Keister, G.P., R.G. Anthony and E.J. O'Neill. 1987. Use of communal roosts and foraging area by bald eagles wintering in the Klamath Basin. Journal of Wildlife Management 51(2):415-420.

Knight, R. and S.K. Knight. 1984. Responses of wintering bald eagles to boating activity. Journal of Wildlife Management 48:999-1004.

Linscombe, J.T., T.J. Hess, Jr., and V.L. Wright. 1999. Effects of seismic operations on Louisiana's nesting bald eagles. Proceedings of the Southeastern Association of Fish and Wildlife Agencies. 54:235-242.

Maine (State of) Inland Fisheries and Wildlife Rules. Chapter 8.05 Essential Habitat for Species Listed as Threatened or Endangered.

Mathisen, J.E. 1968. Effects of human disturbance on nesting bald eagles. Journal of Wildlife Management 32(1): 1-6.

McGarigal, K., R.G. Anthony and F.B. Isaacs. 1991. Interactions of humans and bald eagles on the Columbia River estuary. Wildlife Monographs 115:1-47.

McKay, K.J., J.W. Stravers, B.R. Conklin, U. Konig, S. Hawks, C.J. Kohrt, J.S. Lundh and G.V. Swenson. 2001. Potential human impacts on bald eagle reproductive success along the Upper Mississippi River.

McKewan, L.C. and D.H. Hirth. 1979. Southern bald eagle productivity and nest site selection. Journal of Wildlife Management 43:585-594.

Millsap, B.A. Status of wintering bald eagles in the conterminous 48 States. 1986. Wildlife Society Bulletin 14:433-440.

Millsap, B.A, T. Breen, E. McConnell, T. Steffer, L. Phillips, N. Douglass, and S. Taylor. In Press. Comparative fecundity and survival of bald eagles fledged from suburban and rural natal areas in Florida. Journal of Wildlife Management 68(4).

Montana Bald Eagle Working Group. 1986. Montana Bald Eagle Management Plan. Department of the Interior, Bureau of Land Management. Billings, MT.

Nesbitt, S.A., M.J. Folk and D.A. Wood. 1993. Effectiveness of bald eagle habitat protection guidelines in Florida. Proceedings of the Annual Conference of the Southeast Association of Fish and Wildlife Agencies.

Newman, J.R., W.H. Brennan and L.M. Smith. 1977. Twelve-year changes in nesting patterns of bald eagles on San Juan Island, Washington. The Murrelet 58(2)37-39.

Postapulsky, S. 1974. Raptor reproductive success: some problems with methods, criteria, and terminology. Pages 21-31 *in* F.N. Hammerstrom, Jr., B.E. Harrell, and R.R. Olendorff, eds. Management of raptors. Raptor Res. Found., Vermillion, S.D.

Rodgers, J.A. and Schwikert, S.T. 2003. Buffer zone distances to protect foraging and loafing waterbirds from disturbance by airboats in Florida. Waterbirds 26(4): 437-443.

Russell, D. 1980. Occurrence and human disturbance sensitivity of wintering bald eagles on the Sauk and Suiattle Rivers, Washington. In R.L. Knight, G.T. Allen, M.V. Stalmaster and C.W. Servheen [eds.]. Proceedings of the Washington Bald Eagle Symposium. Nature Conservancy, Seattle, Washington, pp. 165-174.

Shapiro, A.E., F. Montalbano, and D. Mager. 1982. Implications of construction of a flood control project upon bald eagle nesting activity. Wilson Bulletin 94(1), pp. 55-63.

Skagen, S.K. 1980. Behavioral responses of wintering bald eagles to human activity on the Skagit River, Washington. In R.L.Knight, G.T. Allen, M.V. Stalmaster and C.W. Servheen [eds.]. Proceedings of the Washington Bald Eagle Symposium. Nature Conservancy, Seattle, Washington, pp. 231-241.

Skagen, S.K., R.L. Knight and G.J.H. Orians. 1991. Human disturbance of an avian scavenging guild. Ecological Applications 1:215-225. (Internet)

Stalmaster, M.V. 1976 Winter ecology and effects of human activity on bald eagles in the Nooksack River Valley, Washington. MS Thesis, Western Washington State College, Bellingham.

Stalmaster, M.V. 1980. Management strategies for wintering bald eagles in the Pacific Northwest. Proceedings of the Washington Bald Eagle Symposium, pp 49-67.

Stalmaster, M.V. and J.L. Kaiser. 1998. Effects of recreational activity on wintering bald eagles. Wildlife Monographs 137:1-46.

Stalmaster, M.V. and J.L. Kaiser. 1997. Flushing responses of wintering bald eagles to military activity. Journal of Wildlife Management 61:1307-1313.

Stalmaster, M.V. and J.R. Newman. 1978. Behavioral responses of wintering bald eagles to human activity. Journal of Wildlife Management 42:506-513.

Steenhof, K. 1978. Management of Wintering Bald Eagles. FWS/OBS-78/79. U.S. Fish and Wildlife Service, Department of the Interior, Washington D.C.

Steidl, R.J. and R.G. Anthony. 2000. Experimental Effects of Human Activity on Breeding Bald Eagles. Ecological Applications 10(1), pp. 258-268.

Therres, G.D., M.A. Byrd and D.S. Bradshaw. 1993. Effects of development on nesting bald eagles: case studies from Chesapeake Bay. Transactions of the North American Wildlife and Natural Resources Conference 58:62-69.

U.S. Fish and Wildlife Service. 1979. Bald Eagle Management Guidelines: Oregon – Washington. Portland. OR.

U.S. Fish and Wildlife Service. 1983. Northern States bald eagle recovery plan. Appendices E, F, and G. U.S. Fish and Wildlife Service, Region 6, Denver, CO.

U.S. Fish and Wildlife Service. 1987. Habitat Management Guidelines for the Bald Eagle in the Southeast Region. U.S Fish and Wildlife Service, Region 4. Atlanta, GA.

U.S. Fish and Wildlife Service. 1993. Bald Eagle Basics. Anchorage, AK.

U.S. Fish and Wildlife Service. 1993. Habitat Management Guidelines for Bald Eagles in Texas. Austin, TX.

U.S. Fish and Wildlife Service and Virginia Department of Game and Inland Fisheries. 2001. Bald Eagle Protection Guidelines for Virginia. Gloucester and Richmond, VA.

Watson, J.W. 1993. Responses of nesting bald eagles to helicopter surveys. Wildlife Society Bulletin 21:171-178.

Watson, J.W. 2004. Responses of nesting bald eagles to experimental pedestrian activity. Journal of Raptor Research 38:295-305.

Wood, P.B. 1999. Bald eagle response to boating activity in northcentral Florida. Journal of Raptor Research 33:97-101.

Wood, P.B., T.C. Edwards Jr. and M.W. Collopy. 1989. Characteristics of bald eagle nesting habitat in Florida. Journal of Wildlife Management 53(2):441-449.

Young, L.S. 1980. A quantitative evaluation of human disturbance impacts on breeding eagle ecology of bald eagles in the San Juan Islands, Washington. Washington Department of Game, Olympia.

Eagle Watching Etiquette

For the safest and least intrusive viewing experience, please follow these guidelines when observing or photographing nesting eagles:

- Use binoculars or a spotting scope to observe eagles closely. Photographers should use telephoto lenses.
- Do not stand directly under an eagle nest or in close view of the eagles. The recommended viewing distance is at least 330 feet.
- Once parked safely off the road, remain in or near your vehicle. Vehicles can serve as very effective "bird blinds".
- Do not make loud or sudden noises. Avoid yelling, car door slamming, or horn honking.
- Move quickly and quietly to any designated observation areas.
- Never try to make eagles fly or stand up at the nest.
- Always ask permission before entering private property.
- Keep pets at home.

Always give eagles and other wildlife the space they need. Please share your knowledge and set an example for others.

DO NOT ENTER
Bald Eagle Nesting Area

For the safest and least intrusive viewing experience, the following *Eagle Etiquette* is recommended:

- Respect restricted areas around eagle nests.
- Use binoculars or a spotting scope instead of trying to get “a little bit closer.”
- Do not approach the nest directly or attempt to make an eagle fly.
- Avoid loud noises, such as yelling, door slamming, or horn honking.
- Observe from designated viewing areas where available.

On public land, it is unlawful for any person to knowingly enter any area posted as closed for the protection of bald eagles, their nests, or their nest trees, except the staff or authorized agents of the managing public entity for that area, or as authorized. (F.A.C. 68A-16.002)

FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

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Appendix D
Florida Master Site File and Associated Maps

This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.

March 28, 2017

Florida Master Site File

Susan D. Shaw
Senior Scientist/Senior Managing Associate
ESA | Southeast Region
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Orlando, Florida 32819
407-403-6305 direct; 407-709-9615 cell
E-mail: sshaw@esassoc.com

In response to your inquiry of March 28, 2017 the Florida Master Site File lists no archeological sites or any other cultural resources found at the designated parcel (Brownie Wise Park) of Osceola County, Florida

T25S R29E Section 26 as submitted with search request.

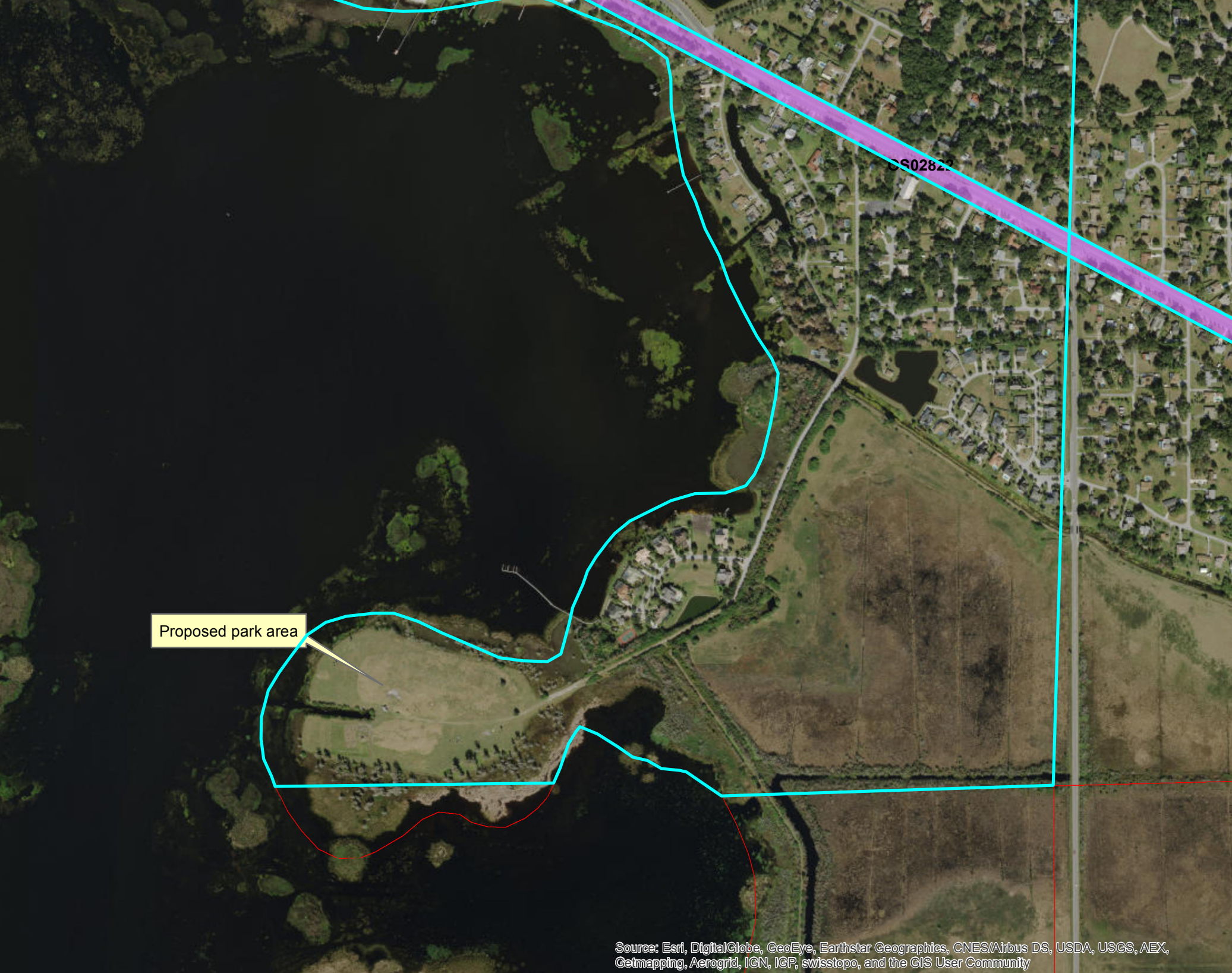
When interpreting the results of this search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Eman M. Vovsi
Data Base Analyst
Florida Master Site File
Eman.Vovsi@DOS.MyFlorida.com


Proposed park area
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Appendix E
Budgetary Considerations

Brownie Wise Park at Tupperware Island Conservation Area Implementation and Management Cost Estimate Table

Items	Unit Cost	Year 1	Year 2	Year 3*	Year 4*	Year 5*
Annual Maintenance (Perpetual)						
Facility Maintenance (Gate, Kiosks, Pavilions, Restrooms, Picknic Tables, Benches, Garbage Cans, Grils, Roads)	*$5,000/yr*	*$5,000.00*	*$5,000.00*	*$5,000.00*	*$5,000.00*	*$5,000.00*
Tree / debris removal and maintenance	*Estmate*	*$1,000.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*
Nuisance / Exotic Species Management	*$2,000/yr*	*$2,000.00*	*$2,000.00*	*$2,000.00*	*$2,000.00*	*$2,000.00*
Mowing / Facility Maintenance / Supplies	*Estimate*	*$2,000.00*	*$2,000.00*	*$2,000.00*	*$2,000.00*	*$2,000.00*
Kayak / Canoe Launch Maintenance	*Estimate*	*$500.00*	*$500.00*	*$500.00*	*$500.00*	*$500.00*
Trail Maintenance	*Estimate - $0.75/linear ft*	*$1,000.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*
Observation Deck Maintenance	*Estimate*	*$500.00*	*$500.00*	*$500.00*	*$500.00*	*$500.00*
Habitat Restoration	*Estimate*	*$0.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*	*$1,000.00*
Health Department Permit	*$200/yr*	*$200.00*	*$200.00*	*$200.00*	*$200.00*	*$200.00*
Pest Prevention	*$120/yr*	*$120.00*	*$120.00*	*$120.00*	*$120.00*	*$120.00*
Water Monitoring	*$540/yr*	*$540.00*	*$540.00*	*$540.00*	*$540.00*	*$540.00*
Total Annual Cost		**$12,860.00**	**$13,860.00**	**$14,414.40**	**$14,968.80**	**$15,523.20**
* *Total Annual Cost is adjusted by 4% for years 3, 4 and 5*						

Brownie Wise Park at Tupperware Island Conservation Area Capital Improvement Project (CIP) Table

Activities	2018	2019	2020	2021	2022
Habitat Restoration	*$180,000.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Pavilion Construction	*$20,000.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Total Annual Cost	**$200,000.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**

For Information Contact:
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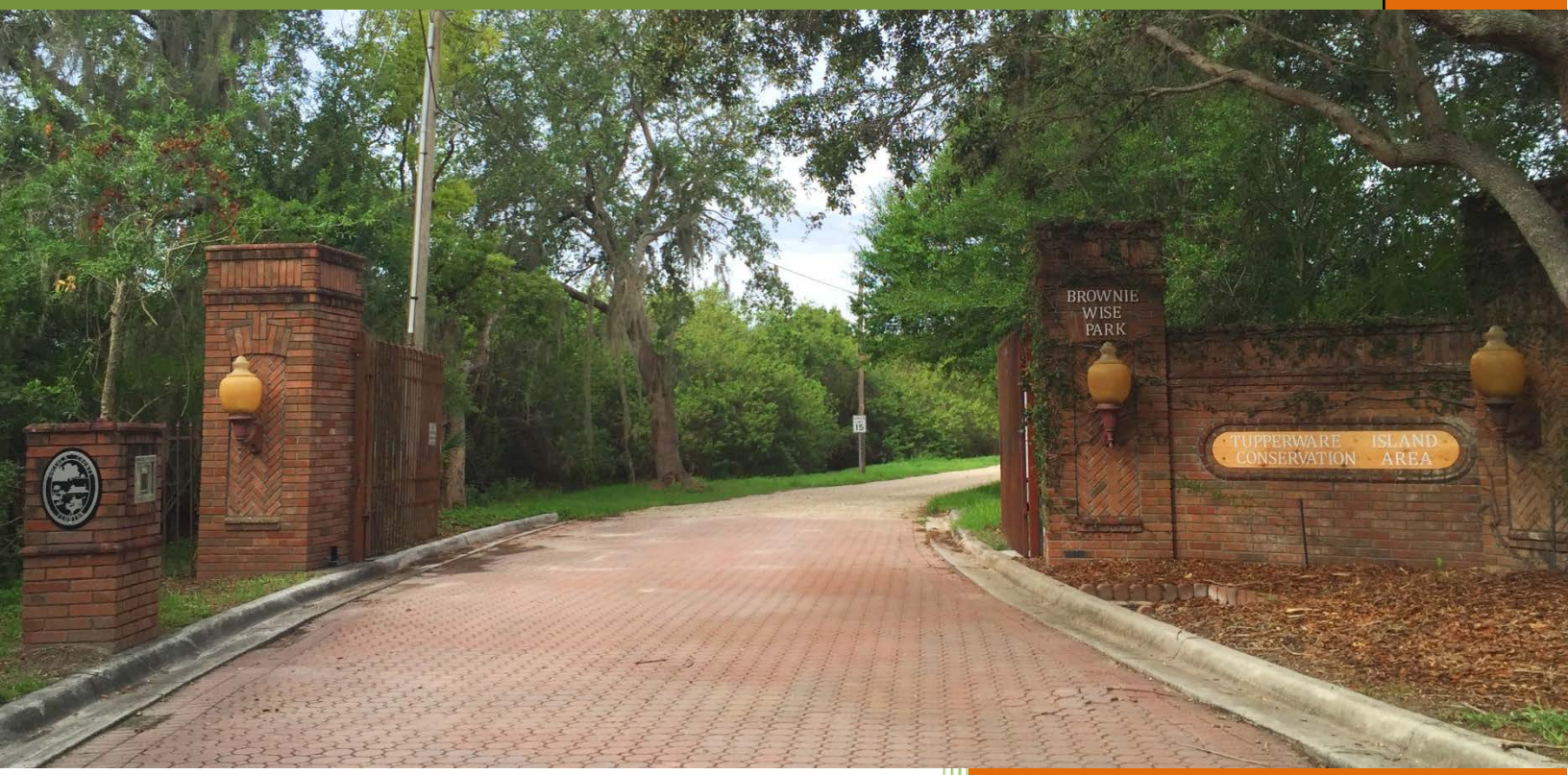

Osceola County Parks