Arthur R. Marshall Loxahatchee National Wildlife Refuge
DRAFT Visitor Services Plan and Environmental Assessment

U.S. Fish and Wildlife Service
Southeast Region
(DRAFT September 10, 2018)
Arthur R. Marshall Loxahatchee National Wildlife Refuge
Draft Visitor Services Plan

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Section A. Visitor Services Plan

Summary

The U.S. Fish and Wildlife Service (USFWS) established the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) on June 8, 1951 through a license agreement with the South Florida Water Management District (SFWMD). The Refuge currently includes 145,188 acres of land and water, of which 99% of the land would be open to the public.

This Visitor Services Step-Down Plan (VSP) identifies program goals, objectives, and strategies to reach over the next 15-year period and is to be used in conjunction with the Urban Wildlife Conservation Program plan. The development of this proposed VSP will revise and amend the visitor services program of the 2000 Comprehensive Conservation Plan (CCP). New and proposed uses for hunting and fishing addressed in this VSP will amend portions of the 2012 Hunt Plan and 2014 Fishing Plan. It ensures that recreational uses on the Refuge are compatible with the National Wildlife Refuge System (NWRS) mission and the purposes of the Refuge.

This VSP addresses the following proposed compatible wildlife-dependent recreational uses on the Refuge: hunting, fishing (including frog gigging, bowfishing, and fish gigging), wildlife observation, photography, environmental education, and interpretation (Appendix D). Hiking and biking are supporting uses allowed under wildlife-dependent recreation. In addition, concessionaire operations, non-motorized watercraft, horseback riding, pet walking, ceremonies, instructor-led small group activities, camping, commercial uses, and motorized watercraft are forms of non-wildlife dependent recreation being proposed, and in designated areas have also been determined to be compatible (Appendix D).

This document was written during the spring and summer of 2018 with assistance from the Region 4 Regional Office Visitor Services and Planning staff.
I. Background Information

A. REFUGE HISTORY, PURPOSES, AND RESOURCES

The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape (Figure 1). It is located seven miles west of the city of Boynton Beach, in Palm Beach County, Florida. Palm Beach County is the largest county east of the Mississippi River in terms of land area and is the largest agriculture-producing county in the east in terms of dollar value. The Refuge is located west of U.S. Highway 441, south of U.S. Highway 80, and 15 miles west of the Atlantic Ocean.

The Everglades Agricultural Area (EAA), which includes large sugar cane fields, winter vegetable fields, sod farms, and cattle ranches, is located northwest of the Refuge. Rapidly expanding communities and quickly disappearing small farms are found east of the Refuge where nearly six million people live from Ft. Pierce south to Miami (within a two-hour drive of the Refuge). Several development activities have been proposed adjacent to the western border of the Refuge, including an above-ground landfill, rock quarries, and a wind farm. The remainder of the central and southern Everglades, located south of the Refuge, is divided into Water Conservation Areas (WCAs) 2 and 3 and Everglades National Park.

Beginning with the Swampland Act of 1845 and later the 1907 Everglades Drainage Act, excessive drainage activities occurred in the Everglades to pave the way for agriculture and population expansion. Three WCAs were constructed by the U.S. Army Corps of Engineers in the 1940’s. Bounded by levees and connected only by a series of canals, these areas were placed under the jurisdiction of what is now the SFWMD.

The Refuge was established in 1951 under the authority of the Migratory Bird Conservation Act of 1929 with a 50 year license agreement between the State of Florida and the USFWS. The Refuge encompasses WCA-1, which is referred to as the 'Refuge Interior.' WCA-1 is owned by the SFWMD, but managed by the USFWS under the license agreement as a national wildlife refuge (NWR). In 2002, the initial license agreement was revised and renewed for an additional 50 years. On February 26, 2018, the USFWS and SFWMD entered into a renegotiated 20-year license agreement.

When the Refuge was established, it was known as the Loxahatchee National Wildlife Refuge. In 1986, the Refuge was renamed the Arthur R. Marshall Loxahatchee National Wildlife Refuge to honor former USFWS employee and noted South Florida conservationist, Arthur Raymond Marshall.

The current acreage of the Refuge Interior is approximately 141,374 acres. In addition to the licensed lands, the USFWS owns 3,814.50 acres in fee title to the east of the Refuge Interior. This acreage is sub-divided into three management impoundments (A, B, and C), a 400-acre cypress swamp, and the recently acquired 2,586-acre Strazzulla. In total, the Refuge currently includes 145,188 acres.


The Refuge was created by two agreements entered into by the Department of the Interior. The first agreement is a General Plan with the Florida Game and Fresh Water Fish Commission (now the Florida Fish and Wildlife Conservation Commission) which permitted WCA-1 to be used by the USFWS for the national migratory bird management program. The second agreement is a long-term License from the Central and Southern Florida Flood Control District (now SFWMD) which provided for the use of WCA-1 by the USFWS “as a Wildlife Management Area, to promote the conservation of wildlife, fish, and game, and for other purposes embodying the principles and objective of planned multiple land use.”

According to the Fish and Wildlife Coordination Act, this Refuge “…shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements…and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon….” (16 USC § 664).

The Migratory Bird Conservation Act of 1929 states that the Refuge is to be “…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 USC § 715d).

This purpose and the mission of the NWRS is fundamental to determining the compatibility of proposed uses of the Refuge.

**PHYSICAL RESOURCES**

**AIR QUALITY**

Air quality is not perceived to be as critical a concern as water quality. However, research shows that some of the mercury in the Everglades, generated from incinerators or power plants, is transported there atmospherically.

**PHYSIOGRAPHY, SOILS, AND GEOLOGY**

The Refuge is composed of 145,188 acres of Everglades habitat and is part of a series of large fresh water storage areas connected by canals and levees, which were completed by the U.S. Army Corps of Engineers in 1960. The underlying aquifer provides water for nearby coastal communities.

Underlying the Refuge is a depression in the Fort Thompson Formation, a limestone bedrock, which results in greater water depth than the surrounding Everglades. Unlike other areas of the Everglades where there are only shallow layers of soil overlying the bedrock, soil depths in the Refuge range from 3.6-14.0 feet (Silveria 1996). The soil is primarily Loxahatchee Peat which forms from the roots, rootlets, and rhizomes of white water lily, and is an indication of a historic slough community. The peat is lightly colored, fibrous and spongy, reflective of high organic content. The low ash content of the soil is an indication of infrequent burns in the area.

Loxahatchee Peat is found only in three areas in the Everglades — the Refuge, WCA-2, and in the western portions of WCA-3/Shark Slough. Loxahatchee Peat is slightly more acidic and has lower mineral content than other peats. The oldest peat on the Refuge has been dated at 4,800
years. Everglades Peat (formed primarily from sawgrass) and Gandy Peat (formed from woody material, especially associated with tree islands) are also present on the Refuge.

The Refuge is on a gradual north to south slope which results in slowly moving surface water sheet flow. The topography undulates throughout the Refuge, creating mounds and depressions that are covered by varying depths of water. In addition, the Refuge contains thousands of tree islands, many of which formed when a layer of peat dislodged from the substrate and floated to the surface. During periods of low water, such tree islands become rooted to the substrate. Plant succession occurs rapidly, and within about three years, woody vegetation is established.

HYDROLOGY

Water flowing from the Everglades is vital to supplying surface water for South Florida, replenishing the Florida and Biscayne aquifers, carrying essential nutrients and clean, fresh water to estuaries, and supporting an extremely rich and diverse assemblage of wildlife and plants. Changes in the hydroperiods (the duration that an area is inundated) and hydropatterns (the depth, timing, flow, and location of surface water) have altered these vital wetland functions in the South Florida ecosystem.

WATER QUALITY

Due to human activities during the last century, nutrients and toxic substances are a ubiquitous and an ever-increasing problem in the South Florida environment, including in the Refuge. Nutrients and toxic substances from urban and agricultural lands have degraded the once oligotrophic freshwater wetlands of the Refuge. Impacts include altered vegetation communities and periphyton assemblages.

BIOLOGICAL RESOURCES

HABITAT

The Refuge provides a variety of habitat types including sloughs, wet prairies, sawgrass, tree islands, and cypress swamp. Sloughs are the deepest natural marsh communities in the Everglades and the underlying sediment layer is composed of peat soils. During the rainy season, water depth in sloughs may exceed three feet with an annual average depth of approximately one foot. The sloughs support numerous fish species, aquatic invertebrates, and other wildlife. Wet prairies are shallower than sloughs and characterized by short emergent plants. Wet prairies are the most prevalent vegetative community (approximately 50% land coverage) in most of the central and eastern portions of the Refuge and are generally found between sawgrass marshes and sloughs. This important vegetative community provides prey for wading birds and the endangered Everglade snail kite in the form of fish, aquatic invertebrates, and apple snails. Sawgrass communities (approximately 25% land cover) are characterized by the saw-edged sedge that dominates this type of habitat. Sawgrass areas often border tree islands, separating them from wet prairies. The Refuge is characterized by thousands of tree islands that range from less than one acre to more than 300 acres. Approximately 20% of the Refuge Interior is comprised of tree islands. Tree islands in the Refuge form when submerged peat patches rise to the surface of the water and plants become established on "pop-up tree islands" or when sawgrass ridges are invaded by shrubs ultimately leading to the formation of strand tree islands. A 400-acre cypress swamp community is located on the eastern edge of the Refuge. This cypress swamp is the largest remaining remnant of a
cypress community on the east side of the Everglades that once stretched from the southeast corner of Lake Okeechobee to Ft. Lauderdale.

**ECOLOGICAL CONSIDERATIONS** (Figure 3)

The ecology of the Refuge is largely influenced by water quality and hydrology, which was historically rainfall-driven. Now, the Refuge is surrounded by a perimeter canal that stores and transports urban and agricultural runoff. Canal water is known to be high in nutrients and other contaminants that can have deleterious impacts on the ecology of the Refuge. Under certain conditions, canal water can move into the Refuge Interior, degrade soil and water quality, and ultimately alter vegetation communities that comprise the foundation of Refuge habitats (McCormick et al. 2009, Curtis et al. 1997). As a result, there is a gradient of impact that is roughly correlated with distance from canal. Because of a north to south elevation gradient, water tends to pond in the southern portion of the Refuge, while the northern areas experience shortened hydroperiods (Surratt et al. 2008). As a result of the water quality gradient, hydrologic dynamics and subsequent impacts, all areas of the Refuge do not have the same ecological value. The Refuge can generally be divided into three zones of ecological value based on total levels of impact. Levels of impact generally decrease with distance from perimeter canals, while ecological value generally increases. The three zones are characterized as having Low Ecological Value, High Ecological Value, or Highest Ecological Value and represent increasing distances from the canal, respectively.

*Highest Ecological Value.* Approximately 81,000 acres (~57% of Refuge Interior marsh) is the least impacted and most representative of the historic northern Everglades. This area has the highest ecological and conservation value because it includes the greatest extent of the most intact habitat (tree islands, vegetation communities, water quality, hydrology) in the Refuge. This area serves as sanctuary to trust species such as migratory birds (as per the USFWS mission and Refuge purpose), as evidenced by the numerous monitored (Figure 3) and unmonitored wading bird colonies, which frequently change location from year to year and can range in size from 10s to 1000s of birds. The northernmost portion is of regional importance as pre-breeding foraging habitat for wading birds. The Highest Ecological Value area also provides suitable habitat for snail kites, although the extent of use of this area by snail kites is not well known due to the limited area covered during regional surveys and typical low detection rates of nests.

Additional considerations include bald eagle nesting in recent years and habitat suitability and known populations of other marsh birds such as rails, bitterns, and waterfowl. Alligator nesting and muskrat lodges are also common in this area, as well as white-tailed deer and marsh rabbit sightings. This area also contains many past and currently active research sites. This area can be particularly difficult to navigate due to highly variable seasonal water levels, dense vegetation, and a high density of tree islands.

*High Ecological Value.* This portion of the Refuge is ~42,000 acres (~30% of Refuge Interior marsh) and is characterized by elevated nutrients and minerals compared to the most interior marsh, however is still ecologically valuable for the habitat and resources provided to wildlife. This area supports snail kite nesting and wading bird nesting colonies similar to the Highest Ecological Value area, but does not have the density of tree islands or provide the same amount of high quality habitat as the interior-most area. This area also supports some active research sites, and due to fewer tree islands and less variation in water levels, this area is more consistently and easily accessible than the most interior area.
**Low Ecological Value.** Approximately 18,000 acres (~12%) are characterized as having low ecological value. This area consists primarily of the fringe of willow, cattail, and phragmites that is generally found along the canal-marsh interface and is considered to be the most impacted area. This area encompasses the flooded, southern-most area that has largely transformed into open water or cattail habitat due to the combined effects of increased nutrients, hydropersiods and water depths. While some wildlife can be found in this area, particularly during dry periods, nesting wading birds are the most frequent users of this area.

**WILDLIFE**

The Refuge provides important feeding, roosting, and nesting habitats for many species of birds, mammals, reptiles, amphibians, and fish. In a given year, as many as 257 species of birds may use the diverse habitats found on the Refuge. Of those, approximately 93 species are considered common or abundant during certain seasons.

Over forty species of fish, 23 species of mammals, 10 species of turtles, 8 species of lizards, 11 species of anurans (frogs and toads), and 24 species of snakes have been documented on the Refuge. Alligators are considered keystone species in the Everglades ecosystem because of their critical role in creating dry season refugia for the aquatic organisms that make up the prey base.

At least 63 plant or wildlife species listed by the State or Federal government as endangered, threatened, or species of special concern are known to occur on the Refuge, either currently or historically. These species include, but are not limited to: the wood stork (*Mycteria americana*), Everglade snail kite (*Rostrhamus sociabilis*), bald eagle (*Haliaeetus leucocephelus*), Florida sandhill crane (*Grus canadensis pratensis*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), and roseate spoonbill (*Ajaia ajaia*) (USFWS 2000).

**CULTURAL RESOURCES**

By the time European explorers stepped foot on the Florida peninsula, there were five tribal groups associated with the east coast of Florida. These groups were the Timucua to the North, the Ais, the Guacata, the Jeaga, and the Tequesta to the south. All tribes were known to collect shellfish and other marine and aquatic resources, which resulted in large shell and bone middens near the villages (Andrews and Andrews 1985). There is evidence that these middens/mounds were used as safe-havens of dry land when coastal flooding occurred (Andrews and Andrews 1985).

Tribal groups most associated with the Refuge area were the Guacata, the Jeaga and the Tequesta (Griffin et al. 1979). It appears that the Guacata occupied a territory in a band north of the Refuge which included the eastern shore of Lake Okeechobee and the coast near St. Lucie. Other groups such as the Jeaga and perhaps even the Tequesta would be located south of what is now the Refuge.

By the 1800s, Native Americans from Georgia, Alabama, and South Carolina began filtering down into the Florida peninsula. These people became more cohesive through time as they fought together against the encroaching Europeans in the Second Seminole War of 1835-1842 (Neill 1956). The war’s end could be nothing but a loss for the Seminoles as they were forcibly moved west. Those that chose to remain made their way into the Everglades inhabiting a land that the newer Americans did not seem to want (Griffin et al. 1979).
With improved transportation, more settlers began to move into the area. Small communities, most of which were short lived, sprang up near the Refuge. These consisted of Belle Glade c. 1913; Glade Crest c. 1914, on the Hillsboro Canal; Shawano c. 1924, on the Hillsboro Canal; 20-Mile Bend at the juncture of the Hillsboro and West Palm Beach Canals, Gladeview on Hillsboro Canal, and Loxahatchee c. 1913, on West Palm Beach Canal (Will 1964) (Will 1968) (Griffin et al. 1979). The new settlements, with associated road construction, managed to bypass the Refuge due to the inhospitable environment.

B. VISITOR SERVICES PROGRAM PURPOSE AND SCOPE OF PLAN

In 1997, Congress passed the National Wildlife Refuge Improvement Act (Improvement Act) which clearly states, that on national wildlife refuges, wildlife comes first. The Improvement Act identified six priority wildlife-dependent public use activities and programs that are compatible with the mission of the NWRS. These uses include hunting, fishing, wildlife observation, photography, environmental education, and interpretation.

The purpose of the visitor services program is to connect visitors with the Refuge’s fish, wildlife, plants, and their habitats through safe, high quality, appropriate, and compatible wildlife-dependent recreational and educational programs and activities. This VSP was prepared based upon these guidelines. In addition to the CCP, with the adoption and implementation of this step-down plan, all visitor services activities and programs on the Refuge would be in conformance with national guidelines and would ensure that all visitor activities are compatible with the overarching wildlife mission and purposes of the Refuge and NWRS.

The purpose of this VSP is to establish priorities and identify improvements to guide the Refuge’s visitor services program over the next fifteen years. Existing goals, objectives, and strategies for visitor services have been identified on pages 65-69 of the CCP (USFWS 2000), on pages 4-5 of the Hunt Plan (USFWS 2012), and on pages 4-5 of the Fishing Plan (USFWS 2014). Additional goals, objectives, and strategies for all visitor services standards have been prepared for Table 4 within this planning document. This VSP addresses proposed compatible wildlife-dependent recreational uses on the Refuge including hunting, fishing (including frog gigging, bowfishing, and fish gigging), wildlife observation, photography, environmental education, and interpretation (Appendix D). Hiking and biking are supporting uses allowed under wildlife-dependent recreation. Concessionaire operations, non-motorized watercraft, horseback riding, pet walking, ceremonies, instructor-led small group activities, camping, commercial uses, and motorized watercraft are being proposed and are forms of non-wildlife dependent recreation that are being evaluated for compatibility. (Appendix D).

C. HISTORY OF THE REFUGE VISITOR SERVICES PROGRAM

The Refuge was established in 1951 as the 216th Refuge in the National Wildlife Refuge System (NWRS) through a license agreement between the SFWMD and the USFWS, under the Migratory Bird Conservation Act. The wetland ecosystems and surrounding canals of the Refuge make it a popular location for fishing and boating. The extensive levee and dike system at the Refuge allows for miles of hiking and bicycling for visitors to view wildlife and enjoy the Everglades. Since 1951, the Refuge has developed an extensive visitor services program.
After opening in 1951, the original recreational uses on the Refuge included waterfowl hunting, sport fishing, and sightseeing. The initial visitor count for the first year was approximately 900 visitors. The 50’s were heavily devoted to ditch digging and landfiling.

The 1960’s were marked by the construction of major public use groundwork such as boat ramps, roads, observation areas, and site filling for a Visitor Center and more parking. This decade was the first to dedicate its focus to creating and enhancing infrastructure for public use. In 1969, specific emphasis was placed on expanding local school programs with the Refuge which consisted of staff providing in-class programs and presentations followed by class tours at the Refuge. This relationship between the Refuge and local schools became the foundation for the extensive environmental education program to come.

Major visitor services advancements were made in the 1970’s including the construction of an auditorium, observation tower, the Cypress Swamp Boardwalk, a photo blind, and a canoe trail. During this time, fishing and hunting were the main recreational activities for visitors as well as walking trails and observation areas for wildlife viewing. At this time, there was a concession for airboat tours at the southern end of the Refuge that attracted many visitors. Through collaboration with the Florida Atlantic University Pine Jog Environmental Education Center, the Refuge’s facilities and trails became an outdoor classroom for thousands of students in environmental education programs each year.

The Friends of the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Friends) was founded in February of 1982 as the Loxahatchee Natural History Association, making it the oldest Friends group in continuous operation in the USFWS. The name was changed to the current one in 2003. In 1983, the volunteer program at the Refuge began functioning in an official capacity and a brand new Wildlife Interpretive Center/Visitor Center opened at Headquarters with new exhibits. Many renovations and improvements were made to existing public use structures, signage, and exhibits during the 1980’s, which helped increase on- and off-site public programs. In 1987, the Refuge implemented its entrance fee collection program and in 1989 VCR equipment was installed in the Visitor Center allowing for the first ever video of the Refuge to be shown. Through this decade, the Marsh Trail, Canoe Trail, and airboat tours brought in many visitors interested in learning more about the Everglades and exploring its ecosystems.

In the early 1990’s, the Marsh Trail observation tower was replaced with an improved tower for viewing. Additionally, to increase accessibility for disabled visitors, a handicap fishing platform and an observation tower were constructed at the Headquarters boat launch area. The 1990s brought many hurricanes and tropical storms that did minimal damage to structures but did flood boat ramps, fishing docks, and the Cypress Swamp Boardwalk. In 1999, the first bicycle trail, a 12-mile section of the L-40 levee connecting the Headquarters area to the Hillsboro area, was established on the Refuge. This newly-opened bicycling trail brought a new and active way for the public to explore the Everglades and observe wildlife. Although the airboat concession at Hillsboro closed in 1990, Loxahatchee Canoeing, Inc. was established in 1999 at the Headquarters boat launch area under a Special Use Permit with canoe, kayak, and bicycle rentals available to the public.

In the year 2000, the Refuge held its first annual Everglades Day festival, which has since continued as a valuable annual event to engage the community in many aspects of the Everglades ecosystem. The first annual Family Fishing Day was also held in 2000, which has become a successful annual opportunity for children and their families to visit the Refuge, learn
about fishing, and fish in the Everglades. The grand opening of 20-Mile Bend, the third entrance station at the northern end of the Refuge occurred in 2005.

In 2003, the Loxahatchee Impoundment Landscape Assessment (LILA) was built on the western portion of the Refuge’s C-Impoundment through a partnership between SFWMD, the USFWS, and the U.S. Army Corps of Engineers. LILA is a working 80-acre model of the Everglades ecosystem. This “living laboratory” gives experts an opportunity to research and apply restoration techniques on a small, controlled scale before taking them into the 1.7 million acre Everglades ecosystem. LILA provides a unique educational opportunity to staff, volunteers, and visitors in the C Impoundments.

Hurricane season in both 2004 and 2005 brought three hurricanes that did significant damage to trees, the new environmental education pavilion built in 2000, the administrative and Visitor Center building, and the Cypress Swamp Boardwalk. Following the destruction of these structures, a new education pavilion was erected in the footprint of the old Visitor Center and a new administrative office and Visitor Center were opened in 2008.

In 2010, the Cypress Swamp Boardwalk was replaced and an outdoor classroom for visiting students was created south of the Visitor Center. The Refuge allowed its first recreational alligator hunt with the issuance of 11 permits in 2014. Each permit allowed for the harvest of two alligators for a potential total of 22. This new hunting opportunity greatly increased the number of hunt visits to the Refuge after 2015. In 2015, approximately 35 additional miles of trail on Refuge levees were opened for hiking, bicycling, and fishing with an added 6.5 miles of trails in the A, B, and C Impoundments.

Presently, there are more than 560 NWRs in the NWRS, of those; there are 14 priority urban refuges that are within 25 miles from populations of 250,000 or more. In 2011, the Refuge was designated a priority urban refuge. This close proximity to major cities affords the Refuge the opportunity to engage a wide variety of individuals, many of whom are not currently aware of the USFWS and its mission.

With three visitor access entrances including the Headquarters area, Lee Road off US 441/SR 7, Hillsboro Area at the west end of Loxahatchee Road, and 20-Mile Bend off CR 880 and 20-Mile Bend Boat Ramp Road, the Refuge has the capacity to engage the community across a wide area. The visitor services program now includes an extensive trail system for bicycling, hiking, and canoeing/kayaking. Interpretive programs offered by volunteers and staff at the Refuge include tram tours, guided walks, photography, canoe tours, environmental education programs, and community outreach and involvement. Between 1992 and 2017, visitation ranged from a low of 105,581 in 1995 to a high of 408,812 in 2014. Refuge visitation has increased significantly in the past two decades due largely to improvements in visitor services and public use opportunities and greater outreach efforts.

D. VISITOR SERVICES ISSUES, CONCERNS, AND FACTORS TO CONSIDER

Current Issues and Concerns
During the development of the VSP in 2018, the planning team developed a list of issues and concerns that were likely to be associated with visitor services management on the Refuge. This list was derived from team knowledge of the area, a public scoping meeting, and written comments submitted by the public.
Welcome and Orient
- Improve facilities, especially Americans with Disabilities (ADA) compliance.

Hunting and Fishing
- Keep hunting the same.
- Open entire Refuge for hunting.
- Hunt only exotic and invasive species (pythons, hogs, exotic fish).
- Expand hunting areas.
- No hunting should be allowed.
- No hunting in the Refuge Interior.
- Increase alligator hunting.
- Oppose alligator hunting.
- Allow night bowfishing and frog gigging.
- Allow airboats, mud motors, buggies, all-terrain vehicles (ATVs), outboards for hunting and fishing.
- Do not allow airboats for hunting and fishing.
- Fishing line and hook receptacles should be at all docks.
- No extra hunt days but expand hours.
- Open Refuge to year round hunting and fishing.
- Manage by FLA Fish and Game rules.
- No fishing should be allowed.
- Fishing piers.
- Increase waterfowl hunting.
- Biological assessment needed before increasing hunting.
- Allow small game hunt.
- Do not allow small game hunt.
- Allow specialty hunts.

Wildlife Observation, Photography, Interpretation, and Environmental Education
- Add photo blinds.
- Add photo station.
- Off-season birding and herpetofauna activities.
- Expand tram program.
- No activities that involve noise and disrupting wildlife.
- Add islands for nesting and roosting to accommodate wildlife observation and photography and observation towers for environmental education.
- Focus on educational programs.
- Increase staff to support environmental education.

Other Recreational Uses
- No airboating.
- Allow airboating.
- Allow mud motors.
- No air cooled engines or jet drives.
- More access.
- Limited airboating for traditional uses.
- Open entire perimeter for a continuous trail for biking, hiking, etc.
• Passive recreation only.
• Allow camping.
• Camping platforms with bathrooms.
• No pets should be allowed.
• No weddings.
• Allow night access.
• Increase kayak/canoe trails.
• Buy more land for recreation.
• Plant cypress trees for hiking trails.

Outreach, Partnerships, and Volunteers
• Increase outreach to school and school group activities.
• Work to make public aware of Refuge.
• Need more volunteers.
• Host groups to volunteer for “clean up” days.
• Partner with schools for more volunteer opportunities.
• Volunteer programs to remove invasive/nuisance species.

Recreational Fees
• Expand Visitor Center and charge fees for public events.
• Reevaluate the entrance fee.
• Have Volunteer or staff at the entrance fee gate to ensure payment.
• Evaluate “pay to play” for hunting.
• Increase fees.

Concessions and Commercial Uses
• Simplify concession rules.
• Increase concessions and locations.
• No single use plastics at concessions.
• No commercial uses should be allowed.
• No concessions.

Strazzulla
• Open for limited quota hunting.
• Increase hunting.
• Add fishing pier.
• Add observation towers.
• Add launch for non-motorized watercraft.
• Expand public access.
• Add trails.
• Add invasive species hunts.
• Allow camping.
• Add boardwalk.
• Offer shuttle boat to Visitor Center.
• Create some open waters.
• Maintain snags for bird use.
• Recycling should be available.
• Litter should be minimized.
**2000 CCP Issues and Concerns**

During the development of the CCP (USFWS 2000), the planning team developed a list of issues and concerns that were likely to be associated with the management of the Refuge. The following list was derived from team knowledge of the area, a public scoping meeting, and written comments submitted by the public.

**Public Use**

- There are not enough opportunities to observe wildlife and its habitat in a quiet, natural, non-developed environment.

  Many people expressed their appreciation for the Refuge, its relatively quiet environment and its undeveloped nature. Since much of the land in South Florida has been developed (in their view), the Refuge needs to stay relatively unsullied and quiet—a sanctuary for the public as well as for wildlife. Some people wished that more areas of the Refuge (e.g., Strazzulla or the perimeter levee) were open so they could participate in more passive wildlife observation. Many people said that they don’t want any activity that will disrupt wildlife populations or damage wildlife habitat.

- There is a need for increased access to the Refuge for active recreational uses such as hiking, camping, bicycling, horseback riding, canoeing and airboating.

  A number of people would like to bicycle, horseback ride, ride all-terrain vehicles, camp, hike, or airboat on the Refuge. Many people believe that many kinds of recreation have not been offered to the public and should be. Due to the loss of natural lands in South Florida, people said they want to be able to enjoy green space in ways other than walking.

- There is a need to provide increased access to the Refuge for hunting waterfowl, deer, alligator, turkey, bear and frogs. The habitat needs better management for fishing and hunting activities.

- Some people expressed frustration that the Refuge provides a limited amount of access for hunting; further, they wished that the Refuge allowed the use of airboats, especially for that purpose. Others desired a greater number of species to hunt. A number of individuals expressed frustration with what they perceive to be poor management of hunting and fishing habitat, especially with regard to the dense cattail growth at the south end of the Refuge.

- Do not allow airboating.

  A number of people wrote comments and stated at the public meeting that the Refuge should not be opened to private airboating.

- There is a need to provide access and improve/provide public use facilities at Hillsboro and Strazzulla.

  Many people expressed a desire for improved facilities and support services at the Hillsboro area, located at the south end of the Refuge. The desired facilities and services should include a concession (with interpretive tours, boat rentals, and educational experiences), usable boat ramps, telephones and restrooms. In addition, some people
wished to have access to Strazzulla. Many people were concerned about the poor maintenance of the canoe trail and lack of additional access to the Refuge Interior. A few people desired an access point at the north end of the Refuge to replace the closed “20-Mile Bend” access point.

**Partnerships**

- There is a need for the Refuge to develop partnerships with state, county, and community agencies, universities and educational institutions, natural resource based organizations and other entities.

People think the Refuge should work more closely with other natural resource agencies and user groups. To enhance management, some people believe there is a need to share equipment and knowledge between agencies.

- Take the Refuge from the USFWS and give it back to the Florida Fish and Wildlife Conservation Commission (FWC).

Some people do not want the USFWS to manage WCA-1. Currently, a license agreement with the SFWMD gives authority to the USFWS to manage wildlife in keeping with its mission and establishing legislation, but the Water Management District retains the authority to manage water for flood control and water supply. These citizens feel the license agreement has been violated regarding wildlife and habitat management and by public access.

- Many of the public wish the Refuge to develop ecotourism connections with the business community.

Citizens recognize that the Refuge is a tourist attraction and they hope that it can continue to be beneficial to the local economy. Some citizens wish the Refuge would join the Chamber of Commerce and create connections between hotels, recreational sport organizations and businesses.

### E. THEMES, MESSAGES, AND TOPICS

Staff would like to provide visitors with an understanding that the National Wildlife Refuge System is an assemblage of protected lands and that there is an overall purpose for which each national wildlife refuge was established. The purpose of the Refuge is to manage and protect migratory bird populations, other wildlife species, and ecological systems associated with the Everglades ecosystem in which the Refuge exists.
Messages
- Foster understanding of what the USFWS and individual wildlife refuges are, their historical backgrounds, and the key roles they play in natural resources conservation today.
- The Refuge holds the northernmost 221 square miles of a globally recognized habitat, the Everglades ecosystem, in Palm Beach County, Florida.
- The Refuge provides a quiet oasis away from the Greater Miami Area, which holds an estimated population of over 6.7 million people in 2016.
- The Refuge provides free ecosystem services that benefit the people of South Florida by providing clean air, clean water, flood control, prevention of salinization of aquifers (saltwater intrusion), natural habitat for wildlife, and many other benefits.

Topics
- What is the U.S. Fish and Wildlife Service?
- What is the National Wildlife Refuge System?
- The Refuge was established for migratory birds.
- Everglades wildlife and their habitats.
- Do not feed wildlife/alligators.
- Water quality, quantity, timing, distribution.
- Recreational opportunities.

F. VISITOR FACILITIES AND SERVICES

The Refuge has a well-developed visitor services program that promotes priority public use activities while simultaneously implementing national and regional initiatives along with refuge-specific goals.

The program’s primary responsibilities are:

- Visitor Center operations.
- Interpretive programming.
- Environmental education.
- Community outreach.
- Special events.
- Website and Facebook.
- Volunteer program management.
- Public information.
- Recreation Fee program management.
- Permits (special use & commercial use).
- Visitor services facilities maintenance.
- Visitor services planning.

Public Use Infrastructure
The following list describes public use facilities and infrastructure that are currently used by visitors as they travel throughout the Refuge.

Headquarters/Lee Road area
- Buildings:
  - Visitor Center/Headquarters building.
• ADA restroom facility.
• Fee booth.
• Road: Lee Road, paved.
• Parking lots:
  o Visitor Center (paved, 51 spaces, three ADA spaces).
  o Bus parking area (paved three spaces).
  o Marsh Trail parking lot (29 spaces, two ADA spaces).
  o C-6 Pavilion parking lot (11 spaces).
  o Lee Road Boat Ramp parking lot (17 spaces, two ADA spaces, 20 boat trailer spaces).
• Boat Launch and Ramps: Lee Road boat launch, three ramps.
• Kiosks and signs
  o Entrance.
  o Visitor Center.
  o Marsh Trail parking lot.
  o LILA.
  o Marshall Trail.
  o Lee Road Boat Ramp.
• Trails
  o Cypress Swamp Boardwalk – 0.4-mile, ADA accessible.
  o A Impoundments – 3.2 miles of hiking/bicycling trails.
  o C Impoundments – 6.7 miles of hiking/bicycling trails.
  o L-40 Levee – 36 miles of hiking/bicycling trails.
  o Canoe Trail – 5.5 miles of paddling trails.
• Observation towers: Marsh Trail and Lee Road Boat Ramp.
• Marshall Trail to LILA pedestrian bridge.
• Pavilions/shelters: Cypress Swamp, Marsh Trail, and C-6.
• C-8 photo blind and boardwalk.
• Cypress Swamp Boardwalk.
• Fishing pier.
• Mounted scope (Marsh Trail observation tower).
• TRAFx vehicle counter.
• Iron ranger (self-pay station).
• Trash cans and recycling center.
• Bicycle racks.
• Recreational vehicle (RV) camp pads for resident volunteers.
• Benches
  o Visitor Center.
  o Cypress Swamp Boardwalk.
  o Cypress Swamp Pavilion.
  o Marsh Trail.
  o C-6 Pavilion.

20-Mile Bend
• Road: 20-Mile Bend Boat Ramp Road, paved.
• Boat ramp parking lot (12 vehicle, one ADA, and 14 vehicle/trailer spaces).
• Boat Launch and Ramps: 20-Mile Bend Boat Launch, one ramp.
• Kiosks at entrance and boat launch.
• Iron ranger.
• Fishing pier.
• Two aluminum docks.
• Portable ADA restroom.
• TRAFx vehicle counter.
• Trash cans and recycling center.

Hillsboro
• Road: Loxahatchee Road, unpaved on the Refuge.
• Parking lot– unimproved, gravel surface, could fit approximately 24 vehicle/trailers.
• Boat Launch and Ramps: Hillsboro Boat Launch, three ramps.
• Kiosk at entrance.
• Fee booth.
• Iron ranger.
• Portable ADA restroom.
• Cement bank-fishing platform (8x8).
• Railed fishing structure.
• Railed lock, deeper water, bank fishing.
• TRAFx vehicle counter.
• Trash cans and recycling center.

Informational Resources
Informational resources orient, inform, and interpret the resource to the public in a way that does not require personal interaction between Refuge staff and visitors. Informational resources services are an important aspect of the visitor services program because they facilitate a positive experience for visitors when visitors do not have the opportunity to interact with Refuge staff and volunteers.

Visitor Center Operations
• Interactive exhibits.
• Brochures.
• Fact sheets.
• Orientation film.
• Binocular loan program.

Signs
• Entrance sign (e.g. standard).
• A-Series (e.g. standard 11x14 inch signs for boundaries, public hunting, fishing areas).
• Interpretive signs (e.g. tells a story).
• Regulatory signs (e.g. permitted and prohibited activities).
• Directional/Informational signs (e.g. orientation, maps).
• Traffic signs (e.g. stop signs, speed limit, and parking areas).

Interpretive Resources
• Junior Refuge Manager Program.
• Scavenger hunt.
• QR Code program.

Community Outreach
• Brochures.
Staff-based Services

News releases.
Website.
Facebook.

Web-based Media
Website: https://www.fws.gov/refuge/arm_loxahatchee/.
Facebook: https://www.facebook.com/ARMLoxahatcheeNWR/.

Volunteer Program Management
Volunteer opportunities.
Recognition and appreciation board.
Recruitment announcements on Facebook and website.
Position descriptions.

Public Information Officer
News releases.

Recreation Fee Program Management
America the Beautiful - National Parks and Federal Recreational Lands Passes program.
Refuge entrance fees.
Commercial use fees.

Hunt program
Calendar of events.
News releases.
Website updates.
Facebook posts.

Permits
General Special Use Permits.
Commercial Activities Special Use Permit.

Visitor Services Planning
Annual work plans.
Partnership plans.
Project cost plans.
Implementation schedules.
Urban Wildlife Conservation Program planning.

Staff-based Services
Staff-based services orient, inform, and interpret the Refuge’s resources to the public through personal interaction with Refuge staff, Friends, volunteers, and interns.

Visitor Center/Refuge Headquarters
Built in 2008, this state-of-the-art 4,965 square foot Visitor Center is filled with exhibits, displays, and information to help visitors learn about and connect with the Everglades ecosystem. During a walk-through of the Visitor Center, visitors can learn about the Everglades through a time-line exhibit, see and hear the different nighttime sounds of the Everglades, crawl into an alligator
hole under a tree island, and even take a virtual airboat ride without getting their feet wet. On the back side of the building are a patio and pavilion in the footprint of the old Visitor Center.

A small conference room provides space for meetings, programs, and workshops. A theater/auditorium with audiovisual (AV) capabilities plays a Refuge orientation video upon request. The Visitor Center is open 7 days a week from 9:00 am to 4:00 pm and closed on Thanksgiving and Christmas days. The front desk is staffed by trained volunteers.

The Friends maintain a nature store within the Visitor Center. All proceeds support Refuge programs and activities.

Interpretive programming
A variety of interpretive programming is offered, including tram tours, guided hikes, interpretive talks, demonstrations, conducted activities, and informal roving.

Environmental education
A variety of curriculum-based hands-on environmental education programs are offered, both on-site and off-site. Participation varies from year to year, but typically, over 10,000 students visit the Refuge annually.

Community outreach events
Community outreach is focusing on relevancy within the local communities (who we are, what we do, why it is important to support), and engagement with urban and underserved communities. The Refuge is represented by staff, volunteers, or Friends members at numerous community events and festivals such as: Lake Worth Tree Board’s Festival of Trees, Palm Beach County’s Outdoor Adventure Day, MacArthur Beach State Park’s NatureScaping, Broward County Park’s Water Matters Event, Palm Beach County Historical Society’s Everglades Day, Palm Beach County Solid Waste Authority’s SWA Run Away 5K Event, Palm Beach State College’s Earth Day, Palm Beach Atlantic University’s Earth Day, Friends of Okeeheelee Nature Center’s Earth Day, Green Cay Nature Center’s Migration Celebration, Jonathan Dickinson State Park’s Fire Fest, Bedner’s Farm Market’s Fall Festival, and the Caridad Center’s Family Health Festival.

Special Events
Everglades Day has been held annually on the second Saturday in February since 2000. Visitors can expect wildlife presentations, canoeing, fishing and birds of prey demonstrations, live music, educational programs, guest speakers, Presentations in Spanish, food trucks, interactive activities, LILA tours, and over 30 exhibitors from partner organizations.

Family Fishing Day has been held annually on the second Saturday in June since 1998. Families are invited to get hooked on fishing and learn about casting and fishing, knot-tying, fish identification, and fishing ethics and conservation.

National Public Lands Day is celebrated on the last Saturday of September each year. The Refuge has had several programs over the years including cypress seed harvest, tree planting, and Refuge trash clean up.

An inaugural Christmas Bird Count for Kids was held in 2017 to teach kids and families how to count birds, use binoculars, and become citizen scientists in a fun, hands-on way.
An annual photography contest sponsored by the Friends group has been held each year since 1983 to promote awareness and appreciation of the Refuge. Contest categories include avian, fauna, flora, landscapes, artistic, and youth. Contest entries are generally accepted January-April with an awards ceremony in May. Winners and honorable mentions will be displayed at the Visitor Center, published on the contest web site, and featured in the annual Refuge calendar.

The *Loxahatchee Visions Art Contest* is sponsored by the Friends group and has been held annually since 2009.

**Website and Facebook**
Information is updated on the website as needed. Facebook is updated a minimum of 3-5 times per week.

**Volunteer Program Management**
Staff manage the volunteer program through recruitment, training, recognition, and an annual appreciation banquet to honor all volunteers who have donated their time to the Refuge.

**USFWS Liaison to Non-Profit Friends Group**
Staff attend monthly board meetings, serve on numerous committees, provide advice regarding USFWS policy and nature store operations and inventory, and assist with strategic planning.

**Recreation Fee Program Management**
Staff collect and process entrance fees from daily and annual refuge passes, the America the Beautiful - National Parks and Federal Recreational Lands Passes program, the Federal Duck Stamp program, and Special Use Permit fees.

**Hunt Program Management**
Staff assist with facilitating the hunt program by disseminating current informational resources through the website and Facebook, answering questions in person and on the phone, and training volunteers in answering hunting-related questions.

**Visitor Services Facilities Maintenance**
Staff and volunteers manage and maintain a variety of facilities that enable visitors to experience the Refuge in a safe and accessible environment. This includes maintenance of Visitor Center exhibits and signs, walking, biking, and paddling trails, landscaping, and other general housekeeping and cleaning tasks.

**Visitor Services Planning**
Staff, volunteers and interns within the Visitor Services department help connect visitors with the Refuge’s fish, wildlife, plants, and their habitats through safe, high quality, appropriate, and compatible wildlife-dependent recreational and educational programs and activities. Having a plan for a station’s visitor services program is important to ensure resources are used effectively and includes involvement from the public, partners, and other stakeholders.
G. VISITOR SERVICES MAPS

Figure 1. Refuge Overview
Figure 2. Current Refuge Map

A.R.M. Loxahatchee National Wildlife Refuge

Closed to Public Use

N 26°27.130

Open to Public Use, Alligator, and Waterfowl Hunting

Current Uses, Access Points, & Facilities

Refuge Boundary

0 1.25 2.5 5 Miles

Parking  Observation Tower  Restroom
Canoe Trail  Educational Pavilion  Hunting
Hiking  Photo Blind  Kayaking/Canoing
Interpretive Trail  Fishing
Wildlife Observation  Boat Launch

Headquarters Area
Figure 3. Ecological Considerations
Figure 4. Proposed New Uses, Access, and Facilities

A.R.M. Loxahatchee National Wildlife Refuge

Proposed New Uses, Access Points, & Facilities

- Parking
- Canoe Trail
- Hiking
- Interpretive Trail
- Wildlife Observation
- Fenced
- Observation Tower
- Horseback Trail
- Photo Blind
- Hunting
- Information
- Ranger Station

- Primitive Camping
- Biking
- Kayaking/Canoing
- Fishing
- Fee Concessions

Refuge Boundary
Figure 5. Proposed Motorized (not including airboats)/Non-motorized Watercraft Area
Figure 6. Proposed Alligator Hunting Area

A.R.M. Loxahatchee National Wildlife Refuge
Proposed Alligator Hunting

Legend:
- Alligator Hunting Including Airboats
- Alligator Hunting - No Airboats
- No Alligator Hunting
- Refuge Boundary

0 1.25 2.5 5 Miles
Figure 7. Proposed Deer and Hog Hunting Area

A.R.M. Loxahatchee National Wildlife Refuge
Proposed Deer and Hog Hunting

Legend
- Deer and Hog Hunting with Potential Airboat Use
- Deer and Hog Hunting with Non-motorized Access
- Spectator Hunts
- No Hunting
- Refuge Boundary

Legend:
- Deer and Hog Hunting with Potential Airboat Use
- Deer and Hog Hunting with Non-motorized Access
- Spectator Hunts
- No Hunting
- Refuge Boundary

0 1.25 2.5 5 Miles

Tower Road
Strazzulla Tower
Cypress Swamp
A Impoundments
Figure 10. Proposed Camping Area

A.R.M. Loxahatchee National Wildlife Refuge
Proposed Primitive Camping

Legend

- Primitive Camping
- Refuge Boundary

0 1.25 2.5 5 Miles
Figure 11. Proposed Horseback Riding Area
Figure 12. Proposed Provisional Non-hunting Airboating Area

A.R.M. Loxahatchee National Wildlife Refuge
Proposed Non-hunting Airboat Access
Figure 13. Proposed Concessionaire Location

A.R.M. Loxahatchee National Wildlife Refuge
Proposed Concessions Operations

Legend
- Main Concession
- Satellite Concession
- Refuge Boundary

0 1.25 2.5 5 Miles

Loxahatchee Road
H. REFUGE VISITATION TRENDS AND IDENTIFYING AUDIENCES

REFUGEE VISITATION TRENDS

Visitors are recorded by staff and volunteers manually at special events and the Visitor Center, and automatically using traffic counters for vehicles, bicyclists, and pedestrians entering the Refuge and using trails. The Refuge visitation trends are reported annually in both Annual Narratives and the Refuge Annual Performance Plan. (Table 1)

Table 1. Refuge Visitation From 1992-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Total # of Visitors</th>
<th>States Represented</th>
<th>Countries Represented</th>
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<tbody>
<tr>
<td>2017</td>
<td>405,342</td>
<td>50</td>
<td>27</td>
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<tr>
<td>2016</td>
<td>397,894</td>
<td>49</td>
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<td>2015</td>
<td>321,364</td>
<td>49</td>
<td>35</td>
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<tr>
<td>2014</td>
<td>408,812</td>
<td>48</td>
<td>21</td>
</tr>
<tr>
<td>2013</td>
<td>247,797</td>
<td>46</td>
<td>18</td>
</tr>
<tr>
<td>2012</td>
<td>323,241</td>
<td>47</td>
<td>34</td>
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<td>2011</td>
<td>300,717</td>
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<td>23 -</td>
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<td>333,725</td>
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<td>283,915</td>
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<td>2008</td>
<td>335,072</td>
<td>50</td>
<td>30+</td>
</tr>
<tr>
<td>2007</td>
<td>336,829</td>
<td>50</td>
<td>30+</td>
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<tr>
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<td>315,602</td>
<td>50</td>
<td>30+</td>
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<td>1996</td>
<td>109,032</td>
<td>50, DC, Puerto Rico</td>
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<td>1995</td>
<td>105,581</td>
<td>50, DC, Puerto Rico</td>
<td>35</td>
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<tr>
<td>1994</td>
<td>106,264</td>
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<tr>
<td>1993</td>
<td>123,549</td>
<td>50, DC, Puerto Rico</td>
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</tr>
<tr>
<td>1992</td>
<td>118,078</td>
<td>49, DC, Puerto Rico</td>
<td>39</td>
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</tbody>
</table>

The Refuge hosts about 400,000 visitors annually, encompassing both local individuals and visitors to South Florida from around the United States and the world. The highest visitation period is from November to May. The Visitor Center, nature trails, and wildlife viewing opportunities offer a quiet setting away from the bustling urban area and are the primary visitor attractions. Freshwater fishing, hiking and biking, bird watching, and nature photography are popular pastimes year-round on the Refuge.
Visitation to the Refuge has ranged from 247,797 to 408,812 from the year 2000 to the year 2017. The lower visitation count in 2013 can be partly attributed to the Federal government shutdown that took place from October 1-17, 2013. These visitation numbers are obtained by taking the average number of people per car multiplied by the number of vehicles recorded by counters entering the Refuge.

From 2000 to 2017, the number of annual visitors to the Visitor Center ranged from 17,853 in 2007 to 65,613 in 2000. Low visitation was marked in 2007, because the main Visitor Center was closed in May due to upcoming construction of a new Visitor Center/administration building. Some exhibits were moved to a temporary trailer for visitors. The new Visitor Center was completed and opened for the public in June 2008. In October 2009, new exhibits were open to the public.

On February 11, 2000, the Refuge celebrated its first annual Everglades Day which attracted approximately 2,500 visitors. It has since become a yearly event that continues to draw interest from thousands of visitors. The range of visitation between 2000 and 2018 for this event was 2,200 to 4,660. So far, 2017 marks the year of highest visitation, with 4,660 people attending.

Within the years 2012 to 2017, the number of annual hunting visits ranged from 105 in 2014 to 1,265 in 2017. The increase in total hunting visits each year can be partially attributed to the opening of the southern end of the Refuge to recreational alligator hunting in 2014. Waterfowl hunting visits also increased from 181 visits to 1,209 from 2012 to 2017.

The Refuge expanded its hiking and biking trail system in October of 2015 by approximately 45 miles, making bicycling a more popular way to explore and enjoy wildlife viewing at the Refuge. The total number of bicycle visits between 2012 and 2017 ranges from 1,065 to 17,486.

Refuge visitation was tabulated from annual reports over the last 26 years. Data include the visitation year, total number of visitors, and the states and countries represented on the visitor log in the Visitor Center.

**SOCIOECONOMIC ENVIRONMENT**

The Refuge’s CCP outlined socioeconomic conditions and history on pages 50-55, which is incorporated herein by reference. This VSP will focus on changes since that time.

**DEMOGRAPHIC INFORMATION**

By 2010, Florida’s population had soared to 18 million, with 77% living in Florida’s 35 coastal counties (U.S. Department of Commerce, U.S. Census Bureau 2010). By 2017, this number had reached over 20 million (U.S. Department of Commerce, U.S. Census Bureau 2017). The projected population of the State of Florida is expected to increase by 44% from 2000 to 2030 to over 28 million (U.S. Department of Commerce, U.S. Census Bureau 2017) and almost double from 2010 to 2060 to nearly 36 million (Zwick and Carr 2006). Table 2 compares the 2010 and 2017 U.S. Census population figures and provides 2060 population estimates for Palm Beach County, and the State of Florida.
Table 2. County and State Population Comparison.

<table>
<thead>
<tr>
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<tr>
<td>Palm Beach County</td>
<td>1,320,134</td>
<td>1,471,150</td>
<td>2,701,242</td>
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<tr>
<td>State of Florida</td>
<td>18,804,594</td>
<td>20,984,400</td>
<td>35,814,574</td>
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</table>

* U.S. Department of Commerce, U.S. Census Bureau 2010  
+ U.S. Department of Commerce, U.S. Census Bureau 2017  
^ Zwick and Carr 2006

Table 3 compares demographic data from the 2017 Census, showing that compared to the State of Florida, Palm Beach County has a higher percentage of the population over the age of 65, a lower percentage of the population identified as white, a higher percentage of the population identified as black or African American, and a lower percentage of the population identified as Hispanic or Latino (U.S. Department of Commerce, U.S. Census Bureau 2017).

Table 3. County and State Demographic Comparison.

<table>
<thead>
<tr>
<th></th>
<th>Palm Beach County</th>
<th>State of Florida</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Population &gt;65 years old</td>
<td>23.3%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Percent White</td>
<td>75.4%</td>
<td>77.6%</td>
</tr>
<tr>
<td>Percent Black or African American</td>
<td>19.4%</td>
<td>16.8%</td>
</tr>
<tr>
<td>Percent American Indian or Alaska Native</td>
<td>0.6%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Percent Asian</td>
<td>2.8%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Percent Hawaiian and Other Pacific Islander</td>
<td>0.1%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Percent of Total Population Also Identified as Hispanic or Latino</td>
<td>21.5%</td>
<td>24.9%</td>
</tr>
</tbody>
</table>
I. VISITOR CAPACITY

Balancing the needs of visitors and the goal of protecting and managing resources can be challenging. In addition to resource protection, visitor capacity also impacts the quality of the experience for visitors. Visitor capacity is not always about limiting the numbers of visitors, but also about the visitor’s experience and limiting impacts to resources. Negative impacts of high visitation include crowding, traffic, litter, trail degradation, vegetation trampling, and disturbance of wildlife. These impacts take away from the visitor experience and put additional pressure on staff and volunteers to maintain safe public facilities and infrastructure.

The current visitor experience at the Refuge is excellent, based on verbal feedback to staff and volunteers, in addition to online reviews. Currently over 50 miles of pedestrian, bicycling, and paddling trails provide access for wildlife observation, photography, and fishing. These trails also provide places for environmental education and interpretation opportunities.

Additional visitor facilities are planned to increase access for priority public uses such as the construction of additional observation towers, fishing piers, trails, boardwalks, and photography blinds.
II. Implementation Strategies

This section uses the format of the 14 Visitor Services Standards in correlation with the relevant goals and objectives. Visitor Services related objectives may be found within other CCP goals (i.e. Fish and Wildlife Populations, Habitat Management, Resource Protection, and Refuge Administration). This process will identify existing strategies and develop additional strategies that will form the basis of the VSP.

Table 4 lists the goals and objectives that are relevant to Visitor Services. The following acronyms are used within the table: Comprehensive Conservation Plan (CCP), Visitor Services Plan (VSP), Hunting Plan (HP), and Fishing Plan (FP).

Table 4. Goals and Objectives Summary.

<table>
<thead>
<tr>
<th>MANAGEMENT GOALS</th>
<th>OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CCP GOAL 3</strong></td>
<td>Comprehensive Conservation Plan (CCP) Objectives 1-7 can be found below as they relate to visitor services standards, or on pages 65-69 of the CCP.</td>
</tr>
<tr>
<td><strong>VSP GOAL 1-Visitor Services Plan</strong></td>
<td>Visitor Services Plan (VSP) Objective 1.1: Develop a Visitor Services Plan that sets goals, objectives, strategies, and establishes evaluation criteria.</td>
</tr>
<tr>
<td><strong>VSP GOAL 2-Welcome and Orient</strong></td>
<td>CCP Objective 2: Provide public access to Strazzulla.</td>
</tr>
<tr>
<td><strong>VSP GOAL 2-Welcome and Orient</strong></td>
<td>VSP Objective 2.1: Ensure all public use infrastructure, informational resources, and staff-based services are welcoming, safe, accessible, and provide current orientation information.</td>
</tr>
<tr>
<td>HP GOAL 3: Hunting</td>
<td>CCP Objective 5: The Refuge will provide appropriate, compatible, wildlife-dependent fishing and hunting opportunities.</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Develop and conduct a quality and biologically sound program that: 1) leads to enjoyable recreation experiences; 2) leads to greater understanding and appreciation of wildlife resources; and 3) aids in the conservation of wildlife populations and their habitats. (Hunt Plan 2012)</td>
<td>Hunting Plan (HP) Objective 3.1: Promote public understanding of, and increase public appreciation for the area’s natural resources (2012 Hunt Plan).</td>
</tr>
<tr>
<td>HP Objective 3.2: Provide opportunities for quality recreation and educational hunting experiences (2012 Hunt Plan).</td>
<td>HP Objective 3.3: Maintain viable, diverse populations of wildlife based on sound biological principles and data that seek to maintain wildlife populations at sustainable levels (2012 Hunt Plan).</td>
</tr>
<tr>
<td>VSP Objective 3.1: Ensure all informational resources, staff-based services, and public use infrastructure support quality hunting opportunities.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FP GOAL 4-Fishing</th>
<th>CCP Objective 5: The Refuge will provide appropriate and compatible, wildlife-dependent fishing and hunting opportunities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop and conduct a quality and biologically sound program that: 1) leads to enjoyable recreation experiences; 2) leads to greater understanding and appreciation of aquatic resources; and 3) aids in the conservation of fish populations and their habitats. (Fishing Plan 2014)</td>
<td>Fishing Plan (FP) Objective 4.1: Promote public understanding and appreciation of the area’s natural resources (Fishing Plan 2014).</td>
</tr>
<tr>
<td>FP Objective 4.2: Provide opportunities for high-quality recreational and educational fishing experiences (Fishing Plan 2014).</td>
<td>FP Objective 4.3: Maintain viable, diverse populations of fish based on sound biological principles and data that maintain fish populations at sustainable levels (Fishing Plan 2014).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 5: Wildlife Observation and Photography</th>
<th>CCP Objective 1: Expand appropriate and compatible wildlife-dependent recreational opportunities at the Headquarters Area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide visitors of all ages and abilities an opportunity to observe and photograph key wildlife and habitat resources of the Refuge.</td>
<td>VSP Objective 5.1: Ensure all public use infrastructure, informational resources, and staff-based services support quality wildlife observation and wildlife photography opportunities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 6: Environmental Education</th>
<th>CCP Objective 6: Develop an environmental education curriculum by 2002 for use on and off the Refuge that centers on providing an understanding and appreciation of the Everglades, the Refuge’s ecology, and the human influence on ecosystems of southeast Florida.</th>
</tr>
</thead>
</table>
section 605 FW 1.6, and facilitate curriculum-based environmental education opportunities that advance public awareness, understanding, appreciation, and knowledge of key fish, wildlife, plant, and resource issues.

<table>
<thead>
<tr>
<th>VSP GOAL 7: Interpretation</th>
<th>Communicate the most important fish, wildlife, habitat, and natural resource issues to visitors of all ages and abilities through effective interpretation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Objective 7:</td>
<td>Upgrade and expand the interpretive program, portraying the significance of the Refuge and threats affecting the Refuge and the South Florida ecosystem. The interpretive program will be updated using the guidelines from the Fish and Wildlife Service National Outreach Strategy.</td>
</tr>
<tr>
<td>VSP Objective 7.1:</td>
<td>Ensure all public use infrastructure, informational resources, and staff-based services support quality interpretation of key resources and issues.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 8: Other Recreational Uses</th>
<th>Ensure all public uses are appropriate and compatible while supporting or enhancing one of the wildlife dependent recreational uses.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Objective 3:</td>
<td>Develop a hiking and bicycling trail on the existing main levee.</td>
</tr>
<tr>
<td>VSP Objective 8.1:</td>
<td>Ensure all public use infrastructure, informational resources, and staff-based services support appropriate and compatible recreational use opportunities that support or enhance one of the wildlife-dependent recreational uses.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 9: Outreach</th>
<th>Engage off-site public in effective outreach.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSP Objective 9.1:</td>
<td>Ensure all informational resources and staff-based services promote an understanding and appreciation of the Refuge’s fish, wildlife, habitat conservation, along with the mission of the National Wildlife Refuge System.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 10: Volunteers, Friends, and Partnerships</th>
<th>Ensure Refuge staff initiate and nurture relationships with volunteers and Friends organizations.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSP Objective 10.1:</td>
<td>Ensure all public use infrastructure, informational resources, and staff-based services support an effective volunteer program.</td>
</tr>
<tr>
<td>VSP Objective 10.2:</td>
<td>Ensure all public use infrastructure, informational resources, and staff-based services support an effective Friends organization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VSP GOAL 11: Recreation Fee Program</th>
<th>Institute an effective Recreation Fee Program under the guidance of the Federal Lands Recreation Fee Program or as mandated by Congress for</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSP Objective 11.1:</td>
<td>Ensure all public use infrastructure, informational resources, and staff-based services support an effective Recreation Fee program.</td>
</tr>
</tbody>
</table>
sustaining resources for the operation and maintenance of recreation areas, visitor services improvements, including seasonal staffing, and habitat enhancement projects of Federal lands.

<table>
<thead>
<tr>
<th>VSP GOAL 12: Concessions</th>
<th>VSP Objective 13.1: Ensure all public use infrastructure, informational resources, and staff-based services support an effective Commercial Recreational Use Program.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide wildlife-dependent recreational activities to the visiting public through private entities by permit or contract.</td>
<td>CCP Objective 4: In cooperation with state and county natural resource agencies, develop a Contact Station and Interpretive Center at the Hillsboro Area. Also, a limited concession contract will be awarded to expand appropriate and compatible wildlife-dependent recreational opportunities at the Hillsboro Area.</td>
</tr>
</tbody>
</table>

VSP GOAL 13: Commercial Recreational Uses
Institute an effective Commercial Recreational Use Program that contributes to the achievement of the Refuge purpose or the mission of the Refuge System.
The following section addresses current program discussions, goals, objectives, strategies, proposed program changes, and monitoring information for the 14 Visitor Services Standards.

**STANDARD 1: DEVELOP A VISITOR SERVICES PLAN**

**Policy (605 FW 1.14 A)**  
Refuge Managers will develop a Visitor Services Plan that addresses all compatible wildlife-dependent recreational uses on their refuge (Appendix G).

**Current Program Discussion**  
The Refuge does not have a current Visitor Services Plan (VSP).

This Draft VSP and Environmental Assessment (EA) will propose and analyze the impacts of new potential uses in Exhibit C of the license agreement (USFWS 2018a) SFWMD. This new plan will revise and amend the CCP. This management plan will identify resource needs and establish visitor service programs based on goals, objectives, and strategies identified through public scoping and planning and will serve as the visitor services strategic plan for the next 15 years.

**Visitor Services Staff**  
Permanent staffing for visitor services are:  
- Park Ranger/Interpretive Specialist – GS-9  
- Visitor Services Park Ranger – GS-9  
- Urban Refuge Program Coordinator – GS-7/9

Seasonal and temporary staffing for visitor services are:  
- Park Ranger/Fee Collector and Volunteer Coordinator – GS-5  
- Park Ranger/Fee Collector – GS-2 or GS-3

The visitor services program is also supported by local, seasonal, and resident volunteers along with student interns.

**STANDARD 1: GOALS, OBJECTIVES, AND STRATEGIES**

**VISITOR SERVICES PLAN GOAL 1**  
Meet or exceed the standard set by policy and develop a VSP that addresses all compatible wildlife-dependent recreational uses on the Refuge. This plan should be completed in 2018.

**Visitor Services Plan Objective 1**  
Develop a VSP that sets goals, objectives, and strategies that includes evaluation criteria.

**Strategies**
- Develop a VSP through collaborative involvement of Refuge staff, partners, stakeholders, and the public.
- Annually update the VSP as strategies are completed and new needs are recommended.

**Monitor and evaluate:**
- Incorporate public input from planning meetings and written input.
STANDARD 2: WELCOME AND ORIENT VISITORS

Policy (605 FW 1.14 B)
We will assure that our refuges are welcoming, safe, and accessible. We will provide visitors with clear information so they can easily determine where they can go, what they can do, and how to safely and ethically engage in recreational and educational activities. Facilities will meet the quality criteria defined in 605 FW 1, Section 1.6 of the Service Manual. We will treat visitors with courtesy and in a professional manner (Appendix G).

Current Program Discussion
The Refuge welcomes and orients visitors through the Visitor Center, staff, volunteers, a website, Facebook page, signs, brochures, and other publications. The Visitor Center is open daily from 9:00 am - 4:00 pm and is closed on Thanksgiving and Christmas. Outdoor facilities, grounds, and trails are open daily from 5:00 am - 10:00 pm. Hours are posted at the Headquarters, Hillsboro, and 20-Mile Bend entrances. Night use is strictly prohibited. The administrative office is open Monday – Friday, 8:00 am - 4:30 pm and is closed on all Federal holidays. The Refuge headquarters area is centrally located and currently has a Visitor Center/headquarters office where the public can directly communicate with staff and volunteers to receive information. The front desk is staffed by trained volunteers to welcome and orient visitors to the Refuge.

Visitors can access Refuge property at three designated entrances: Headquarters, Hillsboro, and 20-Mile Bend. Each designated entrance has a kiosk with signs, but current signage does not meet the USFWS standard set by USFWS policy. Improvements needed to each kiosk include updating fee information, regulations, and Refuge maps.

Below is a list of current visitor services facilities as they apply to welcoming and orienting visitors:

Public Use Infrastructure
• Visitor Center.
• Kiosks.

Informational Resources
• Kiosks.
• Brochures.
• Signs.
• Facebook and website.

Staff-based Services
• Visitor Center front desk.
• Informal roving contacts.
• Public programs and special events (interpretive, environmental education, and outreach).

STANDARD 2: GOALS, OBJECTIVES, AND STRATEGIES:

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.
Comprehensive Conservation Plan Objective 2
Provide public access to Strazzulla.

Strategies
- Parking access may be developed in partnership with the Village of Wellington and the ACME Drainage District. (NOT COMPLETE)

VISITOR SERVICES PLAN GOAL 2
Provide visitors with a safe, welcoming, and accessible experience by providing clear information so they can safely and ethically engage in wildlife-dependent recreational activities.

Visitor Services Plan Objective 2.1
Ensure all public use infrastructure, informational resources, and staff-based services are welcoming, safe, accessible, and provide current orientation information.

Strategies

Public Use Infrastructure
- Maintain all public Refuge roads, trails, and parking areas and address any unsafe conditions.
- Maintain boardwalks, decks, fishing piers, observation platforms, and photo blind and address any unsafe conditions.
- Maintain existing benches on trails and behind the Visitor Center.
- Install automatic ADA accessible doors at the Visitor Center.
- Give names to the trails in the A, B, and C Impoundments.
- Install benches on fishing pier at 20-Mile Bend.

Informational Resources
- Complete a sign inventory.
- Develop a sign plan.
- Refurbish wooden signs periodically.
- Update all signs to USFWS Graphic Standards with current map and information.
- Update all brochures and publications to USFWS Graphic Standards with current map and information.
- Post current information on the website and social media.
- Remodel Lee Road entrance gate.
- Translate publications to locally common languages spoken in Palm Beach County.
- Install a sign that greets visitors with “Welcome” in at least 10 different languages.
- Remove all unsafe/out of date signs and publications.

Staff-based Services
- Maintain current Visitor Center hours of operation.
- Provide customer services training to all staff and volunteers.
- Provide interpretive training to visitor services staff and volunteers.
- Provide environmental education training to visitor services staff and volunteers.
- Provide diversity training to all staff and volunteers.
- Provide conflict resolution training to visitor services staff.
- Provide web-based media training to visitor services staff.
- Develop a staff/volunteer “roving” presence to welcome and orient visitors.
- Update the phone greeting to allow visitors to connect with the Visitor Center.
• Train staff on troubleshooting Visitor Center exhibits.

Other Recommendations
• Need additional signs directing to trails and the Visitor Center.
• Work with Palm Beach County and others to disseminate information at the Visitors Center.
• Look at adding more visible signs on US 441/SR-7.

Proposed Program Changes

Refuge Hours
• Lee Road/Headquarters/Visitor Center hours remain same. Remainder of the Refuge would be open 24 hours/day.

Signs and Kiosks
• Update and replace all kiosks consistent with USFWS Sign Standards.

Publications
• Update all publications consistent with USFWS Graphic Standards.

Access-Designated Entry Points
• Existing entrances are at Loxahatchee Road, Lee Road, and 20 Mile Bend. Additional access points would be established on the L-40, L-39, and L-7 levees and Strazzulla.
• Designated access points may be identified over the life of the plan.

Motorized and Non-motorized Watercraft Access (Figure 5)
• Open the entire Refuge with limited access for non-motorized watercraft, excluding the A, B, and C Impoundments and Strazzulla.
• The designated Hunt Zone would be referred to as the Motorized Watercraft Zone (not including airboats) vs. Non-motorized Watercraft Zone.
• Provisional airboating areas will vary. (Figure12)

Monitor and evaluate
• The visitor services program should have a periodic review by regional and local visitor services staff to assess if the VSP goals and objectives are being met.
• Incorporate public input from planning meetings and written input.
STANDARD 3: HUNTING

Policy (605 FW 2)
Hunting is an appropriate use of wildlife resources of the NWRS, when compatible. Hunting programs will be of the highest quality, conducted in a safe and cost-effective manner, and to the extent practicable, carried out in accordance with State regulations (Appendix G).

Current Program Discussion
This VSP will update the Hunt Plan for the Refuge, which was completed in 2012. Season dates, bag limits, and weapon restrictions will follow the FWC’s state regulations to the greatest extent possible, and will be coordinated with FWC annually. More restrictive regulations will be implemented as necessary, to conserve wildlife populations and provide for safe, quality wildlife-dependent recreation, and to avoid user conflicts depending on staff level available to support. Designation of season dates will be coordinated with dates set at nearby state and Federal hunting areas as much as possible to allow the public a variety of hunting options throughout the season.

Currently, the Refuge allows alligator, duck, coot, early teal season, and youth hunts on approximately 30,000 acres in the Refuge Interior south of latitude line 26°27.2’N and north of mile markers 12 and 14. Only water-cooled outboard boats (no airboats, “Go Devils,” or mudboats), canoes and kayaks are allowed. All hunters are required to carry a signed annual Refuge hunt permit on them at all times and fill out Migratory Bird Hunt Report (FWS Form 3-2361) or Big Game Hunt Report (FWS Form 3-2359) and place in the fee canister after each day’s hunt. Refuge hunts may be terminated early, or some of the hunt area closed, should unusual climatic conditions result in threats to visitor safety, management activities, possible degradation of habitat by visitor use, or a concentration of endangered species within the hunt area.

The following is specific to the species hunted:

Waterfowl and other migratory game birds
The Refuge currently allows duck, coot, early teal season, and youth hunts on approximately 30,000 acres in the Refuge Interior south of latitude line 26°27.2’N and north of mile marker 12 and 14 in cooperation with FWC. We prohibit hunting from canals, levees, and areas posted as closed. Hunters may enter the Refuge beginning at 4:00 am from Wednesday through Sunday during season. Daily shooting hours are thirty minutes before sunrise until 1:00 pm. Waterfowl hunting is not permitted on Mondays and Tuesdays. Hunters must enter and leave the Refuge from the Headquarters area or the Hillsboro area. Waterfowl hunters are required to be in possession of a valid Federal Duck Stamp, which in addition to serving as hunting license and conservation tool, a current Federal Duck Stamp also provides fee-free entry onto any national wildlife refuge that charges an entry fee. The use of dogs is encouraged to retrieve dead or wounded waterfowl.

Alligator Hunting
The Refuge currently allows alligator hunting on approximately 30,000 acres in the Refuge Interior south of latitude line 26°27.2’N and north of mile marker 12 and 14 in cooperation with FWC. The Refuge permits hunting in canals, and prohibits hunting from levees and areas posted as closed. Alligator season is concurrent with the state season. Hunting is permitted the first two weekends during Harvest Period 1 and the first two weekends during Harvest Period 2. Following the close of Harvest Period 2, the remaining weekends in October will be open for alligator harvest permittees that possess unused Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) tags. Hunting days are Friday night through Sunday. Hunting hours are one hour before sunset Friday night to one hour after sunrise Saturday morning and one hour before sunset Saturday
night to one hour after sunrise on Sunday morning. Hunters must enter and leave the Refuge from the Hillsboro area only. Non-toxic shot must be used. Baited hooks or wooden pegs are prohibited.

Below is a list of current visitor services facilities as they apply to hunting:

**Public Use Infrastructure**
- Visitor Center.
- Kiosks and signs.
- Boat ramps.
- Parking lots.

**Informational Resources**
- Kiosks.
- Alligator hunting brochure with Refuge annual hunt permit.
- Waterfowl hunting brochure with Refuge annual hunt permit.
- Migratory Bird Hunt Report (FWS Form 3-2361).
- Big Game Harvest Report (FWS Form 3-2359).
- Signs.
- Facebook and website.

**Staff-based Services**
- Visitor Center.
- Law enforcement contacts.

**STANDARD 3: GOALS, OBJECTIVES, AND STRATEGIES**

**COMPREHENSIVE CONSERVATION PLAN GOAL 3**
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

**Comprehensive Conservation Plan Objective 5**
The Refuge will provide appropriate, compatible, wildlife-dependent fishing and hunting opportunities.

**Strategies**
- Develop a Hunt Plan for Alligators and Feral Hogs and update the Waterfowl and Fishing Plans by 2002. *(HUNT PLAN FOR ALLIGATORS/WATERFOWL COMPLETE)*
- Redefine the boundaries of the waterfowl hunt area to make it more accessible. *(COMPLETE)*
- Eventually increase waterfowl hunt area accessibility by developing paths through the invasive cattail area on the east side of the Refuge Interior depending on water quality improvement in the perimeter canal. *(ATTEMPTED BUT STAFFING LEVELS WOULD NOT ALLOW THIS TO BE SUSTAINED)*

**HUNT PLAN GOAL 3: HUNTING**
Develop and conduct a quality and biologically sound program that: 1) leads to enjoyable recreation experiences; 2) leads to greater understanding and appreciation of wildlife resources; and 3) aids in the conservation of wildlife populations and their habitats. *(Hunt Plan 2012)*
Hunting Plan Objective 3.1
Promote public understanding of, and increase public appreciation for the area’s natural resources. (Hunt Plan 2012)

Strategies
- Train staff on how-to educate the public that hunting ethics involves respect for nature, for the land, for wildlife, and for other people.
- Promote visitor understanding about how hunting directly supports wildlife conservation through Federal Duck Stamp funds.
- Promote understanding about how the Federal Aid in Wildlife Restoration Act funds conservation programs through an excise tax on firearms, ammunition and other related equipment to state wildlife agencies to be used for wildlife conservation projects, hunter education, and outdoor recreation access.

Hunting Plan Objective 3.2
Provide opportunities for quality recreation and educational hunting experiences. (Hunt Plan 2012)

Strategies
- Offer scouting days for hunters to become familiar with the hunt area.
- Offer hunter safety courses at the Refuge.
- Maintain existing alligator hunting opportunities.
- Maintain existing waterfowl hunting opportunities.

Hunting Plan Objective 3.3
Maintain viable, diverse populations of wildlife based on sound biological principles and data that seek to maintain wildlife populations at sustainable levels. (Hunt Plan 2012)

Strategies
- Harvest decisions are based on sound biological principles.
- Minimize wildlife disturbance by implementing time and space restrictions.

Visitor Services Plan Objective 3.1
Ensure all informational resources, staff-based services, and public use infrastructure support quality hunting opportunities.

Strategies

Public Use Infrastructure
- Maintain current hunting information and regulations at the Visitor Center.
- Maintain boat ramps.
- Maintain parking lots.

Informational Resources
- Maintain current hunting information on Refuge web site.
- Publish posts on Facebook to notify the public of Refuge hunting activities and seasons.
- Maintain current hunting information and regulations on kiosks and signs.
- Maintain and annually update the alligator hunting brochure with Refuge annual hunt permit.
- Maintain and annually update the waterfowl hunting brochure with Refuge annual hunt permit.
- Maintain and annually update the Migratory Bird Hunt Report (FWS Form 3-2361).
- Maintain and annually update the Big Game Harvest Report (FWS Form 3-2359).
Staff-based Services

- Provide hunt program training to all visitor services staff and volunteers.
- Expand hunter skills workshops as resources allow.
- Collaborate between workgroups to ensure accurate and efficient information can be disseminated to the public.

Additional Strategies

- Consider turning Strazzulla into a FWC Wildlife Management Area.

Proposed Program Changes:

All portions of the Refuge, with the exception of the B and C Impoundments, are being proposed for some form of hunting (Figure 4). These areas include the 141,374 acres of the Refuge Interior and perimeter canal, the 2,586 acres of Strazzulla, and the 750 acres of the Cypress Swamp and A Impoundment. Locations and facilities open to hunting each species would be subject to change. The below stipulations would be recommended in order for hunting each species to be compatible in the most liberal circumstances. Slight modifications and further restrictions may be implemented for sustainability. Final stipulations would be found in the CFR and associated Special Use Permit (SUP) Special Conditions.

Applicable for All Hunting

- For quota hunts, only one watercraft vessel per hunting permit is authorized.
- Persons possessing, transporting, or carrying firearms on national wildlife refuges must comply with all provisions of Federal, State, and local law. Persons may only use (discharge) firearms in accordance with Refuge regulations.
- Certain quota permits would be determined by annual population surveys and Refuge carrying capacity, and would be subject to change.
- Hunting is allowed on designated areas of the Refuge in accordance with State law, except where Federal regulations have been set as found in Title 50, Code of Federal Regulations, Section 32.
- All applicable State Hunting licenses, State permits, CITES tags, Federal stamps, and Refuge hunt permits must be in the possession of the hunter.
- Hunters under the age of 16 must be accompanied by an adult 21 years of age or older. Hunters under the age of 16 must also have completed a Hunter Education Course.
- No hunting from Refuge structures or within one-half mile of canoe trails or boat ramps.
- Taking or herding wildlife from any motorized vehicle and vessels which is under power is prohibited until power and movement from that power has ceased, except statewide alligator harvest program permittees that would be attempting to take alligators.
- Only temporary blinds of native vegetation would be allowed. We prohibit the taking, removing, manipulation, or destroying of Refuge vegetation.
- There is a 35 mph speed limit in all waters of the Refuge. A 500-foot (150-meter) Idle Speed Zone is at each of the Refuge's three boat ramps.
- We require all boats operating outside of the main perimeter canals (the L-40 Canal, L-39 Canal, and L-7 Canal) in Refuge Interior areas to fly a 10-inch by 12-inch (30-cm × 30-cm) orange flag 10 feet (3 m) above the vessel's waterline.
- Taking of any plants or other wildlife is prohibited.
**Alligators (Figure 6)**

- Would allow limited airboating by permit for alligator hunting in L-7, L-39, entire motorized zone on the South side and the L-40 on the South end. Increase permits as population surveys allow. Maximum of 20 airboat permits at any time; less than 15 permits initially.
- Hunters must read, sign, and have on their possession a signed copy of the Refuge alligator hunt permit while hunting. The permit is located on the Refuge’s Regulations brochures and would be available at the Refuge’s Visitor Center and on the Refuge’s website.
- Hunting from levees and those areas posted as closed is prohibited.
- Hunting on the Refuge is allowed one hour before sunset on Fridays through one hour after sunrise on Saturdays, and one hour before sunset on Saturdays through one hour after sunrise on Sundays. Alligator hunting would be permitted the first 2 weekends during Harvest Period 1 (August) and the first two weekends during Harvest Period 2 (September). Following the close of Harvest Period 2, the remaining weekends in October would be open for alligator harvest permittees who possess unused CITES tags. Specific dates for the alligator hunt would be provided on the harvest permit.
- Hunters 18 years and older must be in possession of all necessary State and Federal licenses, permits, and CITES tags, as well as a Refuge hunt permit (signed hunt brochure) while hunting on the Refuge. They must possess an Alligator Trapping License with CITES tags or an Alligator Trapping Agent License, if applicable.
- Hunters under the age of 18 may not hunt alligators, but may only accompany an adult of at least 21 years of age who possesses an Alligator Trapping Agent License.
- Hunters may take alligators using hand-held snares, harpoons, gigs, snatch hooks, artificial lures, manually operated spears, spear guns, and crossbows. Taking of alligators using baited hooks, baited wooden pegs, or firearms is prohibited. We allow the use of bang sticks (a hand-held pole with a pistol or shotgun cartridge on the end in a very short barrel) with nontoxic ammunition only for taking alligators attached to a restraining line. Once an alligator is captured, it must be killed immediately. We prohibit catch and release of alligators. Once the alligator is dead, you must lock a CITES tag through the skin of the carcass within 6 inches (15.2 centimeters) of the tip of the tail. The tag must remain attached to the alligator at all times.
- Hunters may be required to complete a Big Game Harvest Report (FWS Form 3-2359) and place it in an entrance fee canister each day prior to exiting the Refuge. An FWC Alligator Harvest Report Form (FWC Form 1001AT, supplied with your FWC permit) must be completed by the permit holder within 24 hours of taking each alligator and prior to the transfer to a permitted alligator processing facility. A copy of the FWC Alligator Harvest Report Form must accompany the alligator carcass until processing. An online version of the form can be found at MyFWC.com/alligator.
- Hunters must remove all personal property from the hunting area each day.

**Deer and Hog in Strazzulla and Cypress Swamp (Figure 7)**

- **Strazzulla:** Archery, crossbow, and air gun would be permitted for the general public, while shotguns will be allowed for specialty hunts. Specialty hunts are being proposed on a portion of the levee to the Tower in Strazzulla. Hunts would be zero to 16 days dependent on population data. If population data allows the Refuge would start with limited - two 3-day hunts, one in early season and one in winter.
  - A 300-foot buffer around private lands for any hunting in Strazzulla would be imposed.

- **Cypress Swamp/A Impoundments (Specialty Hunts Only):** Archery, crossbow, air gun, shotgun, and centerfire rifle would be permitted. Hunts would be one or two days with hunt area closed to other uses during the hunt.
• The levee area running North-South between the Cypress Swamp and A Impoundments is being proposed for specialty hunts only such as mobility impaired or disabled veterans.
• Permitted system and quotas would be subject to change for management and sustainability.
• Incidental take on hogs.
• No limits or size restrictions for hogs.
• Only one deer per permit may be harvested.
• Dogs would be prohibited for deer and hog hunting.
• Only deer with at least one antler with two or more points (forked antler) may be harvested, except for those approved for specialty hunts.
• All deer taken shall be tagged immediately with the antlered deer tag provided by the FWC.
• The head may not be removed from the carcass of any deer on the Refuge.
• Method of take will be in accordance with State regulations and season.
• Feral hogs may not be transported alive.
• Hunting wildlife (other than migratory birds) with air guns is allowed. See Florida Hunting Regulations handbook for details on hunting with air guns.
• Hunting deer with air guns would be in accordance with State regulations.
• No hunting within 300 feet of adjacent private lands.

Deer and Hog in Refuge Interior (Figure 7)
• Hunts would be zero to 16 days. Archery, crossbow, air gun, shotgun, centerfire rifle would be permitted in accordance with State regulations, and hunts would be based on a lottery system.
• Quota permit deer hunt with non-motorized and airboat access permitted for permittees only.
• Permitted system and quotas would be subject to change for management and sustainability.
• Maximum of 20 airboat permits at any time. Less than 10 permits to start.
• Airboat must be in place and stopped one hour before sunrise and not move until 1 hour after sunrise. No forward movement would be permitted and airboat must be turned off for a period of 15 minutes before shooting. Airboat permit required.
• Refuge Interior closed to public and staff during hunts.
• No hunting from the canal, structures, or within ½ mile of boat ramps or canoe trails.
• Incidental take on hogs.
• No limits or size restrictions for hogs.
• Dependent on population surveys.
• Only one deer per permit may be harvested.
• Dogs would be prohibited for deer and hog hunting.
• Only deer with at least one antler with two or more points (forked antler) may be harvested, except for those approved for specialty hunts.
• All deer taken shall be tagged immediately with the antlered deer tag provided by the FWC.
• The head may not be removed from the carcass of any deer on the Refuge.
• Motorized vessels must be in place and stopped one hour before sunrise and not move until one hour after sunrise.
• Feral hogs may not be transported alive.
• Method of take will be in accordance with State regulations and season.
• Hunting wildlife (other than migratory birds) with air guns is allowed. See Florida Hunting Regulations handbook for details on hunting with air guns.

Waterfowl and Other Migratory Birds (Figure 8)
• Migratory bird hunting is being proposed for expansion from the area previously known as the “Hunt Zone” to the entire Refuge Interior including the Motorized and Non-motorized Zones.
• Open during state hours and no longer closing at 1:00 pm.
• Hunt days would match state regulations. Waterfowl hunting would be open 7 days a week and on Christmas Day.
• Strazzulla and A, B, and C Impoundments closed.
• Expanded species to include in the waterfowl hunt/incidental take are Moorhen, Rail, and Snipe.
• No hunting from Refuge structures, canals, or within one-half mile of canoe trails or boat ramps.
• Airboats would be allowed in Phase 2 of the State waterfowl season by quota permit only other motorized and non-motorized access allowed in designated area during the hunt. Maximum of 20 airboat permits at any time. Less than 15 permits initially.
• Hunters must read, sign, and have on their possession a signed copy of the Refuge waterfowl hunt permit while hunting. The permit is located on the Refuge’s Regulations brochures and would be available at the Refuge Visitor Center and on the Refuge's website.
• Hunters must remove decoys and other personal property from the hunting area each day.
• The Refuge encourages the use of dogs to retrieve dead or wounded waterfowl. Dogs must remain under the immediate control of the owner at all times.
• Hunters may be required to complete a Migratory Bird Hunt Report (FWS Form 3-2361) and place it in an entrance fee canister each day prior to exiting the Refuge.

Monitor and evaluate:
• Incorporate public input from planning meetings and written input.
• Use approved data collection forms at hunter check-stations for visit information.
• Monitor the quality of hunts through law enforcement observations and hunter anecdotes.
STANDARD 4: FISHING

Policy (605 FW 3)
Fishing is an appropriate use of the NWRS, when compatible. Fishing programs will be of the highest quality, conducted in a safe and cost-effective manner, and to the extent practicable, carried out in accordance with State regulations (Appendix G).

Current Program Discussion
A Fishing Plan for the Refuge was completed in 2014. Public fishing is allowed on the Refuge in accordance with State regulations and additional Federal/Refuge regulations.

The Refuge has three designated entrances to facilitate fishing opportunities: Lee Road Headquarters Area, Hillsboro, and 20-Mile Bend. Numerous shallow, open marsh areas of approximately 40,000-50,000 acres are open to fishing year-round. Fishing is permitted in Refuge perimeter canals and within the Interior south of latitude N 26° 27.130'. Fishing is also allowed along the northern boundary between Stormwater Treatment Area 1 East (STA-1 E) and 20-Mile Bend. Shoreline fishing is permitted in the A, B, and C Impoundments.

Over 40 species of fish have been detected on the Refuge. Freshwater anglers may catch native species that include largemouth bass, channel catfish, black crappie, bowfin (mud fish), redeer sunfish, chain pickerel, Florida gar, bluegill, and warmouth. Additionally, anglers might also catch exotic species that occur in South Florida such as the Mayan cichlid, blue tilapia, butterfly peacock bass, oscar, spotted tilapia, sailfin catfish, bullseye, snakehead and others.

In addition to bank fishing from many parts of the Refuge, there are two universally accessible fishing piers available on the south side of the Lee Road boat ramps and at 20-Mile Bend. The fishing pier at Lee Road was damaged on September 10, 2017 during Hurricane Irma and as of June 2018, the Refuge was still awaiting funding to repair or replace the pier. In the interim, the floating dock near the Lee Road boat ramp is open to fishing.

Below is a list of current visitor services facilities as they apply to fishing:

Public Use Infrastructure

Headquarters
- ADA accessible fishing pier.
- Floating boat dock.
- Bank fishing access.
- Three single-vehicle boat ramps.
- Paved parking lot with boat trailer parking.
- Non-motorized launch area on the north side of Lee Road Boat Ramp.
- Kayak/canoe rental concession.
- Restroom facilities.
- Trash cans and recycling center.
- Benches.

Hillsboro
- Four single vehicle boat launches.
- Bank fishing access.
- Kiosk with fishing regulations.
• Portable restroom facilities.
• Trash cans and recycling center.
• Unpaved parking lot.
• Benches.

20-Mile Bend
• One large multi-vehicle boat ramp.
• ADA accessible fishing pier.
• Kiosk with fishing regulations.
• Portable restroom facilities.
• Trash cans and recycling center.
• Unpaved parking lot.
• Benches.

Informational Resources:
• Kiosks and signs.
• Fishing and boating brochure.
• Refuge tearsheet.
• Facebook posts.
• Website landing page for fishing.

Staff-based Services:
• Youth and family fishing events and programs at Everglades Day.
• Commercial fishing guides are allowed in areas designated as open to public fishing and are regulated by Special Use Permits.
• Seventeen annual bass fishing tournaments allowed.

STANDARD 4: GOALS, OBJECTIVES, AND STRATEGIES

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

Comprehensive Conservation Plan Objective 5
The Refuge will provide appropriate, compatible, wildlife-dependent fishing and hunting opportunities.

Strategies
• Continue to permit up to four small fishing tournaments per year. (COMPLETE. Increased to 17 in 2014)
• Develop fishing facilities at Strazzulla such as an ADA accessible fishing pier. (NOT IMPLEMENTED)
• Expand recreational fishing opportunities at Hillsboro by establishing concessions operations that offer fishing tackle, guides, gear, and bait rental. (ONGOING)

VISITOR SERVICES PLAN GOAL 4: FISHING
Develop and conduct a quality and biologically sound program that: 1) leads to enjoyable recreation experiences; 2) leads to greater understanding and appreciation of aquatic resources; and 3) aids in the conservation of fish populations and their habitats. (2014 Fishing Plan)
Fishing Plan Objective 4.1
Promote public understanding of and appreciation of the area’s natural resources. (Fishing Plan 2014)

Strategies
- Maintain current open fishing areas.
- Expand areas open to fishing where compatible.

Fishing Plan Objective 4.2
Provide opportunities for high-quality recreational and educational fishing experiences. (Fishing Plan 2014)

Strategies
- Expand and maintain Family Fishing Day events by working with partners.
- Look at providing specialized fishing opportunities for youth, wounded warriors, and others.
- Place fishing line and hook receptacles at all docks.

Fishing Plan Objective 4.3
Maintain viable, diverse populations of fish based on sound biological principles and data that maintain fish populations at sustainable levels. (Fishing Plan 2014)

Strategies
- Fishing guidelines and regulations will be based on sound biological principles and state laws.
- The Refuge fishing program will be managed in accordance with State regulations and additional Federal/Refuge regulations.
- The fishing program will be compatible with Refuge objectives and will not interfere with public use and wildlife management objectives.

Proposed Program Changes

Fishing Facilities
Proposed facilities to support this use include two additional fishing piers and floating docks: 1) located adjacent to Strazzulla along the L40 levee/canal, 2) located along the L39 levee/canal at the Hillsboro Area. All proposed facilities and improvements would be dependent upon funding availability.

Bowfishing, Fish Gigging, and Frog Gigging (Figure 9)
Proposed bowfishing, fish gigging, and frog gigging would be allowed anywhere fishing is allowed except Strazzulla, the Cypress Swamp, and the A, B, and C Impoundments (Figure 4). Fish gigging and bowfishing would be permitted every day throughout the year during the operating hours of the Refuge. Frogging would be permitted from July 16 through March 15. This proposal would be allowed with the following stipulations:
- Bowfishing, fish gigging, and frog gigging would be allowed on designated areas of the Refuge in accordance with State law, except where Federal regulations have been set as found in Title 50, Code of Federal Regulations, Section 32.
- Commercial fishing and the taking of turtles and other wildlife would be prohibited.
- No frogging, fish gigging, or bowfishing from Refuge structures or within one-half mile of canoe trails or boat ramps.
- Frog gigging with an airboat is limited to the non-hunting airboat zone and allowed time frame.
• Bag limit for frogging would be 50 frogs per boat/party.
• Hovercraft, mud boats, jet skis, jet boats, and wave runners would be prohibited.
• All anglers would be required to possess and carry all applicable State fishing and recreational gear licenses while fishing; the exception is Palm Beach County residents fishing with cane poles. Entrance fees would apply to access boat ramps but no registration procedures would be necessary for the individual angler. At this time, there are no restrictions or limits on the number of individual anglers permitted on the Refuge.
• Anglers must attend lines at all times.
• The possession or use of cast nets, seines, trotlines, jugs, and yo-yos would be prohibited.
• Anglers would be permitted to launch boats only at the Headquarters Area (Boynton Beach), the Hillsboro Area (Boca Raton), and 20 Mile Bend (West Palm Beach).
• There would be a 35 MPH maximum speed on all waters of the Refuge and idle speed zones at each boat ramp.
• There would be a slow speed minimum wake zone in the crossover canal from the L-7 canal to the L-40 canal at the 20 Mile Bend boat ramps.
• All boats operating outside of the main perimeter canals (the L-40 Canal, L-39 Canal, and L-7 Canal) within the Motorized and Non-motorized Zones, would be required to fly a 10 inch by 12 inch (30 cm x 30 cm) orange flag, 10 feet (3 m) above the vessel's waterline.
• Motorized vehicles of any type on the levees and undesignated routes would be prohibited.
• Anglers, their vehicles, boats, equipment, and other belongings would be subject to inspection by law enforcement officers.
• Fishing line recycling stations will be installed at all three boat ramps.

Special Events – Fishing
• Proposing the addition of more youth fishing events over the course of the plan.

Monitor and evaluate
• When available, fisheries sampling methods such as electrofishing surveys and creel surveys data will be analyzed to make sound scientific assessment of Refuge fisheries conditions. Sampling will occur based on funding and available resources.
• Auto counters, angler contact in the field, comments during agency and public meetings, e-mails, and letters are some of the methods used to evaluate visitor use levels, trends, and needs. Visitor use is recorded annually in the Annual Narrative and the Refuge Annual Performance Plan.
• Commercial guide services will be evaluated through information collected from the guides as required in the Special Use Permit as well as through observation and law enforcement activities. The information will be summarized in the Refuge Annual Narrative.
• The fishing program is designed to minimize wildlife, management, and public use conflicts. However, any unforeseen future conflicts will be reviewed and the Fishing Plan and/or Special Use Permits will be updated as necessary.
• Incorporate public input from planning meetings and written input.
STANDARD 5: WILDLIFE OBSERVATION AND WILDLIFE PHOTOGRAPHY

Policy (605 FW 4 and 604 FW 5)
Wildlife observation and wildlife photography are appropriate wildlife-dependent recreational uses of Refuge System lands, when compatible. Visitors of all ages and abilities will have an opportunity to observe and photograph key wildlife and habitat resources of the Refuge. Viewing and photographing wildlife in natural or managed environments will foster a connection between visitors and natural resources (Appendix G).

Current Program Discussion
Wildlife observation and photography are the most predominant uses at the Refuge and occur at any location where access is allowed. Land-based observation occurs along the Cypress Swamp Boardwalk, Marsh Trail, throughout the A, B, and C Impoundments, and along the L-40, L-39, and L-7 perimeter levees. Water-based observation and photography from boats or canoes/kayaks occur along the 5.5-mile Canoe Trail, within the perimeter canal, and in the 30,000 acre Public Use Area located in the south end of the Refuge.

As many as 257 species of birds, 23 types of mammals, at least 60 species of reptiles and amphibians, and approximately 40 species of butterflies can be found on the Refuge. Visitors might catch a glimpse of endangered and threatened species such as the wood stork and snail kite while looking for migratory songbirds, secretive marsh birds, shorebirds, and waterfowl that visit throughout the year. Year-round residents include pileated woodpeckers, alligators, herons, egrets, deer, and bobcats.

Wildlife viewing varies throughout the year and is best during the early morning or evening. Trails, viewing blinds, and observation platforms have been developed to encourage and enhance wildlife viewing. The Refuge maintains 10 impounded wetlands with walking trails accessible from the Marsh Trail parking lot. In these impounded wetlands, water levels are manipulated to encourage different species of birds to feed and nest. All of these wetlands are surrounded by levees that provide paths for visitors to observe and photograph birds and other wildlife in a natural setting.

Below is a list of current visitor services facilities as they apply to wildlife observation and photography:

Public Use Infrastructure
- Visitor Center.
- Butterfly Garden.
- Walking and bicycling trails in the A, B, and C Impoundments.
- 0.4-mile Cypress Swamp Boardwalk.
- 5.5-mile Canoe Trail.
- Loxahatchee Impoundment Landscape Assessment (LILA).
- C-8 Photo blind.
- Marsh Trail observation tower.
- Lee Road boat ramp observation tower.
- Benches behind the Visitor Center and along trails.

Informational Resources
- Kiosks.
- Brochures.
- Signs.
• Web based media.

Staff-based Services
• Visitor Center front desk.
• Volunteer Roving Naturalist.
• Loxahatchee Canoeing, Inc. concessionaire.
• Interpretive programs (tram tours, night walks, Cypress Swamp Boardwalk tours, bike tours).
• Friends’ annual photography contest.
• Friends’ annual art contest.
• Friends’ photography workshop.
• Friends’ binocular loan program.

STANDARD 5: GOALS, OBJECTIVES, AND STRATEGIES

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

Comprehensive Conservation Plan Objective 1
Expand appropriate and compatible wildlife-dependent recreational opportunities at the Headquarters Area.

Strategies
• Repair existing trails at the Headquarters Area and meet or exceed the Americans with Disabilities Act code. (COMPLETE)
• Enhance the Cypress Swamp Boardwalk by constructing a tree canopy observation tower. (ONGOING)
• Rehabilitate and elevate the existing observation platform at the boat launch area. (ONGOING)
• Rebuild the boardwalk into the C-8 Impoundment and build a photo blind by 2001 through partnerships with our various Refuge support groups and other volunteers. (COMPLETE)
• Extend the existing canoe trail at the Headquarters Area and include one or two overnight camping platforms. (EVALUATED. Determined to not be implementable.)
• Develop two short boardwalks, an observation tower, photo blinds, and interpretive signage at Strazzulla. (NOT COMPLETE)

VISITOR SERVICES PLAN GOAL 5
Provide visitors of all ages and abilities an opportunity to observe and photograph key wildlife and habitat resources of the Refuge.

Visitor Services Plan Objective 5.1
Ensure all public use infrastructure, informational resources, and staff-based services support quality wildlife observation and wildlife photography opportunities.

Strategies

Public Use Infrastructure
• Maintain all Refuge-owned trail systems.
• Maintain photo blind on C-8.
• Maintain vegetation removal twice a year on 5.5-mile Canoe Trail.
• Maintain Marsh Trail observation tower.
• Maintain Lee Road boat ramp observation tower.
• Maintain benches behind Visitor Center and along trails.
• Maintain all shelters and pavilions.
• Maintain all kiosks and signage.

Informational Resources
• Maintain current wildlife information in brochures and publications such as the bird checklist, boating/fishing brochure, and general brochure/tearsheet.
• Continue the Friends’ annual photography and art contests.
• Continue the binocular loan program.
• Post recent wildlife sightings on Facebook.
• Maintain wildlife sections on website.
• Promote eBird Trail Tracker on website.
• Maintain Wildlife Sightings Kiosk in Visitor Center.

Staff-based Services
• Provide observation and photography training to all staff and volunteers.
• Work with SFWMD to interpret the Loxahatchee Impoundment Landscape Assessment.
• Work with partners to expand wildlife observation and wildlife photography programs and workshops.

Other recommendations
• Explore developing a canopy-level observation tower in the cypress swamp and Strazzulla.
• Explore live feed bird/wildlife cameras. Look at partnerships to assist.

Proposed Program Changes
(Figure 4)
Observation Towers
• Would raise height of observation tower at Lee Road boat ramp for visitors to see the Everglades, would keep the structure ADA accessible. Would add two towers in Strazzulla and one in the Cypress Swamp. Would evaluate if one of the new towers can be canopy-level.

Photo Blinds
• Would add photo blind in Strazzulla.

Live Cams
• Would install live-feed bird camera.

Boardwalks
• Would add two new boardwalks in Strazzulla and one new boardwalk in Cypress Swamp.

Impoundment Conversion
• Would evaluate conversion of up to three of our impoundments and make them suitable for wading bird nesting as resources allow.
Monitor and evaluate

- Incorporate public input from planning meetings and written input.
STANDARD 6: ENVIRONMENTAL EDUCATION

Policy (605 FW 6)
Through formal, curriculum-based environmental education tied to national and state education standards, we will advance public awareness, understanding, appreciation, and knowledge of key fish, wildlife, plant, and their habitats. Each refuge staff person will assess their potential to work with schools in providing an appropriate level of environmental education. We may support environmental education through the use of facilities, equipment, educational materials, teacher workshops, and study sites that are safe and conducive to learning (Appendix G).

Current Program Discussion
The Refuge offers curriculum-based environmental education opportunities for preschool- through college-age students. The program is supported by staff, volunteers, and interns who provide a variety of grade-level specific lesson plans which incorporate hands-on and interactive learning opportunities. Typical field experiences focus on topics that include water quantity, water quality, exotics (non-native species), flora and fauna, wildlife management, and habitats of the Everglades. Water quantity addresses information on water distribution and timing, including the amount that enters the Refuge throughout the year. The quality of the water entering the Refuge is a concern because of possible dangers to wildlife, vegetation, and humans due to pollution. Exotic plants and wildlife are a tremendous threat to the ecosystem and its water supply.

Refuge staff work closely with Palm Beach County and Broward County Schools, science department chairs, area teachers, private schools, and homeschool educators to build a positive relationship between local educators and the Refuge. A Refuge teacher’s manual, the *Rhythms of the Refuge: A Guide for Educators* was created in 2017 to supplement the environmental education program and serve as an educational resource for teachers. Environmental education participation varies throughout the year but is most popular with school groups during fall, winter, and spring. During the summer, the program coordinates with summer camps, Broward School District Junior Reserve Officers’ Training Corps (JROTC), Pine Jog Environmental Education Center’s “H2O To Go”, and the School District of Palm Beach County’s 21st Century Community Learning Center.

Below is a list of current visitor services facilities as they apply to environmental education:

Public Use Infrastructure
- Visitor Center.
- Trail system.
- Pavilions.
- Fishing pier.
- Boat ramps.
- LILA.

Informational Resources
- Kiosks.
- Brochures.
- Signs.
- Website and Facebook.
- Junior Refuge Manager Program.
- *Rhythms of the Refuge* educator guide.
Staff-based Services
- Visitor Center.
- On- and off-site environmental education programs for Pre K – College.

STANDARD 6: GOALS, OBJECTIVES, AND STRATEGIES

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

Comprehensive Conservation Plan Objective 6
Develop an environmental education curriculum by 2002, for use on and off the Refuge that centers on providing an understanding and appreciation of the Everglades, the Refuge's ecology, and the human influence on ecosystems of southeast Florida. This plan will follow guidelines from the National Outreach Strategy and be part of a strategy to reach key community leaders such as teachers, school board members, elected officials, and the news media.

Strategies
- Update Environmental Education and Interpretation Plan by 2002. (COMPLETE. UPDATED 2017)
- Increase educational opportunities with an enhanced and expanded environmental education/Visitor Center and a teaching pavilion near the Marsh Trail in the Headquarters Area. (COMPLETE)
- Expand educational topics to include water quality and exotic and invasive plant impacts on the natural environment. (COMPLETE)
- Update the environmental education manual to include the Strazzulla and Hillsboro Area. (NOT ATTEMPTED)
- Initiate teacher in-service training using the Refuge as an outdoor classroom. (COMPLETE)
- Make the most effective use of USFWS resources (for example, teaching teachers). Support specific USFWS resource priorities as outlined in the Outreach Strategy. (COMPLETE)
- To assist visiting teachers and promote a 'leave no trace' ethic, increase liaisons with county and private school boards to implement a volunteer education and guide program. (ONGOING)
- Coordinate satellite downlinks with the USFWS and area schools, and create a downlink site when a Refuge classroom is available. (NO LONGER RELEVANT)
- Create and maintain an interactive web site. (COMPLETE)
- With the assistance of the regional archaeologist and local Native American communities, develop an education program highlighting Native American cultural heritage as it pertains to the Refuge. (COMPLETE)

VISITOR SERVICES PLAN GOAL 6
Meet or exceed the quality criteria defined in section 605 FW 1.6, and facilitate curriculum-based environmental education opportunities that advance public awareness, understanding, appreciation, and knowledge of key fish, wildlife, plant, and resource issues.
Visitor Services Plan Objective 6.1
Ensure all public use infrastructure, informational resources, and staff-based services support a quality environmental education program.

Strategies

Public Use Infrastructure
- Maintain current operating hours of the Visitor Center.
- Maintain and provide Refuge housing to volunteers and interns.
- Maintain all Refuge-owned trail systems.
- Maintain photo blind on C-8.
- Maintain Marsh Trail observation tower.
- Maintain Lee Road boat ramp observation tower.
- Maintain all shelters and pavilions.
- Maintain all kiosks and signage.

Informational Resources
- Provide current environmental education program information on our website and encourage our partners to do the same.
- Update the Junior Refuge Manager Program booklet to include Scout badge requirements.
- Update the Junior Refuge Manager Program booklet to include Palm Beach County’s Junior Research Ranger Program requirements.
- Expand environmental education themes and topics as appropriate to support local and National priorities.
- Create a self-guided environmental education program itinerary for teachers to use when staff are not available.

Staff-based Services
- Maintain and expand partnerships with local education facilities.
- Hire additional park ranger positions to assist with programs.
- Recruit environmental education volunteers and interns through outreach and web-based media.
- Recruit and train volunteers, interns, and staff to assist with environmental education programs and pre-visits to education facilities.
- Train all front desk and environmental education volunteers on the Junior Refuge Manager Program.
- Continue to participate in the Every Kid in a Park program for 4th grade students.
- Incorporate and promote Leave No Trace ethics into programs and messaging.
- Maintain activities and lessons that specifically address deficiencies in students when taking the Florida Standards Assessment Test. Reach out to area school boards as a facility for test improvement.
- Explore web-based distance learning and virtual visits for educational facilities.
- Offer more pre-trip visits for off-site partners such as Boys and Girls Clubs, YMCA, etc.
- Invite additional partners to use the Refuge as an outdoor learning facility.
- Explore additional bus funding sources.
- Expand partnerships with local home schools.
- Attend quarterly meetings for Resources in Science Education (RISE).
• Maintain partnerships with a wide variety of local, regional, and national organizations through educational visits to complement Urban Refuge Initiative and foster future environmentally sensitive citizens.
• Continue to work with Palm Beach County Soil and Water Conservation District and University of Florida Institute of Food and Agriculture Science’s Mounts Botanical Garden on the Ambassadors of the Wetlands programs.

Other recommendations
• Continue programs with targeted audiences, for example, 4th grade classes, STEM, etc.
• Explore funding opportunities and look into constructing an environmental education center with programs for groups and camps.
• Invasive species removal by the public. Remove barrier and allow people to collect invasive species off the Refuge. Preferred method as a citizen science project.

Proposed Program Changes

Environmental Education Infrastructure
• Construct an additional teaching facility at Strazzulla

Monitor and evaluate
• Incorporate public input from planning meetings and written input.
STANDARD 7: INTERPRETATION

Policy (605 FW 7)
We will communicate the most important fish, wildlife, habitat, and other natural resource issues to visitors of all ages and abilities through effective interpretation. We will tailor messages and delivery methods to specific audiences and present them in appropriate locations. Through heightened awareness, we will inspire visitors to take positive actions supporting refuge goals and the Refuge System mission (Appendix G).

Current Program Discussion
Refuge staff and volunteers interpret key resources and issues through special events, formal interpretive programs, Visitor Center exhibits, and interpretive signage along trails and on kiosks. A variety of staff or volunteer led interpretive programs are offered throughout the year. All programs are free with a valid Refuge entrance pass. Monthly programs are advertised online, through local news outlets, and on the Visitor Center front desk events calendar. Programs are tailored to audiences, wildlife activities, national initiatives, and participant abilities. Guided interpretive programs are primarily led by volunteers, vary throughout the season, and include bird walks, wildflower and butterfly walks, roving naturalists, ethnobotany walks, roving wildlife photographers, cypress swamp boardwalk tours, night walks, sunset walks, canoe tours, bike tours, and tram tours. The seasonal Learning at Loxahatchee lecture series was developed in 2016 and each invited guest spoke to a packed audience.

The interpretive signs are on kiosks, observation decks, trailheads, and along trails at the Headquarters Area. Most of the signs in the kiosks at the Visitor Center parking lot, Marsh Trail parking lot, and Boat Ramp parking lot of the Headquarters Area entrance are dated. The interpretive signs along the Cypress Boardwalk and Marsh Trail were developed and fabricated within the last fifteen years. The QR Code Trail implemented by the Friends provides the general public with a self-guided, independent study approach to visiting the Refuge. The signs on 20-Mile Bend and Hillsboro also need updating. Ultimately, the goal of interpretive products is to facilitate understanding and appreciation of Refuge resources. With understanding and appreciation, visitors will behave in a way that enhances protection of resources.

Below is a list of current visitor services facilities as they apply to interpretive opportunities:

Public Use Infrastructure
- Visitor Center.
- Visitor Center Theater.
- Cypress Swamp Boardwalk.
- Marsh Trail.
- C-6 Pavilion.
- Boat Ramps.

Informational Resources
- Visitor Center.
- Brochures.
- Kiosks and signs.
- Art and photo displays in the Visitor Center Theater.
- Cypress Swamp Boardwalk with interpretive signs.
- QR Code signs along the Marsh Trail.
- C-6 Pavilion with interpretive signs.
• Boat ramps at Headquarters, 20-Mile Bend, and Hillsboro.
• Facebook and website.
• Junior Refuge Manager Program.

Staff-based Services
• Visitor Center.
• Informal interpretive contacts (on- and off-site).
• Formal interpretive programs (on- and off-site).
• Special Events (on- and off-site).
• Outreach.

STANDARD 7: GOALS, OBJECTIVES, AND STRATEGIES

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

Comprehensive Conservation Plan Objective 7
Upgrade and expand the interpretive program, portraying the significance of the Refuge and threats affecting the Refuge and the South Florida ecosystem. The interpretive program will be updated using the guidelines from the Fish and Wildlife Service National Outreach Strategy.

Strategies
• Host appropriate events such as Everglades Day, International Migratory Bird Day, National Wildlife Refuge Week, and seasonal “Calendar of Events” programming. (COMPLETE, ONGOING)
• Enhance Refuge literature, ensuring updated information about the USFWS and National Wildlife Refuge System missions. (ONGOING)
• Provide multi-lingual brochures and other handouts. (COMPLETE, ONGOING)
• Promote and expand interpretive tours. (ONGOING)
• Enhance and expand the Volunteer Speakers Bureau. (COMPLETE)
• Repair, replace, and improve interpretive signs. (COMPLETE)
• Create interpretive signs or kiosks to explain impoundment management at the Headquarters, Hillsboro, and Strazzulla. (COMPLETE)
• Maintain the current media and elected officials outreach program. (ONGOING)

VISITOR SERVICES PLAN GOAL 7
Communicate the most important fish, wildlife, habitat, and natural resource issues to visitors of all ages and abilities through effective interpretation.

Visitor Services Plan Objective 7.1
Ensure all public use infrastructure, informational resources, and staff-based services support quality interpretation of key resources and issues.

Strategies

Public Use Infrastructure
• Utilize Visitor Center exhibits and special theater gallery viewings as teaching tools.
• Utilize signs and kiosks as interpretive teaching tools.
• Promote and use the QR Code Trail as an interpretive teaching tool.

Informational Resources
• Maintain and periodically refurbish Visitor Center exhibits.
• Maintain special viewings in the theater gallery.
• Update and maintain interpretive messages on Refuge kiosks, signs, and publications as appropriate.
• Maintain monthly calendar of events on website.
• Post current special events and interpretive programs on Facebook.
• Develop a self-guided interpretive program.

Staff-based Services
• Recruit and train additional volunteers to lead interpretive programs.
• Provide interpretive training to all interested staff.
• Continue to offer staff and volunteer-led interpretive programs.
• Continue to host special events that help visitors connect with the Refuge.
• Maintain, develop, and create new partnerships and speaker possibilities for Learning at Loxahatchee lecture series.
• Work with local bicycling clubs to offer more biking-related programs.
• Offer internship opportunities focused on environmental interpretation.
• Maintain partnerships with regional universities to recruit quality interns.
• Develop an environmental interpretation step-down plan.
• Explore developing virtual geocache opportunities for each designated entrance area.

Proposed Program Changes

Exhibits
• Would develop a Visitor Center exhibit geared towards youth pre-K through 3rd grade.

Interpretation
• Recruit and train volunteers to lead interpretive programs in Spanish, French, Haitian Creole, and other languages.

Events
• Incorporate additional Everglades-related events as staff and budget allow.

Monitor and evaluate
• Incorporate public input from planning meetings and written input.
• Periodically check web-based reviews from Facebook, Yelp, Trip Advisor, and others.
• Conduct program audits to ensure programs are focused on establishing interpretive themes and that they offer opportunities for the public to connect with Refuge resources.
STANDARD 8: MANAGE FOR OTHER RECREATIONAL USE OPPORTUNITIES

Policy (605 FW 1 and 603 FW 1)
The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997, states that compatible wildlife-dependent recreational uses are the priority public uses of the National Wildlife Refuge System (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation) and will receive enhanced consideration over other general public uses. Volunteers, partners, recreation fees, and concessions are tools available to assist in managing these uses. We will only permit other uses when we determine that they are legally mandated, provide benefits to the Service, occur due to special circumstances, or facilitate one of the priority wildlife-dependent recreational uses (Appendix G).

Current Program Discussion
The Refuge currently allows a variety of public uses that support or enhance wildlife-dependent recreation. Such uses include walking, hiking, bicycling, canoeing, kayaking, and motor boating.

Approximately 36 miles of the perimeter levee, from the S-362 pump station on the L-40 levee south and then west along the L-39 levee to the S-6 pump station, are open to walking, hiking, and bicycling. The A, B, and C Impoundments are also open to these uses providing another 6.5 miles of trails. The 0.4 mile Cypress Swamp Boardwalk is only open to pedestrians. Tram tours of the Impoundments are run by volunteers on a regular schedule.

Canoes and kayaks are permitted on the 5.5-mile canoe trail, in the perimeter canal, and in the designated public use area at the southern end of the Refuge. Water-cooled motor boats may launch at any of the three designated boat launches: Headquarters, Hillsboro, or 20-Mile Bend and are permitted in the perimeter canal and in the designated public use area at the southern end of the Refuge.

Below is a list of current visitor services facilities as they apply to other recreational uses:

Public Use Infrastructure
- Trails.
- Boat launches.
- Docks.
- Parking lots.
- Benches.
- Observation tower and platform.
- Bicycle racks.
- Restrooms.
- Trash/recycling receptacles.

Informational Resources
- Kiosks.
- Interpretive and directional signs.
- Brochures, maps, and online resources.
Staff-based Services
- Staff and volunteers provide information at the Visitor Center and fee booths.
- Canoe, kayak, and bicycle rental managed by permittee.
- Guided canoe, kayak, and bicycle tours.
- Guided interpretive walks/hikes.
- Guided tram tours.

STANDARD 8: GOALS, OBJECTIVES, AND STRATEGIES

COMPREHENSIVE CONSERVATION PLAN GOAL 3
Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.

Comprehensive Conservation Plan Objective 3
Develop a hiking and bicycling trail on the existing main levee (COMPLETE)

Strategies
- Continue the recently opened bicycle use of the perimeter levee from Headquarters to Hillsboro. (COMPLETE)
- Permit hiking use of the main levee from Hillsboro northwest to the S-6 Pump. (COMPLETE)
- Hiking is also allowed from Hillsboro Area to the ACME-1 Pump Station northeast of Strazzulla. (COMPLETE)
- Repair existing trails at the Headquarters Area and meet or exceed the Americans with Disabilities Act code. (COMPLETE)
- Rebuild the boardwalk into the C-8 Impoundment and build a photo blind by 2001 through partnerships with our various Refuge support groups and other volunteers. (COMPLETE)
- Improve visitor services such as enhanced informational and educational signage and additional benches throughout Impoundment C trails. (COMPLETE)

VISITOR SERVICES PLAN GOAL 8
Ensure all public uses are appropriate and compatible while supporting or enhancing one of the wildlife dependent recreational uses.

Visitor Services Plan Objective 8.1
Ensure all public use infrastructure, informational resources, and staff-based services support appropriate and compatible recreational use opportunities that support or enhance one of the wildlife-dependent recreational uses.

Strategies

Public Use Infrastructure
- Ensure information depicted on signs and kiosks is current, well described, and conforms to USFWS Graphic Standards.
- Install additional benches along the perimeter levee.
- Install bicycle racks at the Hillsboro and 20-Mile Bend areas.
- Install picnic table and pavilion at 20-Mile Bend.
- Include proposals for new or expanded infrastructure in facilities planning and funding requests.
- Create openings at all gates to allow pedestrians and bicyclists to pass.
• Explore options for bypassing the gate at the S-362 pump station.
• Explore options for connecting the perimeter levee to adjacent municipal and county lands such as the Wellington Environmental Preserve, West Delray Regional Park, or the South County Regional Park.
• Create additional canoe/kayak launching points around the perimeter canal.
• Install additional trail counters at strategic locations.
• Develop picnic areas.
• Partner with the SFWMD to open the remaining 24 miles of the perimeter levee to hiking and bicycling.
• Consider installing wash stations at the boat ramps.

Informational Resources
• Ensure information presented in brochures, maps, and online is current, well described, and conforms to USFWS Graphic Standards.
• Maintain public use infrastructure including hiking trails, Cypress Swamp Boardwalk, boat ramps, docks, parking lots, observation tower and platform, benches, kiosks, signs, and bicycle racks promptly correcting any unsafe conditions.
• Remove encroaching vegetation from the canoe trail at least twice per year.
• Partner with the SFWMD to maintain the perimeter levee and canal.
• Update maps, brochures, and online resources to show additional trails as they are opened for public use.
• Translate maps, brochures, and online content into other locally common languages.

Staff-based Services
• Provide information about walking, hiking, bicycling, canoeing, kayaking, and motor boating opportunities at the Visitor Center and fee booths.
• Develop programs for presentation on and off-Refuge explaining the variety of recreational facilities and opportunities available on the Refuge.
• Provide information about new recreational opportunities at the Visitor Center and fee booths.
• Work with partners and volunteers to increase the number of guided tours and expand tours into new areas such as the perimeter levee.
• Partner with local clubs, groups, and organizations to host special events such as canoe paddles, trail rides, and group hikes.
• Provide information about hiking and bicycling opportunities on the perimeter levee at the Visitor Center and fee booths.
• Expand guided hiking and bicycling tours to include sections of the perimeter levee.

Proposed Program Changes

Trails (Figure 4)
• Would route a proposed trail north up Florida Power & Light (FP&L) right-of-way then west on an unimproved levee. Would also expand hiking and biking opportunities from the S-362 pump station on the L-40 levee to the S-6 pump station on the L-7 levee adding an additional 18 to 20 miles.

Motorized and Non-motorized Watercraft Access (Figure 5)
• Open the entire Refuge with limited access for non-motorized watercraft, excluding the A, B, and C Impoundments and Strazzulla.
• The designated Hunt Zone would be referred to as the Motorized Watercraft Zone (not including airboats) and Non-motorized Watercraft Zone.
• Provisional limited non-hunting airboat use.

Leashed pets
A proposal to allow only leashed or confined (e.g. caged pet, dog strollers, or other travel enclosure) pets in all areas open to general public use would be permitted on the Refuge with the following stipulations:

• Pet owners would be required to maintain control of their animal at all times while on the Refuge and must refrain from entering closed areas.
• Leashes would be no longer than six feet in length.
• Visitors with pets would be required to immediately bag and remove their pet(s) fecal matter and dispose of it in the proper trash receptacles.
• Owners have the burden to ensure their pet causes no harm to wildlife, the Refuge, or for others visitors on the Refuge.
• No more than two pets per visitor.
• Public awareness would be increased through interpretive or educational materials about responsible pet ownership in the context of wildlife disturbance and threat of injury or death to pets during all outdoor recreational pursuits.
• Organized training or competitive events would be prohibited.
• If a high number of reports of negative pet-wildlife or pet-people interactions on Refuge trails were to be reported, the Refuge would reassess the use.
• Pets may be restricted at Refuge-sponsored events (i.e. Family Fishing Day, Everglades Day, NWR Week).
• Certain areas may be closed to the public and pets due to management activities.

Ceremonies
Each request would be required to comply with Special Conditions attached to their SUP to ensure compatibility. At a minimum, the following standard SUP Special Conditions would be included.

• No portion of the Refuge would be closed to accommodate such ceremonies.
• Music would be limited to unplugged instruments of five or less pieces or hand-held players.
• Ceremonial props would be allowed to be in place one hour before the ceremony and must be removed within one hour after the ceremony. Ceremony props would have to be approved before the ceremony. All items must be removed within 1 hour of the ceremony’s conclusion.
• Special accommodations and settings for people with special needs (elderly, physically disabled) may be granted. If needed, this should be described in a written request.
• Refuge staff does not provide any assistance in setting up or removal of props for ceremonies.
• No litter may be left on site including biodegradable materials.
• No balloons, rice, birdseed, confetti, plastic, etc. permitted because it poses a hazard to wildlife.
• Activities or practices that could be hazardous to visitors, wildlife, vegetation, or facilities would not be allowed. Such activities include, but would not be limited to, lighting candles, burning incense, sacrifices (animal or otherwise), or scattering ashes.
• All event activities would meet the standards of public decency and would not violate any animal or human rights.
• Each request must be submitted a minimum of 30 calendar days in advance of the event by completing an SUP application. Each request would then be evaluated for appropriateness and compatibility.
• Up to two events may be permitted per month. Preference would be given to new requests over repeat requests.
• Events would not exceed four hours in duration. This window includes time for set up and breakdown of equipment, materials, etc. Event length should be limited to the shortest amount of time reasonably required.
• It would be the responsibility of the permittee to provide and manage all activity-related materials (tables, chairs, additional mobile restrooms, etc.) and ensure that all participants remove litter and other activity-related materials from Refuge property immediately following conclusion of the event.
• A maximum of 50 people may participate in an event.
• Bond requirement is at the discretion of the Refuge Manager, based on an analysis of the nature and scope of the event, and the associated level of risk for resource damage and anticipated cost of any restoration or repair of any damage. The permittee is responsible for site cleanup immediately following any ceremonial event. The Refuge Manager shall inspect the site prior to release of any bond.
• Permittee and designated associates would comply with all the Refuge regulations and additional instructions as provided by the Refuge Manager.
• Failure of the permittee to comply with any of these Special Conditions or with any State or Federal laws or special Refuge regulations would be sufficient cause for permit revocation and may result in denial of future SUPs.
• Permittee must have the SUP in their possession at all times while on the Refuge. A copy of the permit must also be prominently displayed on the dash of permittee’s vehicle(s) at all times while on the Refuge. The permit must be presented to Refuge personnel upon request.
• All vehicles must park in designated spaces. No vehicles may be parked on the grass or other natural areas.
• Decorations and other activity-related materials that are made from any type of plant (e.g. flower and plant arrangements) or animal (e.g. feathers, shells, etc.) materials need to be approved prior to the event in order to maintain the environmental health of the Refuge and to prevent the introduction of any pests, pathogens, or invasive species to the Refuge.
• All activities would be conducted in such a manner as to minimize disturbance to wildlife, Refuge resources, and the visiting public. The following would be specifically prohibited: 1) audio amplification devices; 2) adhering, fixing, or fastening decorations to vegetation and/or structures; 3) erecting self-supporting decorations, banners, flags, etc. in a manner that would obstruct the view of public areas or disturb wildlife; 4) throwing or scattering rice, bird seed, or similar products; and 5) the release of any type of wildlife (e.g. butterflies, doves, etc.), balloons, or lanterns.
• No food or beverages would be allowed unless they are a fundamental part of a religious practice or ceremony and would not cause any disturbance to wildlife. Receptions in association with permitted events would not be allowed.
• A NWRS fact sheet would be provided with every SUP and must be distributed by the permittee to all adult participants.
• The permittee agrees to forever hold harmless the United States, its officers, agents, employees, contractors and/or assigns from any and all damages to property or injuries to persons which arises or may be incidental to the activities associated with an SUP.

Instructor-led small group activities
A proposal to allow instructor-led small group activities on the Refuge. Each request must comply with Special Conditions attached to their SUP to ensure compatibility. At a minimum, the following standard SUP Special Conditions would be included.
• Each request must be submitted a minimum of 30 calendar days in advance of the first scheduled activity by completing an SUP application. Each request would be reviewed on a case-by-case basis.
• Up to two (2) activities may be permitted per month. Preference would be given to new requests over repeat requests.
• Activities would not exceed two hours in duration, which includes set-up and breakdown. Activity length should be limited to the shortest amount of time reasonably required.
• It would be the responsibility of the permittee to provide and manage all activity-related resources and ensure that all participants remove litter and other activity-related materials from Refuge property immediately following conclusion of the session.
• A maximum of 50 participants may be permitted for one-time activities, and a maximum of 20 participants may be permitted for recurring activities.
• Permittee and activity participants would comply with all the Refuge regulations and additional instructions as provided by the Refuge Manager.
• Failure of the permittee to comply with any of these special conditions or with any State or Federal laws or special Refuge regulations would be sufficient cause for permit revocation and may result in denial of future SUPs.
• Permittee must have the SUP in their possession at all times while on the Refuge. A copy of the permit must also be prominently displayed on the dash of permittee’s vehicle(s) at all times while on the Refuge. The permit must be presented to Refuge personnel upon request.
• All vehicles must park in designated spaces. No vehicles may be parked on the grass or other natural areas.
• Activity-related materials made from any type of plant (e.g. flower and plant arrangements) or animal (e.g. feathers, shells, etc.) materials would need to be approved prior to the activity in order to maintain the environmental health of the Refuge and to prevent the introduction of any pests, pathogens, or invasive species to the Refuge.
• All activities would be conducted in such a manner as to minimize disturbance to wildlife, Refuge resources, and the visiting public. The following would be specifically prohibited: 1) audio amplification devices; 2) adhering, fixing, or fastening decorations to vegetation and/or structures; 3) erecting self-supporting decorations, banners, flags, etc. in a manner that would obstruct the view of public areas or disturb wildlife; 4) throwing or scattering rice, bird seed, or similar products; and 5) the release of any type of wildlife (e.g. butterflies, doves, etc.), balloons, or lanterns.
• A NWRS fact sheet would be provided with every SUP and must be distributed by the permittee to all adult participants.
• The permittee agrees to forever hold harmless the United States, its officers, agents, employees, contractors and/or assigns from any and all damages to property or injuries to persons which arises or may be incidental to the activities associated with an SUP.

Camping (Figure 10)
This proposal would allow a limited, permitted, fee-based, overnight backcountry camping opportunity. Campsites on the L-7 would be for hiking and biking access only. Two camping platforms would be constructed along the southern canoe trail with boat access on the canoe trail. The Refuge Manager may close campsites to prevent conflict with wildlife species, including threatened and endangered species. The Refuge Manager would limit all access to protect nesting snail kites, colonial nesting birds, resting waterfowl, or for other management purposes, when necessary. The following stipulations would apply:
• Camping would be allowed only at the designated campsite.
• No wood gathering or vegetation removal would be allowed without a permit.
• Feeding wildlife would not be permitted.
• All trash and waste must be carried out and properly disposed of off-site.
• Pets would not be authorized.
• The sites would be available on a first-come basis by permit.
• Only free standing tents (no stakes) would be allowed on the platforms.
• The maximum number of tents on a platform allowed would be two.
• The maximum length of stay would be two nights.
• The maximum number of people occupying a platform campsite would be six and levee site would be twenty.
• No fires would be allowed on the canoe trail platforms.
• Fishing would not be permitted on canoe trail platforms.
• Only one motorized boat would be permitted at a canoe trail platform at a time.
• A nominal fee would be associated with camping permits.

Horseback Riding (Figure 11)
Refuge specific rules and regulations would apply to the proposed horseback riding expansion. Most of this activity would occur on the 58 miles of perimeter levees (L-39, L-40, L-7) that surround the Refuge Interior and the northern boundary of Strazzulla. The following stipulations would apply:
• Horses would be required to wear manure containment bags and riders would be responsible for removal of all horse manure.
• Limit all access when necessary to protect nesting snail kites, colonial nesting birds, resting waterfowl, or for other management purposes.
• Access would be restricted to posted hours.
• Areas of the Refuge may be restricted seasonally to avoid disturbance of breeding or nesting wildlife or to protect sensitive habitat.
• Trash must be packed out and properly disposed of off-site.
• Clearing of vegetation would be prohibited.
• Each visitor may only ride/walk one horse on the Refuge at a time.
• Groups consisting of more than five horses would require a Special Use Permit.

Provisional Non-hunting Airboating (Figure 12)
• Would allow limited provisional non-hunting airboating by permit in a 13,900-acre portion of the motorized zone. Limited quota of 0 to 20 boats per year, annual boat permit, lottery once a year, mandatory airboat orientation and workshop, water level restrictions, Monitor and re-evaluate in 3 to 5 years. Supports all of the Big 6. Non-hunting airboating restricted during waterfowl season.
• The use of non-hunting airboating outside of the hunting season will only be permitted on weekends (Friday, Saturday, and Sunday) from July-November except during waterfowl hunting dates.

Canoe Trail (Figure 4)
• Proposed construction of a canoe trail on the south end of Refuge.

Monitor and evaluate
• Conduct periodic Comprehensive Condition Assessments that include all recreational infrastructure.
• Hold periodic public meetings to solicit feedback from the public on ways to improve the Refuge’s recreational offerings.
• Install additional trail counters at strategic locations to better understand public use levels and patterns and tailor facilities and programs to support these needs.
• Incorporate public input from planning meetings and written input.
STANDARD 9: OUTREACH

Policy (605 FW 1.14I)
Effective outreach depends on open and continuing communication between the Refuge staff and the public. This communication involves determining and understanding the issues, identifying audiences, crafting messages, selecting the most effective delivery techniques, and evaluating effectiveness. Achieved results will further the mission of the National Wildlife Refuge System and purpose(s) of the Refuge. See the National Outreach Strategy: A Master Plan for Communicating in the U.S. Fish and Wildlife Service, and America’s National Wildlife Refuge System: 100 on 100 Outreach Campaign (Appendix G).

Current Program Discussion
Outreach is a two-way communication between the USFWS and the public to establish and promote involvement, and influence attitudes and action, with the goal of improving joint stewardship of our natural resources. Outreach includes but is not limited to the following: relations with news media, congressional, corporate, constituent groups, community, state and local government, state wildlife agencies, environmental education and interpretive activities, public involvement, traditional public information activities such as open houses, information products such as brochures, leaflets, exhibits, slide shows, videos, public service announcements, and web based media.

Media outreach at the Refuge typically occurs in the form of news releases, radio and television interviews, and phone contacts. Staff maintain good working relationships with local media sources, and a number of articles are printed each year covering various Refuge topics.

As one of fourteen priority Urban National Wildlife Refuges, the Refuge’s Urban Plan guides outreach strategies for the surrounding community. This plan is updated on a regular basis as needs dictate.

Refuge staff, volunteers, and Friends are invited to participate in a number of outreach events each year such as special events, festivals, and workshops. All requests are considered with actual participation based on staff schedules and availability, as well as budget considerations for the cost associated with participation. Over the years, the staff has typically participated in numerous outreach events including Earth Day festivals, Outdoor Adventure Day at John Prince Park, Resources in Science Education (RISE), Career Days at local schools, various environmental festivals, and through repeated engagements with partners including communities of faith, environmental education centers, Boys and Girls Clubs, Miami Children’s Hospital, and many other organizations.

Below is a list of current visitor services facilities as they apply to outreach:

- **Public Use Infrastructure**
  - Not Applicable.

- **Informational Resources**
  - Brochures.
  - Web based media.
  - Television.
  - Radio.
  - Newspapers.

- **Staff-based Services**
  - Off-site environmental education programs.
• Off-site interpretive programs.
• Off-site special events.
• Web based media.
• Radio.
• Newspapers.

STANDARD 9: GOALS, OBJECTIVES, AND STRATEGIES

VISITOR SERVICES PLAN GOAL 9
Engage off-site public in effective outreach.

Visitor Services Plan Objective 9.1
Ensure all informational resources and staff-based services promote an understanding and appreciation of the Refuge’s fish, wildlife, habitat conservation, along with the mission of the National Wildlife Refuge System.

Strategies

Informational Resources
• Develop an outreach plan that articulates communications strategies and schedules.
• Update brochures to reflect national outreach messages and initiatives.
• Expand and maintain the website and Facebook to highlight Refuge accomplishments.
• Expand and maintain website and Facebook to reflect national outreach messages and initiatives.
• Tailor informational resources to urban, diverse, and underserved audiences.
• Implement the Refuge’s Urban Wildlife Refuge Plan.
• Expand and maintain updated web-based media that reflects national outreach messages and initiatives.
• Expand and maintain relationships with regional television stations, radio stations, and news media.
• Expand and maintain media contact lists, local government lists, colleges and universities, chambers of commerce, and other civic organizations.

Staff-Based Services
• Foster and maintain strong partnerships with community organizations to create programs and opportunities beneficial to conservation.
• Leverage volunteer capacity to expand outreach potential.
• Maintain and expand opportunities to be involved in community events.
• Incorporate national outreach messages into all off-site environmental education.
• Incorporate national outreach messages into all off-site interpretive programs.
• Incorporate national outreach messages into all off-site special events.
• Tailor staff-based services to urban, diverse, and underserved audiences.
• Offer more internship opportunities focused on outreach.
• Recruit and train volunteers to facilitate outreach.
• Maintain partnerships with regional universities to recruit quality interns.
• Encourage Friends to submit grants requests that would provide additional outreach staff.
• Establish partnerships with community organizations to disseminate information.
• Host “town hall” events, including community leaders.
• Develop community specific programs.
Other recommendations
- Consider setting up an annual agency-planning meeting.
- Consider setting up an annual stakeholders meeting.
- Meet annually with city councils.
- Ecotourism.

Proposed Program Changes

Planning meetings
- Would consider annual meetings with other governmental agencies, stakeholders, and city councils.

Outreach plan
- Would develop an outreach plan that articulates communications strategies and schedules.

Off-site events
- Would expand relationships with local leaders and media.
- Would host “town hall” events.
- Would develop community specific programs.

Informational resources
- Would update and expand outreach information.

Monitor and evaluate
- Urban Refuge Program reviews will be conducted periodically to ensure the Refuge is meeting visitor service standards. These programmatic reviews will also assess if the VSP goals and objectives are being met. To ensure a thorough external and internal review of the program or service, we will monitor and evaluate the program or service using a variety of methods, including program reviews, literature reviews, site visits, focus groups, personal interviews, economic analyses, and surveys.
- Incorporate public input from planning meetings and written input.
STANDARD 10: VOLUNTEERS AND FRIENDS

Policy (605 FW 1.14J)
Volunteer and Refuge support groups fortify Refuge staffs with their gift of time, skills, and energy and are integral to the future of the National Wildlife Refuge System. Refuge staff will initiate and nurture relationships with volunteers and Refuge support groups, and will continually support, monitor, and evaluate these groups with the goal of fortifying important Refuge activities. The National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998 (P.L. 105-242) strengthens the Refuge System’s role in developing effective partnerships with various community groups. Whether through volunteers, Refuge support groups, or other important partnerships in the community, Refuge staff will seek to make the Refuge an integral part of the community, giving rise to a stronger Refuge System (Appendix G).

Current Program Discussion:

Volunteers
The Refuge has a well-established volunteer program with approximately 365 individuals donating their time, skills, and energy each year. Volunteers support all work groups at the Refuge with the visitor services program receiving the majority of support. Volunteers are recruited passively at the Visitor Center, online, and through local media, with a short narrative describing opportunities and the application process. Targeted recruitment for specific positions occur at local volunteer fairs. Volunteers are especially important as workloads increase while staff levels remain static. The program utilizes three recreational vehicle pads and a Refuge bunkhouse with six rooms to house volunteers, interns, and partners.

The Refuge has a four phase volunteer program: regular, resident, events, and Friends. Regular volunteers are divided into year-round and seasonal categories. These are individuals who commit to a set number of hours per week or per month. Residents or Recreational Vehicle campers make up another segment of the program. These are individuals or couples who live on the Refuge in their personal camper or Refuge bunkhouse. Special event volunteers work occasions such as the Everglades Day Festival, Migratory Bird Surveys, and National Public Lands Day. The Friends group also contributes a significant number of volunteer hours.

Volunteers provide much needed assistance to Refuge staff. Volunteers staff the Visitor Center front desk, provide administrative and clerical work, lead guided tours, assist with special art projects, staff off-site exhibits, and provide assistance with off-site programs such as the Speakers Bureau, help with on-site special events such as the Everglades Day Festival, National Public Lands Day, and Christmas Bird Count for Kids. They act as roving interpreters on the various trails and public use areas, assist in education programs for visiting students, assist biologists with the collection of field data for studies and surveys, remove invasive exotic plants and trees, assist in reforestation projects, and perform various maintenance duties.
Table 5. Volunteer hours by work category 2008 to 2017

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<td>3,250</td>
<td>3,216</td>
<td>3,216</td>
<td>5,427</td>
<td>5,927</td>
</tr>
<tr>
<td>Wildlife Dependent Recreation</td>
<td>5,934</td>
<td>2,874</td>
<td>6,585</td>
<td>4,916</td>
<td>7,900</td>
<td>10,320</td>
<td>5,817</td>
<td>11,939</td>
<td>7,960</td>
<td>8,460</td>
</tr>
<tr>
<td>Other Activities</td>
<td>361</td>
<td>374</td>
<td>322</td>
<td>4,142</td>
<td>900</td>
<td>380</td>
<td>974</td>
<td>974</td>
<td>585</td>
<td>985</td>
</tr>
<tr>
<td>Total Hours</td>
<td>13,477</td>
<td>6,911</td>
<td>11,753</td>
<td>14,463</td>
<td>14,000</td>
<td>16,440</td>
<td>16,119</td>
<td>16,129</td>
<td>13,972</td>
<td>12,692</td>
</tr>
</tbody>
</table>

Figure 14. Volunteer Hours by Work Category
Friends of the Arthur R. Marshall Loxahatchee National Wildlife Refuge

The mission of the Friends group is to promote a better understanding and appreciation of the natural history and environment of South Florida, the Refuge, and the entire Everglades system. The Friends is a 501(c) (3) non-profit organization that partners with the Refuge to provide support for environmental education, community outreach, fundraising, and advocacy. The Friends have a current signed partnership agreement with the Refuge as of 2015. The purpose of this agreement is to facilitate and formalize collaboration between the Friends and the USFWS in order to achieve common goals and objectives at the Refuge. The agreement is valid for 5 years.

The Friends obtain funding through membership dues, private donations, fundraising, and sales from their nature store located in the Refuge’s Visitor Center. They support the Refuge and its staff by acting as a volunteer-based organization to aid in a wide variety of positions at the Refuge including event organization, maintenance, staffing the nature store, leading tours, and finding sponsors. The Friends provide transportation funding to the School District of Palm Beach County to support increased student visitation at the Refuge. They also encourage community involvement and stewardship through public and Refuge events and promote clean-up efforts on the Refuge.

The Friends publish a monthly e-mail newsletter as well as a periodic newsletter referred to as “Gator Tales”. These newsletters detail recent, current, and upcoming events and tours at the Refuge, recognize staff and volunteer accomplishments, highlight art and photography, and include articles on a variety of Refuge related material. The Friends raise awareness through regular and relevant posting on the Friends’ Facebook page and ensure that the Friends’ website is updated with current information. They maintain a self-guided tour along the Marsh Trail, a Visitor Service Guide and brochure, and help maintain Visitor Center exhibits through contributions to the exhibit maintenance fund. They also maintain a brick paver pathway behind the Visitor Center that leads to the Cypress Swamp Boardwalk.

Originally founded in February of 1982 under the name “Loxahatchee Natural History Association”, the Friends are the longest continuously functioning Friends group in the country. In 2003, the name was changed to its current one.

Below is a list of current visitor services facilities as they apply to volunteers, Friends, and partners:

**Public Use Infrastructure**
- Visitor Center.
- Kiosks.
- Nature Store.
- Pavilions.
- Trails.
- Parking lots.
- Roads.
- Photo blind.
- Observation towers.
- Recreational vehicle (RV) camp pads.
- Bunkhouse.

**Informational Resources**
- Interactive kiosks and displays.
- Informative brochures.
- Self-guided tour on Marsh Trail.
• Interpretive signage.
• Facebook and website.
• Non-Web and Web publications.
• Recognition/appreciation board.
• Recruitment flyers & board.
• Position descriptions.
• Volunteer opportunities.

Staff-based Services
• Visitor Center.
• Friends-staffed nature store with Refuge-themed merchandise.
• Public programs and special events (interpretive, environmental education, and outreach).
• Speakers Bureau.
• Volunteer and Friends recruitment.
• Volunteer and Friends training.
• Volunteer and Friends recognition.
• Volunteer and Friends appreciation.

Partnerships
Refuge staff maintain partnerships with other Federal and state agencies, in addition to non-governmental organizations, local schools and universities, and the general public. A full list of partnerships can be found in Table 8 of this document.

STANDARD 10: GOALS, OBJECTIVES, AND STRATEGIES

VISITOR SERVICES PLAN GOAL 10
Ensure Refuge staff initiate and nurture relationships with volunteers and Friends organizations.

Visitor Services Plan Objective 10.1 (Volunteers)
Ensure all public use infrastructure, informational resources, and staff-based services support an effective volunteer program.

Strategies

Public Use Infrastructure
• Maintain housing facilities utilized by volunteers.
• Maintain resident campsites utilized by volunteers.
• Explore development of a volunteer resources station.

Informational Resources
• Update and maintain kiosks, publications, and web-based media with volunteer opportunity information.
• Develop quarterly volunteer newsletters.
• Develop and disseminate a Refuge-specific volunteer handbook.

Staff-based Services
• Develop new strategies to recruit volunteers.
• Promote volunteer opportunities on www.volunteer.gov webpage.
• Recruit volunteers who are fluent in locally common languages and develop interpretive and outreach programs to better serve local communities.
• Encourage all departments to utilize volunteers.
• Conduct quarterly volunteer, orientations, trainings, and meetings.
• Develop and promote volunteer opportunities that help promote the mission of the Refuge.
• Encourage local schools, non-profit organizations, and for-profit organizations to participate in stewardship/volunteer programs.
• Expand training opportunities by utilizing available resources. For example, local and area resources, on-the-job trainings, teacher workshops, and courses offered by the USFWS’s National Conservation Training Center (NCTC) to provide training needs.
• Seek additional scholarship to NCTC or request assistance from the Friends group to fund training as needed.
• Seek opportunities for non-traditional rewards for volunteers such as guided tours of other Refuges within the state or Complex.

Visitor Services Plan Objective 10.2 (Friends)
Ensure all public use infrastructure, informational resources, and staff-based services support an effective Friends organization.

Strategies

Public Use Infrastructure
• Maintain the nature store.

Informational Resources
• Provide links to the Friends’ website on the Refuge’s website.
• Provide information about Friends in Refuge publications.
• Provide current Refuge information in Hot Read at front desk.
• Support Friends Facebook by sharing posts.
• Share Refuge Highlights with Friends members.
• Continue to contribute to Gator Tales articles.

Staff-based Services
• Continue to promote and support Friends recruitment and involvement.
• Provide Refuge support at monthly Friends board meeting.
• Maintain a Speakers Bureau and train speakers to provide talks and presentations to the community on a variety of Refuge topics.
• Continue to support and work closely with the Friends in planning Everglades Day.
• Continue to promote and support Friends-sponsored special events such as clean-ups and annual art and photography contests, receptions, and awards ceremonies.

Proposed Program Changes

Volunteer Program
• Would develop new strategies to recruit volunteers.

Friends Program
• Would expand the Friends group.
Partnerships
- Would expand partnerships.

Monitor and evaluate
- Solicit feedback from volunteers on a regular basis.
- Conduct exit interviews with all volunteers that leave the program.
- Assess volunteer program regularly and make adjustments as needed.
- Visitor service program reviews will be conducted periodically to ensure the Refuge is meeting visitor service standards. These programmatic reviews will also assess if the VSP goals and objectives are being met. To ensure a thorough external and internal review of the program or service, we will monitor and evaluate the program or service using a variety of methods, including program reviews, literature reviews, site visits, focus groups, personal interviews, economic analyses, and surveys.
- Incorporate public input from planning meetings and written input.
11: RECREATION FEE PROGRAM

Policy (261 FW 1; 263 FW 1)
Federal Lands Recreation Enhancement Act of 2004 (P.L. 108-447);

“The Federal Lands Recreation Enhancement Act of 2004 (FLREA) allows land management agencies, such as the National Wildlife Refuge System, to charge fees for entry and certain amenities (user fees). The charging of entrance and user fees at national wildlife refuges can be a helpful management tool if the program is well-managed and implemented.” (Appendix G)

Current Program Discussion:
The Refuge currently collects entrance fees, sells interagency passes, and Federal Duck Stamps. Daily entrance fees are charged per vehicle, pedestrian/bike, commercial tours under 25 passengers, and commercial tours over 25 passengers. In addition to daily entrance fees, visitors have the option to buy an annual Refuge-specific pass. The Refuge is an official site where interagency America the Beautiful - National Parks and Federal Recreational Lands Passes are sold, issued, and accepted. Interagency passes include a senior lifetime pass, senior annual pass, annual pass, military annual pass, access/disability pass, and 4th grade pass. The Refuge collects an average of $90,000 per year in recreational fees.

Entrance fees are collected by staff at the front desk and fee booth, or a self-pay iron ranger at the Visitor Center/Headquarters Office on Lee Road. Entrance fees are collected at Hillsboro on Loxahatchee Road at a staffed fee booth or self-pay iron ranger. Entrance fees are collected at 20-Mile Bend on Southern Boulevard by a self-pay iron ranger only. Interagency passes, annual Refuge specific pass, and duck stamps are issued at entrance fee booths and the Visitor Center.

Under this program (with the exception of revenues collected from Duck Stamps), 80 percent of revenues collected are returned to the Refuge for maintenance and further improvement of visitor-use facilities and programs.

The Refuge currently issues special use permits (SUP) for commercial fishing tournaments, commercial filming, commercial tours, and commercial environmental education tours. In 2017, there 14 private, commercial, or non-profit companies/organizations permitted to provide commercial programs on the Refuge.

Below is a list of current visitor services facilities as they apply to recreational fees:

- **Public Use Infrastructure**
  - Visitor Center.
  - Lee Road fee booth.
  - Hillsboro fee booth.
  - Lee Road iron ranger.
  - Hillsboro iron ranger.
  - 20-Mile Bend iron ranger.

- **Informational Resources**
  - Kiosks.
  - Signs.
  - Website.
Staff-based Services
• America the Beautiful - National Parks and Federal Recreational Lands Passes program.

STANDARD 11. GOALS, OBJECTIVES, AND STRATEGIES

VISITOR SERVICES PLAN GOAL 11
Institute an effective Recreation Fee Program under the guidance of the Federal Lands Recreation Fee Program or as mandated by Congress for sustaining resources for the operation and maintenance of recreation areas, visitor services improvements, including seasonal staffing, and habitat enhancement projects of Federal lands.

Visitor Services Plan Objective 11.1
Ensure all public use infrastructure, informational resources, and staff-based services support an effective Recreation Fee program.

Strategies

Public Use Infrastructure
• Maintain Visitor Center hours that offer ample opportunities to purchase Federal land passes.
• Maintain fee booths at Lee Road and Hillsboro.
• Maintain iron rangers at Lee Road, Hillsboro, and 20-Mile Bend.

Informational Resources
• Update and maintain accurate entry fee information on all informal contact points such as the website, publications, kiosks, and signage.

Staff-based Services
• Continue to sell Refuge and interagency passes.
• Train additional staff and volunteers on the America the Beautiful - National Parks and Federal Recreational Lands Passes Program administrative duties.
• Conduct annual refresher training for fee collectors.
• Continue outreach to provide 4th graders an “Every Kid in a Park” pass.

Additional Strategies
• Annually issue new/renewed commercial use SUPs in January for upcoming calendar year.
• Evaluate fees for commercial SUPs to determine if rates are appropriate based on new fee schedule.
• Conduct a coordination meeting with all interpretive guide SUP holders to ensure understanding of permit conditions and relay appropriate Refuge messages.

Proposed Program Changes
A reevaluation of the recreational fee program would be conducted in the future.

Refuge Daily Fees
• Would eliminate pedestrian and bike fee.

Refuge Annual Pass
• Would increase annual fee from $12 to $25 to match the Federal Duck Stamp.
Public Use Fees
- Introduce fees for camping ($10 per night), hunting ($25 per year), and airboats ($50 per year)

Monitor and evaluate
- Track fees collected and number of permits sold or issued.
- Conduct phone interviews with all commercial use special use permit holders to ensure understanding of permit conditions and relay appropriate Refuge messages.
- Collect monthly program numbers (# of programs, # of participants) and feedback from SUP holders.
- Track commercial activities on the Refuge.
- Incorporate public input from planning meetings and written input.
12: CONCESSIONS

Policy (50 CFR Part 25.61) and Director’s Order No. 139
Concession Contracts, discusses the Service’s current policy for concession management and provides guidance for permitting and administering concession operations on Service lands. We use concessions to assist us in providing wildlife-dependent recreation activities to the visiting public. The concessions are managed through contracts between the Service and a private entity, where the private entity is allowed to charge a fee for services provided at a field station to the visiting public (Appendix G).

Current Program Discussion

Currently there are no concession operations on the Refuge.

In April 1990, a concession operation at Hillsboro closed down due to the new underground fuel storage requirement by the Department of Transportation.

In 2005, a new concession contract was sent to 87 interested parties. Of the 87 individuals or companies interested in the concession, seven people attended the contract meeting but no one submitted a bid for the 2005 contract. The reason many of them gave for not submitting a proposal was the USFWS’s high level of expectation for the contract, particularly the building.

STANDARD 12. GOALS, OBJECTIVES, AND STRATEGIES

VISITOR SERVICES PLAN GOAL 12
Provide wildlife-dependent recreational activities to the visiting public through private entities by permit or contract.

Comprehensive Conservation Plan Objective 4
In cooperation with state and county natural resource agencies, develop a Contact Station and Interpretive Center at Hillsboro. Also, a limited concession contract will be awarded to expand appropriate and compatible wildlife-dependent recreational opportunities at Hillsboro.

Strategies

- An approved concessionaire is required to provide the following:
  - Rentals including watercraft, Jon boats, canoes, kayaks, associated boating and safety equipment, bicycles, binoculars, and fishing equipment;
  - Sales of fishing tackle, fishing equipment, licenses, fish bait, ponchos, recreational wearing apparel, books, souvenirs, beverages, and other merchandise deemed appropriate by the Refuge Manager;
  - Guided interpretive tours for the public utilizing a pontoon boat, canoes, and/or kayaks.
- Build a Visitor Contact Station at Hillsboro that would provide offices, public telephones, and restroom facilities. (INCOMPLETE, ONGOING)
- Efforts would be made to partner with the FWC, SFWMD, and local agencies to convey the value of the Everglades and major restoration efforts, contrast the unique differences between Water Conservation Areas 1, 2, and 3, and adjacent Wildlife Management Areas. (COMPLETE)
Proposed Program Changes

This proposal would allow concession operations at Loxahatchee Road with airboat tours (max capacity 6 people), rental of boats, bikes, fishing gear, guided tours by pontoon boat, boat shuttle from Loxahatchee Road to Lee Road, boat shuttle from Lee Road to Strazzulla, tram tours in the Impoundments, satellite operations at Lee Road and 20-Mile Bend, sale of food, fishing supplies, bait and other items, and visitor contact station with staff offices (Figure 14). Stipulations necessary:

- Concession users would follow the general regulations set forth for the general public.
- Concessionaire would provide personal flotation devices (PFDs) for participants.
- Absolutely no landing of recreational watercraft would be allowed on any Refuge tree islands. It shall be the responsibility of the concessionaire to ensure that the public is notified of, and (to the extent practicable) complies with this requirement.
- Any recreational activities, tours, and events that the concessionaire may propose to conduct or offer outside the normal hours of operation require the prior written approval of the Refuge Manager.
- Guided interpretive tours for the public in various locations within the Refuge, utilizing a pontoon boat, trams, airboats, canoes, and/or kayaks. The Refuge would approve tour routes.
- Tour and guide boat operators would use only designated boat landing sites. Airboat tours would be only on a designated route with six passengers or less.
- Rental boats would not operate at night or in dense fog conditions (1/4 mile visibility or less) when a visitor could easily become disoriented and unknowingly violate a posted closed area. However, through the use of a SUP, guided boat tours may be authorized to conduct nighttime operations. Regulations to ensure the safety of all participants would be included with permits or concession contracts; specific conditions that may apply to the requested activity would be addressed through the SUP or concession contract.
- Concessionaire would be required to educate watercraft renters about safe boating operations and the prohibition against disturbing wildlife and trespassing.
- Refuge visitor information services and products would emphasize the importance of staying on trails, public access areas, closed areas, along with providing “leave no trace” principles, practices and watercraft/biking tips.
- No physical items, including litter, would be placed or left on the Refuge.
- No items would be removed from the Refuge.
- All paddles would be of a neutral coloration so they do not disturb wildlife.
- All canoes/kayaks/boats would be well maintained and clean.
- Programs, tours, and events would be periodically attended/monitored by Refuge personnel for compliance to Refuge standards. The concessionaire shall provide space in tour vessels for monitoring personnel at no cost to the Government.

Monitor and evaluate

- Refuge staff will conduct periodic studies to determine human impact upon trust resources.
- Incorporate public input from planning meetings and written input.
13: COMMERCIAL RECREATIONAL USES

Policy (50 CFR 29.1; 50 CFR 27.97; 8 RM 16; 603 FW 1; 605 FW 5)
A commercial recreational use is a use that generates revenue or that results in a commodity which is or can be sold for income or revenue. Before considering compatibility, the use must be determined to contribute to the achievement of the refuge purpose or the mission of the Refuge System, as outlined in Title 50 Code of Federal Regulations, 29.1 (Appendix G).

To be allowed on a refuge, a commercial use must go beyond the “not materially interfere with…” requirement and must contribute to the achievement of the refuge purpose or mission of the Refuge System. The contribution must be clearly defined in the justification section of the compatibility determination for any commercial use.

Title 50, Code of Federal Regulations, 27.97, Private Operations, prohibits an unauthorized commercial enterprise on any national wildlife refuge. Thus, commercial tours are required to apply for a special use permit (SUP) from the Refuge Manager. By establishing a SUP system, the refuge staff is able to set sustainable limits on the number of permits issued.

In determining if a commercial recreational use is compatible, one way to connect it to the mission of the System is to determine if the commercial recreation use will facilitate one of the wildlife-dependent priority public use activities which are “directly related to the mission of the System.” (Refuge Improvement Act – 1997)

Current Program Discussion

The Refuge currently issues special use permits (SUP) for commercial fishing tournaments, commercial filming, commercial tours, and commercial environmental education tours.

In 2017, a total of 14 companies and/or organizations were issued SUPs to provide commercial programs on the Refuge. These are private, commercial, or non-profit organizations that maintain an SUP to conduct commercial activity on the Refuge. There is no limit as to the number of permits that are issued each year, but each proposal is reviewed for appropriateness and compatibility.

This standard covers all commercial SUP uses on this Refuge. Each SUP has its own compatibility determination that is readily available to be attached to each SUP. In addition, commercial filming permits also have an AV application that is attached to the permit. The Refuge follows 8 Refuge Manual 16 for Audio-Visual Production and Commercial Filming and 43 CFR Part 5.

STANDARD 13: GOALS, OBJECTIVES, AND STRATEGIES

VISITOR SERVICES PLAN GOAL 13
Institute an effective Commercial Recreational Use Program that contributes to the achievement of the Refuge purpose or the mission of the Refuge System.

Visitor Services Plan Objective 13.1
Ensure all public use infrastructure, informational resources, and staff-based services support an effective Commercial Recreational Use Program.
Strategies

Public Use Infrastructure
- Maintain Visitor Center hours that offer ample opportunities to inquire about commercial use opportunities, regulations, and the permit processes.

Informational Resources
- Maintain commercial recreational use program information on website.

Staff-based Services
- Train staff on commercial recreational use program administration.
- Annually issue new/renewed commercial SUPs in January for upcoming calendar year.

Additional Strategies
- Evaluate fees for commercial SUPs to determine if rates are appropriate based on new fee schedule.
- Review SUPs annually to ensure compliance and work with non-compliant permittees to resolve outstanding issues.

Proposed Program Changes

Commercial Uses
- Would expand by exploring partnerships for commercial guides to facilitate specialty hunts.
- Would expand by exploring partnerships for commercial guides to facilitate ecotourism.

Monitor and evaluate
- Conduct phone interviews with all commercial use SUP holders to ensure understanding of permit conditions and relay appropriate Refuge messages.
- Collect monthly program numbers (# of programs, # of participants) and feedback from SUP holders.
- Track commercial activities on the Refuge and when it is determined that the commercial use is not covered by special use permit switch permittee to a concession contract.
- Incorporate public input from planning meetings and written input.
14: WILDERNESS


The Wilderness Act of 1964 directs the Secretary of the Interior, within 10 years, to review every roadless area of 2,024 or more hectares (5,000 or more acres) and every roadless island (regardless of size) within national wildlife refuges and national parks, and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System by later special Acts of Congress. The Act provides criteria for determining suitability and contains provisions related to activities that can be undertaken on a designated area.

The Wilderness Act establishes additional purposes for the designated wilderness areas within refuges (50 CFR 29.12), which “shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for the future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.” Proposed wilderness areas are managed so as to protect their wilderness values pending action by Congress (Appendix G).

Current Program Discussion

Of the lands within the Refuge, 141,373 acres, or 97%, of the 145,188 acres are owned by the state of Florida. All Refuge acres are subject to intensive, on-going management. As a result, an area suitable for preservation under the Wilderness Act of 1964 has not been pursued since no Refuge lands conform to the criteria that would make them eligible for wilderness designation.
### III. Implementation Schedule

Table 6 allows the Refuge to view strategies as it relates to the project completion schedules during the life of the VSP.

**Table 6. Visitor Services Strategies Implementation Schedule.**

<table>
<thead>
<tr>
<th>PROJECTS</th>
<th>TIME FRAME FOR PROJECT COMPLETION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand refuge hours to be open 24 hours/day. (Lee Road/Headquarters/Visitor Center remains the same.)</td>
<td>X</td>
<td>Need 50CFR update.</td>
</tr>
<tr>
<td>Open entire Refuge to non-motorized and motorized access.</td>
<td>X</td>
<td>Need 50CFR update.</td>
</tr>
<tr>
<td>Expand access points on the perimeter levees and Strazzulla. Develop additional access points over the life of the plan.</td>
<td>X</td>
<td>Need MOUs with partners Need engineering design</td>
</tr>
<tr>
<td>Increase number of alligator quota permits.</td>
<td>X</td>
<td>Meet with FWC to determine quota.</td>
</tr>
<tr>
<td>Expand waterfowl hunt days and hours to match the state.</td>
<td>X</td>
<td>Need a 50CFR update.</td>
</tr>
<tr>
<td>Open perimeter canal to alligator hunting.</td>
<td>X</td>
<td>Need cumulative impacts study with FWC.</td>
</tr>
<tr>
<td>Opening refuge to deer hunting</td>
<td>X</td>
<td>Need a 50CFR update.</td>
</tr>
<tr>
<td>PROJECTS</td>
<td>TIME FRAME FOR PROJECT COMPLETION</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Construct two fishing piers with docks, one at Acme 1 and one at Loxahatchee Road.</td>
<td></td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Host additional youth and family fishing events.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Allow bowfishing, fish gigging, and frog gigging.</td>
<td>X</td>
<td>Need 50CFR update.</td>
</tr>
<tr>
<td>Raise height of observation tower at Lee Road boat ramp, keeping the structure ADA accessible.</td>
<td>X</td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Construct two observation towers at Strazzulla.</td>
<td>X</td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Construct one observation tower in the Cypress Swamp.</td>
<td></td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Construct a photo blind in Strazzulla.</td>
<td>X</td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Construct two boardwalks in Strazzulla and one boardwalk in the Cypress Swamp.</td>
<td>X</td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Evaluate conversion of impoundments from marsh to woody vegetation.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Construct teaching facility at Strazzulla.</td>
<td></td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Create a trail using the FP&amp;L right-of-way.</td>
<td>X</td>
<td>Pending funding.</td>
</tr>
</tbody>
</table>
## Strategies Implementation Schedule

<table>
<thead>
<tr>
<th>PROJECTS</th>
<th>TIME FRAME FOR PROJECT COMPLETION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expand hiking and biking opportunities from the S-362 pump station on the L-40 levee to the S-6 pump station on the L-7 levee.</td>
<td>2019: X</td>
<td>Pending completion of the STA-1W expansion in 2019.</td>
</tr>
<tr>
<td>Allow leashed pets.</td>
<td>2018: X</td>
<td></td>
</tr>
<tr>
<td>Allow ceremonies and instructor led small-group activities.</td>
<td>2019: X</td>
<td></td>
</tr>
<tr>
<td>Provide camping adjacent to the L-7 levee by permit.</td>
<td>2019: X</td>
<td>Pending funding and completion of STA-1W expansion.</td>
</tr>
<tr>
<td>Construct camping platforms in the Refuge Interior.</td>
<td>2019: X</td>
<td>Pending funding.</td>
</tr>
<tr>
<td>Establish a canoe trail on south end of Refuge.</td>
<td>2019: X</td>
<td></td>
</tr>
<tr>
<td>Allow limited provisional airboating by permit in a 13,900 acre portion of the motorized zone.</td>
<td>2019: X</td>
<td></td>
</tr>
<tr>
<td>Provide concession operation at the Loxahatchee Road Entrance</td>
<td>2019: X</td>
<td></td>
</tr>
<tr>
<td>PROJECTS</td>
<td>TIME FRAME FOR PROJECT COMPLETION</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>for canoe and kayak rental, john boat rental, bike rental, commercial hunting guides, fishing guides, bait, snacks, and drinks and guided tours for wildlife observation.</td>
<td>Day  Week  Annual  2018  2019  2020  2021  2022  2023  2024  2025  2026  2027  2028  2029  2030  2031</td>
<td></td>
</tr>
</tbody>
</table>
IV. Visitor Services Annual Work Plan

Table 7 allows the individuals within the visitor services program to see at a glance what the plans are for the year and associated deadlines for the task.

**Table 7. Visitor Services Annual Work Plan.**

<table>
<thead>
<tr>
<th>Category</th>
<th>Event</th>
<th>JAN</th>
<th>FEB</th>
<th>MAR</th>
<th>APR</th>
<th>MAY</th>
<th>JUN</th>
<th>JULY</th>
<th>AUG</th>
<th>SEPT</th>
<th>OCT</th>
<th>NOV</th>
<th>DEC</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Events</strong></td>
<td>Media Day</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>End of January</td>
</tr>
<tr>
<td></td>
<td>Everglades Day</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2nd Sat in February</td>
</tr>
<tr>
<td></td>
<td>International Migratory Bird Day</td>
<td>X</td>
<td></td>
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## Visitor Services Annual Work Plan - Fiscal Year 2018

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V. Visitor Services Annual Partnership Planning

Table 8 tracks the Refuge’s formal and informal partnerships.

Table 8. Visitor Services Annual Partnership Planning.

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<thead>
<tr>
<th>Name of Partnership</th>
<th>Type of Partnership (Academia, Non-profit, Agency, etc.)</th>
<th>Agreement Type (Grant, Challenge Cost Share, Cooperative, MOU, Donation, Programmatic, etc.)</th>
<th>Partnership’s Goal for Refuge</th>
<th>Type of Contribution</th>
<th>Time Frame of Project</th>
<th>Comments</th>
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<tr>
<td>Friends of Arthur R. Marshall Loxahatchee National Wildlife Refuge</td>
<td>Non-profit environmental organization - profit</td>
<td>MOU, Friends Partnership Agreement</td>
<td>Support opportunities for environmental education and outreach</td>
<td>Advocacy, outreach, general volunteerism</td>
<td>As needed, bus funding</td>
<td>Ongoing Part of Everglades Coalition, founding partner of Everglades Day</td>
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<td>State agency</td>
<td>License Agreement, MOU</td>
<td>Regulation, research collaboration</td>
<td>Expertise, knowledge, invasive species management</td>
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<td>Ongoing Ongoing support for regulation, Refuge projects and initiatives</td>
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<td>MOU</td>
<td>Hunting, fishing, law enforcement, regulation, research collaboration</td>
<td>Expertise, knowledge, law enforcement</td>
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<td>Name of Partnership</td>
<td>Type of Partnership (Academia, Non-profit, Agency, etc.)</td>
<td>Agreement Type (Grant, Challenge Cost Share, Cooperative, MOU, Donation, Programmatic, etc.)</td>
<td>Partnership's Goal for Refuge</td>
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<td>Assists with Everglades Day and other fishing events</td>
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</table>
Section B. Environmental Assessment

Environmental Assessment

DRAFT

Visitor Services Plan

For

ARTHUR R. MARSHALL LOXAHATCHEE
NATIONAL WILDLIFE REFUGE
PALM BEACH COUNTY, FLORIDA
CHAPTER 1 PURPOSE AND NEED

1.1 Introduction
This Environmental Assessment (EA) is being prepared to evaluate the effects associated with the proposed action to develop a Visitor Services Plan (VSP) that outlines the future management of compatible outdoor recreation opportunities for the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) and complies with the National Environmental Policy Act (NEPA) in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1509) and Department of the Interior (43 CFR 46; 516 DM 8) and USFWS (550 FW 3) regulations and policies. NEPA requires examination of the effects of proposed actions on the natural and human environment.

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (Improvement Act) (16 U.S.C. § 668dd et seq.) provides authority for the U.S. Fish and Wildlife Service (USFWS) to manage national wildlife refuges across the country. In accordance with the Act, refuges will be managed to fulfill the mission of the National Wildlife Refuge System (NWRS); fulfill the individual purpose of each refuge; and maintain the biological integrity, diversity, and environmental health of the natural system.

While wildlife is first priority in refuge management, wildlife-dependent recreational uses or other uses may be allowed after they have been determined appropriate and compatible by the Refuge Manager or Project Leader. There are six priority wildlife-dependent public uses identified in the Improvement Act: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. These six uses, called the "Big Six", are dependent upon healthy fish and wildlife populations, and are to receive enhanced consideration over other public uses in planning and management.

The Refuge was established in 1951 under the authority of the Migratory Bird Conservation Act of 1929 and a 50-year license agreement between the State of Florida and the USFWS. When the Refuge was established, it was known as the Loxahatchee National Wildlife Refuge. In 1986, the Refuge was renamed the Arthur R. Marshall Loxahatchee National Wildlife Refuge to honor former USFWS employee and noted South Florida conservationist, Arthur Raymond Marshall. The Refuge encompasses Water Conservation Area (WCA)-1, which is referred to as the 'Refuge Interior.' WCA-1 is owned by the SFWMD, but managed by the USFWS under the license agreement as a National Wildlife Refuge. In 2002, the initial license agreement was revised and renewed for an additional 50 years. On February 26, 2018, the USFWS and SFWMD entered into a renegotiated 20-year license agreement.

The current acreage of the Refuge Interior is approximately 141,374 acres. In addition to the licensed lands, the USFWS owns 3,815 acres in fee title to the east of the Refuge Interior. This acreage is sub-divided into three management impoundments, the A, B, and C Impoundments, a 400-acre cypress swamp, and the recently acquired 2,586-acre Strazzulla tract. In total, the Refuge currently includes 145,188 acres.

According to the Fish and Wildlife Coordination Act, this Refuge “…shall be administered by him (Secretary of the Interior) directly or in accordance with cooperative agreements…"
accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon...." (16 USC § 664).

The Migratory Bird Conservation Act of 1929 states that the Refuge is to be “....for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 USC. § 715d).

This purpose and the mission of the National Wildlife Refuge System is fundamental to determining the compatibility of proposed uses of the Refuge.

The mission of the NWRS, as outlined by the National Wildlife Refuge System Administration Act (NWRSAA), as amended by the Improvement Act (16 U.S.C. 668dd et seq.), is to:

“... to administer a national network of lands and waters for the conservation, management and, where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans”

1.2 Purpose and Need
NEPA (1970) is an environmental law that promotes the enhancement of the environment. NEPA requires that all executive federal agencies analyze the potential environmental effects of proposed actions through planning documents such as EAs.

This EA evaluates proposed uses while also meeting the mission of the NWRS, the purposes of the Refuge, the vision and goals identified in the Comprehensive Conservation Plan (CCP), other mandates, and special designations of the Refuge and/or affecting the Refuge.

The purpose of developing the draft VSP/EA is to ensure that only appropriate and compatible uses occur on the Refuge in compliance with the outlined stipulations in order to ensure that impacts of the proposed uses are minimized, that the proposed uses do not detract from or materially interfere with the purposes of the Refuge, and that the proposed uses contribute to these purposes and the mission of the NWRS, while also ensuring that the Refuge serves as an inviolate sanctuary for migratory birds; protects a variety of habitats to support native biodiversity; sustains an abundance of waterfowl and other migratory birds; conserves rare, threatened, endangered, and other imperiled species; controls and eliminates exotic, invasive, and nuisance species; provides opportunities for enjoyment of appropriate and compatible, wildlife-dependent recreation; promotes awareness and appreciation of natural resources; promotes support for refuge management activities; coordinates with a wide variety of governmental and non-governmental partners; protects outstanding natural, scenic, and ecologic values; and provides for appropriate and compatible scientific research.

This EA addresses the need to develop a step down plan that would revise and amend the visitor services component of the 2000 CCP for the Refuge, revise and amend the Refuge’s hunt (2012) and fishing (2014) plans, and evaluating the recommendations set forth in the 20-year license agreement with SFWMD.

The NWRSAA mandates the Secretary of the Interior in administering the National Wildlife Refuge System to (16 U.S.C. 668dd(a)(4)):

• Provide for the conservation of fish, wildlife, and plants, and their habitats within the NWRS;
• Ensure that the biological integrity, diversity, and environmental health of the NWRS are maintained for the benefit of present and future generations of Americans;
• Ensure that the mission of the NWRS described at 16 U.S.C. 668dd(a)(2) and the purposes of each refuge are carried out;
• Ensure effective coordination, interaction, and cooperation with owners of land adjoining refuges and the fish and wildlife agency of the States in which the units of the NWRS are located;
• Assist in the maintenance of adequate water quantity and water quality to fulfill the mission of the NWRS and the purposes of each refuge;
• Recognize compatible wildlife-dependent recreational uses as the priority general public uses of the NWRS through which the American public can develop an appreciation for fish and wildlife;
• Ensure that opportunities are provided within the NWRS for compatible wildlife-dependent recreational uses; and
• Monitor the status and trends of fish, wildlife, and plants in each refuge.

There are a number of situations where future Refuge closures or restrictions may be warranted. Examples of these situations include, but are not limited to, specific designated use areas; the protection of endangered species (flora or fauna); protection of colonial bird nesting colonies or roost sites; management activities including invasive/exotic species removal or prescribed fire; restriction of hunting to certain days of the week; closing a hunt season due to population decline or high water events; establishment of hunter quota systems to provide for public safety and a high quality hunting experience or to achieve specific wildlife population objectives; minimizing conflicts with other Refuge management or public use programs; and/or inadequate funds or staff to administer the activities.

1.3 Public Participation
In accordance with USFWS guidelines and NEPA recommendations, public involvement has been a crucial factor throughout the development of this EA. This EA has been written with input and assistance from Federal, State, and local agencies, non-government organizations, and interested citizens. The participation of these stakeholders and their ideas has been of great value in setting the public use management direction for the Refuge. The USFWS, as a whole, and the Refuge’s staff, in particular, are very grateful to each one who has contributed time, expertise, and ideas to the planning process.

The Refuge announced its intent to draft a Visitor Services Plan April 10, 2018. Additionally, two public meetings were held to engage stakeholders. The first public meeting was held on May 19, 2018 at the Palm Beach County Extension Office with 69 attendees and the second meeting was held on May 22, 2018 at the South County Civic Center with 107 attendees. A news release was widely distributed announcing public scoping meetings. Meetings were also advertised on the Refuge’s website and Facebook page, the Friends of Loxahatchee Facebook page, in the Refuge Visitor Center, the SFWMD website, as well as in Boca Magazine, Sun Sentinel, Tucson News, and WPTV. The comment period for the Draft EA ran from April 10, 2018 through August 3, 2018. The Draft EA will be made available for public review and comment on the Refuge’s website and a hardcopy will be located at the front desk in the Visitor Center.
CHAPTER 2   Proposed Action and Alternatives

2.1 Alternative A: No Action – Current Visitor Services
NEPA requires an EA to consider the “No Action” alternative, where current conditions and trends are projected into the future without another proposed action (40 CFR 1502.14(d)). Under Alternative A (No Action), the Refuge would continue to implement the visitor services program outlined in the Draft VSP, the CCP (2000), the Refuge’s Hunting Plan (2012) and the Refuge’s Fishing Plan (2014), hereby incorporated by reference.

2.2 Alternative B: Expanded Public Use (Proposed Action)
The proposed action is to develop a VSP that outlines future management of public outdoor recreational opportunities on the Refuge. The proposed action would address new and expanded uses on the Refuge, would update and amend the public use section of the CCP (2000), the Hunting Plan (2012) and the Fishing Plan (2014) for the Refuge.

Proposed actions are often iterative and evolve during the planning process as the agency refines its proposal and receives input from the public, Tribes, and other agencies. Therefore, the final proposed action may be different from the original. The final decision on the proposed action would be made at the conclusion of the public comment period for the EA.

For the purpose of this EA, the Refuge is proposing the following public use opportunities in line with the draft Visitor Services Plan Standards:

Welcome and Orient
The Refuge would expand opportunities to welcome and orient visitors to the Refuge including opening portions of the Refuge to 24 hours/day use, updating and replacing informational kiosks and publications, increasing entry points to the Refuge, and opening the entire Refuge for limited access.

Hunting
All portions of the Refuge, with the exception of the B and C Impoundments, are being proposed for some form of hunting. These areas include the 141,374 acres of the Refuge Interior and perimeter canals, the 2,586 acres of Strazzulla, and the 750 acres of the Cypress Swamp and A Impoundments.

Migratory Bird Hunting: Migratory bird hunting is being proposed for expansion from the area previously known as the “Hunt Zone” to the entire Refuge Interior including the “Motorized and Non-motorized Zones”. This does not include the perimeter canal or areas east of the L-40 levee including A, B, and C Impoundments and Strazzulla. Migratory birds permitted to hunt on the Refuge will include duck, coot, moorhen, snipe, and rail. Duck season generally begins with an early teal season in September and regular seasons consisting of Phase I and Phase II from November through January with breaks in between. The Youth Waterfowl Hunt is generally held the first weekend each February. Duck hunting on the Refuge will now coincide with the State of Florida hunt days and times; 7 days a week with legal shooting hours of one-half hour before sunrise until sunset. The Refuge will now be open Christmas day as well. Hunt days and hours are subject to change and may be further restricted for management purposes. In addition to duck harvest, the following species may be harvested (if in season) as incidental take while duck hunting: coot, moorhen, rail, and snipe.
**Alligator Hunting:** Alligator hunting is being proposed for expansion from the area previously known as the “Hunt Zone” to the area now designated as the “Motorized Zone”, including the entire perimeter canal. Alligator hunting on the Refuge will be concurrent with the state season. Hunting is permitted the first two weekends during Harvest Period 1 and the first two weekends during Harvest Period 2. Following the close of Harvest Period 2, the remaining weekends in October will be open for alligator harvest permittees that possess unused CITES tags. Specific dates for the alligator hunt will be provided on the harvest permit. Hunt days and hours may be further restricted on the Refuge and are subject to change for management purposes. See 50 CFR §32.28(B) for current regulations.

**White-Tailed Deer/Feral Hog Hunting:** White-tailed deer hunting with incidental take of feral hog is being proposed in Strazzulla and the Refuge Interior. The portion containing the levee running north-south between the Cypress Swamp and A Impoundments and a portion of the access road leading to the Tower in Strazzulla is being proposed for specialty hunts only (i.e. mobility impaired, wounded warrior, etc.). White-tailed deer may be hunted on the Refuge during the approved deer hunt seasons. Feral hog hunting would be approved for incidental take during deer hunts. In particular, it is neither the goal nor intent of the USFWS to manage feral hogs as a huntable game species. The Refuge falls within Florida’s Deer Management Unit (DMU) A1, whose season generally runs from August through November depending on the method of take. However, white-tailed deer hunts on the Refuge will be more restrictive. Available hunt days may range from zero to 16 days and begin with two 3-day hunts spread across the season. The Refuge would allow a minimum of two (2) weekends total per season, not to exceed the dates and times allowed by the FWC for DMU A1. One weekend may take place early in the hunt season (Archery Season), and one weekend may take place during the latter half of the season (General Season). All hunts and quotas are subject to change depending on wildlife species population survey results, hunter success rates, environmental conditions, conflicting management activities (prescribed burns, low water levels, exotic plant removal, etc.), and/or staffing. Maintaining flexibility allows the Refuge to provide a hunt. Annual hunt dates will become available through the FWC’s Limited Entry/Quota Hunt Program and/or on the Refuge’s website depending on the species. A 300-foot buffer around private lands for any hunting in Strazzulla would be imposed.

**Fishing**
Potential fishing opportunities would be expanded to include frog gigging, bowfishing, and fish gigging. This activity would be allowed anywhere fishing is currently allowed except for Strazzulla and the A, B, and C Impoundments. There would be a 50-frog limit per boat or party per day. Frog gigging, bowfishing, and fish gigging would not be allowed from structures. The Refuge is also proposing to add more youth fishing events. Facilities would be increased by the addition of two fishing piers with a dock at ACME 1 and Loxahatchee Road. These facilities would have to be constructed as funding becomes available.

**Wildlife Observation and Photography**
The perimeter canal (L-40) that borders Strazzulla and the Refuge Interior offers wildlife viewing and photographic opportunities for a variety of wading birds, waterfowl, hawks, alligators, and other wildlife. Furthermore, the levee adjacent to the L-40 canal offers one of the highest vistas enabling observation of the unique Everglades habitats. The levee allows opportunities for wildlife observation while limiting the impact or disturbance from human use. Wildlife observation and photography would be enhanced with the addition of two observation towers, one photo blind and one new boardwalk in Strazzulla. The Refuge is proposing one observation
tower and boardwalk to be constructed in the Cypress Swamp. We are also proposing that the observation tower at Lee Road be elevated for visitors to better observe the Everglades. All construction of new infrastructure would be done as funding becomes available. All new visitor facilities would be designed to comply with Americans with Disabilities Act (ADA) standards. The Refuge is evaluating the installation of web cams for nesting birds and other wildlife on the Refuge.

Environmental Education and Interpretation
Environmental education and interpretation programs would be enhanced as budgets allow. There would be a proposed indoor educational facility near Strazzulla in Heritage Farms.

Other Recreational Uses
Other recreation uses are further analyzed in Appendix C-Appropriate Use (FOA) and Appendix D-Compatibility Determination (CD). Other recreational uses proposed in this alternative include:

Trails: Alternative B proposes to route a trail from Lee Road north up the FP&L right-of-way west on an unimproved levee and then through the cypress swamp connecting to the A impoundment trail. Also proposed is expanding hiking and biking opportunities from the S-362 pump station on the L-40 levee to the S-6 pump station on the L-7 levee which would add an additional 18-20 miles.

Camping: A limited, permitted, fee-based, overnight backcountry camping opportunity is proposed to facilitate wildlife-dependent priority public uses including wildlife observation and photography. Campsites on the L-7 would accommodate no more than 20 persons with hiking and bicycle access only. Two camping platforms would be constructed along the southern canoe trail, which would be accessed by motorized or non-motorized watercraft. No restrooms, tables, garbage disposal, or other amenities would be provided and all trash and waste would need to be packed out.

Horseback Riding: Horseback riding would be allowed on over 58 miles of perimeter levees (L-39, L-40, L-7) that surround the Refuge Interior and the Northern boundary of Strazzulla. Manure containment bags would be required.

Non-motorized watercraft: The Refuge currently allows non-motorized watercraft in approximately 37,000 acres of the Refuge Interior and all interior perimeter canals. Alternative B is proposing to open the entire 141,374 acres of the Refuge Interior for non-motorized access except in Strazzulla and the A, B, and C Impoundments. Non-motorized watercraft includes but is not limited to kayaks, canoes, paddleboards, rowboats, and pedal boats.

Motorized watercraft: Limited airboating by permit would be allowed in a 13,900-acre portion of the new motorized zone. There would be a limited quota of 0 to 20 boats per year, annual boat permit, lottery once a year, mandatory airboat orientation and workshop, and water level restrictions, Monitor and re-evaluate in 3 to 5 years. Supports all of the Big 6. The use of non-hunting airboating outside of the hunting season will only be permitted on weekends (Friday, Saturday, and Sunday) from July-November except during waterfowl hunting dates. Non-hunting airboating restricted during waterfowl season.

Pets on leash: Pets on leash would be allowed in all areas open to general public use on the Refuge except inside the Visitor Center, on boardwalks, in observation towers, photo blinds,
camping sites, and other confined structures. Leashes would be no longer than six feet in length. This proposal does not impose restrictions on Service Animals.

*Ceremonies (non-Refuge sponsored):* Ceremonies would be allowed by permit only and may include, but are not limited to weddings, religious ceremonies, memorial services, or charitable organization activities. SUPs would be issued to provide specific stipulations needed to avoid exceeding maximum capacity of locations or disturbance to wildlife or other priority public uses.

*Instructor-led small group activities:* Instructor-led small group activities would be proposed on the Refuge and may include, but are not limited to yoga, martial arts, aerobics, artistry, astronomy, or natural areas-related instruction on various topics (i.e. edible plants). These would be evaluated on a case-by-case basis and must be pre-approved by the Refuge Manager.

**Outreach**
Alternative B proposes to expand outreach through additional planning meetings including annual meetings with stakeholders, government agencies, and city councils. An outreach plan would be developed to articulate communication strategies and schedules. The Refuge would work to expand relationships with local leaders and the media. All outreach information such as brochures, tear sheets, and websites would be updated and expanded to provide information on the Refuge through an SUP.

**Volunteers, Friends, and Partnerships**
The Refuge proposes to develop new strategies to recruit volunteers as well as support and expand the Friends group and other partnerships.

**Recreation Fees**
Alternative B proposes to eliminate pedestrian and bicycle fee but increase the cost of the Refuge annual pass to match the Federal Duck Stamp ($25). Fees for consideration include camping ($10 per night), hunting ($25 per year), and airboats ($50 per year). A recreation fee package would be developed in a separate planning process in the near future.

**Concessions**
The Refuge proposes a concession with airboat tours (maximum capacity 6 passengers) at Loxahatchee Road. This concession may include rental of boats, bikes, fishing gear, fishing guides, guided tours by pontoon boat, boat shuttle from Loxahatchee Road to Lee Road, boat shuttle from Lee Road to Strazzulla, and tram tours in the Impoundments. Satellite operations may be located at Lee Road, the ACME pump station, and 20 Mile Bend. Sale of food, fishing supplies, bait, and other items would be discussed.

**Commercial Use**
Alternative B proposes to explore partnerships for commercial guides to facilitate specialty hunts.
2.3 Alternatives or actions considered, but eliminated from further study.

Waterfowl hunting from the canal:
The Improvement Act identified hunting as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in planning and management. The USFWS attempts to provide opportunities for this use in the NWRS where compatible. Although hunting has been deemed compatible on the Refuge, it has been determined that hunting migratory birds from the canal would materially interfere with or detract from the purpose for which the Refuge was established and is not consistent with goals and objectives stated in the Refuge’s CCP or Hunt Plan. Goal 3, Objective 5 of the CCP states, “The Refuge will provide appropriate, compatible, wildlife-dependent fishing and hunting opportunities. The waterfowl hunt area would be modified to create easier access and to include better habitat. Create access trails into the waterfowl hunt area from the east and southeast perimeter canal (depending on water quality improvement in the perimeter canal).” Including the perimeter canal in the hunt area would not be providing better habitat for a more successful hunt as much of the habitat found along the perimeter of the interior is reduced in value and less habitable to wildlife, as sawgrass marsh and wet prairies have been replaced by dense cattail and willow. Additionally, the overall goal of the Refuge’s 2012 Hunt Plan is to, “develop and conduct a quality and biologically sound program that: 1) leads to enjoyable recreation experiences; 2) leads to greater understanding and appreciation of wildlife resources; and 3) aids in the conservation of wildlife populations and their habitats. Due to the mostly impenetrable vegetation between the canal and the interior marsh, waterfowl that is dispatched over the marsh interior has a higher probability of not being able to be retrieved by hunters or retriever dogs. Increased probability of “lost” waterfowl encourages illegal actions such as wanton waste (50 CFR 20.25) and bag limit infractions (50 CFR 20.24) which does not aid in “the conservation of wildlife populations”. These incidents can also lead to an unenjoyable, low quality hunt to responsible, ethical hunters.

Small game hunting:
A small game hunt that would include bobcats, otters, squirrels, rabbits, raccoons, opossums, etc. (all State listed small game species) was evaluated. After direct and cumulative impacts were considered this use was not considered implementable. A primary reason for deciding not to include this proposed hunt was concern about cumulative impacts from the hunt and expansion of python populations into the Refuge. Pythons are known to commonly prey on many of the same species that would be targeted by a small game/furbearer hunt. In areas where pythons are more densely populated, mammals such as bobcats and raccoons have seen precipitous declines in population numbers (Dorcas et al. 2012; Mccleery et al. 2015) and similar impacts are expected in all areas that pythons expand to, including the Refuge. Although the status of pythons in the Refuge is not well characterized, data suggests small mammal numbers are already in decline on the perimeter levees (Mazzotti, unpubl data), which could be a current impact from pythons considering their close proximity and low detection rates. Hunting season for small game generally takes place from December through February or March, although squirrel season starts in October and rabbit hunting is allowed year-round. Although there is little overlap with other hunting seasons (with the exception of rabbit hunting), these dates coincide with the period of highest visitation to the Refuge and may create additional user conflicts. In addition to the bald eagle and endangered snail kite, many wading birds nest during the same period as a potential hunt. Wading birds form nesting colonies on tree islands and visitor observation was found to have no impact on the activity of heron colonies when a buffer of 50 m was effectively implemented. However, nest mortality rates of 15 – 28% were reported when the colony was entered (Burger et al. 1995). Erwin (1989) found that
a mixed colony of ibis and small herons flushed when approached at an average distance between 30 – 50 m. Rodgers and Smith (1997) recommended buffers of over 100 m for large herons, egrets, and cormorants. These and other study results suggest that activity, such as hunting, on tree islands with active wading bird colonies would be a disturbance that could result in a decrease in successful reproduction.

Lygodium is typically associated with flooded and/or disturbed swamps (Naumen and Austin 1978) but in areas like the Refuge, disturbance is not necessary for establishment (Ferriter et al. 2001). Lygodium spores are highly mobile and have been shown to be easily transported through the air (Volin 2006) as well as on the clothing and equipment of people that come into contact with the plant (Hutchinson and Langeland 2006). Cutting trails is often necessary to access the interior of tree islands, which creates disturbances that can further facilitate the spread of Lygodium. Therefore, additional traffic on tree islands would likely add to the spread of Lygodium, undermining control efforts.

Control of invasive species and tree island conservation are two major goals of the Refuge and a hunt could negatively affect both. For these reasons, consideration of a small mammal hunt on the Refuge was rejected.

State law prohibits hunting from levees, which contain the greatest opportunity for small game hunting on the Refuge.

2.4 Adaptive Management


The guidebook provides the following definition for adaptive management: Adaptive management is a decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. It is not a ‘trial and error’ process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social and economic goals, increases scientific knowledge, and reduces tensions among stakeholders. This definition gives special emphasis to the uncertainty about management impacts, iterative learning to reduce uncertainty, and improved management as a result of continuous learning. This approach recognized that we can never achieve perfect understanding of the natural world and that we must implement management in
the face of uncertainty. At the refuge level, adaptive management is an integral part of
management planning, research design, and monitoring. Uncertainties about ecological
systems are addressed through targeted monitoring of resource response to management
actions and predictive models that mimic the function of the natural world.
CHAPTER 3 AFFECTED ENVIRONMENT

This chapter describes a summary of the environmental conditions of the lands being proposed for public use recreational opportunities on the Refuge.

Ecosystem Context
The Refuge is located within the Peninsular Florida Landscape Conservation Cooperative. The Peninsular Florida area is unique and complex, connecting subtropical and temperate climate zones, and featuring a mosaic of more than 40 habitat types.

The ecology of the Refuge is largely influenced by water quality and hydrology, which was historically rainfall-driven. Now, the Refuge is surrounded by a perimeter canal that stores and transports urban and agricultural runoff. Canal water is known to be high in nutrients and other contaminants that can have deleterious impacts on the ecology of the Refuge. Under certain conditions, canal water can move into the interior marsh, degrade soil and water quality, and ultimately alter vegetation communities that comprise the foundation of Refuge habitats (McCormick et al. 2009, Curtis et al. 1997). As a result, there is a gradient of impact that is roughly correlated with distance from canal. Because of a north to south elevation gradient, water tends to pond in the southern portion of the Refuge, while the northern areas experience shortened hydroperiods (Surratt et al. 2008). As a result of the water quality gradient, hydrologic dynamics and subsequent impacts, all areas of the Refuge do not have the same ecological value. The Refuge can generally be divided into three zones of ecological value based on total levels of impact. Levels of impact generally decrease with distance from perimeter canals, while ecological value generally increases. The three zones are characterized as having Low Ecological Value, High Ecological Value, or Highest Ecological Value and represent increasing distances from the canal, respectively.

Highest Ecological Value. Approximately 81,000 acres (~57% of Refuge Interior marsh) is the least impacted and most representative of the historic northern Everglades. This area has the highest ecological and conservation value because it includes the greatest extent of the most intact habitat (tree islands, vegetation communities, water quality, hydrology) in the Refuge. This area serves as sanctuary to trust species such as migratory birds (as per the USFWS mission and Refuge purpose), as evidenced by the numerous monitored (Figure 3) and unmonitored wading bird colonies, which frequently change location from year to year and can range in size from 10s to 1000s of birds. The northernmost portion is of regional importance as pre-breeding foraging habitat for wading birds. The Highest Ecological Value area also provides suitable habitat for snail kites, although the extent of use of this area by snail kites is not well known due to the limited area covered during regional surveys and typical low detection rates of nests.

Additional considerations include bald eagle nesting in recent years and habitat suitability and known populations of other marsh birds such as rails, bitterns, and waterfowl. Alligator nesting and muskrat lodges are also common in this area, as well as white-tailed deer and marsh rabbit sightings. This area also contains many past and currently active research sites. This area can be particularly difficult to navigate due to highly variable seasonal water levels, dense vegetation, and a high density of tree islands.

High Ecological Value. This portion of the Refuge is ~42,000 acres (~30% of Refuge Interior marsh) and is characterized by elevated nutrients and minerals compared to the most interior marsh, however is still ecologically valuable for the habitat and resources provided to wildlife.
This area supports snail kite nesting and wading bird nesting colonies similar to the Highest Ecological Value area, but does not have the density of tree islands or provide the same amount of high quality habitat as the interior-most area. This area also supports some active research sites, and due to fewer tree islands and less variation in water levels, this area is more consistently and easily accessible than the most interior area.

Low Ecological Value. Approximately 18,000 acres (~12% of Refuge Interior marsh) are characterized as having low ecological value. This area consists primarily of the fringe of willow, cattail, and phragmites that is generally found along the canal-marsh interface and is considered to be the most impacted area. This area encompasses the flooded, southern-most area that has largely transformed into open water or cattail habitat due to increased hydroperiods and water depths. While some wildlife can be found in this area, particularly during dry periods, nesting wading birds are the most frequent users of this area.

Physical Resources

The Refuge is located on the east coast of Florida and is bordered on the west by the EAA and on the east by extensive urban development leading to the Atlantic Ocean.

Air Quality
Air quality is not perceived to be as critical a concern as water quality. However, research shows that some of the mercury in the Everglades, generated from incinerators or power plants, is transported to the Everglades ecosystem atmospherically.

Physiography, Soils, and Geology
The Refuge is 145,188 acres of Everglades habitat and is part of a series of large fresh water storage areas connected by canals and levees, which were completed by the U.S. Army Corps of Engineers in 1960. The underlying aquifer provides water for nearby coastal communities.

Underlying the Refuge is a depression in the Fort Thompson Formation, a limestone bedrock, which results in greater water depth than the surrounding Everglades. Unlike other areas of the Everglades, where there are only shallow layers of soil overlying the bedrock, soil depths in the Refuge range from 3.6-14.0 feet (Silveria 1996). The soil is primarily Loxahatchee Peat, which forms from the roots, rootlets, and rhizomes of white water lily, and is an indication of a historic slough community. The peat is lightly colored, fibrous and spongy, reflective of high organic content. The low ash content of the soil is an indication of infrequent burns in the area.

Loxahatchee Peat is found only in three areas in the Everglades — the Refuge, WCA-2, and in the western portions of WCA-3/Shark Slough. Loxahatchee Peat is slightly more acidic and has lower mineral content than other peats. The oldest peat on the Refuge has been dated at 4,800 years. Everglades Peat (formed primarily from sawgrass) and Gandy Peat (formed from woody material, especially associated with tree islands) are also present on the Refuge.

The Refuge is on a gradual north to south slope which results in slowly moving surface water sheet flow. The topography undulates throughout the Refuge, creating mounds and depressions that are covered by varying depths of water. In addition, the Refuge contains thousands of tree islands many of which formed when a layer of peat dislodged from the substrate and floated to the surface. During periods of low water, such tree islands become rooted to the substrate. Plant succession occurs rapidly, and within about three years, woody vegetation is established.
Hydrology
Water flowing from the Everglades is vital to supplying surface water for South Florida, replenishing the Florida and Biscayne aquifers, carrying essential nutrients and clean, fresh water to estuaries, and supporting an extremely rich and diverse assemblage of wildlife and plants. Changes in the hydroperiods (the duration that an area is inundated) and hydropatterns (the depth, timing, flow, and location of surface water) have altered these vital wetland functions in the South Florida ecosystem.

Water Quality
Due to human activities during the last century, nutrients and toxic substances are ubiquitous and an ever-increasing problem in the South Florida environment. Nutrients and toxic substances from urban and agricultural lands have degraded the relatively pristine lakes, streams, estuaries, and bays of the region (McPherson and Halley 1997).

Biological Resources

Habitat
The Refuge provides a variety of habitat types including sloughs, wet prairies, sawgrass, tree islands, and cypress swamp. Sloughs are the deepest natural marsh communities in the Everglades and the underlying sediment layer is composed of peat soils. During the rainy season, water depth in sloughs may exceed three feet with an annual average depth of approximately one foot. The sloughs support numerous fish species, aquatic invertebrates, and other wildlife. Wet prairies are shallower than sloughs and characterized by short emergent plants. Wet prairies are the most prevalent vegetative community (approximately 50% land coverage) in most of the central and eastern portions of the Refuge and are generally found between sawgrass marshes and sloughs. This important vegetative community provides prey for wading birds and the endangered Everglade snail kite in the form of fish, aquatic invertebrates, and apple snails. Sawgrass communities (approximately 25% land cover) are characterized by the saw-edged sedge that dominates this type of habitat. Sawgrass areas often border tree islands, separating them from wet prairies. The Refuge is characterized by thousands of tree islands that range from less than one acre to more than 300 acres. Approximately 20% of the Refuge Interior is comprised of tree islands. Tree islands in the Refuge form when submerged peat patches rise to the surface of the water and plants become established on "pop-up tree islands" or when sawgrass ridges are invaded by shrubs ultimately leading to the formation of strand tree islands. A 400-acre cypress swamp community is located on the eastern edge of the Refuge. This cypress swamp is the largest remaining remnant of a cypress community on the east side of the Everglades that once stretched from the southeast corner of Lake Okeechobee to Ft. Lauderdale.

Wildlife
The Refuge provides important feeding, roosting, and nesting habitats for many species of birds, mammals, reptiles, amphibians, and fish. In a given year, as many as 257 species of birds may use the diverse habitats found on the Refuge. Of those, approximately 93 species are considered to be common or abundant during certain seasons.

Over 40 species of fish, 23 species of mammals, 10 species of turtles, 8 species of lizards, and 24 species of snakes have been documented on the Refuge. Alligators are considered keystone species in the Everglades ecosystem because of their critical role in creating dry season refugia for the aquatic organisms that make up the prey base.
At least 63 plant or animal species listed by the State or Federal government as endangered, threatened, or species of special concern are known to occur on the Refuge, either currently or historically. These species include, but are not limited to: the wood stork (*Mycteria americana*), Everglade snail kite (*Rostrhamus sociabilis*), bald eagle (*Haliaeetus leucocephalus*), Florida sandhill crane (*Grus canadensis pratensis*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), and roseate spoonbill (*Ajaia ajaia*) (USFWS 2000).

**Cultural Resources**

By the time European explorers stepped foot on the Florida peninsula, there were five tribal groups associated with the east coast of Florida. These groups were the Timucua to the North, the Ais, the Guacata, the Jeaga, and the Tequesta to the south. All tribes were known to collect shellfish and other marine and aquatic resources, which resulted in large shell and bone middens near the villages (Andrews and Andrews 1985). There is evidence that these middens/mounds were used as safe-havens of dry land when coastal flooding occurred (Andrews and Andrews 1985).

Tribal groups most associated with the Refuge area were the Guacata, the Jeaga and the Tequesta (Griffin et al. 1979). It appears that the Guacata occupied a territory in a band north of the Refuge which included the eastern shore of Lake Okeechobee and the coast near St. Lucie. Other groups such as the Jeaga and perhaps even the Tequesta would be located south of what is now the Refuge.

By the 1800s, Native Americans from Georgia, Alabama, and South Carolina began filtering down into the Florida peninsula. These people became more cohesive through time as they fought together against the encroaching Europeans in the Second Seminole War of 1835-1842 (Neill 1956). The war's end could be nothing but a loss for the Seminoles as they were forcibly moved west. Those that chose to remain made their way into the Everglades inhabiting a land that the newer Americans did not seem to want (Griffin et al., 1979).

With improved transportation, more settlers began to move into the area. Small communities, most of which were short lived, sprang up near the Refuge. These consisted of Belle Glade c. 1913; Glade Crest c. 1914, on the Hillsboro Canal; Shawano c. 1924, on the Hillsboro Canal; 20 Mile Bend at the juncture of the Hillsboro and West Palm Beach Canals, Gladeview on Hillsboro Canal, and Loxahatchee c. 1913, on West Palm Beach Canal (Will 1964:180; Will 1968:33) (Griffin et al. 1979). The new settlements, with associated road construction, managed to bypass the Refuge due to the inhospitable environment.

**Socioeconomic Environment**

*Demographic Information*

By 2010, Florida’s population had soared to 18 million, with 77% living in Florida’s 35 coastal counties (U.S. Department of Commerce, U.S. Census Bureau 2010). By 2017, this number had reached over 20 million (U.S. Department of Commerce, U.S. Census Bureau 2017). The projected population of the State of Florida is expected to increase by 44% from 2000 to 2030 to over 28 million (U.S. Department of Commerce, U.S. Census Bureau 2017) and almost double from 2010 to 2060 to nearly 36 million (Zwick and Carr 2006).
Ecotourism
The State welcomed a record number of visitors, approximately 116.5 million, in 2017 (Visit Florida 2017). Of this total, approximately 102.3 million were domestic visits, 10.7 million from overseas, and about 3.5 million from Canada (Visit Florida 2017). Tourism is an important part of Florida’s economy. In 2016, direct tourism spending contributed $109 billion and visitors supported employment for 1.4 million Floridians, making tourism the top industry in the State (www.flgov.com 2017). In an economic analysis of outdoor recreation activities in Florida, the Florida Department of Environmental Protection reported that about 117 million Americans engaged in outdoor activities in 2016, 15 million of which were Floridians. Visitors reported an average spending of $683 individually on outdoor recreation in 2016. According to the Department of the Interior, 101.6 million Americans of ages 16 and above participated specifically in wildlife viewing, fishing, and hunting in 2016. The economic importance of these types of outdoor recreation is evident in the $156 billion spent by these participants in that year. All types of outdoor recreation alone supported 1.2 million jobs and generated nearly $10 billion in tax revenue impacts in 2016 (Florida Department of Environmental Protection).

Refuge Administration and Management

Land Protection and Conservation
The current acreage of the Refuge Interior is approximately 141,374 acres. In addition to the licensed lands, the USFWS owns 3,815 acres in fee title to the east of the Refuge Interior. This acreage is sub-divided into three management impoundments - the A, B, and C Impoundments, a 400-acre cypress swamp, and the acquired 2,586-acre Strazzulla. In total, the Refuge currently includes 145,188 acres.

Visitor Services
The purpose of the visitor services program is to foster an understanding and instill appreciation of fish, wildlife, and plants and their conservation by providing the public with safe, high quality, appropriate and compatible wildlife-dependent recreational and educational programs and activities. In 1997, Congress passed the Improvement Act, which provided that, on national wildlife refuges, wildlife comes first. The 1997 Improvement Act also identified six wildlife-dependent public use activities that should be facilitated on national wildlife refuges; these uses are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

Personnel, Operations, and Maintenance
The Refuge serves as the headquarters for a complex of two NWRs: the Refuge and Hobe Sound NWR. Nineteen employees are currently assigned to Loxahatchee NWR while two employees are stationed at Hobe Sound NWR in Martin County, FL. The staff consists of managers, biologists, firefighters, federal wildlife officers, maintenance workers, administration staff, and visitor services personnel. The visitor services staff of five manages the Refuge’s public use programs. Their responsibilities include managing Refuge volunteers (~365 volunteers), public outreach and education, recreation fee program, and visitor facility operations to support nearly 400,000 annual visitors to the Refuge and the 60,000 annual visitors to Hobe Sound NWR.
CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter describes the foreseeable environmental consequences of implementing two alternatives outlined in Chapter 2. Alternative A (No Action) serves as the baseline environmental condition to which the potential effects of Alternative B are compared.

Environmental effects include those that are direct, indirect, and cumulative. Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Cumulative impacts are effects on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative effects are discussed in a separate section following the analysis of the alternatives.

Potential effects or impacts, either positive (beneficial) and negative (adverse), to resources resulting from the implementation of the two alternatives were identified and placed into one of the listed categories, where possible.

Any public use activity has the potential for impacts to the local flora and fauna; however, the Refuge attempts to minimize any potential impacts to negligible or minor limits for all uses allowed.

- **Negligible impacts** result from management actions that cannot be reasonably expected to alter identified refuge resources or recreational opportunities at the identified scale; impacts are so small that they would not be measurable.

- **Minor impacts** result from a specified management action that can be reasonably expected to have detectable, though limited effects on identified refuge resources or recreation opportunities at the identified scale; impacts are detectable but would affect a small area.

- **Moderate impacts** result from a specified management action that can be reasonably expected to have apparent and detectable effects on identified refuge resources or recreation opportunities at the identified scale; effects would be readily apparent and would occur over a relatively large area but are not extreme or excessive.

- **Major impacts** result from a specified management action that can be reasonably expected to have readily apparent and substantial effects on identified refuge resources and recreation opportunities at the identified scale; effects would be readily apparent and would substantially change the characteristics of the resource over a large area and are extreme or excessive.

EFFECTS COMMON TO ALL ALTERNATIVES

A primary concern for allowing any public use to occur on the Refuge is to ensure that impacts to wildlife and habitats are maintained within acceptable limits and potential conflicts between user groups are minimized. There are some situations that could be harmful to plant and animal life, which would warrant Refuge closures or the development of use restrictions. Examples of these situations include, but are not limited to, protection of trust and listed species (flora and fauna), impacted vegetation, nesting species, and the protection of and possible conflicts with other Refuge management programs. Proposed uses under the VSP standards of outreach; volunteers, Friends, partnerships; and recreations fees would have no to negligible impacts.
Environmental Justice
Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus Federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed Federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in Federal programs substantially affecting human health and the environment, and to provide minority and low-income communities with access to public information and participation in matters relating to human health or the environment.

None of the management alternatives described in this environmental assessment will disproportionately place any adverse environmental, economic, social, or health impacts on minority and low-income populations. Implementation of any action alternative that includes public use and environmental education is anticipated to provide a benefit to the residents residing in the surrounding communities.

4.1 Physical Consequences

This section describes the potential effects on the physical environment of the Refuge, including soils, hydrology, topography, climate, water and air quality, and noise.

4.1.1 Impacts to Physical Environment:

Alternative A:
Continuation of the existing programs for hunting, fishing, environmental education and interpretation, wildlife observation and photography would have negligible impacts on the physical environment. Maintenance or improvement of existing facilities (i.e. parking areas, trails, and boat ramps) will cause minimal short-term impacts to localized soils and waters. Opportunities for visitors to learn about and observe wildlife and habitats may not be fully realized.

Alternative B:
Welcome and Orient
Under Alternative B, impacts are not expected to the physical environment concerning welcome and orient; recreation fees; wildlife observation and photography, and environmental education and interpretation.

Hunting
Hunting, if not managed and monitored carefully, has the potential to cause detrimental impacts by influencing vegetation, soils, hydrology, water quality, and exotic species (USFWS 2018b). More so, there is potential for major habitat destruction in the northern portion of the Refuge should hunters try to access unfamiliar and inaccessible areas. The Northern portion of the Refuge tends to dry down annually and becomes increasingly more difficult to navigate without the general ease provided by average to high water levels. This area contains large expanses of sawgrass interspersed with Melaleuca stumps and pocosin clumps that are treacherous and often impenetrable. Even hunters that are experienced in airboat operations can easily become
stuck, flip their boats, and cause wildfires when they are unfamiliar with the area and habitats. These risks can be mitigated by closing areas when habitat conditions dictate and requiring permitted hunters to complete some form of informative training prior to finalizing the permit process. Overall, impacts to the habitat are expected to be minor due to the limited amount of proposed permits and the type and quantity of approved vessel access.

Some disturbance to surface soils, topography, and vegetation would occur in areas selected for hunting by individuals; however, effects would be minimal. The Refuge controls access to the Interior by limiting public access through permits, closed areas, and zones of allowable watercraft in order to minimize habitat degradation as a result of visitor access. Negligible impacts to the natural hydrology of the Refuge are also expected. The Refuge expects impacts to air and water quality to be minimal and result only from Refuge visitors’ boat emissions.

**Fishing**
Recreational fishing/frogging are expected to have negligible adverse short-term, long-term or cumulative impacts on hydrology or water quality based upon staff observations of past fishing impacts. The use of boats by anglers has the potential to affect water quality negatively by increasing erosion, stirring up bottom sediments, or introducing pollutants into waterways. We do not expect emissions from vehicles or boat motors to substantially affect the water quality of the region. Visitor use of the shoreline for fishing may also trample vegetation, compact soil, and accelerate erosion. That erosion may expose tree roots, resulting in increased tree mortality due to wind throw. Construction of fishing piers to support fishing would have direct, site-specific impacts by converting areas of habitat from unobstructed open water, marsh, or forested areas to habitats interrupted by pilings and periodically shaded by the new structure. Wetland impacts would be mitigated to comply with the requirements of Section 404 of the Clean Water Act and other applicable regulations.

**Wildlife Observation, Photography, Environmental Education and Interpretation**
Construction of the proposed structures (i.e. observation platforms, kiosks, signs, boardwalks, photo blinds, etc.) to support wildlife observation, wildlife photography, environmental education, and interpretation would have direct, site-specific impacts by converting areas of habitat from unobstructed open water, marsh, or forested areas to habitats interrupted by pilings and periodically shaded by the new structure; the spacing of the boards along the boardwalks may allow some light penetration. Shortened wildlife corridors, habitat fragmentation, and edge effects are also direct impacts anticipated from the proposed structures. Construction of proposed infrastructure and associated signage would have localized impacts and result in temporary disturbance or displacement of wildlife. However minimal the wetland effects may be, wetland impacts would be mitigated to comply with the requirements of Section 404 of the Clean Water Act and other applicable regulations. Other site-specific impacts from localized dust and noise created from construction operations would be minor, and should have negligible air quality impacts. The facilities, signage, and other associated infrastructure shall be installed in sparsely vegetated locations that avoid sensitive wildlife habitat. Boardwalks constructed through the cypress swamp would utilize paths of least resistance and would require minimal tree removal. Signage shall also be installed to encourage visitors to limit their disturbance to wildlife and properly dispose of litter. Indirect effects of constructing boardwalks, platforms, and towers include shading out some vegetation and providing shade or shelter to wildlife (from predators) in some areas that do not offer these potential benefits. These structures may also provide unintended perching, resting, or loafing substrates in areas where few are available for wildlife. These indirect impacts could potentially have direct impacts on visitor/wildlife interactions. An indoor educational facility is proposed for construction near Strazzulla adjacent
to Heritage Farms. The proposed site is a dry, ruderal site currently overgrown with weeds. This would likely not require any site preparation activities such as wetland filling. Initial disturbance to wildlife and habitat would occur during the construction of new facilities. However minimal the wetland effects may be, wetland impacts would be mitigated to comply with the requirements of Section 404 of the Clean Water Act and other applicable regulations. Turbidity during construction would be limited by silt screens or other methods to minimize potential runoff during construction. Parking areas would be constructed to allow storm water to percolate into the soil rather than allowing it to run directly into the adjacent wetlands. Short-term negative effects to air, noise quality, and soils within the project site would be expected, and measures to protect the environment would be taken. Allowing non-consumptive educational opportunities on the Refuge would help to maintain and build public support for the Refuge and the Everglades ecosystem.

Other Recreational Uses
Recreation uses other than the “big six” and are further analyzed in Appendix C- Appropriate Use Determinations (FOA) and Appendix D- Compatibility Determinations (CD). These proposed uses include trails, camping and campsites, horseback riding, non-motorized and motorized watercraft, pets on leash, ceremonies, and instructor-led small group activities.

Trails and Camping:
Development and use of trails and campsites may result in soil compaction. It may reduce or remove the organic litter and soil layer and run-off, and soil erosion may increase. Those changes affect soil invertebrates and microbial processes, as well as inhibit plant growth. Fine-textured soils are particularly susceptible to compaction. Camping platforms with vegetated shorelines that are accessed by watercraft may also undergo shoreline erosion from the effects of repeated boat landings compacting soil and removing vegetation. This use would likely cause minor disturbance to surface soils in areas selected as primitive camping sites. Canoe trail camping would not likely have impacts to soil, since visitors would be confined to a platform structure. Improperly disposed human waste at campsites may compromise water quality by introducing pathogens, and affect campsite aesthetics. Human waste, food disposal, and dishwashing may increase aquatic nutrient loads that may result in limited, localized increases in algal growth, facilitating oxygen depletion, and altering the composition of aquatic vegetation and invertebrate communities. Run-off from eroded campsites can increase turbidity and sedimentation, which may affect fish and invertebrates (Marion 2003, Leung and Marion 2000). Soap from improper dishwashing, trash, and fish-cleaning waste, may all pollute water and have an aesthetic impact. However, use of trails and camping generally does not affect water quality to the extent of creating a public health concern, even in areas that receive heavy use (Cole 1981). The proposed FP&L trail through the Cypress Swamp will require the construction of a new boardwalk ranging from 0.1-0.25 miles in length depending on where the trail is established. A slight increase in maintenance costs can be expected in order to keep areas mowed or free of brush and easily accessible for the public.

Horseback Riding:
Horseback riding would cause negligible or short-term impacts to localized vegetation, soils, and waters including vegetation compaction and soil disturbance and compaction; however these impacts would be similar to those experienced from similar recreational uses.

Non-motorized watercraft
In addition to the impacts listed under each type of use, short-term and site specific impacts may be realized from opening an additional 100,000 acres to non-motorized watercraft. This
vast amount of acreage available will help to ameliorate the impacts by not concentrating the use in smaller areas, thereby making them short-term instead of long-term or cumulative. Impacts include negligible soil and vegetation disturbance and minor wildlife disturbances.

Motorized watercraft including airboats
Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses deemed compatible. The following is a summary of potential motorized watercraft impacts that have been identified by south Florida biologists from the National Audubon Society, South Florida Water Management District, Big Cypress National Preserve, Everglades National Park, U.S. Fish and Wildlife Service, Florida Fish and Wildlife Conservation Commission, and other scientists. Potential impacts of motorized watercraft include disturbance via noise, physical collision, disturbance to soils and vegetation communities, changes in water quality and hydrology, and spread of invasive species. In addition to the effect of these on wildlife, motorized watercraft can impact visitors who desire solitude as a result of noise disturbance and visual impact on the landscape. Some mitigation of impacts is possible through effective regulation and management using a multi-use approach.

Regular off-road vehicle operation through sawgrass and wet prairie habitats creates trails, which are open areas where native vegetation is more sparse than surrounding areas due to physical disturbance and soil erosion (Pernas 1995; Duever et al. 1981; Duever et al. 1986). Continually used airboat trails with vegetative damage are unlikely to recover as long as they remain in use (Duever et al. 1986). Impacts are directly influenced by water levels at the time of operation. Off-road vehicle impact research conducted on Big Cypress National Preserve was unable to create heavy impacts in peat marshes from airboats due to the lack of impacting ability of the airboat (Duever et al. 1981 and Duever et al. 1986). Duever et al. 1981 stated that only the airboat treatments exhibited essentially no change in plant taxonomic composition during impact study, and water level was the single most important environmental factor influencing severity of vehicle impacts. These findings were supported by Duever et al. 1986 which stated during normal operations airboats are not in contact with the ground, and frequently are in water deep enough so that the vegetation is merely bent over and shortly thereafter pops back up again. Duever et al. 1986 results indicated that they were unable to produce any lasting impacts in marl marsh by airboats, nor could heavy impacts in marl or peat marsh be achieved, and researchers were never able to produce severe soil disturbance with an airboat. According to Duever et al. 1986, a total of 30% of the documented impacts in peat marsh for medium impact tests were visible for over a year and recovered 100% by year 7. These results were supported by Pernas 1995 which reported that vegetation normally recovered from airboat impacts in less than one year, and that the seasonal use of the airboat during high water periods allowed the vegetation to recover during low water periods and thus cumulative impacts were avoided. If the medium and heavy intensity use repeatedly occurred at lower water levels, recovery results would be expected to not be similar to researcher findings.

Douglas-Mankin and Surratt 2018 indicated water flows have less resistance in locations were dense vegetation between the canal and interior marsh has been removed. This accelerated flow can alter flow dynamics and hydroperiods including increased water depth recession rates, shortened hydroperiods, and impeded sheetflow.

Motor-boat operation increases soil and organic particulate suspension. A turbidity study revealed higher turbidity during periods of airboat traffic, especially in association with low water levels (Weeks 1989). The resultant turbidity reduces the potential growth of vegetation and
periphyton and may cause fish and aquatic plant mortality (DOI 1999). As trails are created into the marsh interior via motorboat use, water quality in the Refuge marsh could likely deteriorate due to canal water intrusion and resuspension of phosphorus into the water column from disturbed soil. Cattail growth could likely proliferate in these areas as seen near existing trails in the Refuge. Trice et al. (2008), found a strong correlation between airboat trails >10 meters wide and total area of cattail. Additionally, Trice et al. (2008) reported a strong correlation between Class 2 (3 meters to 9.9 meters in width) and Class 3 (<3 meters in width) airboat trails due to the tendency for operators to explore new terrain creating additional Class 3 trails. Motorboat use can also increase incidental impacts such as trash, as well as pollutants such as leaked fuel and oil, which could further compromise water quality.

A 2011 study conducted by the National Park Service in Everglades and Dry Tortugas National Parks determined that motorized watercraft (all types) average and typical maximum levels are at higher than thresholds for disrupting interpretive activities with airboat use having the loudest noise sources (NPS 2011). The study recommended that restricting the use, creating motorboat no-wake zones or requiring airboat speed limits can produce large decreases in the noise levels and can be applied to sensitive areas to minimize impacts (NPS 2011). Additionally, regulation passed in 2011 requires that all airboats must have an automotive-style factory muffler per Florida Statute 327.391 (less than or equal to 90 decibels (dBs) at a distance of 50 feet). An inspection and certification process will be required of all permitted airboats on the refuge to ensure compliance with regulation. Additionally, all motorboat operations will be restricted from sensitive areas of the Refuge.

A low nutrient system such as the northern Everglades will not provide as productive foraging opportunities or as large prey as estuarine habitats, mangroves, coastal shores, or high nutrient fresh water marshes. The disturbance factor associated with unlimited use of motorboats should be weighed more heavily in the Refuge, as the disturbance to wildlife may carry a higher energetic cost than in more productive areas. Operators are encouraged through best management practices to avoid disturbance to deer, alligators and other sensitive wildlife. Rodgers and Schwikert (2003) recommended species-specific no-entry buffer distance ranges from 130 m to over 300 m to avoid disturbing nesting, roosting, and foraging waterbirds such as snail kites and bald eagles. Carney and Sydeman (1999) includes at least 50 m buffers from nesting colonial waterbirds. Additionally, a buffer of 500 m from nesting snail kites and an inner protective zone of 130 m during the breeding season (January through May) and roosting areas is recommended by the Vero Beach Ecological Services Conservation Measures for Everglade Snail Kite 2018. A voluntary avoidance program by the public may be adequate to curtail some instances of boat disturbance to waterbirds (Kenow et al. 2003). Rodgers and Schwikert (2003) recommended that conservation personnel monitor changes in species composition at regulated sites to adjust buffer distances to reflect the presence of new, more sensitive species with larger flush distances and requiring large buffer distances. Implementation of a buffer zone should include periodic evaluation of the effectiveness of the buffer zones and corrective measures based on a comparison of the numbers and distribution of birds before and after its implementation (Rodgers and Schwikert 2003). Best management practices on the Refuge will include buffers and monitoring to reduce wildlife disturbance. Additionally, the use of motorboats and specifically airboats at times will be further limited in seasonality, location, and number.

Pets on leash:
Allowing pets on leash would cause negligible or short-term impacts to localized vegetation, soils, and waters including vegetation compaction and soil disturbance and compaction;
however these impacts would be similar to those experienced from similar recreational uses. It is expected that water quality will be negligibly impacted as well, since pet waste (in low concentrations) is presumed to be comparable to the effects of waste from the abundance of wildlife utilizing the Refuge and visitors being required to clean up after their pets and dispose of waste properly.

Ceremonies (non-Refuge sponsored) and Instructor-led small group activities:
Ceremonies and instructor-led small group activities would cause negligible or short-term impacts to localized vegetation, soils, and waters including vegetation compaction and soil disturbance and compaction; however these impacts would be similar to those experienced from similar recreational uses. Stipulations outlined in a required Special Use Permit would minimize those expected impacts.

Impacts from individual concession users are expected to be similar to other public use activities already approved/or being considered for use on the Refuge. Accommodating larger groups may increase the likelihood of disturbances related to noise, trampling, compaction, or a longer duration of continuous activity.

Concessions
As proposed, establishment of concessions for commercial guiding and outfitting is not expected to have major impacts to biological resources for which the Refuge was established. We do not expect the addition of a concessionaire to materially interfere with or detract from the mission of the NWRS, nor diminish the purpose for which the Refuge was established. It will not pose significant adverse effects on Refuge resources, interfere with public use of the Refuge, or cause an undue administrative burden. These uses would contribute to achieving Refuge purposes and the NWRS mission because they facilitate hunting, fishing, wildlife observation and photography, and provide compatible recreational opportunities for visitors to observe and learn about wildlife and habitats firsthand.

Development of concession facilities to support this use should have a minimal impact since the location would be built on an existing parking lot area. There will be a reduction in parking spaces; however, adequate parking will still be available on site without any additional clearing required. Some disturbance to wildlife may occur during the construction of the facility, but due to the low quality habitat of the site, large human presence, and limited construction time, impacts are expected to be short-term and minor in scale.

Commercial Use
Commercial use impacts would be similar to those expected from similar non-commercial recreational uses; however, commercial uses could be more disturbing because commercial uses tend to occur in larger groups of people. Short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. The potential to disturb any threatened or endangered species on the Refuge during this use is extremely low, unless they are a focus of the tour, in which case, further review will be required. This use should not result in long-term impacts that adversely affect wildlife, wildlife populations, or the purposes for which the Refuge was established. The Refuge Manager will use professional judgment in ensuring that the request will have no considerable negative impacts; will not violate Refuge regulations; and that it will contribute to the achievement of the Refuge purpose and the NWRS mission. Stipulations may be placed on the size of the group or modes of transportation to reduce the potential for negative impacts, depending on the activity. Special needs will be
considered on a case-by-case basis and are subject to the Refuge Manager’s approval and may be modified to ensure compatibility (if appropriate). Any approved SUP will outline the conditions in which the use may be conducted, and Refuge staff will ensure compliance with the permit.

4.2 Biological Consequences

This section describes the potential effects of a public use program on the biological resources such as plant and wildlife communities.

4.2.1 Impacts to Plant and Wildlife Communities

Any public use activity has the potential for impacts to the local flora and fauna; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed.

Alternative A:
Continuation of the existing programs for hunting, fishing, environmental education and interpretation, wildlife observation and photography would have negligible to minor impacts on the biological environment. Disturbance by hunters to hunted wildlife would not occur except for what is currently allowed in waterfowl and alligator hunting. Costs associated with visitor services in the form of boat ramp and marsh trail maintenance, instructional sign needs, and law enforcement would remain unchanged. Ramp maintenance, signage, and law enforcement to enforce Refuge regulations would still occur. Maintenance or improvement of existing facilities (i.e. parking areas, trails, and boat ramps) will cause minimal short-term impacts and may cause some wildlife disturbances and damage to vegetation. Opportunities for visitors to learn about and observe wildlife and habitats may not be fully realized.

Alternative B:
Hunting
Hunting, if not managed and monitored carefully, has the potential to cause detrimental impacts by influencing vegetation, soils, hydrology, water quality, and exotic species (USFWS 2018b). More so, there is potential for significant habitat disturbance in the northern portion of the Refuge when hunters may try to access certain areas via airboat. This area tends to dry down annually and becomes increasingly more difficult to navigate. This area contains large expanses of sawgrass interspersed with melaleuca stumps and pocosin clumps that are treacherous and often impenetrable. These risks can be mitigated by closing areas when habitat conditions dictate and requiring permitted hunters to complete some form of informative training prior to finalizing the permit process. Overall, impacts to the habitat are expected to be minor due to the limited amount of proposed permits, the type of approved vessel access, and the typically preferred hunting locations.

Although hunting causes direct mortality and temporary disturbance to wildlife, harvesting populations within the carrying capacity of existing habitat ensures long-term health and survival of the species. Hunting, and its associated activities, can result in positive or negative impacts to wildlife and other Refuge resources. With proper management and monitoring, hunting (as proposed for the Refuge) is expected to cause only minor negative impacts. A positive effect of the Refuge hunting program will be the provision of additional wildlife-dependent recreational opportunities, a better appreciation and more complete understanding of the wildlife and habitats associated with the Refuge, and an opportunity to utilize a sustainable, renewable
resource. This can translate into more widespread and stronger support for the Refuge, the NWRS, and the USFWS. Various impacts in relation to each type of hunt are discussed below.

**Migratory Bird Hunting:** Waterfowl harvest numbers and species are determined by nationwide annual waterfowl trends and population surveys. Expanding access for waterfowl hunters is expected to have minor impacts on total harvest. The amount of acreage still available to waterfowl for refugia far exceeds the acreage hunters would attempt to access with the available means of transportation and motorized watercraft restrictions.

The potential impact to threatened and endangered species may increase slightly due to direct and indirect effects of this use. Hunting migratory birds may lead, and has led to, accidental or intentional shooting of snail kites or wood storks. For example, adjacent to the Refuge, a dove hunter was caught shooting a wood stork in recent years by a Refuge officer. Shooting of snail kites has been cited in the early literature as a threat (Sprunt 1945; Stieglitz and Thompson 1967; Sykes 1978, 1979). Unless directly observed by law enforcement, information regarding take of threatened or endangered species is generally not volunteered to the authorities. Indirect impacts include disturbances during nesting season that may cause parents to flush from their nests. This can result in nest abandonment, egg/nestling deaths due to sun exposure, or predation (FWC 2018a). Many direct impacts are expected to be mitigated since their breeding season and hunting seasons do not generally coincide. Snail kites have been known to nest outside of the nesting season depending on conditions. If a conflict occurs, sensitive areas will be closed to hunters and buffer zones will be established and implemented.

Other short-term impacts include the potential for alligator attacks and retriever dogs getting lost. The Refuge has experienced incidents concerning nuisance alligators, including attacks. Additionally, nesting female alligators or startled animals may demonstrate a more aggressive response. Unprovoked attacks on people and pets are not unheard of in Florida and all visitors should remain vigilant and responsible nonetheless. Dogs and other small pets are more likely to be attacked than humans because they resemble a natural prey item for the alligator (FWC 2005). From 1948 to 2016, 388 unprovoked alligator bite incidents have occurred in Florida (AOL 2017). In 2016, a duck hunter was attacked by an alligator in the Everglades just south of the Refuge (Sun Sentinel 2016). This behavior increases when alligators are provoked or fed and lose their fear of humans, becoming accustomed or attracted to people.

**Alligator Hunting:** Expanding access to alligator hunters will not necessarily increase harvest numbers. Alligator permits available each year allow a specific number of alligators to be harvested; those numbers are based on alligator population surveys and are coordinated with the FWC. Increasing access can be expected to have moderately beneficial impacts to the overall health of alligator populations and their distribution over the Refuge. Furthermore, increasing access for alligator hunters can be expected to have a minor beneficial impact to waterfowl hunters and their retriever dogs. Studies show the Refuge, by far, has a higher density of alligators in the marsh compared to other areas of Everglades habitat (Mazzotti et. al., 1999, Mazzotti et. al., 2004). Higher alligator densities increase the potential for alligator attacks on hunters and their dogs. By allowing alligator hunters to access more areas, the Refuge enables hunters to harvest some of the larger alligators. This can not only create a better environment for waterfowl hunting, but also allow an increased number of juvenile alligators to reach adulthood, potentially increasing the population. Collectively, these actions aid in maintaining a sustainable alligator hunt on the Refuge.
**White-Tailed Deer/Feral Hog Hunting:** If not administered prudently, deer hunting on the Refuge can potentially have long-term adverse impacts on the deer population in the Refuge. Currently, there is a lack of information on deer abundance and population trends on the Refuge. Surveys and monitoring will be conducted either by Refuge staff or in cooperation with state agencies in order to determine the exact number of permits allowed to have a sustainable deer hunt. If deer hunting is managed well, potential impacts on non-target species and their habitats are expected to be minimal. Although no long-term impacts are predicted, cumulative impacts are expected on wildlife or their behaviors. Although USFWS staff, researchers, and exotic plant contractors utilize airboats in the Refuge Interior, the Refuge has not been open to public airboating or deer hunting in decades. Deer that inhabit the Refuge have benefitted with protections from being pursued and/or distressed by human interactions. This is evident in their behavior, as they currently do not attempt to flee the area immediately as they are approached by an airboat in the Refuge Interior. This behavior provides a brief moment of appreciation for wildlife on wild lands by anyone fortunate enough to experience the interaction. By increasing access and allowing hunting activities, wildlife not accustomed to being pursued will be extremely vulnerable to stress or harvest initially. Over time, these experiences of being disturbed or hunted will instill a more cautious existence on the Refuge and wildlife may become less readily observed and enjoyed, and perhaps more difficult to hunt.

Allowing only incidental take of feral hogs while deer hunting is often at odds with those who pursue hogs for sport. Unscrupulous hunters have been caught and prosecuted for illegally releasing live hogs onto national wildlife refuges and other natural areas across the nation (APR 2016). In Florida, trapped animals may not be released on public land, and can only be released on private property with landowner permission. Like other wild animals, feral hogs can carry parasites and diseases, some of which can be transmitted to people. One such disease is swine brucellosis, a bacterial disease. Hunters can be infected with brucellosis bacteria when blood, fluid or tissue from an infected animal comes in contact with their eyes, nose, mouth or skin. This can happen when: field dressing, butchering, handling or preparing raw meat for cooking, or eating meat that is not thoroughly cooked (FWC 2018b). Other diseases carried by feral hogs include pseudorabies and tularemia. Additionally, salmonellosis, foot rot, intestinal bacteria, viruses, and parasites are commonly transmitted via fecal matter (Extension.org 2012).

Applicable to all hunting on the Refuge: Potential impacts associated with hunting include direct mortality, short-term changes in game species distribution and abundance, and disturbance (to target and non-target species).

Both motorized and non-motorized watercraft while hunting can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by deer, waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to airboats and motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). People hunting from motorized boats have a greater chance of disturbing or even striking wildlife (e.g. alligators, turtles, birds) as they tend to move faster than non-motorized boats and provide less time for wildlife to abscond. Turtles and alligators are also at higher risk of being struck by boats or propellers during low water conditions. Conversely, other wildlife are similarly more vulnerable to hunters during high water conditions. Mammals (i.e. deer) begin migrating to upland areas for refugia during times of high water. Prolonged periods of high water increase stress on wildlife as there is less available food sources and those available on tree islands or levees are not as nutritious. Results from these events include stress, disease, starvation, and even death.
Temporary restrictions or even hunt season closures may be imposed at the Refuge Manager's discretion during these critical conditions to mitigate for these risks to wildlife.

Fishing
For fishing, short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Impacts to vegetation and habitat from vessels utilized for this use are expected to be minor due to the typically preferred fishing locations (open water).

Both motorized and non-motorized boating can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). People fishing from vessels in the canals may encounter reptiles and amphibians in particular, but these encounters would be rare because anglers stay in their vessels in both the canals and the flats area of the Refuge. Turtles and alligators are at higher risk of being struck by boat propellers during extremely low water levels. The Refuge may close to all boat use during these conditions to mitigate for these risks to wildlife. Small mammal and avian habitat is not optimal in the open water areas preferred by anglers and disturbance to these species is expected to be minimal.

Casting may disturb some foraging/roosting birds as well as reptiles and small mammals, particularly near the edge of the impoundments and along the northern boundary. Occasionally, anglers may hook turtles or other species as accidental by-catch. Potential risks to non-hunted wildlife such as aquatic species, small mammals, migratory songbirds, raptors, and roosting/foraging wading birds and water birds include discarded fishing line and other fishing litter, which can entangle wildlife and cause injury or death (Thompson 1969, Gregory 1991). With the exception of fishing line entanglement, hook injuries, and increases in litter, overall disturbance to wildlife on the Refuge by anglers is expected to be commensurate with that caused by public users of other wildlife-dependent recreational opportunities that are compatible on the Refuge.

Impacts to threatened and endangered species may increase slightly due to direct and indirect effects of this recreational use. However, many direct impacts are expected to be mitigated by regulations and management activities such as restricting fishing in the event of a snail kite nest or other threatened and endangered species nesting near a fishing area. If a conflict occurs, sensitive areas would be closed to anglers and/or a 500-foot buffer zone would be placed around nests. Furthermore, nesting populations of the Everglade snail kite, wood storks, and other listed species would not likely be disturbed because fishing would be conducted in the canals and flats area, which is not the preferred habitat of threatened and endangered species that utilize the Refuge.

The proposed use is not likely to adversely affect fish and frog populations. Fish harvest would occasionally occur; however, most anglers generally practice catch and release. Although frogging may increase pressure on frog populations, the proposed season and bag limit restrictions should alleviate any pressure on populations or competition from wading birds. The season proposed excludes four months during which frogs are most actively breeding and during peak wading bird foraging/nesting season. Applying restrictions should alleviate any
long-term and/or cumulative impacts to frog populations and the wildlife that prey on them. Recreation participants are required to adhere to all FWC fishing and frogging regulations except where Refuge-specific regulations have been set. These regulations are designed to protect species populations from the pressures of fishing and frogging by the public.

**Wildlife Observation, Photography, Environmental Education and Interpretation**

A primary concern for allowing any public use to occur on the Refuge is to ensure that impacts to wildlife and habitats are maintained within acceptable limits and potential conflicts between user groups are minimized. In most cases, the described activities would result in minimal disturbance to wildlife. Several studies have examined the effects of recreation on birds using shallow water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981; Burger 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1995, 1997; Burger & Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1997; Burger & Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

**Presence:** Birds avoided places where people were present and when visitor activity was high (Burger 1981; Klein et al. 1995; Burger & Gochfeld 1998).

**Distance:** Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported.

**Approach Angle:** Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger & Gochfeld 1981; Burger et al. 1995; Knight & Cole 1995; Rodgers & Smith 1995, 1997).

**Noise:** Noise caused by visitors resulted in increased levels of disturbance (Burger 1986; Klein 1993; Burger & Gochfeld 1998), though noise was not correlated with visitor group size (Burger & Gochfeld 1998).

There are some situations that could be harmful to plant and animal life, which would warrant Refuge closures or the development of use restrictions. Examples of these situations include, but are not limited to, protection of trust and listed species (flora and fauna), impacted vegetation, nesting species, and the protection of and possible conflicts with other refuge management programs. Potential impacts to wildlife and habitats include disrupting foraging or resting activities, repetitive flushing of nesting birds, and stress or change in behavior due to group size and/or volume. Negative responses from wildlife due to human impacts can include, but are not limited to:

- permanent disappearance of migratory bird species or individuals that are unable to adapt to the presence of people by habituation
- increased nest predation due to the continued flushing of birds from their nests
- change of patterns of behavior due to repetitive flushing
- increase of energy demands for wildlife fleeing from human disturbance
- variation in feeding behavior

Other Recreational Uses

Other recreation uses are further analyzed in Appendix C-Appropriate Use (FOA) and Appendix D-Compatibility Determination (CD). Other recreational uses proposed in this alternative include:

**Trails:**
Infrastructure currently exists to afford access for the proposed trails with increased access by the public. Existing infrastructure includes: the FP&L right-of-way along the eastern border of the cypress swamp; an unimproved levee heading west into the central portion of the cypress swamp from the FP&L right-of-way; and the over 58 miles of levees and canals currently existing along the L-40, L-39, and L-7; and the levees and canals around the A, B, and C Impoundment areas. The proposed FP&L trail through the Cypress Swamp will require the construction of a new boardwalk ranging from 0.1-0.25 miles in length depending on where the trail is established. Minor impacts to wildlife resources (i.e. disturbance) can be anticipated, similar to impacts experienced on levee settings currently open to public access via hiking or biking. Impacts tend to occur if visitors venture too close to foraging or nesting wading birds, alligators, and turtles that use the canal and fringe vegetation adjacent to the levees. A slight increase in maintenance costs can be expected in order to keep areas mowed or free of brush and easily accessible for the public.

**Camping and canoe trail:**
The impacts of camping on vegetation are usually locally severe, even with low to moderate use. They include loss of ground vegetation cover, reduced vegetation height and vigor, loss of rare or fragile species, and changes in plant community composition (Leung and Marion 2000). Vegetation may be removed or trampled. Marion and Cole (1996) found on campsites they studied in Delaware that an average of 19 percent of trees had been felled and 77 percent of the standing trees had been damaged (primarily branches cut for firewood or trunks scarred by axes and nails). Such impacts should be reduced given the prohibition of campfires on the platforms, and the very limited woody vegetation available on the levees. Monitoring of canoe trail camp sites by law enforcement would ensure upland habitats (tree islands) in the area are not disturbed.

Trampling resistant vegetation (often grasses or exotics) tend to replace existing understory vegetation (forbs) (Marion and Cole 1996). The indirect effects of vegetation disturbance include microclimate changes and increased erosion. The extent of camping impacts on vegetation is generally related to the frequency sites are used, their durability, and group size (Cole 1995). Larger groups are usually responsible for enlarging campsites more than small groups (Cole 1992, Marion 2003). Campsite enlargement is particularly a problem when campsites are located on flat, open sites. Campers may also enlarge the affected area by developing multiple, uncontrolled “social trails” between tents, to water sources, to viewing points, or favored fishing locations. Some visitors have a much greater impact on vegetation than others, because they may cut down vegetation, dig trenches around tents, and otherwise modify the sites. Many of these potential impacts would be mitigated with this proposal given that there are so few sites proposed and tents/visitor numbers would be limited. Platform camping would be permitted only at a maximum of two designated campsites, so any disturbance to vegetation would be limited to a very small area of the Refuge.
Indirect effects may include a change in vertebrate species composition near the campsite. Changes in vertebrate communities at campgrounds (as compared to control sites) have been reported for birds (Blakesley and Reese 1988, Garton et al. 1977, Foin et al. 1977, Knight and Gutzwiller 1995) and small mammals (Clevenger and Workman 1977). In the case of songbirds, changes in species composition were due primarily to a reduction in ground cover vegetation (for nesting, feeding) at campsites and different levels of sensitivity to human disturbance. Rarer species are generally absent from campgrounds. The presence of humans attracts some species, while others avoid it. The availability of food generally differs between campgrounds and undisturbed areas. Natural foods may decrease in availability, while foods supplied by humans may increase. Humans may intentionally supply foods to wildlife, or unintentionally, because of littering, accidental spillage, or improper food storage (Garton et al. 1977). Human foods may be unhealthy for wildlife or promote scavenging behavior, which may increase vulnerability of animals to predation. Rodent populations often increase at campsites, in response to increased availability of human food, and may negatively affect nesting songbirds. Alligators and other scavengers may be attracted to improperly stored food and may damage property or threaten visitor safety.

The Refuge would provide outreach to the public through the permitting process, to educate campers on how to avoid disturbing wildlife, the importance of not feeding wildlife, and proper food storage. Some disturbance to wildlife and habitat would initially occur with the construction of the sites, platforms, and development of a trail extension. Long-term disturbance would be minimal based on the amount of people permitted and number of campsites allowed in designated areas.

Disturbance related to camping may also affect wildlife health, fitness, reproduction, and mortality rates (Leung and Marion 2000). Due to these potential impacts, pets would not be allowed at campsites.

For the proposed canoe trail, initial disturbance to wildlife and a few minor adverse impacts to the habitat would occur during the construction of the additional canoe trail. The trail would be created utilizing existing open water areas through the marsh where possible in order to reduce the amount of impact required to create the trail. There is potential for long-term, site-specific impacts to vegetation and soil from any dredging or vegetation removal in order to make the trail wide enough and deep enough to allow for canoe and kayak travel through marsh habitat. Because this area tends to maintain deeper water levels, only mechanical equipment to widen the trail will be utilized. Creation of underwater wildlife corridors is another direct impact anticipated from the canoe trail.

The canoe trail extension and overnight platforms would provide benefits such as learning about the Everglades, the unique opportunity to observe nocturnal wildlife by sight and sound, observation of celestial phenomenon somewhat away from urban light pollution, and an opportunity to recognize the uniqueness of the Everglades ecosystem. The longer trail would enable maximum exposure to the most unique feature of the northern Everglades, the numerous tree islands, and the wildlife that use them, which are more prevalent deeper into the Refuge.

Horseback Riding:
Horseback riding on levees is anticipated to have minimal impacts to the areas where horses are allowed to travel. All horse owners accessing the Refuge shall be required to keep horse manure off Refuge lands through the use of manure containment bags and cleaning up after the
horses. Wells and Lauenroth (2007) found horses used on recreational trails represent a potentially important dispersal vector for exotic plants. Campbell and Gibson (2000) found similar results that horse dung is a vector to transporting germinable seeds of both native and exotic species. Exotic and invasive plant seeds may be deposited on the trails and levee from horse manure. Conversely, plants and seeds eaten by horses while on the levee may be deposited off the Refuge. Manure containment bags can help keep invasive and exotic plants from being deposited on the Refuge. Horses walking along trails pose a concern for transporting non-native and invasive species which, if they establish themselves and germinate, they can out-compete native plant species. Disrupting the plant composition can provide long-term impacts on Refuge habitat, altering the environment. Altering the habitat and environment would affect the wildlife species dependent upon those plant species and habitat types, potentially causing them to relocate. This would be prevented by requiring horses to wear manure containment bags and owners cleaning up after the horses.

Horses are not anticipated to cause unreasonable damage to Refuge habitat as long as they are restricted to the levees. The proposed horseback riding trails are flat, narrow gravel, and shell rock levees that would hold up well under hoof traffic. A partnership with the Acme Drainage District and the Village of Wellington would have to be established in order to allow horseback riding on the Northern levee in Strazzulla. Visitors are presently able to walk on the levees as a trail and Refuge and SFWMD staff vehicles currently use the levees to access parts of the Refuge. Horse hoofs are not anticipated to have an additional impact to these man-made levees. Impacts to wildlife from horseback may result in disturbance to wildlife, but are expected to be minimal given the access is restricted to existing levees.

**Non-motorized watercraft:**

Non-motorized watercraft may contribute to the spread of nonnative species. Some of these species can out-compete native flora and fauna, rapidly spread and displace native plant communities and wildlife, including threatened and endangered species. Their rapid growth and copious seed production permit the establishment of dense, impenetrable forests and thickets that shade out desirable native plant species, affect water flow and drainage, obstruct human and wildlife movement and public viewing opportunities. Research shows a large portion of the canoeing community use equipment in multiple locations within short time spans, without cleaning in between sites (Anderson et al 2014). Therefore, non-motorized watercraft usage may act as a vector leading to the spread of invasive species. Kiosks with informational signs about invasive species impacts are located at all public access boat launching sites to educate the public regarding how to prevent the spread of these destructive pests. The “Stop Aquatic Hitchhikers!” campaign lists actions to prevent moving aquatic organisms from place to place (USFWS, Stop Aquatic Hitchhikers!).

**Motorized watercraft**

Motorboats have the potential to impact fauna by creating a means of fish dispersal, destroying apple snail eggs, colliding with and striking birds, alligators and other animals, displacing nesting or foraging birds, and creating stress related to noise and the presence of a large rapidly moving vehicle. Thousands of wading birds, many of which are in decline throughout the system (SFWMD 2018), nest in the Refuge and could be impacted by increased motorboat activity during sensitive activities such as foraging and nesting. Disturbance has negative effects on the energy and nutrient budgets of wildlife and the disturbance contributes to the potential decline of an individual (Bromley 1985). Adverse effects of environmental disruptions including flight, avoidance, or interference with movement uses up energy that could be used for reproduction.
and growth. More sensitive species may find it difficult to secure adequate food or loafing sites as their preferred habitat becomes fragmented and recreation-related disturbances increase (Skagen et al. 1991; Pfister et al. 1992). During periods of high water, airboat activity can impose additional stress on wildlife by allowing additional access to areas normally inaccessible. Additionally, it is expected that extended high water periods are stressful for terrestrial wildlife, such as white-tailed deer and other mammals, due to increasing population densities on the reduced amount of dry ground available as a result of water levels, as well as restricted movement between islands. These conditions could eventually lead to stress, malnutrition, increases in disease, and other factors (Jansen 1996 and Jones et al. 1996).

Research on the effects of human disturbance has shown a 14-foot airboat (operating at 95-105 dB) approaching colonial waterbirds will cause behavior disruption at a greater distance than an approach on foot, canoe, or by a 14-foot johnboat (operating at 80-85 dB) (Rodgers and Schwikert 2002). Duever et al. (1981) reported airboats were the loudest tested off-road vehicle and reported airboats can generate noise in excess of 120 dB when accelerating, 86dB to 92dB while cruising three meters from a sound meter, and 63 dB to 75dB while cruising 100 meters from a sound meter. In comparison, noise generated by airboats would be above acceptable noise levels for cars and motorcycles but probably be within the limit allowed for large trucks on a roadway (Florida Vehicle Noise Prevention and Control Act of 1974, Section 316.293).

Rodgers and Schwikert 2003 detected considerable variation in flush distances among individuals within the same species and significant differences among species in response to an airboat. Average flush distances among all species ranged from 49 m for the Snail Kite (Rostrhamus sociabilis) to 172 m for the Bald Eagle (Haliaeetus leucocephalus). Average flush distances among herons ranged from 65 m for the Tricolored Heron (Egretta tricolor) to 113 m for the Great Egret (Ardea alba). Larger species generally exhibited greater average flush distances. A comparison of the flush distances elicited by a fast moving outboard-powered boat and an airboat indicated that all nine researched species exhibited significantly greater flush distances to the approach of an airboat. This research recommended species-specific no-entry buffer distance ranges from 130 m to over 300 m to avoid disturbing nesting, roosting, and foraging waterbirds such as snail kites and bald eagles (Rodgers and Schwikert 2003).

If animals are not able to adjust to the additional energy, outlay caused by disturbance: survival, reproduction, and growth may be negatively affected (DOI 1992). Some studies have found that some wildlife can adapt to environmental disruptions and learn to limit their energy expenditure in relation to human recreational activity. Harassing activity, which cause alarm and the expenditure of avoidance energy include: 1) unfamiliar or unpredictable behavior, 2) quick movements, sudden noises, loud noises and 3) close and direct approach. It was found that if the harassing activity was constant, the animal would become adapted to it and learn to adjust to the threat or permanently leave the area for other habitat. However, the animal may end up in less quality habitat than what it gave up and potentially suffer less reproductive success or a lower survival rate. An occasional disturbance caused by motorboats could constitute a harassing activity and would elicit an alarm response from most wildlife. Avoidance behavior involves moving to another location or defiance activities. This energy expenditure could be detrimental to wildlife over time (DOI 1992).

Leaf loss and epiphytic plant displacement can occur from airboat propeller wind. There are a number of listed epiphytes growing in the Refuge. The loss of leaves on tree islands can cause the remaining epiphytes to be exposed to greater amounts of light than is optimal (DOI 1999). Periphyton is the critical base of the Everglades food web and can be damaged by airboats
through disruption and displacement of algal mats, especially in wet prairies (Duever et al. 1981 and 1986). A rich diversity of desmids (green algae associated with low nutrient freshwater) not found elsewhere in the Everglades have been identified at the Refuge (USGS, unpublished data) and could be impacted by physical disturbance of periphyton assemblages, as well as the addition of nutrients, that could result from motorboat activity.

Equipment such as motorboats and boat trailers are a known vector for transporting exotic plants into different waterways (Halloran et. al. 2013; Hutchinson and Langeland 2006). Motorboat use near invasive exotics like melaleuca and Old World climbing fern could contribute to the spread of seeds or spores. These plants’ microscopic seeds and spores are easily blown and or transported to new germination sites (tree islands, floating peat islands). During periods of low water in the Refuge, peat mats in wet prairies and in well-traveled airboat trails tend to break free from the underlying substrate and float to the surface and become potential fertile seedbeds for exotic plants. Limiting the areas of exposed peat reduces the potential for exotic plant establishment.

Some invasive exotics, such as azolla, water lettuce, and hyacinth are primarily limited to canals and deeper trails near the perimeter of the Refuge. Cuts through dense vegetation and trails created by airboats can act as conduits for exchange of these species between the marsh interior and canals. Many invasive animals, such as Cuban tree frogs and curly tailed lizards, are not currently known to be present in the interior portion of the Refuge. Increased airboat activity and the introduction of additional motorboats that are used in multiple natural areas, increase the likelihood of transferring invasive exotic plants or animals deeper into the marsh interior of the Refuge through direct transfer of ‘stowaways’ or indirectly by creating trails that facilitate the spread of aggressive species. Additional spread of invasive species into the marsh interior will result in both ecological impacts and financial costs for management efforts.

The degree of impact is strongly driven by water levels (Pernas 1995). The resiliency of the system to fully recover from impacts created by the use of airboats is expected as long as their use is limited to high water periods. Although wet prairie areas may not have the visible impact of sawgrass areas, they are the most susceptible to impacts with repeated use at lower water levels. Special conditions requirements will be developed based on water levels that minimize as many impacts as possible to vegetation and soils. Pernas et al 1995 found that higher water depths eliminated or significantly reduced any impact caused by airboats during the research period. Permit holders of airboats will be required to adhere to restrictions based on water level stages and locations on the Refuge. A monitoring system will be implemented on the Refuge to ensure the impact results of Pernas 1995, Duever et al. 1981, and Duever et al. 1986 are sustained locally as well. If soil and vegetation conditions are not responding in similar fashion to expectations, the use of motorized watercraft may be further restricted or removed entirely from the Refuge.

The Refuge has a lot of variation in the elevation of the variety of habitats found in the interior marsh. Although water levels may seem generally high enough to prevent habitat impacts, there will be other areas where water levels and vegetation may not be protected. For this reason, the use of best management practices and robust monitoring program will be implemented. For example, a typical best management practice includes operating motorized watercraft (including airboats) in a manner that avoids sawgrass areas and focuses operations in emergent sloughs dominated by spike rush, lily pads, and bladderwort/periphyton.
Openings “Cuts” Into the Interior: Due to the loss of resistance in locations were dense vegetation between the canal and interior marsh has been removed (Douglas-Mankin and Surratt 2018) and the potential to spread exotics from existing canals into the interior portion of the Refuge, best management practices ensure all motorized (and non-motorized) watercraft operators are aware of the impacts and refrain from “cutting” new trails or operating on trails during low water conditions.

Motorboat operators should be encouraged to practice good “invasive species hygiene” to reduce the spread of Lygodium spores and other exotics (Hutchinson and Langeland 2006). Practices include: prior to leaving known invasive species infested areas: all equipment, boats, trailers and vehicles should be sprayed down by high-pressure sprayer using water or compressed air with specific focus on all openings cracks, crevices, treads, underside of trailers, vehicles and boats; cleaning should occur along the edge of infestation area to avoid spreading invasive species seeds/spores to new areas; all clothing and accessories should be brushed off and washed daily and disposable suits should be removed prior to leaving infested sites and placed in plastic bag (Hutchinson and Langeland 2006).

When designating areas open to motorized watercraft, close attention is given to modeling after areas within Big Cypress National Preserve and Everglades National Park that have recently developed and implemented new airboat regulations. The regulations restrict open access for airboats and limits the number of commercial airboat tours on established trails.

Pets on leash:
Dogs and other pets on the Refuge have the potential to cause negative ecological impacts and user conflicts with wildlife and visitors. The role of dogs or other pets in wildlife diseases is not well documented. However, domesticated animals host endo- and ecto-parasites and can contract diseases from, or transmit diseases to, wild animals, and transport parasites to or from wildlife habitats. Albeit unlikely, bringing pets from unknown locations with unknown pests can potentially introduce an infestation of particular pests on the Refuge. Any new pest introduction can cause undue financial and administrative burdens to the Refuge and staff for the cost of treatments and control or undergoing extensive approval processes for pesticide approval and use.

Additionally, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals. To reduce the risk of this exposure to wildlife and people, pet owners would be required to promptly pick up their pet’s feces and dispose of it properly. Other ecological impacts can result from the accidental release or escape of pets. If not located and re-captured, escapees can cause detrimental harm to themselves, the habitat and/or the ecosystem.

As with other compatible uses on the Refuge, the potential to disturb threatened or endangered species on the Refuge is extremely low. Disturbances to wildlife, in general, include disruption to nesting or foraging birds, resting alligators, deer movements, or other natural behaviors of various wildlife in the proximity. Most dogs have retained instincts to chase wildlife and those instincts can be triggered by flushed and escaping wildlife (Bowers 1953). If triggered, there is potential for owners to be unprepared or unable to control their dog, resulting in possible escapes and harm to wildlife, the owner, the pet, or other visitors. Conversely, there are also risks to pets from alligators. Alligators are often seen resting on the banks of the water’s edge or walking across the paths of visitors; however, most alligators would leave the area of human intrusion. Nesting females or startled animals may demonstrate a more aggressive response. Unprovoked attacks on people and pets are not unheard of in Florida and all visitors should
remain vigilant and responsible nonetheless. Dogs and other small pets are more likely to be attacked than humans because they resemble a natural prey item for the alligator (FWC 2005). From 1948 to 2016, 388 unprovoked bite incidents have occurred in Florida (AOL 2017). The behavior increases when alligators are provoked or fed and lose their fear of humans and become accustomed or attracted to people. As new developments encroach on alligator habitat, human/alligator conflicts would almost certainly continue to increase (FWC 2005). Informational signs would be developed explaining the need to be vigilant with their pets and the presence of alligators and other wild animals.

Dogs that are unleashed increase the zone of disturbance beyond what it would be in the absence of a dog (Blumstein et al. 2006). Dogs (and likely other pets) elicit a greater response from wildlife than pedestrians alone (MacArthur et al. 1979; Hoopes 1993). In the case of birds, the presence of dogs may reduce bird diversity and abundance in woodlands (Banks and Bryant 2007) and staging areas (Burger 1986, Lafferty 2001), flush incubating birds from nests (Yalden and Yalden 1990), disrupt breeding displays (Baydack 1986), disrupt foraging activity (Hoopes 1993), and disturb roosting activity in ducks (Keller 1991). Many of these authors indicated that dogs with people, dogs on-leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. However, the greatest stress reaction results from unanticipated disturbance. Finally, the presence of dogs may exert a cumulative effect with other disturbances to reduce habitat suitability (Fernandez-Juricic 2002). Sime (1999) concluded that maintaining control of pets while in wildlife habitats reduces the potential of disturbance, injury, or mortality to wildlife. In a study comparing wildlife responses to human and dog use on and off trails, Miller et al. (2001) recommended prohibiting dogs or restricting use to trails to minimize disturbance and that natural land managers can implement spatial and behavioral restrictions in visitor management to reduce disturbance by such activities on wildlife. Pet owners would be required to maintain physical control (i.e. leash or enclosure) of their animal while on the Refuge, thereby reducing the potential and severity of these impacts to wildlife. Any disturbance would be temporary and should not lead to loss of migratory birds or their habitats.

Allowing pets on a leash may cause negligible or short-term impacts to localized vegetation, soils, and waters including vegetation compaction and soil disturbance and compaction; however these impacts would be comparable to those experienced from similar recreational uses. It is expected that water quality would be negligibly impacted as well, since pet waste (in low concentrations) is presumed to be similar to the effects of waste from the abundance of wildlife utilizing the Refuge.

Ceremonies (non-Refuge sponsored) and Instructor-led small group activities:
Ceremonies (non-Refuge sponsored) and instructor-led small group activities would have negligible to minimal negative impacts from this use; any request that does not comply with the stipulations or is determined to pose a risk of negative impacts would not be approved and no SUP would be issued. This use would most likely cause minimal disturbance to wildlife in the immediate vicinity of the event. Depending on the time of year, conflicts can arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Responses of wildlife to human activities include: departure from site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschgen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). However, the amount of acreage available to wildlife in areas closed to public
access far exceeds the few areas the public is able to hold ceremonies. This fact is expected to alleviate and reduce impacts to negligible or acceptable levels.

Wildlife observation for other visitors of the Refuge may be marginally affected due to a pavilion or small space being temporarily occupied and unavailable to persons not participating in-group activities. The Refuge will attempt to minimize any potential impacts to negligible levels or within acceptable limits for all uses allowed.

Concessions and Commercial Use
Regular scheduled tours for concessions and commercial uses to specific areas may displace wildlife use at certain locations to a greater extent than random visitor use. Wildlife may be temporarily disturbed by tour groups or could possibly avoid some of the areas used repeatedly by the groups. Several studies have examined the effects of recreation on birds using shallow water habitats adjacent to trails and roads through NWRs in the eastern United States (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreational activities always has at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance. Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998). Distance: Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported. Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger and Gochfeld 1981, Burger et al. 1995, Knight and Cole 1995, Rodgers and Smith 1995, 1997). Type and Speed of Activity: Landscapers caused birds to flush more than anglers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and birds likely perceive these activities as less threatening (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed, but may flush if the activity stops or slows (Burger et al. 1995). Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

Trash left on the Refuge facilities and natural areas, particularly food or wrappers can attract predators that prey on nesting, loafing, roosting birds and other wildlife. Impacts of commercial tours, guides, and outfitters are likely to be minimal if conducted in accordance with Refuge regulations. The Refuge would manage Refuge closures that restrict public access to minimize disturbance to priority avian species during critical times of the year. Closures can be expanded or decreased as needed, depending on bird activity and results of further disturbance studies. The Refuge is a leave-no-trace facility. We encourage all outfitters and guides to pack in and pack out all food containers, bottles, wrappers, trash, and other waste and refuse. Littering, dumping, and abandoning property are prohibited by Federal regulation at 50 CFR 27.93 and 50 CFR 27.94.
As a business, the concession is concerned over the long-term with making a profit and expanding their customer base. Promotion of their services may bring greater numbers of visitor groups and individuals to the Refuge and thus, greater disturbance to the resources may occur. Long-term use of an area would be monitored as visitation increases and adaptive management strategies developed to address impacts. Monitoring would include an evaluation of changes in wildlife use patterns, trampling of vegetation, and compaction of the soil around the activity area. The Refuge and concession operator would work collaboratively to manage group size and distribute groups to various sites to minimize the impacts resulting from this use. If impacts were unacceptably high, certain areas of the Refuge could be closed to public use for periods of time.

Allowing concessions and commercial use has a positive effect on the overall interpretive, environmental education, and wildlife observation programs of the Refuge, reaching a much larger and more diverse audience. It would also produce a greater appreciation of wildlife resources in participants, and building relationships between the Refuge and area businesses. We do not expect the addition of a concessionaire to materially interfere with or detract from the mission of the Refuge System, nor diminish the purpose for which the Refuge was established. It would not pose adverse effects on Refuge resources, interfere with public use of the Refuge, or cause an undue administrative burden. These uses would contribute to achieving Refuge purposes and the Refuge System mission because they facilitate fishing, wildlife observation and photography and provide compatible recreational opportunities for visitors to observe and learn about wildlife and habitats firsthand.

4.3 Socioeconomic Consequences

4.3.1 Impacts on Public Health and Safety

Alternative A:
Alternative A would have no or negligible effects to public health.

Alternative B:
There are no anticipated impacts on public health and safety for the proposed uses except some considerations for hunting.

On Strazzulla, hunting opportunities would be limited to archery, crossbow, and air gun for the general public, while shotguns will be allowed for specialty hunts. To minimize potential negative interactions with surrounding residential communities, a 300-foot buffer in which hunting is prohibited would be created to protect the safety of neighboring residents. In the Cypress Swamp, we are allowing archery, crossbow, air gun, shotgun, and centerfire rifle for specialty hunts only. In the Refuge Interior, we are allowing archery, crossbow, air gun, shotgun, and centerfire rifle. These hunts would be limited to small-scale lottery hunts for deer and/or feral hog.

Increased access for hunting has the potential to cause various levels of impacts to public safety. The Refuge is open during the hunting season to other priority public uses such as fishing, wildlife observation, wildlife photography, and environmental education and interpretation. To safely provide both hunting and non-hunting recreational uses, the Refuge enforces a series of Refuge-specific hunting regulations. Hunting will be restricted by location, date, or methods of take in order to provide a safe environment for all visitors. Conflicts between mixed user groups might occur, but would be mitigated by time (non-hunting season) and space zoning. The Refuge would focus non-consumptive use (mainly bird watching and other wildlife
viewing) in the areas or at times that are closed to hunting. There will also be a "no hunting" area established east of the L-40 levee where the headquarters and Visitor Center building, Refuge residences, shop compound, other associated facilities, hiking trails, and observation towers are located. Implementation of this "no hunting" zone would facilitate all five of the remaining priority public uses. Conflicts between consumptive users, such as disruption of or hunting too close to other hunters, may occur also but should be mitigated. The size of the areas being proposed for hunting in addition to the limitations implemented to address ecological concerns is expected to help mitigate user conflicts. A 300-foot buffer around private lands for any hunting in Strazzulla would be imposed.

Like other wild animals, feral hogs can carry parasites and diseases, some of which can be transmitted to people. One such disease is swine brucellosis, a bacterial disease. Hunters can be infected with brucellosis bacteria when blood, fluid or tissue from an infected animal comes in contact with their eyes, nose, mouth or skin. This can happen when: field dressing, butchering, handling or preparing raw meat for cooking, or eating meat that is not thoroughly cooked (FWC 2018b). Other diseases carried by feral hogs include pseudorabies and tularemia. Additionally, salmonellosis, foot rot, intestinal bacteria, viruses, and parasites are commonly transmitted via fecal matter (Extension.org 2012).

Other potential safety impacts include hunters becoming lost, injured, or stuck. Due to the vast size of the Refuge, response times and success in locating users in need of assistance is greatly reduced. These circumstances are true for most natural areas and should be expected by hunters. These potential impacts can be mitigated through the general use of GPS units and cell phone habits by hunters/explorers. General warning or caution statements would also be made available in the brochures hunters would be required to sign and have on their person.

Adverse impacts to public safety is a concern with a canoe trail in the southern portion of the Refuge, as this area would be most utilized by motorized watercraft. As long as rules and regulations (i.e. flags on vessels for visibility) are followed and the Refuge is able to limit user conflicts through closures during hunt seasons, these safety concerns can be mitigated.

4.3.2 Impacts on Recreation

Alternative A:

Not expanding recreation use when resources allow is considered an adverse effect, since wildlife-dependent public use opportunities help further the conservation mission of the USFWS. Having areas open to the public to view and enjoy natural resources, can help promote a conservation ethic, which could translate to actions benefitting wildlife on and off-Refuge. Under this alternative, some economic benefits associated with recreational uses would not materialize. Future levels of recreational uses and associated expenditures (e.g. sales of wildlife viewing/photography, hunting and fishing equipment, etc.), as well as indirect economic activities (e.g. restaurant/hotel use by visitors in the surrounding areas) are unknown. However, the possible increase in the economics of public use on the tract compared to the rest of the Refuge would be less given the size of the tract and other limitations.
Alternative B:

Welcome and Orient
Structures such as boardwalks, observation towers, and photo blinds would have a number of long-term beneficial impacts to the environment, accessibility, and visitors’ recreational and educational experiences. These structures would provide visitors, including groups present for educational purposes, extended access or a new vantage point from which to observe and appreciate the vast expanse of Everglades ecosystem, the Refuge, neighboring wetlands, and wildlife. Boardwalks would allow visitors to pass over wetland areas to reach proposed towers or blinds without treading directly through wetlands, which can be hazardous, making the Refuge more accessible, including to those with disabilities. Elevated designs for the observation towers and boardwalks would reduce the potential for environmental impacts to nearby habitats and species. All efforts would be made to use conservative construction techniques (e.g., silt barriers), recycled materials and environmentally friendly treated lumber in each of these projects. Boardwalks would also be built within American with Disabilities Act (ADA) guidelines. Total construction footprints may utilize up to two acres, but are expected to impact less than one acre.

Hunting
The Improvement Act identified hunting as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in planning and management. The Service attempts to provide opportunities for this use in the NWRS where compatible. This activity supports the Service’s goal of Connecting People with Nature and Secretarial Order 3356 in addition to multiple objectives and strategies stated in the Refuge’s CCP. Hunting allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy mentally and physically, but can build a life-long appreciation for wildlife and their habitats.

During Refuge hunts, conflicts between mixed user groups might occur, but would be mitigated by time (non-hunting season) and space zoning. The Refuge would focus non-consumptive use (mainly bird watching and other wildlife viewing) in the areas that are closed to hunting. There would also be a “no hunting” area established east of the L-40 levee where the headquarters and Visitor Center building, Refuge residences, shop compound, other associated facilities, hiking trails, and observation towers are located. Implementation of this "no hunting" zone would facilitate all five of the remaining priority public uses. Conflicts between consumptive users, such as disruption of or hunting too close to other hunters, may occur also but should be mitigated. The size of the areas being proposed for hunting in addition to the limitations implemented to address ecological concerns is expected to help mitigate user conflicts.

Fishing
The Improvement Act identified fishing as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in planning and management. The Service attempts to provide opportunities for this use in the NWRS where compatible. This activity supports the Service’s goal of Connecting People with Nature and Secretarial Order 3356 in addition to multiple objectives and strategies stated in the Refuge’s CCP. Fishing allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy mentally and physically, but can build a life-long appreciation for wildlife and their habitats.
Wildlife Observation, Photography, Environmental Education and Interpretation
The Improvement Act identified wildlife observation and photography, interpretation, and EE as four of the six priority, wildlife-dependent recreational uses to be facilitated in the NWRS, and the Act encouraged the USFWS to provide opportunities for these uses. By providing wildlife observation and photography, the public would have an opportunity to observe/photograph wildlife on the Refuge and share those experiences with others. Through interpretive and EE programs, the public gains a better understanding and appreciation for America’s flora and fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources. One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. These uses can also provide excellent interpretive activities, exposing young people and urban dwellers to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. Providing information regarding the mission of the USFWS and the purposes of the Refuge, along with specific resource information, to Refuge visitors may alleviate potential negative impacts of visitors on wildlife. Wildlife observation and photography, interpretation, and EE allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy for mind, body and spirit, but can build a life-long appreciation for wildlife and their habitats.

Other Recreational Uses

For all proposed other recreations uses, as public use increases, unanticipated conflicts between different user groups could occur. If this should happen, the refuge will adjust its programs, as needed, to eliminate or minimize any public use issues. The refuge will use methods that have proven to be effective in reducing or eliminating public use conflicts. These methods include establishing separate use areas, different use periods, and limits on the numbers of users in order to provide safe, quality, appropriate, and compatible wildlife-dependent recreational opportunities.

Camping:
Conflicts may arise between visitors as a result of noise and over-crowding. Conflicts may also develop between small and large groups and different user groups (anglers, wildlife photographers, etc.). Litter, noise, large group sizes, and crowding may impair the Refuge experience for some visitors. A limited number of campsites would be located across a large landscape. Public outreach may help reduce potential conflicts by reducing littering and promoting a “Leave No Trace” ethic. Overall, the impacts associated with this use would be confined to a minute portion of the Refuge, in the immediate vicinity of the campsite. Periodic closures, when warranted, and the stipulations listed below, should ensure that disturbance of wildlife and impacts on Refuge resources are minimal.

Horseback Riding:
Potential horseback riding opportunities would give this group, who might not otherwise visit the Refuge, an opportunity to appreciate the natural plant community, observe resident wildlife, and enjoy the aesthetic attributes of the Refuge.

Non-motorized and motorized watercraft:
In addition to impacts on wildlife and habitat, there are potential conflicts between the various watercraft user groups that occur on the Refuge. Most of the non-motorized watercraft area would be closed to motorized boats. Motorized watercraft must be courteous to other visitors in the canal and Refuge Interior, and must proceed at “slow speed and minimum wake” when
encountering any non-motorized watercraft. The wakes created by motorized boaters traveling alongside non-motorized boaters at a high speed may represent a safety risk to non-motorized boaters (American Canoe Association 2004). Wakes generated by high speed motorized boaters in narrow channels and backwaters cannot readily dissipate. These wakes could cause water to fill or capsize non-motorized boats. Motorboat operators shall be in compliance with all applicable Refuge, U.S. Coast Guard, and State of Florida regulations and laws.

Another possible impact is litter from users which affects water quality and attracts predators to bird nesting areas. Litter also impacts the visual experience of visitors (Marion and Lime 1986). Several enforcement issues may result from boating, including trampling of vegetation following trespass into closed areas, illegal taking of fish, illegal fires, and disorderly conduct. To mitigate these potential issues, motorized/non-motorized watercraft users are not permitted access to any of the Refuge Interior tree islands.

**Pets on leash:**
Allowing pets on the Refuge, provides visitors with a much sought-after opportunity for non-consumptive wildlife-dependent recreation, and can foster positive public relations (especially with urban populations), and introduce the Refuge to new, non-traditional audiences. Through increased available opportunities with their pets, they may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. This use is low impact, low cost, and highly controllable.

**Ceremonies (non-Refuge sponsored):**
Allowing ceremonies on the Refuge would foster positive public relations, especially with urban populations, and introduce the Refuge to new, non-traditional audiences. Through this experience, they may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. This use is low impact, low cost, and highly controllable.

**Instructor-led small group activities:**
Allowing instructor-led small group activities on the Refuge would introduce the Refuge to new, non-traditional audiences. By acknowledging and supporting the community in their search for ecotherapy, the Service can foster positive public relations in our urban communities, which would ultimately benefit fish, wildlife and their habitats.

**Concessions and Commercial Uses**
The concession and commercial uses would be allowed to operate on the Refuge to provide recreational opportunities to a wide spectrum of individuals with various levels of outdoor skills. They also provide a needed service for those visitors that do not possess appropriate equipment or did not bring their own. This activity has a positive effect on the overall interpretive, environmental education, and wildlife observation programs of the Refuge, reaching a much larger audience.

4.3.3 **Impacts to Infrastructure**

**Alternative A:**
There would be no impact to Refuge infrastructure, as no new infrastructure would be constructed.
**Alternative B:**

Alternative B would require construction of facilities (i.e. interpretive trail, boardwalk, environmental education building at Strazzulla, observation towers, photo blinds) and maintenance (i.e. parking areas, boardwalks, fishing piers), and would cause minimal impacts to localized soils and waters. These actions may cause limited wildlife disturbances and damage to vegetation during construction; however, these disturbances are expected to be short term or during the duration of construction or maintenance. New facility construction or filling activities would comply with the requirements of Section 404 of the Clean Water Act and other applicable regulations. Turbidity during construction would be limited by silt screens or other methods to minimize potential runoff. Parking areas would be constructed to allow storm water to percolate into the soil rather than allowing it to run directly into adjacent wetlands.

Infrastructure via levees currently exists but additional trail construction would be necessary to afford access. The Refuge has experienced minimal impacts to wildlife as a result of existing (hiking and biking) visitor access to levee systems. Allowing public horseback riding access is anticipated to minimally impact wildlife resources, similar to impacts experienced on levee settings currently open to public access.

Anticipated impacts may include increased maintenance of the spaces, parking areas, and boat ramps utilized.

Any new pest introduction can cause undue financial and administrative burdens to the Refuge and staff for the cost of treatments and control or undergoing extensive approval processes for pesticide approval and use.

### 4.4 Cultural Resource Consequences

Under both alternatives, any known or found historic and archaeological sites would be protected under federal ownership as defined in the National Historic Preservation Act of 1966, as amended through 1992 (P.L. 89-665), the Archaeological Resources Protection Act of 1979 (P.L. 96-95), the Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601), and the implementing regulations authored by the Advisory Council on Historic Preservation, the Department of the Interior, and the National Park Service.

**Alternative A:**

Alternative A would not have any effects on cultural resources resulting from public use.

**Alternative B:**

Alternative B includes possible infrastructure additions (e.g. boardwalk, observation tower, fishing pier, environmental education center) that have the potential to disturb cultural resources. Prior to any ground disturbing activities a cultural resources assessment would be conducted. Furthermore, the USFWS is a public agency required to protect cultural resources, thus if any cultural resources were discovered on the property, they would continue to be protected. Overall, the potential impacts to cultural resources under these alternatives is expected to be minimal.
4.5 Cumulative Impacts Analysis

A cumulative impact is defined as an impact on the natural or human environment, which results from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions (40 Code of Federal Regulations, 1508.7).

Cumulative impacts are the overall, net effects on a resource that arise from multiple actions. Impacts can “accumulate” spatially, when different actions affect different areas of the same resource. They can also accumulate over the course of time, from actions in the past, the present, and the future. Occasionally, different actions counterbalance one another, partially canceling out each other’s effect on a resource. More typically, multiple effects add up, with each additional action contributing an incremental impact on the resource. In addition, sometimes the overall effect is greater than merely the sum of the individual effects, such as when one more reduction in a population crosses a threshold of reproductive sustainability, and threatens to extinguish the population.

A thorough analysis of impacts always considers their cumulative aspects, because actions do not take place in a vacuum: there are virtually always some other actions that have affected that resource in some way in the past, or are affecting it in the present, or would affect it in the reasonably foreseeable future. So any assessment of a specific action’s effects must in fact be made with consideration of what else has happened to that resource, what else is happening, or what else would likely happen to it.

Alternative A:
Alternative A would have no significant cumulative impacts. The Refuge would continue its public use program without change. Some potential level of increased economic activity associated with public use would not be fully realized, but this is expected to be a minimal adverse effect.

Alternative B:
With increased wildlife-dependent recreation opportunities, user group conflicts may occur. The refuge’s visitor use programs would be adjusted as needed to eliminate or minimize occurrences to provide quality wildlife-dependent recreational opportunities.

Welcome and Orient
Alternative B would have some adverse cumulative effects to physical resources from possible infrastructure projects. However, through site planning and best management construction practices the effects on soils, hydrology, water and air quality, and noise are expected to be localized and of relatively short duration. The overall impacts to these resources would be minimal. Some minimal adverse effects to biological resources are possible. Proposed infrastructure construction would cause a fraction of wildlife habitat to be lost (about 1 to 2 acres of the entire Refuge), and is considered a minimal adverse effect. Disturbance from public uses to wildlife are anticipated to be localized and/or temporary, and should not result in any long-term changes in the behavior of wildlife, imperiled species, or migratory birds. Opening up the Refuge to expanded public use is expected to instill a greater appreciation and understanding of the Refuge’s biological resources. This could inspire an increased level of conservation awareness and, possibly, action being taken off-Refuge, which would have a positive effect. None of the proposed activities are expected to have any significant cumulative effects to the biological resources of the Refuge. Adverse cumulative impacts that may occur include non-
native exotic vegetation increased along the project sites due to soil or vegetative disturbance. These impacts often occur from soil disturbance during construction activities in natural areas, but are expected to be minor and manageable with current resources through staff and volunteers.

**Hunting**
Refuge management activities can be accomplished without conflicting with hunting activities via administratively closed areas, timing of hunts, and methods of hunt. White-tailed deer can become destructive to habitats when densities become too high for the habitat to support. High densities can also result in a negative impact on deer health. The management of deer through hunting is often necessary and also provides economic return for local economies and provides funding to state programs that benefit all wildlife (Schaefer and Main 1997). Deer hunting on the Refuge should have minimal effects on deer populations and potential beneficial effects on habitat and herd heath. Since breeding seasons largely occur outside of deer hunting season, no cumulative effects are anticipated on resident wildlife, migratory birds, and non-hunted wildlife.

Non-hunted resident wildlife would include resident birds, small mammals such as voles, moles, mice, shrews, and bats; reptiles and amphibians such as snakes, turtles, salamanders, and invertebrates such as butterflies, moths, insects and spiders. Due to limited home ranges of these animals, regional impacts would not occur. Locally there may be temporary displacement of resident birds. Disturbance of many small mammals, reptiles, or amphibians would be minimal due inactivity during hunt seasons. Invertebrates also limit activity during the hunting season when temperatures are lower. The Refuge anticipates no measureable negative cumulative impacts to resident non-hunting wildlife populations locally or regionally.

**Fishing**
The proposed use is not likely to adversely affect fish and frog populations. Fish harvest would occasionally occur; however, most anglers generally practice catch and release. Although frogging may increase pressure on frog populations, the proposed season and bag limit restrictions should alleviate any pressure on populations or competition for wading birds. The season proposed excludes four months during which frogs are most actively breeding and during peak wading bird foraging/nesting season. Applying restrictions should alleviate any long-term and/or cumulative impacts to frog populations and the wildlife that prey on them. Recreation participants are required to adhere to all FWC fishing and frogging regulations except where Refuge-specific regulations have been set. These regulations are designed to protect species populations from the pressures of fishing and frogging by the public.

This use should not result in long-term or cumulative impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the Comprehensive Conservation Plan (CCP). Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur primarily on ruderal communities that can withstand repetitive use. A slight increase in gas emissions may occur due to the increase in vehicular traffic. However, no significant biological or ecological impacts

**Other Recreational Uses**

**Trails:**
Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat.
Camping and canoe trails:
Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Camping would occur on ruderal communities that can withstand repetitive use.

Horseback Riding:
The Refuge believes that with the proper management, horseback riding would not result in any short or long-term impacts that would adversely affect the purpose of the Refuge or the mission of the National Wildlife Refuge System. Horseback riding would be limited to hardened surfaces in a relatively small area on the Refuge and managed to keep any adverse effects at minimal levels. In the long-term, allowing horseback riding would enhance visitor opportunities to participate in wildlife-dependent recreational uses on the Refuge, including wildlife observation and wildlife photography. To mitigate potential disturbances, a combination of Refuge staff presence and informational kiosks would help educate visitors about the potential problems associated with their actions. Should negative impacts be observed, public use levels and options would be adjusted accordingly.

This use should not result in long-term or cumulative impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the CCP. Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur primarily on ruderal communities that can withstand repetitive use. A slight increase in gas emissions may occur due to the increase in vehicular traffic. However, no major biological or ecological impacts have been observed as a result, despite these uses occurring on the Refuge for decades.

Non-motorized watercraft:
No cumulative impacts are anticipated with allowing non-motorized watercraft on the refuge.

Motorized watercraft:
Special conditions requirements will be developed for the use of motorized watercraft on the refuge which should not result in long term cumulative impacts. If conditions indicate that negative resource impacts, the use of motorized watercraft may be further restricted or removed from the Refuge.

Pets on leash:
This use should not result in long-term impacts that adversely affect the purposes for which the Refuge was established. The amount of acreage available to wildlife in areas closed to public access far exceeds the few areas the public is able to recreate with their pets. This fact, in addition to the CFR requiring confinement and control of pets, is expected to alleviate and reduce impacts to negligible or acceptable levels.

Ceremonies (non-Refuge sponsored) and instructor-led small group activities:
Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur on ruderal communities that can withstand repetitive use.

Concessions and commercial Use
There are no anticipated adverse cumulative impacts resulting from concessions and commercial uses. This activity will result in beneficial cumulative impacts by increasing public awareness about conservation issues and the NWRS. Ultimately, this will benefit the USFWS’s mission, the Refuge purposes, and the Refuge visions.
Cultural Resources
There would be no major cumulative effects to cultural resources. Prior to any ground disturbance activities, the USFWS would conduct a cultural resource assessment. Any cultural resources discovered would be protected.

Socioeconomics
Potential effects on socioeconomics are generally expected to be neutral or positive. Increased opportunities for public recreation on the Refuge would help meet some of the growing local demand for such activities. There would be a positive effect on the local economy resulting from public visitation and associated spending. Carefully coordinated and managed hunts are expected to keep any risks to human health and safety to a minimum.
CHAPTER 5 CONSULTATION AND COORDINATION WITH OTHERS

During the negotiations of the 2018 License Agreement between the SFWMD and USFWS, it was requested that the USFWS continue to take the lead on public use management. Both the SFWMD and the FWC requested that the USFWS consider additional opportunities for public access. The USFWS concurred and in response, the USFWS and SFWMD agreed upon 25 additional potential public access opportunities to evaluate, and upon approval, implement. The USFWS and SFWMD have had multiple meetings on these uses beginning in 2017. The USFWS and FWC met on at least four occasions to discuss public use on the Refuge. The USFWS, FWC, and SFWMD met on at least four other occasions. These meetings included stakeholder identification, use evaluation, site visits, and other topics. The USFWS also held an Intergovernmental meeting that was well attended by a number of Federal, state, and local agencies, including other USFWS bureaus (fisheries and science), U.S. Army Corps of Engineers, U.S. Geological Survey, SFWMD (land management, migratory birds, public use), FWC, Palm Beach County Tourist Development Council, Palm Beach County Environmental Resource Management, the Village of Wellington, and the City of Boynton Beach. The Refuge also hosted two well-attended public scoping meetings and presented at the SFWMD’s Water Resources Advisory Council-Recreation Sub Committee, which is a public meeting. The Refuge also held a public meeting on the draft Visitor Services Plan and Environmental Assessment. The Refuge also contacted the major bands of the Seminole and Miccosukee Tribes, giving one presentation to the Seminole Nation of Oklahoma. The Refuge advertised the public meetings and Visitor Services Plan scoping process on its web site and Facebook page, in addition to a press release that went out to all local news outlets. One TV news station, the Palm Beach Post and the Sun Sentinel all did articles on the public use scoping process. The Friends of the Arthur R. Marshall Loxahatchee National Wildlife Refuge also placed this information on their web page, Facebook, and general e-mail to its members.

Tribal Consultation
The United States has a unique legal and political relationship with recognized Tribes. The United States recognizes Tribes as sovereign governments that are self-governing under Federal law (Pursuant to DOI Policy on Consultation with Indian Tribes as amended on August 10, 2012). The USFWS initiated consultation through formal letters sent to the chairs of affected Tribes. The USFWS invited the tribes to participate in any way that would be meaningful to them, including government-to-government consultation. The Tribes were also included in the distribution of this EA.

Other Consultation
Federal consistency reviews, under the Coastal Zone Management Act are integrated into other review processes conducted by the state depending on the type of federal action being proposed. The Florida State Clearinghouse, administered by the Department of Environmental Protection Office of Intergovernmental Programs, is the primary contact for receipt of consistency evaluations from federal agencies. The Florida State Clearinghouse coordinates the state’s review of proposed federal activities, requests for federal funds, and applications for federal permits other than permits issued under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Consistency reviews of federal permits issued under those Acts are conducted in conjunction with wetland resource and environmental resource permits issued by the Department of Environmental Protection or the water management districts. Section 106 of the National Historic Preservation Act of 1966, as amended, and Section 14 of the Archaeological Resources Protection Act require the USFWS to evaluate the effects of any
of its actions on cultural resources [e.g., historical, architectural, and archaeological] that are listed or eligible for listing in the National Register of Historic Places (NRHP)]. In accordance with these regulations, the USFWS’s regional archeologist and Florida’s State Historic Preservation Office were consulted to ensure that cultural resources would not be adversely affected.

The USFWS provides two major types of protection for potential archaeological or historical sites located on USFWS lands – protection from damage by federal activity and protection from vandalism or theft. The USFWS’s policy is to preserve these cultural, historic, and archaeological resources in the public trust and avoid any adverse effects wherever possible.

The USFWS is required to ensure that any action authorized, funded, or carried out by the USFWS does not jeopardize the continued existence of species listed under the Endangered Species Act or modify their critical habitat. This process is referred to as a Section 7 Evaluation and is done through consultation with the USFWS Ecological Services office. The Refuge consulted the South Florida Ecological Service Office (SFESO) with regards to several Federally listed species that have been documented on the Refuge to ensure that the project would have minimal adverse effects.
Appendices
APPENDIX A: Literature References

REFERENCE MATERIAL

USFWS Service Manual
USFWS National Outreach Strategy (1997)
USFWS Banking on Nature (2015)
USFWS Developing a Visitor Services Step-Down Plan, Southeast Region (2009)
USFWS Developing a Visitor Services Step-Down Plan (2010)
USFWS Conserving the Future (2011)
USFWS Visitor Services Standards Handbook (2011)
USFWS Urban Wildlife Refuge Standards of Excellence (2014)
USFWS Environmental Education Strategic Plan (2014)
Merritt Island NWR Visitor Services Plan (2006)
Ottawa NWR Visitor Services Plan (2015)
Santee NWR Visitor Services Plan (2011)
Savannah NWR Complex Visitor Services Plan (2015)
Tennessee NWR Visitor Services Plan (2016)

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## APPENDIX B: Acronyms and Abbreviations

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
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<tr>
<td>ATV</td>
<td>All-terrain Vehicle</td>
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<tr>
<td>AV</td>
<td>Audiovisual</td>
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<td>BMP</td>
<td>Best Management Practices</td>
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<td>CCP</td>
<td>Comprehensive Conservation Plan</td>
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<td>CD</td>
<td>Compatibility Determination</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>CEQ</td>
<td>Council on Environmental Quality</td>
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<td>CITIES</td>
<td>Convention on International Trade in Endangered Species of Wild Fauna and Flora</td>
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<tr>
<td>COA</td>
<td>Certificate of Authorization</td>
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<tr>
<td>CRADA</td>
<td>Cooperative Research and Development Agreement</td>
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<td>DMU</td>
<td>Deer Management Unit</td>
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<td>DOI</td>
<td>Department of the Interior</td>
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<td>EA</td>
<td>Environmental Assessment</td>
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<td>EE</td>
<td>Environmental Education</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<td>FLREA</td>
<td>Federal Lands Recreation Enhancement Act of 2004</td>
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<td>FOA</td>
<td>Finding of Appropriateness</td>
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<td>FONSI</td>
<td>Finding of No Significant Impact</td>
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<td>FP</td>
<td>Fishing Plan</td>
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<td>FP&amp;L</td>
<td>Florida Power &amp; Light</td>
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<td>FWC</td>
<td>Florida Fish and Wildlife Conservation Commission</td>
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<td>GPS</td>
<td>Global Positioning System</td>
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<td>HP</td>
<td>Hunt Plan</td>
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<td>JROTC</td>
<td>Junior Reserve Officers’ Training Corps</td>
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<td>LILA</td>
<td>Loxahatchee Impoundment Landscape Assessment</td>
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<td>National Conservation Training Center</td>
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<td>NWRS</td>
<td>National Wildlife Refuge System</td>
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<tr>
<td>PFD</td>
<td>Personal Floatation Device</td>
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<tr>
<td>Refuge</td>
<td>Arthur R. Marshall Loxahatchee National Wildlife Refuge</td>
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<tr>
<td>RISE</td>
<td>Resources in Science Education</td>
</tr>
<tr>
<td>RV</td>
<td>Recreational Vehicle</td>
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<tr>
<td>SFWMD</td>
<td>South Florida Water Management District</td>
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<tr>
<td>SFESO</td>
<td>South Florida Ecological Service Office</td>
</tr>
<tr>
<td>STA</td>
<td>Stormwater Treatment Area</td>
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<tr>
<td>STEM</td>
<td>Science, Technology, Engineering, and Mathematics</td>
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<tr>
<td>SUP</td>
<td>Special Use Permit</td>
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<tr>
<td>UAS</td>
<td>Unmanned Aerial System</td>
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<tr>
<td>USC</td>
<td>United States Code</td>
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<tr>
<td>USDA-APHIS</td>
<td>U.S. Department of Agriculture-Animal and Plant Health Inspection</td>
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<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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<td>UTV</td>
<td>Utility Task Vehicle</td>
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<td>VSP</td>
<td>Visitor Services Plan</td>
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<tr>
<td>WCA</td>
<td>Water Conservation Area</td>
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</tbody>
</table>
APPENDIX C: Appropriate Use Determinations

An appropriate use determination is the initial decision process a Refuge Manager follows when first considering whether or not to allow a proposed use on a refuge. The Refuge Manager must find that a use is appropriate before undertaking a compatibility review of the use. This process clarifies and expands on the compatibility determination process by describing when Refuge Managers should deny a proposed use without determining compatibility. If a proposed use is not appropriate, it will not be allowed and a compatibility determination will not be undertaken.

Except for the uses noted below, the Refuge Manager must decide if a new or existing use is an appropriate Refuge use. If an existing use is not appropriate, the Refuge Manager will eliminate or modify the use as expeditiously as practicable. If a new use is not appropriate, the Refuge Manager will deny the use without determining compatibility. Uses that have been administratively determined to be appropriate are:

- Six wildlife-dependent recreational uses - As defined by the National Wildlife Refuge System Improvement Act of 1997, the six wildlife-dependent recreational uses (hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation) are determined to be appropriate. However, the Refuge Manager must still determine if these uses are compatible.

- Take of fish and wildlife under state regulations - States have regulations concerning take of wildlife that includes hunting, fishing, and trapping. The Service considers take of wildlife under such regulations appropriate. However, the Refuge Manager must determine if the activity is compatible before allowing it on a Refuge.

Three of the uses cataloged in the list below; commercial recording, commercial tours, and scientific research, can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusion 43 CFR §46.210 (j): activities which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The use triggers no response to any extraordinary circumstances (43 CFR §46.215).

Appropriate Use Determinations were developed for the following uses:

1. Horseback riding
2. Pets on leash
3. Ceremonies
4. Instructor-led small group activities
5. Camping
6. Concessionaire operation
7. Non-motorized watercraft
8. Motorized watercraft
9. Mud motoring
10. Commercial guided hunting
11. Commercial recording
12. Commercial tours
13. Scientific research
**FINDING OF APPROPRIATENESS OF A REFUGE USE**

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Horseback riding

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
<thead>
<tr>
<th>Decision Criteria</th>
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</thead>
<tbody>
<tr>
<td>(a) Do we have jurisdiction over the use?</td>
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<td></td>
</tr>
<tr>
<td>(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(c) Is the use consistent with applicable Executive orders and Department and Service policies?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(d) Is the use consistent with public safety?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. **Yes ___ No ✓**

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

- **Not Appropriate _____**
- **Appropriate ✓**

Refuge Manager: ____________________________ Date: ____________________________

If found to be **Not Appropriate**, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found **Not Appropriate** outside the CCP process, the refuge supervisor must sign concurrence. If found to be **Appropriate**, the refuge supervisor must sign concurrence.

Refuge Supervisor: ____________________________ Date: ____________________________

**A compatibility determination is required before the use may be allowed.**
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Horseback riding users must adhere to Federal, State, tribal and local laws while on the Refuge.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. Horseback riding will only be conducted on existing trails, on perimeter levees, where it would not conflict with other uses or pose a risk to public safety.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes. Within the Refuge CCP, Goal 3, states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
No. An earlier documented analysis has denied the use. This is the first time this use has been proposed.

(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this activity.

(h) Will this be manageable in the future within existing resources?
Yes. Due to the minimal Refuge resources necessary to manage this activity, the Refuge believes it will be able to manage this resource in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?
Yes. Visitors participating in horseback riding are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. Horseback riding can be an excellent recreational activity, exposing people of all age groups, urban dwellers, and the community to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge.
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future? Yes. Through limiting access to existing trails, the Refuge believes it can accommodate this use without impairing current wildlife-dependent recreation. However, if the use becomes too popular, burdensome, or unmanageable for staff, or if adverse impacts on existing wildlife-dependent recreation occur, the Refuge may impose additional restrictions, up to and including termination, to mitigate disturbance.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Pets on leash

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
<thead>
<tr>
<th>Decision Criteria:</th>
<th>YES</th>
<th>NO</th>
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<tbody>
<tr>
<td>(a) Do we have jurisdiction over the use?</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?</td>
<td>√</td>
<td></td>
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<tr>
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<td></td>
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<tr>
<td>(d) Is the use consistent with public safety?</td>
<td>√</td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>√</td>
<td></td>
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<tr>
<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>√</td>
<td></td>
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<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>√</td>
<td></td>
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<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>√</td>
<td></td>
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<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
<td>√</td>
<td></td>
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<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No √

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate √

Refuge Manager: ______________________________________ Date: __________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: ______________________________ Date: ______________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Visitors always need to adhere to Federal, State, tribal and local laws when on the Refuge.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. With improvements to educational and interpretation signage and appropriate stipulations, risks to pets of responsible pet owners can be mitigated. In addition, the risks to visitors from pets would be mitigated by restraint (i.e. leash) and behavior restrictions. For example, dogs that bark excessively or are disruptive in nature may be required to vacate the premises.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes.
- Goal 3 of the Refuge’s CCP states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”
- A Strategy of the Refuge’s Urban Wildlife Conservation Plan is to, “Provide opportunities to connect urban audiences with nature.”

Allowing pets on the Refuge, provides visitors with a much sought-after opportunity for non-consumptive wildlife-oriented recreation, and can foster positive public relations (especially with urban populations), and introduce the Refuge to new, non-traditional audiences. Through reaching new audiences, we can increase the public’s exposure to, understanding, and appreciation of America’s flora, fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources.

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
No. The use has previously been rejected at the Refuge in the CCP. The following statement is made in the Environmental Assessment attached to the Refuge CCP, “No pets would be allowed on the Refuge because of their potential to cause disturbance to wildlife (with the exception of retrievers in waterfowl hunting).” However, a recent negotiation with the South Florida Water Management District for the renewal of the License Agreement (under which a large portion of the Refuge is managed) requires the USFWS to revisit and review this use with stipulations to minimize disturbance of wildlife.
(g) **Is the use manageable within available budget and staff?**
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with purchasing and posting educational and interpretation signage that is largely a one-time activity.

(h) **Will this be manageable in the future within existing resources?**
Yes. Due to the minimal Refuge resources necessary to manage this activity, the Refuge believes it will be able to manage this resource in the future with existing resources.

(i) **Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?**
Yes. One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. This use, although not a priority public use, can increase the audience reached and increase the public’s exposure to, understanding, and appreciation of America’s flora, fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources.

(j) **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?**
Yes. Through leash restrictions and appropriate signage, the Refuge believes it can accommodate this use without impairing existing wildlife-dependent recreation or reducing the potential to provide this in the future. However, if the use becomes too popular, burdensome, or unmanageable for staff, or if adverse impacts on existing wildlife-dependent recreation occur, the Refuge may impose additional restrictions, up to and including termination, to mitigate disturbance.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Ceremonies

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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<tr>
<td>(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?</td>
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<tr>
<td>(c) Is the use consistent with applicable Executive orders and Department and Service policies?</td>
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<tr>
<td>(d) Is the use consistent with public safety?</td>
<td>√</td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
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<tr>
<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
<td>√</td>
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<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No √

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate √

Refuge Manager: _______________________________ Date: __________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: _______________________________
Date: __________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) **Do we have jurisdiction over the use?**
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?**
Yes. Ceremonies and attendees must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a Special Use Permit describing any additional special conditions the permittee must abide by to maintain compatibility.

(c) **Is the use consistent with applicable Executive Orders and Department and Service policies?**
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service's Compatibility Determination Policy, 603 FW 2.

(d) **Is the use consistent with public safety?**
Yes. Additionally, the Refuge will issue a Special Use Permit describing any additional stipulations or special conditions the permittee must abide by to ensure their safety and the safety of the public.

(e) **Is the use consistent with goals and objectives in an approved management plan or other document?**
Yes.
- Goal 3 of the Refuge’s CCP states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”
- Additionally, a strategy of the Refuge’s Urban Wildlife Conservation Plan is to, “Provide opportunities to connect urban audiences with nature.”

Allowing ceremonies on the Refuge, provides visitors with a much sought-after opportunity for non-consumptive wildlife-oriented recreation, and can foster positive public relations (especially with urban populations), and introduce the Refuge to new, non-traditional audiences. Through reaching new audiences, we can increase the public’s exposure to, understanding, and appreciation of America’s flora, fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources.

(f) **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?**
Yes, this is the first time the use is being proposed on the Refuge.

(g) **Is the use manageable within available budget and staff?**
Yes. The financial and staff resources necessary to provide and administer this use at expected levels on the Refuge are now available and are expected to continue in the future.

(h) **Will this be manageable in the future within existing resources?**
Yes. Budget and staffing plans account for the responsibilities associated with all Special Use
Permits and events each fiscal year. The Refuge believes it will be able to include management of this use in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Allowing ceremonies on the Refuge will benefit the Refuge’s natural or cultural resources by fostering positive public relations, especially with urban populations, and introduce the Refuge to new, non-traditional audiences. Through this experience, they may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. Ceremonies on the Refuge may increase the public’s exposure to, understanding, and appreciation of America’s flora, fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Ceremonies will be managed through the Special Use Permit process and limited in locations available and monthly occurrences. These limitations will provide the flexibility and oversight to minimize impacts or interference with Refuge visitors, public use programs, wildlife or natural and/or cultural resources on the Refuge.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Instructor-led small group activities

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
<thead>
<tr>
<th>Decision Criteria:</th>
<th>YES</th>
<th>NO</th>
</tr>
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<tbody>
<tr>
<td>(a) Do we have jurisdiction over the use?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?</td>
<td></td>
<td>✓</td>
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<td>(c) Is the use consistent with applicable Executive orders and Department and Service policies?</td>
<td></td>
<td>✓</td>
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<tr>
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<td>✓</td>
<td></td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>✓</td>
<td></td>
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<tr>
<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
<td>✓</td>
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<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is “no” to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No ✓

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate ____ Appropriate ✓

Refuge Manager: _____________________________________________ Date: ______________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: __________________________ Date: __________________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) *Do we have jurisdiction over the use?*  
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) *Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?*  
Yes. All visitors engaging in instructor-led small group activities must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a Special Use Permit describing any additional special conditions the permittee and participants must abide by to maintain compatibility.

(c) *Is the use consistent with applicable Executive Orders and Department and Service policies?*  
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) *Is the use consistent with public safety?*  
Yes. Additionally, the Refuge will issue a Special Use Permit describing any stipulations or special conditions the permittee and participants must abide by to ensure their safety and the safety of the public.

(e) *Is the use consistent with goals and objectives in an approved management plan or other document?*  
Yes.

- Goal 3 of the Refuge’s states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”
- A Strategy of the Refuge’s Urban Wildlife Conservation Plan is to, “Provide opportunities to connect urban audiences with nature.”
- One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”.

(f) *Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?*  
Yes, an earlier document has not denied the use; this is the first time the use is being proposed on the Refuge.

(g) *Is the use manageable within available budget and staff?*  
Yes. The financial and staff resources necessary to provide and administer this use at expected levels on the Refuge are now available and are expected to continue in the future.

(h) *Will this be manageable in the future within existing resources?*  
Yes. Budget and staffing plans account for the responsibilities associated with all Special Use Permits and events each fiscal year. The Refuge believes it will be able to include management of this use in the future with existing resources.
(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Allowing non-traditional uses to be held on the Refuge will benefit the Refuge’s natural or cultural resources by fostering positive public relations, especially with urban populations, and introduce the Refuge to new audiences. Ecotherapy is one example of the ways in which supporting the value of natural settings for well-being is likely to prompt greater ecological awareness and environmental care (Hartig et al., 2001). By acknowledging and supporting the community in their search for ecotherapy, the USFWS can foster positive public relations in our urban communities, which will ultimately benefit fish, wildlife and their habitats. Through reaching new audiences, we can increase the public’s exposure to, understanding, and appreciation of America’s flora, fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources. Through this experience, new visitors may become aware of the value of national wildlife refuges and promote fish and wildlife conservation.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Instructor-led small group activities will be managed through the Special Use Permit process and limited in locations available and monthly occurrences. These limitations will provide the flexibility and oversight to minimize impacts or interference with Refuge visitors, public use programs, wildlife or natural and/or cultural resources within the Refuge.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Camping

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
<thead>
<tr>
<th>Decision Criteria:</th>
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<th>NO</th>
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<tr>
<td>(a) Do we have jurisdiction over the use?</td>
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<td></td>
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<tr>
<td>(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?</td>
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<tr>
<td>(c) Is the use consistent with applicable Executive orders and Department and Service policies?</td>
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<tr>
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<td>✓</td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>✓</td>
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<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
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<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
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<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>✓</td>
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<td>(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?</td>
<td>✓</td>
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<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
<td>✓</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes _ _ _ _ _ _ No _ _ _ _ _ _

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate √

Refuge Manager: _______________________________ Date: __________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: _______________________________ Date: __________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Campers must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a permit describing any additional special conditions the permittee must abide by to maintain compatibility.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service's Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. Additionally, the Refuge will issue a permit describing any special conditions the permittee must abide by to ensure their safety and the safety of the public.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes. Within the Refuge’s CCP, Goal 3, states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
Yes. An earlier documented analysis has not denied the use.

(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with administering permits to campers and law enforcement for compliance.

(h) Will this be manageable in the future within existing resources?
Yes. The Refuge believes it will continue to be able to manage this use in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Visitors participating in camping are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. Camping can be an excellent interpretive activity, exposing young people, urban dwellers, and the community to
the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. This use may expand the reach of the Refuge’s environmental education programs.

**(j)** Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Camping generally involves small groups that will be managed through a permit process and will be limited in size to prevent impairments to existing or future wildlife-dependent recreation activities.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Concessionaire operation

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ✓ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ Appropriate ✓

Refuge Manager: ___________________________________________ Date: ________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: _________________________________________ Date: ________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) *Do we have jurisdiction over the use?*  
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) *Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?*  
Yes. Concession operation users must adhere to Federal, State, tribal and local laws while on the Refuge.

(c) *Is the use consistent with applicable Executive Orders and Department and Service policies?*  
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) *Is the use consistent with public safety?*  
Yes. Additionally, the Refuge will issue documentation describing any special conditions the concessionaire must abide by to ensure their safety and the safety of the public.

(e) *Is the use consistent with goals and objectives in an approved management plan or other document?*  
Yes. Within the Refuge’s CCP, Goal 3, states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) *Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?*  
Yes. An earlier documented analysis has not denied the use.

(g) *Is the use manageable within available budget and staff?*  
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with law enforcement for compliance.

(h) *Will this be manageable in the future within existing resources?*  
Yes. The Refuge believes it will continue to be able to manage this use in the future with existing resources.

(i) *Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?*  
Yes. Visitors participating in concession operations are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. This can be an excellent interpretive activity, exposing young people, urban dwellers, and the community to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. This use may expand the reach of the Refuge’s environmental education programs.
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Concession operation users generally involves small groups or individuals that leave minimal footprints and in some cases can improve existing or future wildlife-dependent recreation activities, such as wildlife observation and photography.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Non-motorized watercraft

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes √ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ Appropriate √

Refuge Manager: ________________________________ Date: _____________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: ________________________________ Date: _____________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) **Do we have jurisdiction over the use?**
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?**
Yes. Non-motorized watercraft users must adhere to Federal, State, tribal and local laws while on the Refuge.

(c) **Is the use consistent with applicable Executive Orders and Department and Service policies?**
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) **Is the use consistent with public safety?**
Yes. Non-motorized watercraft access is currently available within the perimeter canals and approximately 37,000 acres of the Refuge Interior. This proposal is to expand the use throughout the remainder of the Refuge Interior, which has already demonstrated consistency with public safety.

(e) **Is the use consistent with goals and objectives in an approved management plan or other document?**
Yes. Within the Refuge’s CCP, Goal 3, states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?**
Yes. An earlier documented analysis has not denied the use.

(g) **Is the use manageable within available budget and staff?**
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with law enforcement for compliance.

(h) **Will this be manageable in the future within existing resources?**
Yes. The Refuge believes it will continue to be able to manage this use in the future with existing resources.

(i) **Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?**
Yes. Visitors participating in non-motorized watercraft access are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. This can be an excellent interpretive activity, exposing young people, urban dwellers, and the
community to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. This use may expand the reach of the Refuge’s environmental education programs.

(j) *Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?*

Yes. Non-motorized watercraft access generally involves small groups or individuals that leave minimal footprints and in some cases can improve existing or future wildlife-dependent recreation activities, such as wildlife observation and photography.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Motorized watercraft

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes √ No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is: Not Appropriate ____ Appropriate √

Refuge Manager: ___________________________________________ Date: ____________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: _________________________________________ Date: ____________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) **Do we have jurisdiction over the use?**
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?**
Yes. Visitors always need to adhere to Federal, State, Tribal, and local laws when on the Refuge.

(c) **Is the use consistent with applicable Executive Orders and Department and Service policies?**
Yes. This use is consistent with applicable Executive Orders, Department and Service policies. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) **Is the use consistent with public safety?**
Yes. With careful consideration and appropriate separation of user groups, this use could be consistent with public safety.

(e) **Is the use consistent with goals and objectives in an approved management plan or other document?**
Yes, if properly regulated using permits that are linked to suitable conditions and monitored impacts for airboats. This use is linked to the following goal and strategy outlined in the CCP:

- Goal 3 of the Refuge’s CCP states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and south Florida ecosystems.”
- A Strategy of the Refuge’s Urban Wildlife Conservation Plan is to, “Provide opportunities to connect urban audiences with nature.”

This use would provide expanded access for wildlife photography and observation, as well as, hunting and fishing, which are listed as appropriate uses, when compatible, by the National Wildlife Refuge System Improvement Act of 1997. While participating in any of these activities, including hunters, visitors are exposed to the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment.

(f) **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?**
Outboard motors have previously been approved. This use of airboats was previously deemed incompatible when evaluated as part of the development of the Refuge Comprehensive Conservation Plan (CCP) in 2000. Over the past 3 years, opportunities to work cooperatively with interested stakeholders has developed partnerships to support refuge management activities and develop appreciation and understanding of the historic use of airboats on the Refuge. Additionally, these opportunities have enabled greater appreciation and understanding of possible impacts of airboat use on the Refuge, means to reduce impacts, and need for sound stewardship.
(g) **Is the use manageable within available budget and staff?**
Yes. Current staff and budgets are minimally capable of overseeing this activity. Related to this activity, the majority of staff time would be associated with monitoring habitat impacts and enforcement of regulations.

(h) **Will this be manageable in the future within existing resources?**
Yes. Due to the minimal Refuge resources necessary to manage this activity, the Refuge believes it will be able to manage this resource in the future with existing resources. However, with additional decreases in staffing, this use may not be manageable.

(i) **Does this use contribute to the public’s understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?**
Yes. This use would provide additional access for wildlife photography and observation, as well as hunting and fishing, all of which are listed as appropriate uses, when compatible, by the National Wildlife Refuge System Improvement Act of 1997. While participating in any of these activities, visitors are exposed to the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment.

(j) **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?**
Yes. With proper management such as restrictions including requiring permits and optimal water levels for protecting habitat and wildlife, this use can be accommodated without impairing other existing and proposed wildlife-dependent uses.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Mud motors

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
<td>√</td>
<td></td>
</tr>
<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
<td>√</td>
<td></td>
</tr>
</tbody>
</table>

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes √ No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate √ Appropriate _____

Refuge Manager: _______________________________________________ Date: ___________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: _____________________________________________ Date: ___________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) **Do we have jurisdiction over the use?**
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) **Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?**
Yes. Visitors always need to adhere to Federal, State, tribal and local laws when on the Refuge.

(c) **Is the use consistent with applicable Executive Orders and Department and Service policies?**
Yes. This use is consistent with applicable Executive Orders, Department and Service policies. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) **Is the use consistent with public safety?**
Yes. With careful consideration and appropriate separation of user groups, this use could be consistent with public safety.

(e) **Is the use consistent with goals and objectives in an approved management plan or other document?**
No. This type of motor boat has been previously determined to cause extensive habitat damage in the Refuge Interior by causing propeller cuts into underlying vegetation, soil, and seedbanks. This disturbance can lead to degradation of habitat through the loss of native plant species, the introduction and/or spread of invasive species and/or altered hydrology, which is not consistent with the following and goals and objectives of the CCP:

- Goal 1, Objective 8: Manage and maintain diverse native habitats and viable wildlife populations consistent with sound biological principles and other objectives of this plan.

- Goal 1, Objective 3: Reduce exotic melaleuca and Old World climbing fern to a maintenance control level in 15 years and restore treated areas with native plants as needed.

- Goal 2, Objective 1: Protect water resources and develop partnerships to ensure an appropriate water regulation schedule (quantity, delivery, and timing), as well as ensuring proper water quality for the benefit of wildlife and habitats of the northern Everglades.

(f) **Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?**
Yes. The use has not been previously rejected at the Refuge.

(g) **Is the use manageable within available budget and staff?**
No. Extensive monitoring for regulation compliance and habitat degradation would be required for this use due to the potential for unacceptable impact to vegetation communities and soils. Neither current biological nor law enforcement staff and budgets are adequate for the amount of oversight and monitoring that would be required to ensure impacts remain at an acceptable level.
(h) **Will this be manageable in the future within existing resources?**
No. The required resources (biological and law enforcement staff) to manage this use is not expected to be available, which is shown in the recent workforce planning exercise in which biology and law enforcement staff is further reduced.

(i) **Does this use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?**
Yes. This use would provide expanded access for wildlife photography and observation, as well as, hunting and fishing, which are listed as appropriate uses, when compatible, by the National Wildlife Refuge System Improvement Act of 1997. While participating in any of these activities, visitors are exposed to the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. However, the potential risk for resource damage is greater than the anticipated benefit.

(j) **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?**
No. Anticipated habitat damage/degradation would reduce and impair existing wildlife-dependent recreational uses such as wildlife observation, photography, and waterfowl hunting.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Commercial guided hunting

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
<thead>
<tr>
<th>Decision Criteria:</th>
<th>YES</th>
<th>NO</th>
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<td>(d) Is the use consistent with public safety?</td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>✓</td>
<td></td>
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<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
<td></td>
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<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>✓</td>
<td></td>
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<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
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<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No ✓

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate ✓

Refuge Manager: ________________________________ Date: __________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: ________________________________ Date: __________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Commercial guided hunting permittees and guests must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a Special Use Permit (SUP) describing any additional special conditions the permittee must abide by to maintain compatibility.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. Additionally, the Refuge will issue a SUP describing any additional stipulations or special conditions the permittee must abide by to ensure their safety and the safety of the public. The SUPs will also outline details including, but not limited to, the time of day of the use on the Refuge, number of individuals under the SUP, etc.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes. Within the Refuge’s CCP, Goal 3 of the Refuge’s CCP states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
Yes. An earlier documented analysis has not denied the use. Commercial guided hunting would be a new use on the Refuge.

(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with reviewing and administering SUPs. Staff time may also be necessary in providing access to the Refuge and/or coordinating with permittees to have access to the Refuge.

(h) Will this be manageable in the future within existing resources?
Yes. Budget and staffing plans account for these responsibilities each fiscal year. The Refuge believes it will continue to be able to manage this resource in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Compatible commercial guided hunting provides an opportunity to expand and promote wildlife dependent recreation on the Refuge. Commercial operators would potentially bring new visitors to the Refuge.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Commercial guided hunting activities will be managed through the SUP process which will provide flexibility and oversight to minimize impacts or interference with Refuge visitors, public use programs, wildlife or natural and/or cultural resources on the Refuge.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Commercial recording

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision Criteria:

<table>
<thead>
<tr>
<th>YES</th>
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<td>(a) Do we have jurisdiction over the use?</td>
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<td>(d) Is the use consistent with public safety?</td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
<td>√</td>
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<tr>
<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>√</td>
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<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>√</td>
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<tr>
<td>(h) Will this be manageable in the future within existing resources?</td>
<td>√</td>
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<td>(i) Does the use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?</td>
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<tr>
<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No √

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate √

Refuge Manager: ________________________________  Date: __________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: ________________________________  Date: __________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of lands owned and/or managed by the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Commercial recording permittees and guests must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a Special Use Permit (SUP) describing any additional special conditions the permittee must abide by to maintain compatibility.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service's Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. Additionally, the Refuge will issue a SUP describing any additional stipulations or special conditions the permittee must abide by to ensure their safety and the safety of the public. The SUPs will also outline details including, but not limited to, the time of day of the use on the Refuge, number of individuals under the SUP, etc.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes.
- Goal 3 of the Refuge’s CCP states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”
- Additionally, a strategy of the Refuge’s Urban Wildlife Conservation Plan is to, “Provide opportunities to connect urban audiences with nature.”

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
Yes. An earlier documented analysis has not denied the use. Commercial recording is an existing use on the Refuge.

(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with reviewing and administering SUPs. Staff time may also be necessary in providing access to the Refuge and/or coordinating with permittees to have access to the Refuge.

(h) Will this be manageable in the future within existing resources?
Yes. Budget and staffing plans account for these responsibilities each fiscal year. The Refuge believes it will continue to be able to manage this resource in the future with existing resources.
(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?

Yes. Compatible commercial recording in its various forms provides an excellent opportunity to inform and educate the public and promote the Refuge and the NWRS. Indirectly, the products (films, photographs, and educational media) of these activities will expose more people to the purpose, mission, and resources of the Refuge. Commercial operators will potentially bring new visitors to the Refuge and enhance the experience of repeat visitors by providing them with high-quality, environmental education, interpretation, wildlife photography, and wildlife observation programs. These activities will increase the participant’s understanding and appreciation of wildlife and their habitat as well as the role of the NWRS in resource conservation.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?

Yes. Commercial recording activities will be managed through the SUP process which will provide flexibility and oversight to minimize impacts or interference with Refuge visitors, public use programs, wildlife or natural and/or cultural resources on the Refuge.
FINDING OF APPROPRIATENESS OF A REFUGE USE

Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Commercial tours

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

<table>
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<tr>
<th>Decision Criteria</th>
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<td>(a) Do we have jurisdiction over the use?</td>
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<td></td>
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<tr>
<td>(e) Is the use consistent with goals and objectives in an approved management plan or other document?</td>
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<td></td>
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<td>(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?</td>
<td>✓</td>
<td></td>
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<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
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<td>(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D, 603 FW 1, for description), compatible, wildlife-dependent recreation into the future?</td>
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Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No ✓

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate ✓

Refuge Manager: ___________________________________________ Date:___________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor:_________________________________________ Date:___________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?
Yes. The Refuge has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?
Yes. Commercial tour permittees and guests must adhere to Federal, State, tribal and local laws while on the Refuge. The Refuge will issue a Special Use Permit describing any additional special conditions the permittee must abide by to maintain compatibility.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?
Yes. Additionally, the Refuge, if the use is found compatible, will issue a Special Use Permit describing any special conditions the permittee must abide by to ensure their safety and the safety of the public.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?
Yes. Within the Refuge’s CCP, Goal 3, states, “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and South Florida ecosystems.”

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?
Yes. An earlier documented analysis has not denied the use. Commercial tours are an existing use on the Refuge and have been deemed compatible since the 1960s.

(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this activity. Related to this activity, the majority of staff time will be associated with administering Special Use Permits to operators. Staff time may also be necessary in providing access to the Refuge and/or coordinating with permittees to have access to the Refuge.

(h) Will this be manageable in the future within existing resources?
Yes. Budget and staffing plans account for these responsibilities each fiscal year. The Refuge believes it will continue to be able to manage this use in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Visitors participating in commercial tours are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The
experience can instill an appreciation for future stewards of the environment. Commercial tours can be an excellent interpretive activity, exposing young people, urban dwellers, and the community to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. This use may expand the reach of the Refuge’s environmental education programs.

(j) **Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?**

Yes. Commercial tours generally involve larger groups and more organized transportation services than consumptive uses; therefore, they will be managed through the Special Use Permit process and may be limited in size, type or number of commercial vehicles to prevent impairments to existing or future wildlife-dependent recreation activities.
Refuge Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

Use: Scientific research

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

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<td>✓</td>
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<tr>
<td>(g) Is the use manageable within available budget and staff?</td>
<td>✓</td>
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Where we do not have jurisdiction over the use (“no” to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe (“no” to (b), (c), or (d)) may not be found appropriate. If the answer is “no” to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No √

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor’s concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____  Appropriate √

Refuge Manager: ____________________________ Date: ____________________________

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use. If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence. If found to be Appropriate, the refuge supervisor must sign concurrence.

Refuge Supervisor: ____________________________ Date: ____________________________

A compatibility determination is required before the use may be allowed.
Decision Criteria

(a) Do we have jurisdiction over the use?  
Yes. The Complex has jurisdiction over this use, because it would occur within the boundaries of the Refuge.

(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?  
Yes. Researchers will adhere to Federal, State, tribal and local laws when on the Refuge. The Refuge will issue a Special Use Permit describing any additional special conditions the permittee must abide by. Researchers will also submit copies of permits that authorize certain research-related activities not permissible or lawful to the public as needed.

(c) Is the use consistent with applicable Executive Orders and Department and Service policies?  
Yes. This use is consistent with applicable Executive Orders, Department and Service polices. If this use is deemed appropriate, it must be found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2.

(d) Is the use consistent with public safety?  
Yes. Additionally, the Refuge will issue a Special Use Permit describing any additional special conditions the permittee must abide by to ensure their safety and the safety of the public. Close coordination will be ensured by Refuge staff to maintain safety during hunt seasons or dry down conditions when access becomes increasingly hazardous.

(e) Is the use consistent with goals and objectives in an approved management plan or other document?  
Yes. The Refuge lists several strategies to meet the goals and objectives in the CCP.

- Goal 1, Objective 2 includes, “Work with state and federal agencies, universities, and other parties associated with the Comprehensive Everglades Restoration Plan.
- Goal 1, Objective 3 includes, “Foster partnerships with organizations and agencies addressing common issues, including those that are developing bio-control agents.”
- Goal 1, Objective 4 includes, “Foster partnerships with organizations and agencies addressing common issues, including those that are developing bio-control agents.”
- Goal 2, Objective 1 includes, “Develop partnerships for research, control, and monitoring of exotic and invasive species with entities such as the Florida Exotic Pest Plant Council, Southeast Florida Invasive Plant Working Group and the South Florida Water Management District” and “Develop new and continue existing partnerships for research and monitoring of biological resources with universities, conservation organizations (e.g., Ducks Unlimited, Waterfowl USA, Partners-In-Flight), and agencies (e.g., South Florida Water Management District, Florida Department of Environmental Protection, and Florida Fish and Wildlife Conservation Commission)”.

(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?  
Yes. An earlier documented analysis has not denied the use. Scientific research by non-Service entities is supported in the CCP.
(g) Is the use manageable within available budget and staff?
Yes. Current staff and budgets are capable of overseeing this use. Related to this use, the majority of staff time will be associated with review of proposals, preparation of SUPs and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of project implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time.

(h) Will this be manageable in the future within existing resources?
Yes. Budget and staffing plans account for these responsibilities each fiscal year. The Refuge believes it will continue to be able to manage this resource in the future with existing resources.

(i) Does this use contribute to the public’s understanding and appreciation of the refuge’s natural or cultural resources, or is the use beneficial to the refuge’s natural or cultural resources?
Yes. Use of the Refuge to conduct scientific research will generally provide information that would benefit fish, wildlife, plants, and their habitats. Reducing uncertainty regarding wildlife and habitat responses to Refuge management actions in order to achieve desired outcomes reflected in resource management objectives is essential for adaptive management in accordance with 522 DM 1. Scientific research on the Refuge is inherently valuable to the USFWS because it will expand scientific information available for resource management decisions.

(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality compatible wildlife-dependent recreation into the future?
Yes. Close coordination between Refuge staff and researchers can help eliminate conflicts between existing wildlife-dependent recreational uses and research activities. Additionally, when issuing a Special Use Permit, the Refuge Manager or their designee can add stipulations to help minimize and/or eliminate the potential for these conflicts in the future as well.
APPENDIX D: Compatibility Determinations

The legal provision (16 U.S.C. 668dd-668ee) states that lands within NWRS are closed to public use unless specifically and legally opened. No refuge use may be allowed unless it is determined to be compatible. A compatible use is one that, in the sound professional judgment of the Refuge Manager, will not materially interfere with or detract from the fulfillment of the mission of NWRS or the purposes of the Refuge. All programs and uses must be evaluated based on the mandates set forth in the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57, USC668dd) (Improvement Act) as follows:

- Contribute to ecosystem goals, as well as refuge purposes and goals;
- Conserve, manage, and restore fish, wildlife, and plant resources and their habitats;
- Monitor the trends of fish, wildlife, and plants;
- Manage and ensure appropriate visitor uses as those uses benefit the conservation of fish and wildlife resources and contribute to the enjoyment of the public; and,
- Ensure that visitor activities are compatible with refuge purposes.

The Improvement Act of 1997 further identifies six priority wildlife-dependent recreational uses. These uses are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. As priority public uses on the NWRS, they receive priority consideration over other public uses in planning and management.

The public use program will be reviewed annually to ensure that it contributes to Refuge objectives in managing quality recreational opportunities and protecting habitats, and is subject to modification if on-site monitoring by Refuge personnel or other authorized personnel results in unanticipated negative impacts to natural communities, wildlife species, or their habitats. Refuge law enforcement officer(s) will promote compliance with refuge regulations, monitor public use patterns and public safety, and document visitor interactions. Refuge law enforcement personnel will monitor all areas and enforce all applicable State and Federal regulations.

Environmental impacts associated with these uses can be found in the Draft Visitor Services Plan’s Environmental Assessment.

Three of the uses cataloged in the list below; commercial recording, commercial tours, and scientific research, can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusion 43 CFR §46.210 (j): activities which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The use triggers no response to any extraordinary circumstances (43 CFR §46.215).

Proposed uses include:
1. Hunting
2. Recreational fishing and frogging
3. Wildlife observation, photography, environmental education, and interpretation
4. Horseback riding
5. Pets on leash
6. Ceremonies
7. Instructor-led small group activities
8. Camping
9. Non-motorized watercraft
10. Motorized watercraft
11. Concessionaire operation
12. Commercial guided hunting
13. Commercial recording
14. Commercial tours
15. Scientific Research
**Refuge Name:** Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge)

**Date Established:** June 8, 1951

**Establishing and Acquisition Authorities:** A cooperative agreement between the Central and South Florida Flood Control District [precursor to the South Florida Water Management District (SFWMD)] and the U. S. Fish and Wildlife Service (Service) under authority of the Migratory Bird Conservation Act of 1929 and the Fish and Wildlife Coordination Act of 1934 (amended 1946) established the Refuge [Federal Register Notice 20 FR 7969 (21 Oct 1955)]. Public Law 99-615, approved November 6, 1986 (100 Stat 3484), renamed the Refuge for the late Arthur Marshall, a former Service employee and well-known advocate for preservation of the Everglades.

**Refuge Purposes:** “…for use as an inviolate sanctuary, or for other management purposes, for migratory birds.” (Migratory Bird Conservation Act of 1929, 16 U.S.C. § 715d)

“…shall be administered by him [Secretary of the Interior] directly or in accordance with cooperative agreements…and in accordance with such rules and regulations for the conservation, maintenance, and management of wildlife, resources thereof, and its habitat thereon…” (Fish and Wildlife Coordination Act, 16 U.S.C. § 644).

Federally designated as critical habitat for the endangered Everglade snail kite in 1977 (50 CFR §17.95).

The Refuge Vision statement: "To serve as an outstanding showcase for ecosystem management that restores, protects, and enhances a portion of the unique north Everglades biological community. This public asset provides for the enjoyment and enhanced quality of life for present and future generations." (USFWS 2000)

**National Wildlife Refuge System Mission:** The mission of the National Wildlife Refuge System (NWRS), as defined by the Improvement Act of 1997, is:

... to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

**Public Review:** In accordance with Service guidelines and NEPA requirements, public involvement is an important factor in the development of the EA and the draft CDs for the Refuge. A 30-day public review and comment period on the draft CDs and EA provides the public the opportunity to comment on the proposal. Opportunities to comment will be advertised at the administrative office of the Refuge, in local newspapers, press releases, and on the Refuge’s website and Facebook page.

The Service will review all comments submitted and will respond to the substantive comments in an appendix included with the final documents.
**Use**: Hunting - Migratory Bird, Alligator, White-tailed Deer, and Feral Hog

(a) **What is the use? Is it a priority public use?** The use being evaluated in this compatibility determination (CD) is hunting. Huntable species that inhabit the Refuge include white-tailed deer, feral hogs, migratory birds, and alligators. Migratory bird (ducks and coots) and alligator hunting are existing uses of the Refuge. They are being re-evaluated in order to expand the hunts into other areas of the Refuge. Including other migratory birds such as moorhen, snipe, and rail and hunting for white-tailed deer and feral hog are new uses being evaluated. Hunting is a wildlife-dependent recreational activity designated as a priority public use of the National Wildlife Refuge System (NWRS) as established in the National Wildlife Refuge System Improvement Act of 1997. This CD updates and replaces the Refuge’s 2012 CD for Hunting (USFWS 2012).

(b) **Where would the use be conducted?** All portions of the Refuge, with the exception of the B and C Impoundments, are being proposed for some form of hunting. This opens an additional 100,000 acres of the Refuge to the public for increased wildlife-dependent recreation. These areas include the 141,374 acres of the Refuge Interior and perimeter canal, the 2,586 acres of Strazzulla, and the 750 acres of the Cypress Swamp and A Impoundments. To accommodate hunting for multiple species (some within the same timeframe), the Refuge would carefully manage hunts by assigning areas available for hunting particular species and restricting access to other user groups. Natural communities found on the Refuge include a cypress swamp and those consistent with the Everglades ecosystem such as emergent marshes, sloughs, sawgrass ridges, and tree islands; all impacts considered would be relevant with any reassignments or modifications to hunt areas.

Migratory Bird Hunting: Migratory bird hunting is being proposed for expansion from the area previously known as the “Hunt Zone” to the entire Refuge Interior including the Motorized and Non-motorized Zones. This does not include the perimeter canal or areas east of the L-40 levee including A, B, and C, Impoundments and Strazzulla.

Alligator Hunting: Alligator hunting is being proposed for expansion from the area previously known as the “Hunt Zone” to the area now designated as the “Motorized Zone”, including the entire perimeter canal.

White-Tailed Deer/Feral Hog Hunting: White-tailed deer hunting with incidental take of feral hog is being proposed in Strazzulla and the Refuge Interior. The portion containing the levee running north-south between the Cypress Swamp and A Impoundments and a portion of the levee leading to the Tower in Strazzulla is being proposed for specialty hunts only (i.e. mobility impaired).

Locations and specific facilities (roads, boat ramps, parking) that facilitate hunting are identified on the Refuge’s website: [https://www.fws.gov/refuge/ARM_Loxahatchee/](https://www.fws.gov/refuge/ARM_Loxahatchee/).

(c) **When would the use be conducted?** Hunting would be allowed in accordance with all applicable federal and state regulations. Hunting would occur within the hunting season framework established by the Florida Fish and Wildlife Conservation Commission (FWC). Federal regulations in 50 CFR pertaining to the National Wildlife Refuge System Administration Act of 1966, as well as existing Refuge-specific regulations would apply. However, the Refuge Manager may, upon annual review of the hunting program and in
coordination with the FWC, impose further restrictions on hunting, recommend that the Refuge be closed to hunting, or further liberalize hunting regulations within the limits of state seasons and regulations, or as otherwise approved by FWC. The Refuge Manager may restrict hunting opportunities if it conflicts with other, higher priority Refuge programs or endangers Refuge resources or public safety. Legal shooting hours vary by species, however most game may be hunted from one-half hour before sunrise until one-half hour after sunset. This use would take place during normal operating hours of the Refuge when conditions (water levels, wildlife activity) are such that impacts to habitats and wildlife are minimal. This use could be suspended or terminated at any time at the discretion of the Refuge Manager for Refuge management, safety, or other reasons.

Migratory Bird Hunting: Migratory birds available to hunt on the Refuge would include duck, coot, moorhen, snipe, and rail. Duck season generally begins with an early teal season in September and regular seasons consisting of Phase I and Phase II from November through January with breaks in between. The Youth Waterfowl Hunt is generally held the first weekend each February. Duck hunting on the Refuge would now coincide with the State of Florida hunt days and times; 7 days a week with legal shooting hours of one-half hour before sunrise until sunset. The Refuge would now be open Christmas day as well. Hunt days and hours are subject to change and may be further restricted for management purposes. In addition to duck harvest, the following species may be harvested (if in season) as incidental take while duck hunting: coot, moorhen, rail, and snipe. Season dates vary by species and are posted annually. They can also be located on FWC’s website at http://myfwc.com/hunting/regulations/birds/. See 50 CFR §32.28(A) for current regulations on migratory birds.

Alligator Hunting: Alligator hunting on the Refuge would be concurrent with the state season. Hunting is permitted the first two weekends during Harvest Period 1 and the first two weekends during Harvest Period 2. Following the close of Harvest Period 2, the remaining weekends in October would be open for alligator harvest permittees that possess unused CITES tags. Specific dates for the alligator hunt would be provided on the harvest permit. Hunt days and hours may be further restricted on the Refuge and are subject to change for management purposes. See 50 CFR §32.28(B) for current regulations.

White-Tailed Deer/Feral Hog Hunting: White-tailed deer may be hunted on the Refuge during the approved deer hunt seasons. Feral hog hunting would be approved for incidental take during deer hunts. In particular, it is neither the goal nor intent of the Service to manage feral hogs as a huntable game species. The Refuge falls within Florida’s Deer Management Unit (DMU) A1, which season generally runs from August through November depending on the method of take. However, white-tailed deer hunts on the Refuge would be more restrictive. Available hunt days may range from 0 to 16 days and begin with two 3-day hunts spread across the season. The Refuge would allow for a minimum of two (2) weekends total per season, not to exceed the dates and times allowed by the FWC for DMU A1. One weekend may take place early in the hunt season (Archery Season), and one weekend may take place during the latter half of the season (General Season). One weekend may also be available for a specialty hunt coordinated with a disabled or other hunt group to be determined at a later date. See 50 CFR §32.28(B) for current regulations.
All hunts and quotas are subject to change depending on wildlife species population survey results, hunter success rates, environmental conditions, conflicting management activities (prescribed burns, low water levels, exotic plant removal, etc.), and/or staffing. Maintaining flexibility for hunts allows the Refuge to provide a limited, but quality hunt. Annual hunt dates would become available through the FWC’s Limited Entry/Quota Hunt Program and/or on the Refuge’s website depending on the species.

(d) How would the use be conducted? Hunting would be subject to federal, state, and Refuge-specific regulations and occur within the State season framework, unless otherwise approved by FWC. Bag limits and methods of take would coincide with FWC guidelines (to the greatest extent possible) and would be coordinated with FWC. The permit system and quotas are subject to change annually at the discretion of the Refuge Manager, for the purposes of management and sustainability.

Migratory Bird Hunting: For migratory bird hunting, all hunters must also possess a valid Florida State Hunting License, Florida Waterfowl permit, a valid signed Federal Duck Stamp, and a Migratory Bird permit in addition to the Refuge-specific hunting permit. Hunters must complete a Migratory Bird Hunt Report and place it in the entrance fee canister each day prior to exiting the Refuge. Staffed check stations may be implemented as resources allow. State and Refuge regulations may vary from year to year, and are outlined in the annual Refuge hunting permit.

Alligator Hunting: Alligator hunting is permitted in designated hunt areas by permit only. Permits are obtained by lottery drawings through the FWC. The number of permits are based on population survey results and may fluctuate annually. Hunters must complete a Big Game Hunt Report and place it in the entrance fee canister each day prior to exiting the Refuge. License requirements and other detailed information may be found in the annual Refuge Alligator Hunting Regulations available after May or on FWC’s website at [http://myfwc.com/wildlifehabitats/managed/alligator/harvest/](http://myfwc.com/wildlifehabitats/managed/alligator/harvest/).

White-Tailed Deer/Feral Hog Hunting: White-tailed deer and feral hog hunting would be permitted in designated hunt areas by permit only; permits would be obtained via lottery drawings through the FWC. All hunters must possess all required licenses and stamps according to state law in addition to the Refuge-specific hunting permit. No state licenses are required for hog hunting; however, only those hunters that receive quota permits for the white-tailed deer hunt would be authorized to harvest feral hogs and thereby already possess a Refuge-specific hunting permit. For deer hunting, only bucks would be legal for harvest, and a forked antler restriction would be implemented requiring at least one antler having two or more points. Hunters are allowed one buck per permit per year. There would be no size or bag restrictions for feral hogs. Specialty hunts may be more lenient on antler restrictions, but limited in number of hunters. Staffed check stations may be implemented as resources allow.

Main entrances to the Refuge include Loxahatchee Road, Lee Road, and 20 Mile Bend. Access points include locations along the L-40, L-39, and L-7 levees and Strazzulla. Additional locations along the L-40, L-39, and L-7 levees and ACME-2 may become available. Hiking, biking, boating, canoeing, and kayaking are some of the modes of transportation that may be used to facilitate hunting on the Refuge. The Motorized and Non-motorized Zones would be implemented for the Refuge Interior and influence what hunters may use for transportation in certain areas. Specialty hunts may utilize other vehicles approved for mobility-impaired hunting. Other modes of travel (e.g. airboats) are
currently under evaluation and may be used to facilitate hunting if found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2. In the event that airboats are permitted for hunting, up to 20 airboat permits should be given at any time and additional restrictions would be implemented. Airboats would be intended for the use of access only. Airboats are not approved for use in the pursuit of deer or other harassment of wildlife. Access points and modes of travel available to support hunting can be found on the Refuge’s website, map/tearsheet brochure, and Hunting Regulations publication. Refer to the annual Refuge Public Use brochure or website for current regulations on hunting within the Refuge. The Refuge annual hunting permit is required to hunt on the Refuge. To review additional information, the FWC Hunting Regulations may be found at http://myfwc.com/hunting/.

(e) Why is this use being proposed? In addition to hunting being one of the priority public uses, on September 15, 2017, the Secretary of the Interior signed Secretarial Order 3356 with specific directives “to support and expand hunting and fishing, enhance conservation stewardship, improve wildlife management, and increase outdoor recreation opportunities for all Americans” (DOI 2017). Additionally, the 2018 License Agreement with the SFWMD stipulates an increase to [Service evaluated and approved] wildlife-dependent public use opportunities. New uses and expansion of existing uses are being evaluated that may foster positive stakeholder/refuge relations. Hunting is an existing use at the Refuge being re-evaluated in order to expand migratory bird and alligator hunting and allow new hunting opportunities for white-tailed deer and incidental take of feral hog. Since the previous analysis, environmental conditions have not changed substantially (USFWS 2000, USFWS 2012). The Service provides the public with opportunities to participate in compatible wildlife-dependent recreation to appreciate the value of and need for fish, wildlife, and plant conservation. The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape. Visitors participating in hunting activities are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. Furthermore, hunting is a management tool to maintain wildlife populations at acceptable levels and reduce or eradicate and exotic species.

Availability of Resources:

Resources involved in the administration and management of the use – At current staffing levels, the Refuge has marginally sufficient resources for managing expected levels of participation in these various types of hunts. Significant changes in staffing levels may reduce resources to an inadequate level to provide and manage for a quality hunt program. Administration would primarily involve issuing permits, enforcement of regulations, and surveying and monitoring of populations and impacts.

Special equipment, facilities, or improvements necessary to support the use – Existing facilities that support this use include boat ramps, boat dock, parking lots, and restrooms. No additional facilities are proposed to support this use.

Maintenance costs – Maintenance associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include: mowing, trail/levee maintenance, signage, parking areas, structure maintenance (boat ramps, fishing piers), and trash removal. This use should not incur any additional maintenance
needs; however, it may influence the timing of when and how often maintenance should be performed.

**Monitoring costs** – Existing Refuge staff and Federal Wildlife Officers monitor effects of and compliance with current operations during the normal course of their duties. Continued, and in some cases increased, monitoring is recommended to support sustainable hunts. Existing monitoring includes alligator population surveys and regular patrols by Federal Wildlife Officers for compliance. Recommended surveying and monitoring includes systematic reconnaissance flights for deer population estimates, spotlight surveys to monitor trends and impacts in densely treed areas and during high water events, and game check stations for deer and waterfowl. Costs for the surveys are roughly estimated at $20,000 annually. Cost estimates to staff game check stations are estimated at $40,000 annually. An increase in law enforcement personnel is also recommended due to the amount of acreage that would need to be patrolled more diligently for public safety and hunter compliance. There may be opportunities to collaborate with FWC or the SFWMD to address these recommendations.

**Offsetting revenue** – In addition to standard entrance fees, a Refuge hunt permit fee would be charged in accordance with other state and federal fees for similarly permitted activities. Fees would be used to offset cost of regulation enforcement, monitoring biological impacts, and support visitor services programs.

**Anticipated Impacts of the Use:**

Although hunting causes mortality and temporary disturbance to wildlife, harvesting populations within the carrying capacity of existing habitat ensures long-term health and survival of the species. Hunting, and its associated activities, can result in positive or negative impacts to wildlife and other Refuge resources. With proper management and monitoring, hunting (as proposed for the Refuge) is expected to cause only minor negative impacts. A positive effect of the Refuge hunting program would be the provision of additional wildlife-dependent recreational opportunities, a better appreciation and more complete understanding of the wildlife and habitats associated with the Refuge, and an opportunity to utilize a sustainable, renewable resource. This can translate into more widespread and stronger support for the Refuge, the NWRS, and the Service. Various impacts in relation to each type of hunt are discussed below.

**Migratory Bird Hunting:** Waterfowl harvest numbers and species are determined by nationwide annual waterfowl trends and population surveys. Expanding access for waterfowl hunters is expected to have minor impacts on total harvest. The amount of acreage still available to waterfowl for refugia far exceeds the acreage hunters would attempt to access with the available means of transportation and motorized watercraft restrictions.

The potential to impact to threatened and endangered species may increase slightly due to direct and indirect effects of this use. Hunting migratory birds may lead, and has led to, accidental or intentional shooting of snail kites or wood storks. For example, adjacent to the Refuge, a dove hunter was caught shooting a wood stork in recent years by a Refuge officer. Shooting of snail kites has been cited in the early literature as a threat (Sprunt 1945; Stieglitz and Thompson 1967; Sykes 1978, 1979). Unless directly observed by law enforcement, information regarding take of threatened or endangered species is generally not volunteered to the authorities. Indirect impacts include disturbances during nesting season that may cause parents to flush from their nests. This can result in nest abandonment, egg/nestling deaths due to sun exposure, or predation (FWC 2018a). Many direct impacts are expected to be mitigated since their breeding season and hunting seasons don’t generally coincide. Snail kites have been
known to nest outside of the nesting season depending on conditions. If a conflict occurs, sensitive areas would be closed to hunters and buffer zones would be implemented. Other short-term impacts include the potential for alligator attacks and retriever dogs getting lost. The Refuge has experienced incidents concerning nuisance alligators, including attacks. Additionally, nesting female alligators or startled animals may demonstrate a more aggressive response. Unprovoked attacks on people and pets are not unheard of in Florida and all visitors should remain vigilant and responsible nonetheless. Dogs and other small pets are more likely to be attacked than humans because they resemble a natural prey item for the alligator (FWC 2005). From 1948 to 2016, 388 unprovoked alligator bite incidents have occurred in Florida (AOL 2017). In 2016, a duck hunter was attacked by an alligator in the Everglades just south of the Refuge (Sun Sentinel 2016). This behavior increases when alligators are provoked or fed and lose their fear of humans, becoming accustomed or attracted to people.

Alligator Hunting: Expanding access to alligator hunters would not necessarily increase harvest numbers. Alligator permits available each year allow a specific number of alligators to be harvested; those numbers are based on alligator population surveys and are coordinated with the FWC. Increasing access can be expected to have moderately beneficial impacts to the overall health of alligator populations and their distribution over the Refuge. Furthermore, increasing access for alligator hunters can be expected to have a minor beneficial impact to waterfowl hunters and their retriever dogs. Studies show the Refuge, by far, has a higher density of alligators in the marsh compared to other areas of Everglades habitat (Mazzotti et. al., 1999, Mazzotti et. al., 2004). Higher alligator densities increase the potential for alligator attacks on hunters and their dogs. By allowing alligator hunters to access more areas, the Refuge enables hunters to harvest some of the larger alligators. This can not only create a more friendly environment for waterfowl hunting, but also allow an increased number of juvenile alligators to reach adulthood, potentially increasing the population. Collectively, these actions aid in maintaining a sustainable alligator hunt on the Refuge. Some disturbance to surface soils, topography, and vegetation would occur in areas selected for hunting; however, effects would be minimal. The Refuge controls access to the Refuge Interior by limiting public access through permits, closed areas, and zones of allowable watercraft in order to minimize habitat degradation as a result of visitor access. Negligible impacts to the natural hydrology of the Refuge are also expected. The Refuge expects impacts to air and water quality to be minimal and result only from Refuge visitors’ boat emissions. No long-term or cumulative impacts are anticipated as a result of hunting alligators as proposed on the Refuge.

White-Tailed Deer/Feral Hog Hunting: If not administered prudently, deer hunting on the Refuge can potentially have long-term adverse impacts on the deer population in the Refuge. Currently there is a lack of information on deer abundance and population trends on the Refuge. Surveys and monitoring would be conducted either by Refuge staff or in cooperation with state agencies in order to determine the exact number of permits allowed to have a sustainable deer hunt. If deer hunting is managed well, potential impacts on non-target species and their habitats are expected to be minimal. Although no long-term impacts are predicted, cumulative impacts are expected on wildlife or their behaviors. Although Service staff, researchers, and exotic plant contractors utilize airboats in the Refuge Interior, the Refuge has not been open to public airboating or deer hunting in decades. Deer that inhabit the Refuge have benefitted with protections from being pursued and/or distressed by human interactions. This is evident in their behavior, as they currently do not attempt to flee the area immediately as they are approached by an airboat in the Refuge Interior. This behavior provides a brief moment of appreciation for wildlife on wild lands by anyone fortunate enough to experience the interaction. By increasing access and allowing hunting activities, wildlife not accustomed to being pursued, would be
extremely vulnerable to stress or harvest initially. Over time, these experiences of being disturbed or hunted would instill a more cautious existence on the Refuge and wildlife may become less readily observed and enjoyed, and perhaps more difficult to hunt.

If not managed and monitored carefully, deer hunting via airboat has the potential to cause detrimental impacts by influencing vegetation, soils, hydrology, water quality, and exotic species (USFWS 2018b). More so, there is potential for significant habitat destruction in the northern portion of the Refuge when hunters may try to access certain areas. This area tends to dry down annually and becomes increasingly more difficult to navigate without the general ease provided with higher water levels. This area contains large expanses of sawgrass interspersed with Melaleuca stumps and pocosin clumps that are treacherous and often impenetrable. Even hunters that are experienced airboat operators can easily become stuck, flip their boats, and cause wildfires when they are unfamiliar with the area and habitats. These risks can be mitigated by closing areas when habitat conditions dictate and requiring permitted hunters to complete some form of informative training prior to finalizing the permit process. Overall, impacts to the habitat are expected to be minor due to the limited amount of proposed permits, the type of approved vessel access, and the typically preferred hunting locations.

Allowing only incidental take of feral hogs while deer hunting is often at odds with those who pursue hogs for sport. Unscrupulous hunters have been caught and prosecuted for illegally releasing live hogs onto national wildlife refuges and other natural areas across the nation (APR 2016). In Florida, trapped animals may not be released on public land, and can only be released on private property with landowner permission. Like other wild animals, feral hogs can carry parasites and diseases, some of which can be transmitted to people. One such disease is swine brucellosis, a bacterial disease. Hunters can be infected with brucellosis bacteria when blood, fluid or tissue from an infected animal comes in contact with their eyes, nose, mouth or skin. This can happen when: field dressing, butchering, handling or preparing raw meat for cooking, or eating meat that is not thoroughly cooked (FWC 2018b). Other diseases carried by feral hogs include pseudorabies and tularemia. Additionally, salmonellosis, foot rot, intestinal bacteria, viruses, and parasites are commonly transmitted via fecal matter (Extension.org 2012).

Applicable to all hunting on the Refuge: Potential impacts associated with hunting include direct mortality, short-term changes in game species distribution and abundance, and disturbance (to target and non-target species).

Both motorized and non-motorized boating while hunting can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by deer, waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to airboats and motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). People hunting from motorized boats have a greater chance of disturbing or even striking wildlife (e.g. alligators, turtle, birds) as they tend to move faster than non-motorized boats and provide less time for wildlife to abscond. Turtles and alligators are also at higher risk of being struck by boats or propellers during low water conditions. Conversely, other wildlife are similarly more vulnerable to hunters during high water conditions. Mammals (i.e. deer) begin migrating to upland areas for refugia during times of high water. Prolonged periods of high water increase stress on wildlife as there is less available food sources and those available on tree islands or levees are not as nutritious. Results from these events include stress, disease, starvation, and even death. Temporary restrictions or even hunt season closures may be imposed at the Refuge Manager’s discretion during these critical conditions to mitigate for these risks to wildlife.
Increased access for hunting has the potential to cause various levels of impacts to public safety. The Refuge is open during the hunting season to other priority public uses such as fishing, wildlife observation, wildlife photography, and environmental education and interpretation. To safely provide both hunting and non-hunting recreational uses, the Refuge enforces a series of Refuge-specific hunting regulations. Hunting would be restricted by location, date, or methods of take in order to provide a safe environment for all visitors. Conflicts between mixed user groups might occur, but would be mitigated by time (non-hunting season) and space zoning. The Refuge would focus non-consumptive use (mainly bird watching and other wildlife viewing) in the areas that are closed to hunting. There would also be a "no hunting" area established east of the L-40 levee where the headquarters and Visitor Center building, Refuge residences, shop compound, other associated facilities, hiking trails, and observation towers are located. Implementation of this "no hunting" zone would facilitate all five of the remaining priority public uses. Conflicts between consumptive users, such as disruption of or hunting too close to other hunters, may occur also but should be mitigated. The size of the areas being proposed for hunting in addition to the limitations implemented to address ecological concerns is expected to help mitigate user conflicts.

Other potential safety impacts include hunters becoming lost, injured, or stuck. Due to the vast size of the Refuge, response times and success in locating users in need of assistance is greatly reduced. These circumstances are true for most natural areas and should be expected by hunters. These potential impacts can be mitigated through the general use of GPS units and cell phone habits by hunters/explorers. General warning or caution statements may also be made available in the brochures hunters and would be required to sign and have on their person.

Refuge management activities can be accomplished without conflicting with hunting activities via administratively closed areas, timing of hunts, and methods of hunt. A slight increase in gas emissions may occur due to the increase in vehicular traffic. However, no significant biological or ecological impacts have been observed as a result, despite other priority public uses occurring via vehicular traffic on the Refuge for decades. With a conservative approach in allowing this use on the Refuge, cumulative impacts are expected to be minimal or negligible and within acceptable limits. This use should not result in long-term impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the Comprehensive Conservation Plan (CCP).

This CD is not comprehensive in its evaluation of impacts resulting from various modes of transportation utilized while hunting such as motorized vessels or airboats. Those impacts are addressed in more detail in their corresponding CDs.

**Determination (check one below):**

- [ ] Use is Compatible
- [√] Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** The below stipulations are recommended in order for hunting each species to be compatible in the most liberal circumstances. Slight modifications and further restrictions may be implemented for sustainability. Final stipulations would be found in the CFR and associated SUP Special Conditions.

**Applicable for All Hunting**
• For quota hunts, only one watercraft vessel per permit is authorized.
• Persons possessing, transporting, or carrying firearms on national wildlife refuges must comply with all provisions of Federal, State, and local law. Persons may only use (discharge) firearms in accordance with Refuge regulations.
• Certain quota permits would be determined by annual population surveys and Refuge carrying capacity, and are subject to change.
• Hunting is allowed on designated areas of the Refuge in accordance with State law, except where Federal regulations have been set as found in Title 50, Code of Federal Regulations, Section 32.
• All applicable State Hunting licenses, State permits, CITES tags, Federal stamps, and Refuge hunt permits must be in the possession of the hunter.
• Hunters under the age of 16 must be accompanied by an adult 21 years of age or older. Hunters under the age of 16 must also have completed a Hunter Education Course.
• No hunting from Refuge structures or within one-half mile of canoe trails or boat ramps.
• Taking or herding wildlife from any motorized vehicle and vessels which is under power is prohibited until power and movement from that power has ceased, except statewide alligator harvest program permittees that are attempting to take alligators.
• Only temporary blinds of native vegetation are allowed. We prohibit the taking, removing, manipulation, or destroying of refuge vegetation.
• There is a 35 mph speed limit in all waters of the Refuge. A 500-foot (150-meter) Idle Speed Zone is at each of the Refuge's three boat ramps.
• We require all boats operating outside of the main perimeter canals (the L-40 Canal, L-39 Canal, and L-7 Canal) in Refuge Interior areas to fly a 10-inch by 12-inch (30-cm × 30-cm) orange flag 10 feet (3 m) above the vessel's waterline.
• Taking of any plants or other wildlife is prohibited.

Migratory Birds

• Hunters must read, sign, and have on their possession a signed copy of the Refuge waterfowl hunt permit while hunting. The permit is located on the Refuge's Regulations brochures and are available at the Refuge Visitor Center and on the Refuge's website.
• Hunters must remove decoys and other personal property from the hunting area each day.
• The Refuge encourages the use of dogs to retrieve dead or wounded waterfowl. Dogs must remain under the immediate control of the owner at all times.
• Hunters may be required to complete a Migratory Bird Hunt Report (FWS Form 3-2361) and place it in an entrance fee canister each day prior to exiting the Refuge.
• No hunting from Refuge structures, canals, or within one-half mile of canoe trails or boat ramps.

Alligator

• Hunters must read, sign, and have on their possession a signed copy of the Refuge alligator hunt permit while hunting. The permit is located on the Refuge's Regulations brochures and are available at the Refuge Visitor Center and on the Refuge's website.
• Hunting from levees and those areas posted as closed is prohibited.
Hunting on the Refuge is allowed 1 hour before sunset on Fridays through 1 hour after sunrise on Saturdays, and 1 hour before sunset on Saturdays through 1 hour after sunrise on Sundays. Alligator hunting would be permitted the first 2 weekends during Harvest Period 1 (August) and the first 2 weekends during Harvest Period 2 (September). Following the close of Harvest Period 2, the remaining weekends in October would be open for alligator harvest permittees who possess unused CITES tags. Specific dates for the alligator hunt would be provided on the harvest permit.

Hunters 18 years and older must be in possession of all necessary State and Federal licenses, permits, and CITES tags, as well as a Refuge hunt permit (signed hunt brochure) while hunting on the Refuge. They must possess an Alligator Trapping License with CITES tags or an Alligator Trapping Agent License, if applicable.

Hunters under the age of 18 may not hunt alligators, but may only accompany an adult of at least 21 years of age who possesses an Alligator Trapping Agent License.

Hunters may take alligators using hand-held snares, harpoons, gigs, snatch hooks, artificial lures, manually operated spears, spear guns, and crossbows. Taking of alligators using baited hooks, baited wooden pegs, or firearms is prohibited. We allow the use of bang sticks (a hand-held pole with a pistol or shotgun cartridge on the end in a very short barrel) with nontoxic ammunition only for taking alligators attached to a restraining line. Once an alligator is captured, it must be killed immediately. We prohibit catch and release of alligators. Once the alligator is dead, you must lock a CITES tag through the skin of the carcass within 6 inches (15.2 centimeters) of the tip of the tail. The tag must remain attached to the alligator at all times.

Hunters may be required to complete a Big Game Harvest Report (FWS Form 3-2359) and place it in an entrance fee canister each day prior to exiting the Refuge. A FWC Alligator Harvest Report Form (FWC Form 1001AT, supplied with your FWC permit) must be completed by the permit holder within 24 hours of taking each alligator and prior to the transfer to a permitted alligator processing facility. A copy of the FWC Alligator Harvest Report Form must accompany the alligator carcass until processing. An online version of the form can be found at MyFWC.com/alligator.

Hunters must remove all personal property from the hunting area each day.

White-tailed Deer and Feral Hog

- Only one deer per permit may be harvested.
- Dogs are prohibited for deer and hog hunting.
- Only deer with at least one antler with two or more points (forked antler) may be harvested, except for those approved for specialty hunts.
- All deer taken shall be tagged immediately with the antlered deer tag provided by the FWC.
- The head may not be removed from the carcass of any deer on the Refuge.
- Motorized vessels must be in place and stopped one hour before sunrise and not move until 1 hour after sunrise.
- Method of take will be in accordance with State regulations and season.
- Motorized vessels must be turned off for a period of 15 minutes before shooting.
- Feral hogs may not be transported alive.
- Hunting wildlife (other than migratory birds) with air guns is allowed. See Florida Hunting Regulations handbook for details on hunting with air guns.
- No hunting within 300 feet of adjacent private lands.
**Justification:** The National Wildlife Refuge System Improvement Act of 1997 identified hunting as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in planning and management. The Service attempts to provide opportunities for this use in the NWRS where compatible. Hunting, in some form, has been deemed compatible on the Refuge since its establishment in 1951. Continuing to offer and expand hunting opportunities (where possible and compatible) supports the Service’s goal of Connecting People with Nature in addition to multiple objectives and strategies stated in the Refuge’s CCP. Hunting allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy mentally and physically, but can build a life-long appreciation for wildlife and their habitats. When wildlife populations are managed carefully and monitored, allowing hunting on the Refuge would not materially detract from or interfere with the purposes for establishment of the Refuge and the mission of the NWRS. This CD is based on best available science and sound professional judgement.

**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.

- [ ] Categorical Exclusion without Environmental Action Statement
- [ ] Categorical Exclusion and Environmental Action Statement
- [√] Environmental Assessment and Finding of No Significant Impact
- [ ] Environmental Impact Statement and Record of Decision

**References:**


**Mandatory 15-year Re-evaluation Date:**
Use: Recreational Fishing including Frog Gigging, Fish Gigging, and Bowfishing

Description of Use:

(a) What is the use? Is it a priority public use? Recreational fishing is defined as fishing with authorized recreational fishing gear for personal use only, and not for sale or barter (50 CFR §660.703). Frogging is the act of hunting for and harvesting of frogs. Recreational fishing is a wildlife-dependent recreational activity designated as a priority public use of the National Wildlife Refuge System (NWRS) as established in the Improvement Act of 1997. Largemouth bass is the most sought after species by anglers in the Everglades canals. Florida gar, bluegill, redear sunfish, spotted sunfish, black crappie, warmouth, bowfin, chain pickerel, brown bullhead, and yellow bullhead are also popular game fish found within the canal system. Forage fish common in the canal system include golden shiner, lake chubsucker, and Eastern mosquitofish. In addition to native game species, exotic fish species have been introduced to South Florida. Exotic fish present on the Refuge includes oscar, saffin catfish, blue tilapia, spotted tilapia, Mayan cichlids, brown hoplo, croaking gourami, walking catfish, and bullseye snakehead. Some exotic fish on the Refuge are desirable to anglers. Frog species found in Everglades habitats that may potentially be sought after for harvesting include pig frogs, Southern leopard frogs, and bullfrogs. This compatibility determination (CD) updates and replaces the Refuge’s CD for Recreational Fishing (USFWS 2014a).

(b) Where would the use be conducted? Fishing is permitted throughout the Refuge in canals (including the impoundments), the marsh interior, and from shorelines and fishing pier(s). Frogging, fish gigging, and bowfishing are permitted in the Refuge Interior, including over 58 miles of perimeter canal. Frog gigging with an airboat is limited to the non-hunting airboat zone and allowed time frame. Locations open to fishing and specific facilities (roads, boat ramps, parking) that contribute to fishing are also identified on the Refuge’s website (https://www.fws.gov/refuge/ARM_Loxahatchee/), map/tearsheet brochure, and Fishing and Boating Regulations publication.

(c) When would the use be conducted? Fishing, fish gigging and bowfishing are permitted every day throughout the year during the operating hours of the Refuge. Frogging would be permitted from July 16 through March 15 each year.

(d) How would the use be conducted? All recreational anglers must possess a valid Florida fishing license in accordance with the laws of the state of Florida. Daily bag and possession limits are in accordance with Florida regulations, unless Refuge-specific regulations have been set (50 CFR §32.28(D)). Fish gigging, bowfishing, and frogging is permitted in accordance with the laws of the state of Florida. To review additional information, the Florida Fish and Wildlife Conservation Commission (FWC) Recreational Fishing Regulations may be found at www.myfwc.com/fishing.

Frogs may be harvested for personal use only and in accordance with State law except where Refuge-specific regulations allow under 50 CFR §32.28(D). Per state law, a state recreational license is not required to harvest frogs. Frog species classified as threatened or endangered may not be possessed or taken.
Main entrances to the Refuge include Loxahatchee Road, Lee Road, and 20 Mile Bend. Access points include locations along the L-40, L-39, and L-7 levees. Future potential access points include, but are not limited to, ACME-2, South County Park, S-6 pump station, Marjory Stoneman Douglas Preserve, and 100th Street. Hiking, biking, boating, airboating, canoeing, and kayaking are some of the modes of transportation that may be used to facilitate fishing on the Refuge. The Motorized and Non-motorized Zones would be implemented for the Refuge Interior and guide what anglers may use for transportation in certain areas. Other modes of travel (e.g. airboats) are currently under evaluation and may be used to facilitate fishing if found compatible going through the U.S. Fish and Wildlife Service’s Compatibility Determination Policy, 603 FW 2. Access points and modes of travel available to support fishing and frogging can be found on the Refuge’s website, map/tearsheet brochure, and Fishing and Boating Regulations publication.

(e) Why is this use being proposed? In addition to fishing being one of the priority public uses, on September 15, 2017, the Secretary of the Interior signed Secretarial Order 3356 with specific directives “to support and expand hunting and fishing, enhance conservation stewardship, improve wildlife management, and increase outdoor recreation opportunities for all Americans” (DOI 2017). Additionally, the 2018 License Agreement with the SFWMD stipulates an increase to [Service evaluated and approved] wildlife-dependent public use opportunities. New uses and expansion of existing uses are being evaluated that may foster positive stakeholder/refuge relations. Recreational fishing is an existing use at the Refuge and is being re-evaluated in order to expand opportunities and allow for frogging, fish gigging, and bowfishing. Since the previous analysis, environmental conditions have not changed substantially. The Service provides the public with opportunities to participate in compatible wildlife-dependent recreation to appreciate the value of and need for fish, wildlife, and plant conservation. The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape. Visitors participating in recreational fishing activities are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment.

Availability of Resources:

Resources involved in the administration and management of the use – Except for maintaining and periodically updating regulatory signs and printed materials, minimal costs would be involved. Compliance monitoring is within the regular duties of the Refuge’s federal wildlife officers and would not require resources beyond those already necessary to patrol the area for compliance with current regulations. The financial and staff resources necessary to provide and administer this use at its current level and at expected levels on the Refuge are now available and are expected to continue in the future.

Special equipment, facilities, or improvements necessary to support the use – Existing facilities that support this use include boat ramps, boat dock, fishing pier, parking lots, and restrooms. In addition to potential boat ramp and parking lot improvements, proposed facilities to support this use include two additional fishing piers and floating docks: 1) located adjacent to Strazzulla along the L40 levee/canal; 2) located along the L39 levee/canal at Hillsboro. All proposed facilities and improvements are dependent upon funding availability (Table 1).
### Item  
<table>
<thead>
<tr>
<th>One-Time Cost</th>
<th>Annual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing piers (2)</td>
<td>$500,000 (each)</td>
</tr>
<tr>
<td>Floating dock (2)</td>
<td>$60,000 (each)</td>
</tr>
<tr>
<td>Parking/entry area modifications</td>
<td>$50,000</td>
</tr>
<tr>
<td>Fishing brochure, signage</td>
<td>$5,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,175,000</td>
</tr>
</tbody>
</table>

**Maintenance costs** – Maintenance associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, signage, parking areas, structure maintenance (boat ramps, fishing piers), and trash removal. Maintenance costs for proposed facilities are estimated in Table 1.

**Monitoring costs** – Existing Refuge staff and Federal Wildlife Officers monitor effects of and compliance with operations during the normal course of their duties and should not incur any additional costs.

**Offsetting revenue** – The Refuge does not anticipate charging fees above the standard entrance fee for fishing activities, but reserves the right to do so in the future if the need arises. Fees would be used to offset cost of regulation enforcement and monitoring biological impacts.

**Anticipated Impacts of the Use:**

Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed.

**Habitat**

Short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Impacts to vegetation and habitat from vessels utilized for this use are expected to be minor due to the typically preferred fishing locations (open water). Minimal damage has been observed from shoreline fishing and is expected to remain so.

Constructing the new fishing pier would convert an area of habitat from unobstructed open water habitat to habitat interrupted by pilings and periodically shaded by the new pier structure. Construction of fishing piers, signage, or other associated infrastructure would result in temporary disturbance or displacement of wildlife. Localized dust and noise would be created from construction operations, but should have negligible air quality impacts. The facilities, signage, and other associated infrastructure would be placed in sparsely vegetated (non-sensitive) areas near established or designated public trails to minimize loss of vegetation. Total construction footprint for new fishing infrastructure is expected to be less than 0.5 acre. In the long-term, use of the new fishing facilities would reduce existing impacts to the shoreline and vegetation that result from uncontrolled trampling of these areas by anglers. The facilities would be small (accommodating no more than 20 people at a time) and installed in locations that avoid
sensitive wildlife habitat. Additional signage would be installed to encourage visitors to limit their disturbance to wildlife and properly dispose of litter.

**Wildlife**

Both motorized and non-motorized boating can alter wildlife behavior. Though motorized boats generally have a greater effect on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to have less disturbance effects on most wildlife species (DeLong 2002). People fishing from vessels in the canals may encounter reptiles and amphibians in particular, but these encounters would be rare because anglers stay in their vessels in both the canals and the flats area of the Refuge. Turtles and alligators are at higher risk of being struck by boat propellers during extremely low water levels. The Refuge may close to all boat use during these conditions to mitigate for these risks to wildlife. Small mammal and avian habitat is not optimal in the open water areas preferred by anglers and disturbance to these species are expected to be minimal.

Casting may disturb some foraging/roosting birds as well as reptiles and small mammals, particularly near the edge of the impoundments and along the northern boundary. Occasionally anglers may hook turtles or other species as accidental by-catch. Potential risks to non-hunted wildlife such as aquatic species, small mammals, migratory song birds, raptors, and roosting/foraging wading birds and water birds include discarded fishing line and other fishing litter, which can entangle wildlife and cause injury or death (Thompson 1969, Gregory 1991). With the exception of fishing line entanglement, hook injuries, and increases in litter, overall disturbance to wildlife on the Refuge by anglers is expected to be commensurate with that caused by public users of other wildlife-dependent recreational opportunities that are compatible on the Refuge.

Impacts to threatened and endangered species may increase slightly due to direct and indirect effects of this recreational use. However, many direct impacts are expected to be mitigated by regulations and management activities such as restricting fishing in the event of a snail kite nest or other threatened and endangered species nesting near a fishing area. If a conflict occurs, sensitive areas would be closed to anglers and/or a 500-foot buffer zone would be placed around nests. Furthermore, nesting populations of Everglades snail kite, wood storks, and other listed species would not likely be significantly disturbed because fishing would be conducted in the canals and flats area, which is not the preferred habitat of threatened and endangered species that utilize the Refuge.

The proposed use is not likely to adversely affect fish and frog populations. Fish harvest would occasionally occur; however, most anglers generally practice catch and release. Although frogging may increase pressure on frog populations, the proposed season and bag limit restrictions should alleviate any pressure on populations or competition for wading birds. The season proposed excludes four months during which frogs are most actively breeding and during peak wading bird foraging/nesting season. Applying restrictions should alleviate any long-term and/or cumulative impacts to frog populations and the wildlife that prey on them. Participants are required to adhere to all FWC fishing and frogging regulations in addition to Refuge-specific regulations that have been set. These regulations are designed to protect species populations from the pressures of fishing and frogging by the public.
This use should not result in long-term or cumulative impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the Comprehensive Conservation Plan (CCP). Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur primarily on ruderal communities that can withstand repetitive use. A slight increase in gas emissions may occur due to the increase in vehicular traffic. However, no significant biological or ecological impacts have been observed as a result, despite these uses occurring on the Refuge for decades.

Determination (check one below):

[ ] Use is Compatible
[√] Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

- Recreational fishing including frog gigging, fish gigging, and bowfishing is allowed on designated areas of the Refuge in accordance with State law, except where Federal regulations have been set as found in Title 50, Code of Federal Regulations, Section 32.
- Commercial fishing and the taking of turtles and other wildlife (see Sec. 27.21 of this chapter) is prohibited.
- No frogging, fish gigging, or bowfishing from Refuge structures or within one-half mile of canoe trails or boat ramps.
- Frog gigging with an airboat is limited to the non-hunting airboat zone and allowed time frame.
- Bag limit for frogging is 50 frogs per boat/party.
- Hovercraft, mud boats, jet skis, jet boats, and wave runners are prohibited.
- All anglers are required to possess and carry all applicable State fishing and recreational gear licenses while fishing. Entrance fees apply to access boat ramps but no registration procedures are necessary for the individual angler. At this time, there are no restrictions or limits on the number of individual anglers permitted on the Refuge.
- Anglers must attend lines at all times.
- The possession or use of cast nets, seines, trotlines, jugs, and yo-yos and would be prohibited.
- Anglers may only launch boats at the Headquarters Area (Boynton Beach), Hillsboro (Boca Raton), and 20 Mile Bend (West Palm Beach).
- There is a 35 MPH maximum speed on all waters of the Refuge and idle speed zones at each boat ramp.
- There is a slow speed minimum wake zone in the crossover canal from the L-7 canal to the L-40 canal at the 20 Mile Bend boat ramps.
- All boats operating outside of the main perimeter canals (the L-40 Canal, L-39 Canal, and L-7 Canal) in Refuge Interior areas and within the hunt area, are required to fly a 10 inch by 12 inch (30 cm x 30 cm) orange flag, 10 feet (3 m) above the vessel's waterline.
- Motorized vehicles of any type are prohibited on the levees and undesignated routes (see Sec. 27.31 of this chapter).
- Anglers, their vehicles, boats, equipment, and other belongings are subject to inspection by Federal Wildlife Officers.

Justification: The Improvement Act of 1997 identified fishing as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in
planning and management. The Service attempts to provide opportunities for this use in the NWRS where compatible. Fishing has been deemed compatible on the Refuge. This activity supports the Service’s goal of Connecting People with Nature and Secretarial Order 3356 in addition to multiple objectives and strategies stated in the Refuge’s CCP. Fishing allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy mentally and physically, but can build a life-long appreciation for wildlife and their habitats. Allowing these uses to occur on the Refuge would not materially detract from or interfere with the purposes for establishment of the Refuge and the mission of the NWRS. This CD is based on sound professional judgement.

**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.

___ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

√ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

**References:**


**Mandatory 15-year Re-evaluation Date:**
Use: Wildlife observation and photography; environmental education; and interpretation

Description of Uses:

(a) What are the uses? Are they priority public uses? Wildlife observation and photography, interpretation, and environmental education (EE) are non-consumptive, wildlife-dependent recreational activities defined as priority public uses of the National Wildlife Refuge System (NWRS) as established in the Improvement Act of 1997. Interpretation includes activities and supporting infrastructure that explain management activities, fish, and wildlife resources, ecological processes, and cultural history among other topics to public users. EE includes activities that seek to increase public knowledge and understanding of wildlife and the importance of habitat protection and management. Typical activities include teacher or staff-guided onsite field trips, offsite programs in classrooms, and nature study, such as teacher and student workshops and curriculum-structured instruction. EE programs may involve the incidental collection of flora and fauna such as small fish, invertebrates, butterflies, caterpillars, leaves, seeds, stems, roots, flowers, soil, feathers, scat, discarded eggs, discarded fur, discarded hair, exoskeleton etc. Any sampling or collection activities by non-USFWS programs must be approved via a Special Use Permit (SUP), and samples collected shall be for use only on the Refuge for approved environmental education curricula.

(b) Where would the uses be conducted? The Refuge is comprised of over 145,188 acres encompassing the northern limit of the greater Everglades ecosystem. The Refuge is completely enclosed by a system of levees (unimproved roads) and canals that extend over 58 miles. A majority of the Refuge is managed under a license agreement with the state of Florida that makes up 141,374 acres known as “the Refuge Interior”. The USFWS owns an estimated 3,815 acres in fee title on the east side and adjacent to the interior. Natural communities found at the Refuge are characteristic of wetland habitats and include wet prairie, slough, sawgrass marsh, tree islands, and cypress swamp. The Refuge provides important roosting, foraging, and nesting habitats for many birds, mammals, reptiles, and amphibians. In addition to the various migratory birds and other wildlife commonly found in wetland habitats, keystone species that inhabit the Refuge include alligators, white-tailed deer, bobcats, wading birds, waterfowl, and secretive marsh birds. Threatened or endangered species that regularly utilize the Refuge include the Everglades snail kite and wood stork. Common temperate fresh water fish that occur regularly on the Refuge include mosquitofish, topminnow, largemouth bass, gar, and bowfin. Wildlife observation and photography, interpretation, and EE activities may be conducted by the general public on any portion of the Refuge open to public use.

(c) When would the uses be conducted? Wildlife observation and photography, interpretation, and EE activities may be conducted year-round, during public operating hours except by special permission from the Refuge Manager.
(d) **How would the uses be conducted?** Wildlife observation and photography, interpretation, and EE activities are achieved through guided or self-guided tours and activities. Only modes of transportation permissible to the public on the Refuge (see Regulations) may be used to conduct these uses by the public. Some supporting uses would include hiking and bicycling. The Refuge offers a Visitor Center with multiple exhibits including an introductory video, virtual airboat tour, “Night Sounds” experience, and various taxidermy and informative panels. Other amenities available to the public and utilized in EE and interpretation include walking trails and boardwalks, canoe trails, observation/photo blind, covered shelters (teaching pavilions) overlooking the marsh impoundments, an observation tower, and an observation platform. Each trail or platform also includes informative panels, including QR coded interpretation, on various topics of Everglades habitat and management.

(e) **Why are these uses being proposed?** Wildlife observation and photography, interpretation, and EE are being re-evaluated for the Refuge. These activities have been occurring on the Refuge since it was created in 1951. The Improvement Act of 1997 defines the described uses as priority public uses, and if compatible, they are to receive enhanced consideration over other general public uses in Refuge planning. Non-consumptive uses such as bird watching, nature photography, butterfly watching, and plant identification are enjoyed by approximately 300,000 people a year at the Refuge, and visitors come from as many as 49 foreign countries, all 50 states, as well as locally. The Refuge is known for its easily observed population of alligators, and its diversity and visibility of resident and wintering birds. Florida specialty birds that bring in birders from around the country include the snail kite, swallow-tailed kite, short-tailed hawk, smooth-billed ani, wood stork, and limpkin to name a few. The Refuge provides nesting and foraging areas for these birds, and excellent opportunities for photography. Since the Refuge is geographically positioned in the Atlantic Flyway, there is a good possibility to observe waterfowl and migratory shorebirds. The cypress swamp within the Refuge and the ecotone surrounding it are potentially rewarding areas to see migratory neo-tropical passerines, and many birders enjoy the seasonal show of colorful warblers and vireos. Butterflies, dragonflies, and damselflies grace the landscape providing some of the best photo opportunities in South Florida. An increase in non-consumptive uses is expected to grow rapidly due to increases in resident population growth adjacent to the Refuge, a growing “winter” visitor population, and the awareness of the Refuge’s diverse habitats. These activities can enhance the users’ appreciation of the Refuge, the NWRS, wildlife, their habitats, and the human environment.

**Availability of Resources:**

*Resources involved in the administration and management of the use* – Staff time is associated with administration and law enforcement. Existing staffing and funding are adequate to support these activities at existing and projected levels. Volunteers are utilized extensively to assist in successful programs and opportunities. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3 percent of staff time.

*Special equipment, facilities, or improvements necessary to support the use* – None proposed at this time. Construction of boardwalks, floating docks, observation towers, or additional photo blinds would be contingent on future funding.
Maintenance costs – Maintenance costs associated with this use are already performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, signage, parking areas, structure maintenance (observation blind, kiosks, boat ramps, boardwalks). This use should not incur additional maintenance needs.

Monitoring costs – Existing Refuge staff monitors the effects of current operations during the normal course of their duties. Voluntary evaluations are provided to teachers and visitors for feedback on educational programs and experiences.

Offsetting revenue – The Refuge charges for commercial companies that are using the Refuge for profit when conducting EE. Fees are waived for EE groups that are conducting standards-based teaching or for Boy/Girl Scouts, home school, or faith-based groups that are following a curriculum.

Anticipated Impacts of the Use: A primary concern for allowing any public use to occur on the Refuge is to ensure that impacts to wildlife and habitats are maintained within acceptable limits and potential conflicts between user groups are minimized. In most cases, the described activities would result in minimal disturbance to wildlife. Several studies have examined the effects of recreation on birds using shallow water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981; Burger 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1995, 1997; Burger & Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1997; Burger & Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981; Klein et al. 1995; Burger & Gochfeld 1998).

Distance: Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported.

Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger & Gochfeld 1981; Burger et al. 1995; Knight & Cole 1995; Rodgers & Smith 1995, 1997).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986; Klein 1993; Burger & Gochfeld 1998), though noise was not correlated with visitor group size (Burger & Gochfeld 1998).

There are some situations that could be harmful to plant and animal life, which would warrant Refuge closures or the development of use restrictions. Examples of these situations include, but are not limited to, protection of trust and listed species (flora and fauna), impacted vegetation, nesting species, and the protection of and possible conflicts with other refuge management programs. Potential impacts to wildlife and habitats include disrupting foraging or
resting activities, repetitive flushing of nesting birds, and stress or change in behavior due to
group size and/or volume. Negative responses from wildlife due to human impacts can include,
but are not limited, to:

- permanent disappearance of migratory bird species or individuals that are unable to
  adapt to the presence of people by habituation
- increased nest predation due to the continued flushing of birds from their nests
- change of patterns of behavior due to repetitive flushing
- increase of energy demands for wildlife fleeing from human disturbance
- variation in feeding behavior

The vast amount of Refuge acreage that is closed to the public and the placement of
appropriate buffers and signs utilized for nesting wildlife decrease the likelihood that brief, yet
sometimes frequent, disturbances would result in long-term or cumulative impacts. Sampling
would not result in the intentional death of plants or wildlife, and any short-term impacts would
be minimal and individuals would recover over time. There is a chance of mortality to plants or
wildlife due to the effects of stress during sampling activities. However, this would be minimized
by using standard accepted sampling or handling techniques. This use should not result in long-
term impacts that adversely affect the purposes for which the Refuge was established or alter
any existing or proposed uses as stipulated in the Comprehensive Conservation Plan.
Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would
occur primarily on ruderal communities that can withstand repetitive use. A slight increase in
gas emissions may occur due to the increase in vehicular traffic. However, no significant
biological or ecological impacts have been observed as a result, despite these uses occurring
on the Refuge for decades.

**Determination (check one below):**

- Use is Compatible
- Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**
To mitigate potential disturbances, a combination of Refuge staff presence and informational
kiosks would help educate visitors about the potential problems associated with their actions.
Law enforcement patrol of public use areas would continue to minimize violations of regulations.
If any negative impacts occur, the Refuge would take corrective action to reduce or eliminate
the effects on wildlife or habitats. Set-back distances would be used for nesting wildlife or in
areas that need to be closed to avoid adverse disturbance effects. No-entry and/or limited
activity buffer zones would be created and imposed for threatened or endangered species and
other trust species. A minimum of 500 ft. (150 meter) no-entry and 1,640 ft. (~500 meter) limited
activity zone is recommended for snail kites nests, and a 500 ft. zone is recommended for wood
storks and other trust species nests. Additionally, nesting wildlife such as alligators that
potentially pose a threat to public safety would also require buffer zones. All current and future
Refuge -specific rules and regulations apply to the proposed uses. Law enforcement officers
would be enforcing all laws and regulations and areas may be closed as necessary.
Specialized equipment requests would be evaluated by the Refuge Manager and an SUP would
be required.
Justification: The Improvement Act of 1997 identified wildlife observation and photography, interpretation, and EE as four of the six priority, wildlife-dependent recreational uses to be facilitated in the NWRS, and the Act encouraged the USFWS to provide opportunities for these uses. By providing wildlife observation and photography, the public would have an opportunity to observe/photograph wildlife on the Refuge and share those experiences with others. Through interpretive and EE programs, the public gains a better understanding and appreciation for America’s flora and fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources. One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. These uses can also provide excellent interpretive activities, exposing young people and urban dwellers to the unique sounds of the marsh, the beauty of nature, and the unique setting of the Refuge. Providing information regarding the mission of the USFWS and the purposes of the Refuge, along with specific resource information, to Refuge visitors may alleviate potential negative impacts of visitors on wildlife. Wildlife observation and photography, interpretation, and EE allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy for mind, body and spirit, but can build a life-long appreciation for wildlife and their habitats. Based on the stipulations noted above, allowing these uses to occur on the Refuge would not materially detract or interfere with the purposes for establishment of the Refuge and the mission of the NWRS. This CD is based on sound professional judgement.

NEPA Compliance for Refuge Use Decision: Place a √ in appropriate space.

√ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

___ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

Categorical Exclusion: Wildlife observation and photography, interpretation, and EE, as described in this CD, can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusion 43 CFR §46.210 (j): activities which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The uses trigger no response to any extraordinary circumstances (43 CFR §46.215). Wildlife observation and photography, interpretation, and EE are also covered by the following USFWS Categorical Exclusions (516 DM 8.5).

- A(2) - Personnel training, environmental interpretation, public safety efforts, and other educational activities, which do not involve new construction or major additions to existing facilities.
- B(7) - Minor changes in the amounts or types of public use on Service or State-managed lands, in accordance with existing regulations, management plans, and procedures.
- B(9) - Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices.
- C(3) - The issuance of special regulations for public use of Service-managed land, which maintain essentially the permitted level of use and do not continue a level of use that has resulted in adverse environmental effects.
References:


Mandatory 15-year Re-evaluation Date:
Use: Horseback Riding

Description of Use:

(a) What is the use? Is it a priority public use? This activity involves riders mounted on horses travelling on designated public trails within the boundaries of the Refuge. Horseback riding is a popular local activity that takes place primarily in the fall through spring seasons. The use mainly occurs in very small groups or individually. Potential horseback riding opportunities would give this group, who might not otherwise visit the Refuge, an opportunity to appreciate the natural plant community, observe resident wildlife, and enjoy the aesthetic attributes of the Refuge. Although horseback riding is not a priority public use as defined by the National Wildlife Refuge Improvement Act of 1997, it is supportive of wildlife-dependent recreational uses, including wildlife observation and wildlife photography.

(b) Where the use would be conducted? Most of this activity would occur on 58 miles of perimeter levees (L-39, L-40, L-7) that surround the Refuge Interior and the northern boundary of Strazzulla. The proposed horseback riding trails are flat, gravel, and shell rock levee tops designed for wheeled vehicles that would hold up well under hoof traffic. The sides of the levees are comprised mostly of well-maintained, mowed Bahia grass. A limiting factor to permitting horseback riding on the Strazzulla levee is trailer parking adjacent to Acme 2 Pump Station. The Refuge would partner with the Village of Wellington and the Acme Drainage District to create suitable parking just off the Refuge at this location. This would assist in providing adequate space for all user groups. The Strazzulla equestrian trail would also connect to existing trails on the South Florida Water Management District (SFWMD) and Village of Wellington land. Most of this proposed trail would be on partner land and not on the Refuge proper. The Refuge Interior is predominately wet marsh and not suitable for horseback riding. Hoof traffic in the interior of the Refuge would cause rutting and safety concerns for the horse and rider. Therefore, the Refuge Interior would not be opened to equestrian use.

(c) When would the use be conducted? Horseback riding may take place year-round during the normal operating hours of the Refuge. It is anticipated that the highest traffic from this public use would take place in the late fall to early spring, which is when this activity is most commonly conducted in South Florida.

(d) How would the use be conducted? Although current requests for horseback riding on the Refuge are infrequent, some visitors do wish to travel the Refuge via this means. Any organized group trail rides consisting of more than five horses would require a Special Use Permit. Users can access the riding trails using Refuge public parking facilities at Loxahatchee Road, Lee Road, and 20 Mile Bend or adjacent trails from partner public entities along the L-40 levee and adjacent to Strazzulla. Future potential access points include, but are not limited to, ACME-2 and South County Park. All horses would require the use of manure containment bags. Compliance regulations would be administered by law enforcement. Access points can be found on the Refuge's website and map/tearsheet brochure.

(e) Why is this use being proposed? In 2013, the Refuge was designated as one of 14 priority Refuges in the Urban Wildlife Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program
has established measures to help define and achieve excellence, create a framework for
developing new community partnerships, and establish a Refuge presence in
demographically and geographically varied cities across the U.S. The goal of the Program
is to develop a strong outreach program that engages South Florida’s diverse youth, on
their terms and through their languages, which is essential in advancing the connection of
youth to nature and creating a prototype for future youth-in-conservation planning.

Availability of Resources:

Resources involved in the administration and management of the use includes personnel time
associated with administration and law enforcement. Existing staffing and funding are adequate
to support these activities. Administration of SUPs associated with this activity consists of
approximately 10 staff days or less than 3% of staff time.

No special equipment, facilities, or improvements are required to be constructed on Refuge
property. The Refuge would partner with the Village of Wellington and the Acme Drainage
District to create suitable parking just off the levee near the Strazzulla trail. Approximately
$300,000 would be needed to create the parking lot which would include fencing, signage,
parking bumpers, and gravel. The Refuge would partner with the Village of Wellington and
Acme Drainage District to work towards funding for the necessary parking enhancements. Staff
would maintain levee trails where this use would occur and parking areas, but that is already a
duty of staff members and not directly attributable to this incidental use on the Refuge.

Minimal costs are associated with this use to monitor consequences of horseback riders having
access to the Refuge, such as a degree of littering and/or vandalism. Plants and wildlife would
be monitored to determine any impacts as a result of public use.

No off-setting costs exist for this use.

Anticipated Impacts of the Use:

Horseback riding on levees is anticipated to have minimal impacts to the areas where horses
are allowed to travel. All horses accessing the Refuge shall be required to keep horse manure
off Refuge lands through the use of manure containment bags and cleaning up after the horses.
Wells and Lauenroth (2007) found horses used on recreational trails represent a potentially
important dispersal vector for exotic plants. Campbell and Gibson (2000) found similar results
that horse dung is a vector to transporting germinable seeds of both native and exotic species.
Exotic and invasive plant seeds may be deposited on the trails and levee from horse manure.
Conversely, plants and seeds eaten by horses while on the levee may be deposited off the
Refuge. Manure containment bags can help keep invasive and exotic plants from being
deposited on the Refuge. Horses walking along trails pose a concern for transporting non-native
and invasive species which, if they establish themselves and germinate, can out-compete native
plant species. Disrupting the plant composition can provide long term impacts on Refuge
habitat, altering the environment. Altering the habitat and environment would affect the wildlife
species dependent upon those plant species and habitat types, potentially causing them to
relocate. This would be prevented by requiring horses to wear manure containment bags and
owners cleaning up after the horses.

Horses are not anticipated to cause unreasonable damage to Refuge habitat as long as they
are restricted to the levees. The proposed horseback riding trails are flat, narrow gravel, and
shellrock levees that would hold up well under hoof traffic. A partnership with Acme and the Village of Wellington would have to be established in order to allow horseback riding on the levee in Strazzulla. Visitors are presently able to walk on the levees and Refuge staff vehicles currently use the levees to access parts of the Refuge. Horse hoofs are not anticipated to have an additional impact to these man-made levees.

Infrastructure via levees currently exists but additional trail construction would be necessary to afford access. The Refuge has experienced minimal impacts to wildlife as a result of existing (hiking and biking) visitor access to levee systems. Allowing public horseback riding access is anticipated to minimally impact wildlife resources, similar to impacts experienced on levee settings currently open to public access.

With proper management, horseback riding would not result in any short or long-term impacts that would adversely affect the purpose of the Refuge or the mission of the National Wildlife Refuge System. In the long-term, allowing horseback riding would enhance visitor opportunities to participate in wildlife-dependent recreational uses on the Refuge, including wildlife observation and wildlife photography. To mitigate potential disturbances, a combination of Refuge staff presence and informational kiosks would help educate visitors about the potential problems associated with their actions. Should negative impacts be observed, public use levels and options would be adjusted accordingly.

**Determination (check one below):**

- Use is Compatible
- Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**
Access should be limited to that necessary to facilitate priority public uses and compatible secondary uses. Law enforcement patrol of public use areas would continue to minimize violations of Refuge regulations. If any negative impacts occur, the Refuge would take corrective action to reduce or eliminate the effects on wildlife. Impacts to wildlife from horseback may result in disturbance to wildlife, but are expected to be minimal given the access is restricted to existing levees.

Refuge specific rules and regulations would apply to the proposed horseback riding expansion.

Additional stipulations are to follow:

- Horses are required to wear manure containment bags and riders are responsible for removal of all horse manure.
- Limit all access when necessary to protect nesting snail kites, colonial nesting birds, resting waterfowl, or for other management purposes.
- Public access restricted to posted hours.
- Certain areas of the Refuge may be restricted seasonally to avoid disturbance of breeding or nesting wildlife or to protect sensitive habitat.
- All trash must be packed out and properly disposed of off-site.
- Clearing of vegetation is prohibited.
- Each visitor may only ride/walk one horse on the Refuge at a time.
- Groups consisting of more than five horses require a Special Use Permit.
Justification: Expanding Refuge access to horseback riding provides the public additional opportunities to experience wildlife and enhances the public use experience at the Refuge with minimal impacts to the Refuge resources. The Refuge strives to provide compatible uses that the public can enjoy on a National Wildlife Refuge.

NEPA Compliance for Refuge Use Decision: Place a √ in appropriate space.
___ Categorical Exclusion without Environmental Action Statement
___ Categorical Exclusion and Environmental Action Statement
X  Environmental Assessment and Finding of No Significant Impact
___ Environmental Impact Statement and Record of Decision

References:


Mandatory 10-year Re-evaluation Date:
Use: Pets on leash

Description of Use:

(a) What is the use? Is it a priority public use? This CD does not examine or impose restrictions on Service Animals. This CD examines the impacts of permitting visitors to enjoy the Refuge with their leashed or confined pet (dog or other companion animal). Pets may include, but are not limited to, dogs, cats, pigs, and birds. Animals not permitted on the Refuge for this activity include all animals listed as Prohibited Nonnative Wildlife or Conditional Nonnative species by the Florida Fish and Wildlife Conservation Commission (http://myfwc.com/wildlifehabitats/nonnatives/) or listed as Injurious Wildlife by the Service (https://www.fws.gov/injuriouswildlife/). Although this use can enhance the experience for visitors enjoying priority public uses, this use is not a priority public use of NWRS under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the Improvement Act of 1997 (Refuge Improvement Act) (Public Law 105-57).

This CD does not include uses for equine animals. Equine animals, specifically horseback riding, is addressed in a separate compatibility determination.

(b) Where would the use be conducted? All areas open to general public use for the Refuge are available for use with pets on the Refuge. Pets must not prevent the general public from utilizing Refuge facilities or trails at any time. Pets would not be permitted inside the Visitor Center, or on the boardwalks, observation towers, photo blinds, or other confined structures.

(c) When would the use be conducted? Pets may be allowed year-round, during public operating hours of the Refuge only.

(d) How would the use be conducted? Pets may accompany their owners while enjoying their walking or hiking activities on the Refuge. Other modes of transportation available at the Refuge that may include pets are boating or canoeing. As stated in the Code of Federal Regulations, 50 CFR 26.21(b): no unconfined domestic animals shall be permitted to roam at large on Refuge lands. Pets must be attached to a 6-foot (or shorter) leash with the owner in control of the leash and pet at all times. This leash requirement would be enforced to minimize wildlife and visitor disturbance. Any animal trespassing on Refuge lands may be impounded and disposed of in accordance with State statutes and federal regulations (50 CFR § 28.42). Dogs and cats running at large on the Refuge and observed harassing or molesting humans or wildlife may be disposed of in the interest of public safety and the protection of the wildlife (50 CFR § 28.43). Owners would be required to promptly remove feces from Refuge lands.

(e) Why is this use being proposed? Pets on Refuge lands is a new use at the Refuge. New uses are being evaluated to propose expansion of the current allowable public uses that may foster positive stakeholder/refuge relations. Enhancing current public uses by allowing pets, can potentially reach new groups of visitors and initiate a better understanding of Refuge resources and potential future recreation opportunities available. Allowing pets while enjoying other priority public uses can be an excellent platform for exposing young people and urban dwellers to the sounds and beauty of nature and the unique setting of the Refuge. Because of the accessibility to major urban areas, the Refuge is appealing to those looking for settings to enjoy outdoor pursuits in isolated areas. Additionally, in 2013, the Refuge was designated as one of 14 priority refuges in the Urban Wildlife Conservation Program.
(Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a refuge presence in demographically and geographically varied cities across the U.S. The goal of the Program is to develop a strong outreach program that engages South Florida’s diverse youth, on their terms and through their languages. Pets have historically been excluded for their own safety and the safety of their owners and other visitors. There is a risk of pets being injured or killed by wildlife on the Refuge. However, with improvements to educational and interpretation signage, risks to pets, pet owners, and other visitors can be mitigated. Allowing pets on the Refuge would benefit and promote the goals of the Program.

**Availability of Resources:** *Resources involved in the administration and management of the use* – Except for maintaining and periodically updating regulatory signs and printed materials, minimal costs would be involved. Compliance monitoring is within the regular duties of the Refuge’s federal wildlife officers and would not require resources beyond those already necessary to patrol the area for compliance with current regulations. The financial and staff resources necessary to provide and administer this use at its current level and at expected levels on the Refuge is now available and is expected to continue in the future.

*Special equipment, facilities, or improvements necessary to support the use* – No special equipment or facilities are recommended for this use. Improvements necessary include removing and reposting signs to inform the public where the use is prohibited. First year costs for signs and installation would be approximately $2,500 - $3,000 with recurring costs of about $1,000 every five years. Staff time is estimated at 3 days or 1 percent of staff time for the first year and 1 day (or 0.4%) thereafter.

*Maintenance costs* – Maintenance that may be associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, boardwalk maintenance, signage, and parking areas. This use should not incur any additional maintenance needs.

*Monitoring costs* – Existing Refuge staff and Federal Wildlife Officers monitor effects of and compliance with current operations during the normal course of their duties.

*Offsetting revenue* – None. The Refuge does not anticipate charging fees above the standard entrance fee.

**Anticipated Impacts of the Use:** Any public use activity has the potential for impacts to the local flora and fauna; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed. Conducting this use would cause negligible or short-term impacts to localized vegetation, soils, and waters including vegetation compaction and soil disturbance and compaction; however these impacts would be similar to those experienced from similar recreational uses. It is expected that water quality would be negligibly impacted as well, since pet waste (in low concentrations) is presumed to be similar to the effects of waste from the abundance of wildlife utilizing the Refuge.

Dogs and other pets on the Refuge have the potential to cause negative ecological impacts and user conflicts with wildlife and visitors. The role of dogs or other pets in wildlife diseases is not well documented. However, domesticated animals host endo- and ecto-parasites and can contract diseases from, or transmit diseases to, wild animals, and transport parasites to or from
wildlife habitats (Overgaauw 2009, Sime 1999). Although unlikely, bringing pets from unknown locations with unknown pests can potentially introduce an infestation of particular pests on the Refuge. Any new pest introduction can cause undue financial and administrative burdens to the Refuge and staff for the cost of treatments and control or undergoing processes for pesticide approval and use. Additionally, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals (Overgaauw 2009, Sime 1999). To reduce the risk of this exposure to wildlife and people, pet owners would be required to promptly pick up their pet’s feces and dispose of it properly. Other ecological impacts can result from the accidental release or escape of pets. If not located and re-captured, escapees can cause detrimental harm to themselves, the habitat and/or the ecosystem.

As with other compatible uses on the Refuge, the potential to disturb threatened or endangered species on the Refuge is extremely low. Disturbances to wildlife, in general, include disruption to nesting or foraging birds, resting alligators, deer movements, or other natural behaviors of various wildlife in the proximity. Most dogs have retained instincts to chase wildlife and those instincts can be triggered by flushed and escaping wildlife (Bowers 1953). If triggered, there is potential for owners to be unprepared or unable to control their dog, resulting in possible escapes and harm to wildlife, the owner, the pet, or other visitors. Conversely, there are also risks to pets from alligators. Alligators are often seen resting on the banks of the water’s edge or walking across the paths of visitors; however, most alligators would leave the area of human intrusion. Although the Refuge does not have a history of nuisance alligators or attacks, nesting females or startled animals may demonstrate a more aggressive response. Unprovoked attacks on people and pets are not unheard of in Florida and all visitors should remain vigilant and responsible nonetheless. Dogs and other small pets are more likely to be attacked than humans because they resemble a natural prey item for the alligator (FWC 2005). From 1948 to 2016, 388 unprovoked bite incidents have occurred in Florida (AOL 2017). The behavior increases when alligators are provoked or fed and lose their fear of humans and become accustomed or attracted to people. As new developments encroach on alligator habitat, human/alligator conflicts would almost certainly continue to increase (FWC 2005). Informational signs would be developed explaining the need to be vigilant with their pets and the presence of alligators and other wild animals.

Dogs that are unleashed increase the zone of disturbance beyond what it would be in the absence of a dog (Blumstein et al. 2006). Dogs (and likely other pets) elicit a greater response from wildlife than pedestrians alone (MacArthur et al. 1979; Hoopes 1993). In the case of birds, the presence of dogs may reduce bird diversity and abundance in woodlands (Banks and Bryant 2007) and staging areas (Burger 1986, Lafferty 2001), flush incubating birds from nests (Yalden and Yalden 1990), disrupt breeding displays (Baydack 1986), disrupt foraging activity (Hoopes 1993), and disturb roosting activity in ducks (Keller 1991). Many of these authors indicated that dogs with people, dogs on-leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. However, the greatest stress reaction results from unanticipated disturbance. Finally, the presence of dogs may exert a cumulative effect with other disturbances to reduce habitat suitability (Fernandez-Juricic 2002). Sime (1999) concluded that maintaining control of pets while in wildlife habitats reduces the potential of disturbance, injury, or mortality to wildlife. In a study comparing wildlife responses to human and dog use on and off trails, Miller et al. (2001) recommended prohibiting dogs or restricting use to trails to minimize disturbance and that natural land managers can implement spatial and behavioral restrictions in visitor management to reduce disturbance by such activities on wildlife. Pet owners would be required to maintain physical control (i.e. leash or enclosure) of their animal while on the Refuge, thereby reducing the potential and severity of these impacts to
wildlife. Any disturbance would be temporary and should not lead to loss of migratory birds or their habitats.

Dogs that bark excessively or other pets that are not well behaved may cause disruption to other users seeking to enjoy their recreation activities in the tranquility offered by the remote and natural setting of the Refuge. Some visitors may also experience allergic reactions to or feel threatened by dogs or other pets, which may therefore reduce the enjoyment of their visit.

This use should not result in long-term or cumulative impacts that adversely affect the purposes for which the Refuge was established. The amount of acreage available to wildlife in areas closed to public access far exceeds the few areas the public is able to recreate with their pets. This fact, in addition to the CFR requiring confinement and control of pets, is expected to alleviate and reduce impacts to negligible or acceptable levels.

**Determination:**

- Use is Not Compatible
- Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Only leashed or confined (e.g. caged pet, dog strollers, or other travel enclosure) pets are permitted on the Refuge. Pet owners would be required to maintain control of their animal at all times while on the Refuge and must refrain from entering closed areas. Leashes may be no longer than six feet in length.

- Visitors with pets would be required to immediately bag and remove their pet(s) fecal matter and dispose of it in the proper trash receptacles.
- Owners have the burden to ensure their pet causes no harm to wildlife, the Refuge, or for others visitors on the Refuge.
- No more than two pets per visitor.
- Public awareness would be increased through interpretive or educational materials about responsible pet ownership in the context of wildlife disturbance and threat of injury or death to pets during all outdoor recreational pursuits.
- Organized training or competitive events would be prohibited.
- If a high number of reports of negative pet-wildlife or pet-people interactions on Refuge trails are reported, the Refuge would reassess the use.
- Pets may be restricted at Refuge-sponsored events (i.e. Family Fishing Day, Everglades Day, NWR Week).
- Certain areas may be closed to the public and pets due to management activities.

**Justification:** One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. This use, although not a priority public use, has been determined to be compatible, because it would increase the public’s exposure to, understanding, and appreciation of America’s flora, wildlife, wildlife conservation, and the Service’s role in managing and protecting natural resources. Allowing pets on the Refuge, provides visitors with a much sought-after opportunity for non-consumptive wildlife-dependent recreation, and can foster positive public relations (especially with urban populations), and introduce the Refuge to new, non-traditional audiences. Through increased available opportunities with their pets, they may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. This use is
low impact, low cost, and highly controllable. The actions or effects of this use are not expected to interfere with or detract from the mission of the NWRS nor diminish the purposes for which the Refuge was established. The Improvement Act of 1997 requires that priority consideration be given to wildlife-dependent users, and the presence of pets is not necessary for non-hunting, wildlife-dependent recreational activities. If the use becomes too popular, burdensome, or unmanageable for staff, or if adverse impacts on public use activities or wildlife and their behaviors are identified, the Refuge may impose additional restrictions, up to and including termination, to mitigate disturbance.

**NEPA Compliance for Refuge Use Description:**

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- **X** Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**References:**


**Mandatory 10-year Re-evaluation Date:**
Use: Ceremonies (non-Refuge sponsored)

Description of Use:

(a) What is the use? Is it a priority public use? Non-Refuge sponsored ceremonies including, but not limited to weddings, religious ceremonies, memorial services, or charitable organization activities are a new proposed use on the Refuge. This use is not a priority public use of the NWRS under the Improvement Act of 1997.

(b) Where would the use be conducted? Locations of non-Refuge sponsored ceremonies must be pre-approved by the Refuge Manager. Locations may include the C-6 pavilion, Marsh Trail pavilion, trail, or open grassy areas on Refuge lands. Ceremonies would not be approved in the vicinity of the Headquarters office or Visitor Center. Proposed location must not unduly prevent the general public from utilizing Refuge facilities or trails at any time. Receptions or other gatherings pre- or post-ceremony shall be held off-site.

(c) When would the use be conducted? Ceremonies may be conducted year-round, during public operating hours of the Refuge only. Set up and removal shall occur on the day of the event only.

(d) How would the use be conducted? The person(s) wishing to hold a ceremony on the Refuge would be required to submit a Special Use Permit (SUP) application giving the particulars, such as date, time, number in party, location, and any ceremony items they would like to use. The Refuge would review the request and provide any specific stipulations (Special Conditions) needed to avoid exceeding maximum capacity of specific locations and disturbance to wildlife or other priority public uses; requests may be denied that do not meet these conditions.

(e) Why is this use being proposed? Non-Refuge sponsored ceremonies are a new use being evaluated to propose expansion of the current allowable public uses that may foster positive stakeholder/refuge relations. Visitors would be exposed to the Refuge and our mission in such a manner as to leave them with a better understanding of Refuge resources. The Refuge receives, on average, ten requests for this type of use per year. Ceremonies in natural areas can be an excellent opportunity to expose young people and urban dwellers to the unique sounds of the local fauna, the beauty of nature, and the secluded setting of the Refuge. Wildlife-dependent activities (e.g. nature walks or canoe trips) before or after the event are encouraged to promote an appreciation and understanding for the Refuge, wildlife conservation, and the mission of the NWRS. Because of the accessibility to major urban areas, the Refuge is appealing to those looking for settings to enjoy outdoor pursuits in isolated areas. Additionally, in 2013, the Refuge was designated as one of 14 priority refuges in the Urban Wildlife Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S.

Availability of Resources: Issuing and monitoring SUPs for this use is within the resources available through the visitor services program at the Refuge and/or the Refuge Manager. Based
on the history of requests and number of SUPs in relation to this activity, the Refuge has sufficient resources for managing current and expected levels of uses associated with ceremonies.

**Resources involved in the administration and management of the use** – Staff responsibilities for activities by non-Service entities would primarily be limited to the following: review of proposals, preparation of SUPs and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of activity implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time. Compliance with the terms of the permit is within the regular duties of the Refuge visitor services staff and Federal Wildlife Officers. The permittee must provide appropriate support personnel, equipment, and resources for the ceremony. If a permittee would need assistance from Refuge staff, the permittee must request the assistance in writing when applying for the SUP. Staff and resource availability would be determined by the Refuge Manager based on current Refuge priorities and work plans. The Refuge would not directly supply personnel or equipment for the proposed use unless arrangements have been made prior to the issuance of the SUP and the Refuge Manager has deemed it to benefit the Refuge. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.

**Special equipment, facilities, or improvements necessary to support the use** – Special equipment, facilities, or improvements to support this use are not proposed. Facilities currently accessible on site include restrooms and pavilion(s).

**Maintenance costs** – Maintenance that may be associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include: mowing, trail/levee maintenance, boardwalk maintenance, signage, parking areas, structure maintenance (observation blind, kiosks, and boat ramps). This use should not incur any additional maintenance needs, however, it may influence the timing of when and how often maintenance should be performed.

**Monitoring costs** – Existing Refuge staff monitors effects of current operations during the normal course of their duties. Additional monitoring may be required to ensure compliance with SUP stipulations and is estimated at 2 staff days or less than 1 percent of staff time.

**Offsetting revenue** – An administrative fee may be required in addition to the standard entrance fees. Administrative fees would be assessed on a case-by-case basis and may vary, depending on the size and complexity of the event, number and frequency of demands for this use, and other applicable details. Although there is no standard fee schedule at this time, fees would be comparable to other Refuge use fees on the Refuge and other refuges in the vicinity. The Refuge would observe the Federal Lands Recreation Enhancement Act (16 USC Ch. 87) and all future guidance and policies relating to fees on Refuges. A deposit may also be required.

Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of these uses associated with non-Refuge sponsored ceremonies.

**Anticipated Impacts of the Use:** There would be no to minimal negative impacts from this use; any ceremony request that does not comply with the stipulations below or is determined to pose a risk of negative impacts would not be approved and no SUP would be issued. This use would most likely cause minimal disturbance to wildlife in the immediate vicinity of the event.
Depending on the time of year, conflicts can arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Responses of wildlife to human activities include: departure from site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschgen et al 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschgen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). However, the amount of acreage available to wildlife in areas closed to public access far exceeds the few areas the public is able to hold ceremonies. This fact is expected to alleviate and reduce impacts to negligible or acceptable levels. Wildlife observation for other visitors of the Refuge may be affected due to the fact that the pavilion would be temporarily unavailable to anyone not included in the event. Other anticipated impacts include increased maintenance of the spaces and parking areas utilized. Short-term impacts may include vegetation compaction and soil disturbance and compaction. This use should not result in long-term impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the CCP. The Refuge Manager would use professional judgment in ensuring that the request would have no considerable negative impacts; would not violate Refuge regulations; and that it would contribute to the achievement of the Refuge purposes and the NWRS mission. Special needs would be considered on a case-by-case basis and are subject to the Refuge Manager's approval and may be modified to ensure compatibility (if appropriate). If adverse impacts on public use activities or wildlife and their behaviors are identified, modifications up to and including termination of permitted activities would be implemented to minimize such impacts.

**Determination:**

____ Use is Not Compatible

**X** Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Each request must comply with Special Conditions attached to their SUP to ensure compatibility. At a minimum, the following standard SUP Special Conditions would be included.

- No portion of the Refuge would be closed to accommodate such ceremonies.
- Music will be limited to unplugged instruments of five or less pieces or hand-held players. Ceremonial props are allowed to be in place one hour before the ceremony and must be removed within one hour after the ceremony. Any additional ceremony props will have to be approved before the ceremony. All items must be removed within one hour of the ceremony’s conclusion. Refuge staff does not provide any assistance in setting up or removal of props for ceremonies.
- No litter may be left on site including biodegradable materials.
- No balloons, rice, birdseed, confetti, plastic, etc. permitted because it poses a hazard to wildlife.
- Activities or practices that could be hazardous to visitors, wildlife, vegetation, or facilities would not be allowed. Such activities include, but are not limited to, lighting candles, burning incense, sacrifices (animal or otherwise), or scattering ashes.
- All event activities would meet the standards of public decency and would not violate any animal or human rights.
- Each request must be submitted a minimum of 30 calendar days in advance of the event by completing a SUP application. Each request would then be evaluated for appropriateness and compatibility.
- Up to two (2) events may be permitted per month. Preference would be given to new requests over repeat requests.
- Events would not exceed four hours in duration. This window includes time for set up and breakdown of equipment, materials, etc. Event length should be limited to the shortest amount of time reasonably required.
- It would be the responsibility of the permittee to provide and manage all activity-related materials (tables, chairs, additional mobile restrooms, etc.) and ensure that all participants remove litter and other activity-related materials from Refuge property immediately following conclusion of the event.
- A maximum of 50 people may participate in an event.
- Bond requirement is at the discretion of the Refuge Manager, based on an analysis of the nature and scope of the event, and the associated level of risk for resource damage and anticipated cost of any restoration or repair of any damage. The permittee is responsible for site cleanup immediately following any ceremonial event. The Refuge Manager shall inspect the site prior to release of any bond.
- Permittee and designated associates would comply with all the Refuge regulations and additional instructions as provided by the Refuge Manager.
- Failure of the permittee to comply with any of these Special Conditions or with any State or Federal laws or special Refuge regulations would be sufficient cause for permit revocation and may result in denial of future SUPs.
- Permittee must have the SUP in their possession at all times while on the Refuge. A copy of the permit must also be prominently displayed on the dash of permittee’s vehicle(s) at all times while on the Refuge. The permit must be presented to Refuge personnel upon request.
- All vehicles must park in designated spaces. No vehicles may be parked on the grass or other natural areas.
- Decorations and other activity-related materials that are made from any type of plant (e.g. flower and plant arrangements) or animal (e.g. feathers, shells, etc.) materials need to be approved prior to the event in order to maintain the environmental health of the Refuge and to prevent the introduction of any pests, pathogens, or invasive species to the Refuge.
- All activities would be conducted in such a manner as to minimize disturbance to wildlife, Refuge resources, and the visiting public. The following are specifically prohibited: 1) audio amplification devices; 2) adhering, fixing, or fastening decorations to vegetation and/or structures; 3) erecting self-supporting decorations, banners, flags, etc. in a manner that would obstruct the view of public areas or disturb wildlife; 4) throwing or scattering rice, bird seed, or similar products; and 5) the release of any type of wildlife (e.g. butterflies, doves, etc.), balloons, or lanterns.
- No food or beverages are allowed unless they are a fundamental part of a religious practice or ceremony and would not cause any disturbance to wildlife. Receptions in association with permitted events are not allowed.
- A NWRS fact sheet would be provided with every SUP and must be distributed by the permittee to all adult participants.
- The permittee agrees to forever hold harmless the United States, its officers, agents, employees, contractors and/or assigns from any and all damages to property or injuries to persons which arises or may be incidental to the activities associated with an SUP.
**Justification:** One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. This use, although not a priority public use, has been determined to be compatible, provided the SUP Special Conditions are followed, because it would increase the public’s exposure to, understanding, and appreciation of America’s flora, wildlife, wildlife conservation, and the Service’s role in managing and protecting natural resources. Allowing ceremonies on the Refuge would foster positive public relations, especially with urban populations, and introduce the Refuge to new, non-traditional audiences. Through this experience, they may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. This use is low impact, low cost, and highly controllable. The actions or effects of this use are not expected to interfere with or detract from the mission of the NWRS nor diminish the purposes for which the Refuge was established. Each request has different logistics, and therefore, would be evaluated on a case-by-case basis. A SUP would be issued unless found to be inappropriate or incompatible with the Refuge or Service’s mission. This use would not pose substantial adverse effects on Refuge resources, interferes with public use of the Refuge, nor cause an undue administrative burden. This Compatibility Determination is based on sound professional judgement.

**NEPA Compliance for Refuge Use Description:**

- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

**References:**


**Mandatory 10-year Re-evaluation Date:**
Use: Instructor-led Small Group Activities

Description of Use:

(a) What is the use? Is it a priority public use? Instructor-led small group activities are new proposed uses on the Refuge and may include, but are not limited to yoga, martial arts, aerobics, artistry, astronomy, or natural areas-related instruction on various topics (i.e. edible plants). This use is not a priority public use of the NWRS under the Improvement Act of 1997.

(b) Where would the use be conducted? Locations of instructor-led small group activities would be evaluated on a case-by-case basis and must be pre-approved by the Refuge Manager at the Refuge. Locations at the Refuge may include the C-6 pavilion, Marsh Trail pavilion, cypress boardwalk pavilion, various trails, or open grassy areas. Instructor-led small group activities would not be approved or permitted near the Headquarters office or Visitor Center of the Refuge. Locations being occupied for these uses must not unduly prevent the general public from utilizing Refuge facilities or trails at any time.

(c) When would the use be conducted? Instructor-led small group activities may be conducted year-round, during public operating hours of the Refuge only. A maximum of two groups per week and eight per month would be permitted at the Refuge.

(d) How would the use be conducted? Title 50, Code of Federal Regulations, 27.97, Private Operations, prohibits soliciting business or conducting a commercial enterprise on any national wildlife refuge except as may be authorized by special permit. Thus, instructor-led small group activities are required to obtain a SUP from the Refuge Manager. Special needs (e.g. access to closed areas or night classes) would be considered on a case-by-case basis, are subject to the Refuge Manager's approval, and may include a secondary component negotiated to ensure compatibility (if appropriate). All SUPs would outline the conditions under which the use can be conducted, and Refuge staff would ensure that each permittee maintains compliance with the SUP. The instructor(s) wishing to hold a class on the Refuge would be required to submit a SUP application giving the particulars, such as date, time, number in party, location, and any class-related supplies (i.e. mats, blankets, steps, blocks) they would like to use. The Refuge would review the request and provide any specific stipulations (Special Conditions) needed to avoid exceeding maximum capacity of specific locations and disturbance to wildlife or other priority public uses; requests may be denied that do not meet these conditions. Individuals or pairs engaging in these activities without instructors would not require a SUP, but may use the Refuge as other visitors do, at their leisure.

(e) Why is this use being proposed? Instructor-led small group activities are a newly proposed use of the Refuge in order to increase public use opportunities that may foster positive stakeholder/refuge relations. Ecotherapy is an umbrella term for all nature-based methods aimed at the re-establishment of human and ecosystem reciprocal well-being; a transdisciplinary and ecosystemic approach aimed at the collaborative enhancement of physical, psychological and social health for people, communities and ecosystems (Sempik et al., 2010). The concept of ecotherapy is becoming increasingly popular and represents a commitment to the health of the population and the environment, and so has the
potential to unite the environmental movement with health and health promotion
interests (Lines 2013). Allowing instructor-led small group activities in natural areas can
be an excellent opportunity to expose the next generation and urban dwellers to the
unique sights and sounds of the local flora and fauna, the beauty of nature, and the
secluded setting of the Refuge. Participants would be exposed to the Refuge and our
mission in such a manner as to leave them with a better understanding of Refuge
resources. The Refuge receives a maximum of ten requests for uses that fall into this
category per year. Wildlife dependent activities (e.g. nature walks or canoe trips)
following the non-traditional activity are encouraged to promote an appreciation and
understanding for the Refuge, wildlife conservation, and the mission of the NWRS. In
addition, because of the accessibility to major urban areas, the Refuge is appealing to
those looking for settings to enjoy outdoor pursuits in isolated areas. In 2013, the Refuge
was designated as one of 14 priority refuges in the Urban Wildlife Conservation Program
(Program) that would increase the Service’s relevancy to nearby communities and local
citizens. This Program has established measures to help define and achieve excellence,
create a framework for developing new community partnerships, and establish a Refuge
presence in demographically and geographically varied cities across the U.S.

Availability of Resources: Issuing and monitoring SUPs for this use is within the resources
available through the visitor services program at the Refuge and/or the Refuge Manager. Based
on the history of requests and number of SUPs in relation to this activity, the Refuge has
sufficient resources for managing current and expected levels of uses associated with
instructor-led small group activities.

Resources involved in the administration and management of the use – Staff responsibilities for
activities by non-Service entities would primarily be limited to the following: review of proposals,
preparation of SUPs, and monitoring of activity implementation to ensure that impacts and
conflicts remain within acceptable levels (compatible) over time. Compliance with the terms of
the permit is within the regular duties of Refuge visitor services staff and Federal Wildlife
Officers. The permittee must provide appropriate resources required for all activities. If a
permittee would need assistance from Refuge staff, the permittee must request the assistance
in writing when applying for the SUP. Staff and resource availability would be determined by the
Refuge Manager based on current Refuge priorities and work plans. The Refuge would not
directly supply personnel or equipment for the proposed use unless arrangements have been
made prior to the issuance of the SUP and the Refuge Manager has deemed it to benefit the
Refuge. Administration of SUPs associated with this activity consists of approximately 10 staff
days or less than 3% of staff time.

Special equipment, facilities, or improvements necessary to support the use – Special
equipment, facilities, or improvements to support this use are not proposed. Facilities currently
accessible on site would be available, including restrooms and pavilion(s).

Maintenance costs – Maintenance that may be associated with this use is already being
performed by staff and/or volunteers throughout the year, during the normal course of their
duties. Examples include: mowing, trail/levee maintenance, boardwalk maintenance, signage,
parking areas, structure maintenance (observation blind, kiosks, boat ramps), and trash
removal. This use should not incur any additional maintenance needs; however, it may influence
the timing of when and how often maintenance should be performed.
Monitoring costs – Existing staff monitors effects of current operations during the normal course of their duties. Additional monitoring may be required to ensure compliance with SUP stipulations and is estimated at 2 staff days or less than 1 percent of staff time.

Offsetting revenue – A permit-term administrative fee may be required in addition to the standard Service commercial rate for entrance to the Refuge. Should the permit include multiple visits throughout the term of the permit, only entrance fees would be collected for subsequent visits. Administrative fees would be assessed on a case-by-case basis and may vary, depending on the size and complexity of the class, number and frequency of demands for this use, and other applicable details. Although there is no standard fee schedule at this time, fees would be comparable to other the Refuge use fees and Refuges in the vicinity. The Refuge would observe all future guidance and policies relating to fees on Refuges. A deposit may also be required.

Based on the availability of resources, the Refuge would have sufficient funds for managing current and expected levels of these uses associated with non-Refuge sponsored instructor-led small group activities.

Anticipated Impacts of the Use: There would be no to minimal anticipated negative impacts from this use; any SUP request that does not comply with the stipulations below or is determined to pose a risk of negative impacts would be denied. Instructor-led small group activities would most likely cause minimal disturbance to wildlife in the immediate vicinity of the event. Wildlife observation for other visitors of the Refuge may be marginally affected due to a pavilion or small space being temporarily occupied and unavailable to persons not participating in group activities. Other anticipated impacts include increased maintenance of the spaces and parking areas utilized. Short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Due to the limited number of classes permitted, and since the areas are open to the public, minimal additional disturbance is anticipated. Furthermore, the amount of acreage available to wildlife in areas closed to public access for reprieve far exceeds the few areas the public is able to hold these activities. This fact is expected to alleviate and reduce impacts to negligible or acceptable levels. This use should not result in long-term impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in the CCP. Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur on ruderal communities that can withstand repetitive use. A slight increase in gas emissions may occur due to the increase in vehicular traffic. The Refuge Manager would use professional judgment in ensuring that the request would have no considerable negative impacts; would not violate Refuge regulations; and that it would contribute to the achievement of the Refuge purposes and the NWRS mission. Special needs would be considered on a case-by-case basis and are subject to the Refuge Manager's approval and may be modified to ensure compatibility (if appropriate). If adverse impacts on public use activities or wildlife and their behaviors are identified, modifications up to and including termination of permitted activities would be implemented to minimize such impacts.
Determination:

___ Use is Not Compatible

___ X___ Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Each request must comply with Special Conditions attached to their SUP to ensure compatibility. At a minimum, the following standard SUP Special Conditions would be included.

- Each request must be submitted a minimum of 30 calendar days in advance of the first scheduled activity by completing an SUP application. Each request would then be evaluated for appropriateness and compatibility.
- Up to two (2) activities may be permitted per month. Preference would be given to new requests over repeat requests.
- Activities would not exceed two hours in duration, which includes set-up and breakdown. Activity length should be limited to the shortest amount of time reasonably required.
- It would be the responsibility of the permittee to provide and manage all activity-related resources and ensure that all participants remove litter and other activity-related materials from Refuge property immediately following conclusion of the session.
- A maximum of 50 participants may be permitted for one-time activities, and a maximum of 20 participants may be permitted for recurring activities.
- Permittee and activity participants would comply with all the Refuge regulations and additional instructions as provided by the Refuge Manager.
- Failure of the permittee to comply with any of these Special Conditions or with any State or Federal laws or special Refuge regulations would be sufficient cause for permit revocation and may result in denial of future SUPs.
- Permittee must have the SUP in their possession at all times while on the Refuge. A copy of the permit must also be prominently displayed on the dash of permittee’s vehicle(s) at all times while on the Refuge. The permit must be presented to Refuge personnel upon request.
- All vehicles must park in designated spaces. No vehicles may be parked on the grass or other natural areas.
- Activity-related materials that are made from any type of plant (e.g. flower and plant arrangements) or animal (e.g. feathers, shells, etc.) materials need to be approved prior to the activity in order to maintain the environmental health of the Refuge and to prevent the introduction of any pests, pathogens, or invasive species to the Refuge.
- All activities would be conducted in such a manner as to minimize disturbance to wildlife, Refuge resources, and the visiting public. The following are specifically prohibited: 1) audio amplification devices; 2) adhering, fixing, or fastening decorations to vegetation and/or structures; 3) erecting self-supporting decorations, banners, flags, etc. in a manner that would obstruct the view of public areas or disturb wildlife; 4) throwing or scattering rice, bird seed, or similar products; and 5) the release of any type of wildlife (e.g. butterflies, doves, etc.), balloons, or lanterns.
- A NWRS fact sheet would be provided with every SUP and must be distributed by the permittee to all adult participants.
- The permittee agrees to forever hold harmless the United States, its officers, agents, employees, contractors and/or assigns from any and all damages to property or injuries to persons which arises or may be incidental to the activities associated with an SUP.
Justification: One of the stated goals of the NWRS is to “foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats”. Ecotherapy is one example of the ways in which supporting the value of natural settings for well-being is likely to prompt greater ecological awareness and environmental care (Hartig, Kaiser, and Bowler, 2001). Allowing instructor-led small group activities on the Refuge would introduce the Refuge to new, non-traditional audiences. By acknowledging and supporting the community in their search for ecotherapy, the Service can foster positive public relations in our urban communities, which would ultimately benefit fish, wildlife and their habitats. Through their experience, new visitors may become aware of the value of national wildlife refuges and promote fish and wildlife conservation. This use is low impact, low cost, and highly controllable. The actions or effects of this use are not expected to interfere with or detract from the mission of the NWRS nor diminish the purposes for which the Refuge was established. This use, although not a priority public use, has been determined to be compatible, provided the SUP Special Conditions are followed, because it would increase the public’s exposure to, understanding, and appreciation of America’s flora, wildlife, wildlife conservation, and the Service’s role in managing and protecting natural resources. Instructor-led small group activities are not outlined in an approved plan; however, the uses do not conflict with Refuge CCP goals or objectives. Each request has different logistics and potential impacts, and therefore, would be evaluated on a case-by-case basis. This use would not pose substantial adverse effects on Refuge resources, interfere with public use of the Refuge, nor cause an undue administrative burden. This CD is based on sound professional judgement.

NEPA Compliance for Refuge Use Description:

_____ Categorical Exclusion without Environmental Action Statement
__X__ Categorical Exclusion and Environmental Action Statement
____ Environmental Assessment and Finding of No Significant Impact
_____ Environmental Impact Statement and Record of Decision

References:


Mandatory 10-year Re-evaluation Date:
Use: Camping

Description of Use:

(a) What is the use? Is it a priority public use? The use is overnight camping at designated sites along the western perimeter levee (L-7) and on platforms along the Refuge’s southern canoe trail. Camping is not a priority public use of the National Wildlife Refuge System (Refuge System) under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). Camping is a secondary use that facilitates and supports wildlife-dependent priority public uses including wildlife observation and photography.

(b) Where the use would be conducted? Sites to facilitate camping would be provided on the L-7 levee, and two platforms would be built along the southern Refuge canoe trail.

(c) When would the use be conducted? The campsites and canoe trail camping platforms would be available for use year round, on a first come-first serve basis, by fee-based permit only. There would be a two-night maximum stay per reservation. The Refuge may temporarily prohibit camping for public safety or other reasons.

(d) How would the use be conducted? To provide this experience, a very limited, permitted, fee-based, overnight back-country camping opportunity is proposed. Small designated campsites would be made available on the L-7 levee in the form of cleared vegetative areas, maintained with mowers, with a fire ring, which can accommodate no more than 20 persons per campsite. A maximum of two camping platforms that can each accommodate two tents and six persons would be constructed along the southern canoe trail.

Access to the levee campsites would be possible by hiking or biking from any of the Refuge’s main entrances and public parking lots including Loxahatchee Road, Lee Road, and 20 Mile Bend. An additional access location and parking lot may become available near Strazzulla. Visitors camping along the canoe trail on platforms would be required to travel to the sites using motorized or non-motorized watercraft. All campsites would be primitive in nature, with no available facilities. Camping would be “pack-in/pack-out”, therefore all trash and waste would need to be removed, since no trash receptacles or bathroom facilities would be on site. Access points can be found on the Refuge’s website and map/tearsheet brochure.

Campers would be required to stay on trails and use the designated camp areas to stay overnight. Overnight stays would be by permit only, based on advanced reservations, and limited by number. Specific restrictions and guidelines would prevent visitors from becoming lost during their visit and reduce the number of emergency rescues by law enforcement staff. If mandatory rescue missions become too numerous, the camping experience would be modified or closed. Further stipulations may be made to assure wildlife and habitat is not disturbed, including ending the overnight option.

Campsite regulations consist of the following:
• The sites are available on a first-come basis.
• Only free standing tents (no stakes) are allowed on the platforms.
• The maximum number of tents on a platform allowed is two.
• The maximum length of stay is two nights.
• The maximum number of people occupying a platform campsite is six and levee site is twenty.
• No fires are allowed on the canoe trail platforms.
• Fishing is not permitted on canoe trail platforms.
• Only one motorized boat is permitted at a canoe trail platform at a time.

(e) Why is this use being proposed? In 2013, the Refuge was designated as one of 14 priority Refuges in the Urban Wildlife Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S. One of the goals of the Program is to develop a strong outreach program that engages South Florida’s youth, which is essential in advancing this discussion nationally and creating a prototype for future youth-in-conservation planning.

Camping is a popular local and visitor recreational activity in Florida. While camping is not a wildlife-dependent recreational use, it supports greater opportunity for wildlife observation, and photography. The Refuge supports facilitating these opportunities for the community and visitors as it promotes the associated wildlife-dependent recreation.

Camping opportunities would allow each user group to learn about the Everglades, the unique opportunity to observe by sight and sound nocturnal wildlife, observe celestial phenomenon partially away from urban light pollution, and an opportunity to recognize the uniqueness of the Everglades ecosystem. It is vital to provide ways for our visitors to understand why supporting the cost of ongoing restoration/protection efforts is important to the residents of South Florida.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated Refuge budgets.

(a). Resources involved in the administration and management of the use: Refuge staff would need to prepare and administer permits. Federal Wildlife Officers would spend time enforcing Refuge regulations. This duty is already part of their everyday tasks and would not substantially increase his/her workload. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time. Less than 2% of the time of staff members involved may be required to support this use.

(b). Special equipment, facilities, or improvements necessary to support the use: The Refuge would need to construct the canoe trail platforms for the camping areas. Cost of constructing canoe trail platforms is estimated to be around $50,000.

(c). Maintenance costs: Refuge staff would need to maintain levee camping sites, canoe trails, and camping platforms. Staff and volunteers may spend around 12 hours a week performing this maintenance in support of camping, along with other refuge objectives and uses.
(d). Monitoring costs: Existing staff and volunteers monitor effects of current operations during the normal course of their duties such as mowing, trash pickup, wildlife surveys, or compliance checks by Federal Wildlife Officers.

(e). Offsetting revenue: A nominal fee would be associated with camping permits ranging from $10 to $50.

**Anticipated Impacts of the Use:**

Described below are the potential impacts of camping, as reported in the literature. Impacts may be locally significant, but are usually restricted to a relatively small area (i.e., the campsite itself) (Marion and Cole 1996). Substantial impacts on vegetation and soil generally occur quickly, even with light use (Cole 1981).

**Soil:** Camping results in soil compaction. It may reduce or remove the organic litter and soil layer and run-off, and soil erosion may increase. Those changes affect soil invertebrates and microbial processes, as well as inhibit plant growth. Fine-textured soils are particularly susceptible to compaction. Campsites with vegetated shorelines that are accessed by watercraft may also undergo shoreline erosion from the effects of repeated boat landings compacting soil and removing vegetation. Visitor use of the shoreline for fishing, swimming, dish washing, and collecting water may also trample vegetation, compact soil, and accelerate erosion. That erosion may expose tree roots, resulting in increased tree mortality due to wind throw. (Marion and Cole 1996). This use would likely cause minor disturbance to surface soils in areas selected as primitive camping sites. Canoe trail camping would not likely have impacts to soil, since visitors would be confined to a platform structure.

**Vegetation:** The impacts of camping on vegetation are usually locally severe, even with low to moderate use. They include loss of ground vegetation cover, reduced vegetation height and vigor, loss of rare or fragile species, and changes in plant community composition (Leung and Marion 2000). Vegetation may be removed or trampled. Shrubs and trees are commonly lost from the site or damaged. Axes or fire may scar tree trunks, branches may be broken, bark removed or damaged, or nails placed in trees. Tree regeneration (seedlings and saplings) is generally lost, thus facilitating conversion to a non-forested site. Marion and Cole (1996) found on campsites they studied in Delaware that an average of 19 percent of trees had been felled and 77 percent of the standing trees had been damaged (primarily branches cut for firewood or trunks scarred by axes and nails). Such impacts should be reduced given the prohibition of campfires on the platforms, and the very limited woody vegetation available on the levees. Monitoring of canoe trail camp sites by law enforcement would ensure upland habitats (tree islands) in the area are not disturbed.

Trampling resistant vegetation (often grasses or exotics) tend to replace existing understory vegetation (forbs) (Marion and Cole 1996). The indirect effects of vegetation disturbance include microclimate changes and increased erosion. The extent of camping impacts on vegetation is generally related to the frequency sites are used, their durability, and group size (Cole 1995). Larger groups are usually responsible for enlarging campsites more than small groups (Cole 1992, Marion 2003). Campsite enlargement is particularly a problem when campsites are located on flat, open sites. Campers may also enlarge the affected area by developing multiple, uncontrolled “social trails” between tents, to water sources, to viewing points, or favored fishing locations. Some visitors have a much greater impact on vegetation than others, because they may cut down vegetation, dig trenches around tents, and otherwise modify the sites. Many of these potential impacts would be mitigated with this proposal given that there are so few sites
proposed and it would be limited in tents/visitor numbers. Platform camping would be permitted only at a maximum of two designated campsites, so any disturbance to vegetation would be limited to a very small area of the Refuge.

**Water Quality:** Improperly disposed human waste at campsites may compromise water quality by introducing pathogens, and affect campsite aesthetics. Human waste, food disposal, and dishwashing may increase aquatic nutrient loads. That may result in limited, localized increases in algal growth, facilitating oxygen depletion, and altering the composition of aquatic vegetation and invertebrate communities. Run-off from eroded campsites can increase turbidity and sedimentation, which may affect fish and invertebrates (Marion 2003, Leung and Marion 2000). Soap from improper dishwashing, trash, and fish-cleaning waste, may all pollute water and have an aesthetic impact. However, camping generally does not affect water quality to the extent of creating a public health concern, even in areas that receive heavy use (Cole, 1981).

**Wildlife:** Camping can alter or destroy wildlife habitat, or displace wildlife from preferred habitat or resources (food, water, nest sites). Camping may also modify or disrupt wildlife behavior. Larger groups are generally more likely to disturb wildlife (Marion 2003). The restrictions on the number of tents and occupants should assist with limiting the level of impacts.

Disturbance related to camping may also affect wildlife health, fitness, reproduction, and mortality rates (Leung and Marion 2000).

Indirect effects may include a change in vertebrate species composition near the campsite. Changes in vertebrate communities at campgrounds (as compared to control sites) have been reported for birds (Blakesley and Reese 1988, Garton et al. 1977, Foin et al. 1977, Knight and Gutzwiller 1995) and small mammals (Clevenger and Workman 1977). In the case of songbirds, changes in species composition were due primarily to a reduction in ground cover vegetation (for nesting, feeding) at campsites and different levels of sensitivity to human disturbance. Rarer species are generally absent from campgrounds. The presence of humans attracts some species, while others avoid it. The availability of food generally differs between campgrounds and undisturbed areas. Natural foods may decrease in availability, while foods supplied by humans may increase. Humans may intentionally supply foods to wildlife, or unintentionally, because of littering, accidental spillage, or improper food storage (Garton et al. 1977). Human foods may be unhealthy for wildlife or promote scavenging behavior, which may increase vulnerability of animals to predation. Rodent populations often increase at campsites, in response to increased availability of human food, and may negatively affect nesting songbirds. Alligators and other scavengers may be attracted to improperly stored food and may damage property or threaten visitor safety (Garton et al. 1977).

The Refuge would provide outreach to the public through the permitting process, to educate campers on how to avoid disturbing wildlife, the importance of not feeding wildlife, and proper food storage. Some disturbance to wildlife and habitat would initially occur with the construction of the sites, platforms, and development of a trail extension. Long-term disturbance would be minimal based on the amount of people permitted and number of campsites allowed in designated areas.

**Visitor Conflicts:** Conflicts may arise between visitors as a result of noise and over-crowding. Conflicts may also develop between small and large groups and different user groups (anglers, hunters, wildlife photographers, etc.). Litter, noise, large group sizes, and crowding may impair the Refuge experience for some visitors. A limited number of camp sites would be located across a large landscape. Therefore, conflicts with other users are not anticipated to be
significant. Public outreach may help reduce potential conflicts by reducing littering and promoting considerate camping. Overall, the impacts associated with this use would be confined to a minute portion of the Refuge, in the immediate vicinity of the campsite. Periodic closures, when warranted, and the stipulations listed below, should ensure that disturbance of wildlife and impacts on Refuge resources are minimal.

**Determination (check one below):**

- Use is Compatible
- Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:**

The Refuge Manager may close campsites to prevent conflict with wildlife species, including threatened and endangered species. The Refuge Manager would limit all access to protect nesting snail kites, colonial nesting birds, resting waterfowl, or for other management purposes, when necessary.

- Camping is only allowed at the designated campsite.
- No wood gathering or vegetation removal would be permitted without a permit.
- Feeding wildlife is not permitted.
- All trash and waste must be carried out and properly disposed off-site.
- Pets are not authorized.
- The sites are available on a first-come basis by permit.
- Only free standing tents (no stakes) are allowed on the platforms.
- The maximum number of tents on a platform allowed is two.
- The maximum length of stay is two nights.
- The maximum number of people occupying a platform campsite is six and levee site is twenty.
- No fires are allowed on the canoe trail platforms.
- Fishing is not permitted on canoe trail platforms.
- Only one motorized boat is permitted at a canoe trail platform at a time.
- A nominal fee would be associated with camping permits.

**Justification:**

Camping provides an increased opportunity for the public to participate in priority public uses in a remote setting. Providing the public with an opportunity to experience the Refuge wildlife and natural resources through camping, along with a public educational outreach program, would help motivate visitors to understand and develop a commitment to protecting healthy ecosystems. Experiencing the Refuge through camping and education are tools that can help build a land ethic and conservation support. The Refuge expects the impacts of camping on vegetation and wildlife to be minor and localized.

Based on the limited detrimental impacts of this use and the stipulations above, overnight camping at limited levels would not materially interfere with or distract from the mission of the Refuge System or the purposes for which the Refuge was established. This Compatibility Determination is based on the best available science and sound professional judgement.
NEPA Compliance for Refuge Use Decision: Place a √ in appropriate space.

___ Categorical Exclusion without Environmental Action Statement
___ Categorical Exclusion and Environmental Action Statement
X Environmental Assessment and Finding of No Significant Impact
___ Environmental Impact Statement and Record of Decision

References:


Marion, J.L. 2003. Camping impact management on the Appalachian National Scenic Trail. Appalachian Trail Conference, Harpers Ferry, WV.


**Mandatory 10-year Re-evaluation Date:**
Use: Non-motorized Watercraft

Description of Use:

(a) **What is the use? Is it a priority public use?** The use is non-motorized watercraft access of the Refuge Interior and perimeter canals. This includes any watercraft transportation device that lacks a motor. Examples include but are not limited to kayaks, canoes, paddleboards, row boats, and pedal boats. The use is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). However, it is supportive of and facilitates the priority public uses of fishing, wildlife observation and photography, and environmental education and interpretation.

(b) **Where would the use be conducted?** Non-motorized watercraft are currently permitted in approximately 37,000 acres of the Refuge Interior and all interior perimeter canals. This new proposed expanded use opens the entire 141,374 acres of the Refuge Interior for non-motorized access.

(c) **When would the use be conducted?** Non-motorized access would be available for use year round, 24 hours a day. The Refuge may temporarily prohibit access for public safety or other management reasons, such as prescribed fire, invasive plant management, research, or to protect nesting birds.

(d) **How would the use be conducted?** Non-motorized watercraft access would be allowed as a means to facilitate Refuge public use programs, predominantly the priority public use programs of hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The use would be conducted consistent with Refuge regulations. Visitors would be permitted to launch non-motorized watercraft from all public access sites. Access to the Refuge via main entrances to the Refuge include Loxahatchee Road, Lee Road, and 20 Mile Bend. Access points to facilitate the use include various locations along the L-40, L-39, and L-7 levees and Strazzulla. Future potential access points include, but are not limited to, ACME-2, South County Park, S-6 pump station, Marjory Stoneman Douglas Preserve, and 100th Street. Access points can be found on the Refuge’s website, map/tearsheet brochure, and other activity specific (i.e. hunt) brochures or regulation publications.

(e) **Why is this use being proposed?** In 2013, the Refuge was designated as one of 14 priority Refuges in the Urban Wildlife Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S.

Fishing, wildlife observation, photography, environmental education, and interpretation are five of the six priority public uses of the Refuge System. Where these uses are determined to be compatible, they are to receive enhanced consideration over other uses. Non-motorized watercraft are proposed as a means to facilitate these priority public uses. By allowing this use, we are providing opportunities and facilitating Refuge
programs in a manner and location that offer high quality, wildlife-dependent recreation and maintain the level of current fish and wildlife values.

**Availability of Resources:**
The resources necessary to provide and administer this use are available within current and anticipated Refuge budgets.

(a). Resources involved in the administration and management of the use: The expanded access would place an additional burden on existing law enforcement staff to rescue lost users and respond to emergencies. Currently the Refuge responds to approximately 12 emergencies per year, this number is estimated to increase by 100%. On average, staff time will increase 144 hours per year per involved staff member, Due to the remote and difficult to access nature of much of the Refuge, rescue operations can be delayed. The Refuge may not have good cellular service coverage, which could limit the ability of users to notify rescue personnel (i.e. Law Enforcement) of their location. The Refuge is only accessible by airboat and helicopter which makes rescue operations more of a challenge. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.

(b). Special equipment, facilities, or improvements necessary to support the use: No additional resources are needed to facilitate non-motorized watercraft access. The estimated costs of allowing this use is minimal because there is no additional infrastructure involved and administration of this use is done collectively in conjunction with other uses. The costs associated with signage, law enforcement, and staff presence is common to all these uses. Less than 1% of staff time will be required to support this use.

(c). Maintenance costs: Maintenance associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include: mowing, trail/levee maintenance, signage, parking areas, structure maintenance (boat ramps), and trash removal. Staff and volunteers spend around 40 hours a week performing this maintenance in support of multiple refuge objectives and uses.

(d). Monitoring costs: Existing staff monitors effects of current operations during the normal course of their duties, such as general habitat monitoring, wildlife surveys, compliance checks, and periodic inspections by staff.

(e). Offsetting revenue: The Refuge does not anticipate charging fees above the standard entrance fee for non-motorized watercraft usage, but reserves the right to do so in the future if the need arises. Entrance fees would be used to offset cost of regulation enforcement and monitoring biological impacts. The Refuge hosts an estimated 40,000 non-motorized watercraft visits annually.

**Anticipated Impacts of the Use:**
Non-motorized access at current levels, in accordance with established Federal regulations, has not resulted in significant long-term adverse impacts to natural resources. Frequency of this activity may rise in the next several years as visitation of the Refuge increases and the number of local residents’ increases. If information indicates impacts are increasing, this use may be reevaluated for compatibility. Impacts to natural resources from this activity at present levels are minimal.
Disturbance of Wildlife and Habitat:
Though motorized boats generally have a greater impact on wildlife, even non-motorized boat use can alter distribution, reduce use of particular habitats by waterfowl and other birds, alter feeding behavior and nutritional status and cause premature departure from areas (Knight and Cole 1995). However, compared to motorboats, canoes and kayaks appear to cause fewer disturbances to most wildlife species (DeLong 2002).

Popular public use seasons coincide in part with spring-early summer nesting and brood-rearing periods for many species of migratory birds. Boaters may disturb nesting birds by approaching too closely to nests, causing nesting birds to flush. Flushing may expose eggs to predation or cooling, resulting in egg mortality. Both adult and flightless young birds may be injured or killed if run over by speeding boats. Some disturbance of roosting and feeding shorebirds probably occurs (Burger 1981) but this would be minimized if closed areas are respected. The Refuge would close areas to boating, as needed, around sensitive nest sites and continue public outreach efforts.

Non-motorized watercraft may contribute to the spread of nonnative species. Some of these species can out-compete native flora and fauna, rapidly spread and displace native plant communities and wildlife, including threatened and endangered species. Their rapid growth and copious seed production permit the establishment of dense, impenetrable forests and thickets that shade out desirable native plant species, affect water flow and drainage, obstruct human and wildlife movement and public viewing opportunities. Research shows a large portion of the canoeing community use equipment in multiple locations within short time spans, without cleaning in between sites (Anderson et al 2014). Therefore, non-motorized watercraft usage may act as a vector leading to the spread of invasive species. Invasive species impacts kiosks are located at all public access boat launching sites to educate the public regarding this impact and how to prevent the spread of these destructive pests. The “Stop Aquatic Hitchhikers!” campaign list the below actions to prevent moving aquatic organisms from place to place (U.S. Fish and Wildlife Service, Stop Aquatic Hitchhikers!):

- “Remove any visible mud, plants, fish or animals before transporting equipment.
- Eliminate water from equipment before transporting.
- Clean and dry anything that comes into contact with water (boats, trailers, equipment, clothing, dogs, etc.)
- Never release plants, fish or animals into a body of water unless they came out of that body of water.”

The “Stop Aquatic Hitchhikers!” campaign specifically addresses non-motorized watercraft including kayaks and canoes, and methods to prevent the spread of non-native species (How You Can Help):

- “Clean off visible aquatic plants, animals, and mud from watercraft, gear, paddles, floats, ropes, anchors, dip nets, and trailer before leaving water access. Scrub hull using a stiff brush. Rinse watercraft, trailer and equipment with high pressure hot water, when possible.
- Drain water from watercraft, sponges, bailers, and water containing devices before leaving water access.
• Dry everything five days or more, unless otherwise required by local or state laws, when moving between waters to kill small species not easily seen OR wipe with a towel before reuse."

Access is typically conducted by individuals or small groups. Based on biological data, conservation management plans, unreasonable harassment of wildlife, or destruction of the habitat, the manager may restrict the use or close some areas from this and other public uses, if it is determined that they could have negative impacts on the resources and/or on bird nesting activities.

Impacts on other Refuge Users:
In addition to impacts on wildlife and habitat, there are potential conflicts between the various watercraft user groups that occur on the Refuge. Motorized boating has already been established as compatible on the Refuge. Most of the non-motorized watercraft area would be closed to motorized boats. Motorboats must be courteous to other visitors in the canal and Refuge Interior, and must proceed at “slow speed and minimum wake” when encountering any non-motorized watercraft. The wakes created by motorized boaters traveling alongside non-motorized boaters at a high speed may represent a significant safety risk to non-motorized boaters (American Canoe Association 2004). Wakes generated by high speed motorized boaters in narrow channels and backwaters cannot readily dissipate. These wakes could cause water to fill or capsize non-motorized boats. Motorboat operators shall be in compliance with all applicable Refuge, U.S. Coast Guard, and State of Florida laws.

Another possible impact is litter from users which affects water quality and attracts predators to bird nesting areas. Litter also impacts the visual experience of visitors (Marion and Lime 1986). Several enforcement issues may result from the use, including trampling of vegetation following trespass into closed areas, illegal taking of fish, illegal fires, and disorderly conduct. To mitigate these potential issues, motorized/non-motorized watercraft users are not permitted access to any of the Refuge Interior tree islands.

Determination (check one below):

Use is Compatible

√ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
The Refuge Manager may limit or close access to prevent conflict with wildlife species, including threatened and endangered species. Additionally, the Refuge Manager would limit access to protect nesting snail kites, colonial nesting birds, resting waterfowl, or for other management purposes, whenever deemed necessary.

• A special use permit with stipulations is required for organized groups with more than ten watercraft. Refuge staff would monitor non-motorized transportation activities, and findings from these monitoring efforts would be used to determine what additional management actions, if any, are needed to ensure these activities remain compatible with Refuge purposes and in compliance with federal regulations. All non-motorized watercraft would be required to have an orange flag displayed; mounted on the vessel and reaching at least 10 feet from the marsh surface and is at least 10 x 12 inches per State regulation to ensure other users can see them from a safe distance.

• All state, federal, and Coast Guard boating regulations must be obeyed.
• Visitors are not permitted access to Refuge Interior tree islands.

• Refuge staff would monitor non-motorized transportation activities, and findings from these monitoring efforts would be used to determine what additional management actions, if any, are needed to ensure these activities remain compatible with Refuge purposes and in compliance with federal regulations.

Justification:
This use has been determined compatible because allowing the general public to use non-motorized watercraft for fishing, wildlife observation and photography, and environmental education and interpretation would not interfere with the Service’s work to protect and conserve natural resources. The level of use for these activities is moderate on the Refuge where it is currently permitted. The associated disturbance to wildlife is temporary and minor. Access for fishing, wildlife observation and photography, and environmental education and interpretation, which are priority uses, allows visitors to enjoy the outdoors and wild lands. Non-motorized watercraft access at the Refuge would not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established. Offering a variety of public use opportunities on the Refuge would increase public awareness about conservation and the Refuge System, thus supporting the Service’s overall mission and the Refuge purpose. This Compatibility Determination is based on best available science and sound professional judgement.

NEPA Compliance for Refuge Use Decision: Place a √ in appropriate space.
- Categorical Exclusion without Environmental Action Statement
- Categorical Exclusion and Environmental Action Statement
- X Environmental Assessment and Finding of No Significant Impact
- Environmental Impact Statement and Record of Decision

References:


“How You Can Help.” Stop Aquatic Hitchhikers!, stopaquatic hitchhikers.org/prevention/.


U.S. Fish and Wildlife Service. Stop Aquatic Hitchhikers!

Mandatory 10-year Re-evaluation Date:
Use: Motorized Watercraft

Description of Use:

(a) *What is the use? Is it a priority public use?* Motorized recreational boating currently occurs on the Refuge in support of wildlife dependent recreation. Motorized boating includes electric trolling motors and water-cooled engines. Airboats and the use of “mud motors” have been prohibited in the past and are currently being further analyzed and considered. “Mud motors” have been determined to be not appropriate and will not be further analyzed in this compatibility determination. The use of airboats has been a historic (Johnston 1984) and cultural use on the Refuge and linked to the “Gladesman” tradition of the Everglades. Airboat use traditionally occurred on the Refuge prior to establishment of the refuge and continued until 1990. In 1988, 20 permits were issued for operation of airboats. The use of electric motors and water-cooled engines has been continual; however, it is restricted to portions of the Refuge. A recent evaluation has determined the use of motorized watercraft on the Refuge is appropriate and will be further analyzed in this compatibility determination.

Recreational boating is not one of the wildlife-dependent priority uses defined by the National Wildlife Refuge System Improvement Act of 1997, however, boating activities often supports wildlife-dependent recreational uses. In particular, hunting, fishing, wildlife observation, environmental education, interpretation, and wildlife photography opportunities are increased with the use of motorized watercraft by providing increased access and opportunities.

(b) *Where would the use be conducted?* The Refuge is comprised of over 145,188 total acres that encompasses the last remaining remnants of both the northern Everglades ridge and slough ecosystem, and the cypress swamp strand that historically extended from Lake Okeechobee to the current Ft. Lauderdale area. The Refuge is completely enclosed by a system of levees (unimproved road) and canals that extend over 58 miles. The majority of the Refuge, 141,374 acres known as “the Refuge Interior,” is managed under a license agreement with the state of Florida. The Refuge provides important roosting, foraging, and nesting habitats for many migratory birds and supports many other species of mammals, reptiles, and amphibians that are commonly found in freshwater wetlands. Threatened or endangered species that regularly utilize the Refuge include the Everglades snail kite and wood stork. The use of motorized watercraft will be restricted to support wildlife dependent uses, research, and Refuge management activities such as treatment of exotics, debris removal, search and rescue operations, and water quality investigations. Habitat types will include open water or emergent marsh communities within designated areas, seasons, and times to protect wildlife and habitats. The majority of use will be limited to approximately 33,000 acres within the southern portion of the Refuge and the perimeter canal. The use of airboats outside hunting season will be further restricted to within approximately 13,900 acres of the Refuge and on Refuge designated trails for interpretive and educational purposes.

(c) *When would the use be conducted?* This use would take place during normal operating hours of the Refuge when conditions (water levels, wildlife activity, etc.) are such that impacts to habitats and wildlife are minimized, as well as during designated periods for specific activities such as waterfowl, deer, or alligator hunting. The use of
non-hunting airboating will only be permitted on weekends (Friday, Saturday, and Sunday) from July-November except during waterfowl hunting dates.

(d) **How would the use be conducted?** Refuge specific permits will be issued for airboats utilizing the Refuge. Permits will be issued to applicants selected using a lottery system. Permits will specify allowed uses and designated areas. Zero to 20 General permits will be issued, up to 20 permits will be issued specifically to facilitate waterfowl hunting, up to 20 permits will be issued in support of deer hunting, and up to 20 permits will also be issued to support alligator hunting that is a compatible use. Additional permits will be issued for the support of interpretive airboat tours conducted through the concessionaire. No permits will be issued for the use of other authorized types of motorized watercraft

(e) **Why is this use being proposed?** On September 15, 2017, the Secretary of the Interior signed Secretarial Order 3356 with specific directives to in order “to support and expand hunting and fishing, enhance conservation stewardship, improve wildlife management, and increase outdoor recreation opportunities for all Americans” (USFWS 2017). Additionally, the 2018 License Agreement with the SFWMD (under which the vast majority of the Refuge is managed) stipulates for the Service to consider increasing wildlife-dependent public use opportunities within the 141,374 acres of License Lands. New uses (such as the use of airboats) and expansion of existing uses (use of water-cooled and electric motor boats) are currently being evaluated that may foster positive stakeholder/Refuge relations. As part of that effort and in light of strong interest from stakeholders, the use of airboats and expansion of water-cooled and electric trolling motorized watercraft is being re-evaluated at the Refuge. This use of airboats was previously deemed incompatible when evaluated as part of the development of the Refuge Comprehensive Conservation Plan (CCP) in 2000. Over the past 3 years, opportunities to work cooperatively with interested stakeholders has developed partnerships to support Refuge management activities and develop appreciation and understanding of the historic use of airboats on the Refuge. Additionally, these opportunities have enabled greater appreciation and understanding of possible impacts of airboat use on the Refuge, means to reduce impacts, and need for sound stewardship.

The Service provides the public with opportunities to participate in compatible wildlife-dependent recreation to appreciate the value of and need for wildlife and plant conservation. The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape. Motorized boating activities in support of wildlife dependent recreation can promote a greater understanding and appreciation for the Refuge habitats, wildlife, and the Greater Everglades ecosystem. The experience can motivate and inspire future stewards and advocates of the environment and particularly the Everglades.

**Availability of Resources:**
The Refuge currently has two full-time Federal Law Enforcement Officers, three staff in Visitor Services Program and three staff in Biological Program. Significant changes in staffing levels may reduce resources to an inadequate level to support this use. Administration would primarily involve issuing permits, enforcement of regulations, and habitat monitoring. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.
**Offsetting revenue:** An application fee would be charged in accordance with other state and federal fees for similarly permitted activities. Fees would be used to offset cost of regulation enforcement and monitoring biological impacts.

**Anticipated Impacts of the Use:** Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses deemed compatible. The following is a summary of potential motorized watercraft impacts that have been identified by south Florida biologists from the National Audubon Society, South Florida Water Management District, Big Cypress National Preserve, Everglades National Park, U.S. Fish and Wildlife Service, Florida Fish and Wildlife Conservation Commission, and other scientists.

Potential impacts of motorized watercraft include disturbance via noise, physical collision, disturbance to soils and vegetation communities, changes in water quality and hydrology, and spread of invasive species. In addition to the effect of these on wildlife, motorized watercraft can impact visitors who desire solitude as a result of noise disturbance and visual impact on the landscape. Some mitigation of impacts is possible through effective regulation and management using a multi-use approach.

Regular off-road vehicle operation through sawgrass and wet prairie habitats creates trails, which are open areas where native vegetation is more sparse than surrounding areas due to physical disturbance and soil erosion (Pernas 1995; Duever et al. 1981; Duever et al. 1986). Continually used airboat trails with vegetative damage are unlikely to recover as long as they remain in use (Duever et al. 1986). Impacts are directly influenced by water levels at the time of operation. Off-road vehicle impact research conducted on Big Cypress National Preserve was unable to create heavy impacts in peat marshes from airboats due to the lack of impacting ability of the airboat (Duever et al. 1981 and Duever et al. 1986). Duever et al. 1981 stated that only the airboat treatments exhibited essentially no change in plant taxonomic composition during impact study, and water level was the single most important environmental factor influencing severity of vehicle impacts. These findings were supported by Duever et al. 1986 which stated during normal operations airboats are not in contact with the ground, and frequently are in water deep enough so that the vegetation is merely bent over and shortly thereafter pops back up again. Duever et al. 1986 results indicated that they were unable to produce any lasting impacts in marl marsh by airboats, nor could heavy impacts in marl or peat marsh be achieved, and researchers were never able to produce severe soil disturbance with an airboat. According to Duever et al. 1986, a total of 30% of the documented impacts in peat marsh for medium impact tests were visible for over a year and recovered 100% by year 7. These results were supported by Pernas 1995 which reported that vegetation normally recovered from airboat impacts in less than one year, and that the seasonal use of the airboat during high water periods allowed the vegetation to recover during low water periods and thus cumulative impacts were avoided. If the medium and heavy intensity use repeatedly occurred at lower water levels, recovery results would be expected to not be similar to researcher findings.

Douglas-Mankin and Surratt 2018 indicated water flows have less resistance in locations were dense vegetation between the canal and interior marsh has been removed. This accelerated flow can alter flow dynamics and hydroperiods including increased water depth recession rates, shortened hydroperiods, and impeded sheetflow.

Motor-boat operation increases soil and organic particulate suspension. A turbidity study revealed higher turbidity during periods of airboat traffic, especially in association with low water
levels (Weeks 1989). The resultant turbidity reduces the potential growth of vegetation and periphyton and may cause fish and aquatic plant mortality (DOI 1999). As trails are created into the marsh interior via motorboat use, water quality in the Refuge marsh could likely deteriorate due to canal water intrusion and resuspension of phosphorus into the water column from disturbed soil. Cattail growth could likely proliferate in these areas as seen near existing trails in the Refuge. Trice et al. (2008), found a strong correlation between airboat trails >10 meters wide and total area of cattail. Additionally, Trice et al. (2008) reported a strong correlation between Class 2 (3 meters to 9.9 meters in width) and Class 3 (<3 meters in width) airboat trails due to the tendency for operators to explore new terrain creating additional Class 3 trails.

Motorboat use can also increase incidental impacts such as trash, as well as pollutants such as leaked fuel and oil, which could further compromise water quality.

**Wildlife**: Motorboats have the potential to impact fauna by creating a means of fish dispersal, destroying apple snail eggs, colliding with and striking birds, alligators and other animals, displacing nesting or foraging birds, and creating stress related to noise and the presence of a large rapidly moving vehicle. Thousands of wading birds, many of which are in decline throughout the system (SFWMD 2018), nest in the Refuge and could be impacted by increased motorboat activity during sensitive activities such as foraging and nesting. Disturbance has negative effects on the energy and nutrient budgets of wildlife and the disturbance contributes to the potential decline of an individual (Bromley 1985). Adverse effects of environmental disruptions including flight, avoidance, or interference with movement uses up energy that could be used for reproduction and growth. More sensitive species may find it difficult to secure adequate food or loafing sites as their preferred habitat becomes fragmented and recreation-related disturbances increase (Skagen et al. 1991; Pfister et al. 1992). During periods of high water, airboat activity can impose additional stress on wildlife by allowing additional access to areas normally inaccessible. Additionally, it is expected that extended high water periods are stressful for terrestrial wildlife, such as white-tailed deer and other mammals, due to increasing population densities on the reduced amount of dry ground available as a result of water levels, as well as restricted movement between islands. These conditions could eventually lead to stress, malnutrition, increases in disease, and other factors (Jansen 1996 and Jones et al. 1996). Other areas that allow public airboating in the Everglades (e.g. Water Conservation Areas 2 and 3, Rotenberger Management Area) typically are closed to airboating when water levels are high.

Research on the effects of human disturbance has shown a 14-foot airboat (operating at 95-105 dB) approaching colonial waterbirds will cause behavior disruption at a greater distance than an approach on foot, canoe, or by a 14-foot johnboat (operating at 80-85 dB) (Rodgers and Schwikert 2002). Duever et al. (1981) reported airboats were the loudest tested off-road vehicle and reported airboats can generate noise in excess of 120 dB when accelerating, 86dB to 92dB while cruising three meters from a sound meter, and 63 dB to 75dB while cruising 100 meters from a sound meter. In comparison, noise generated by airboats would be above acceptable noise levels for cars and motorcycles but probably be within the limit allowed for large trucks on a roadway (Florida Vehicle Noise Prevention and Control Act of 1974, Section 316.293).

Rodgers and Schwikert 2003 detected considerable variation in flush distances among individuals within the same species and significant differences among species in response to an airboat. Average flush distances among all species ranged from 49 m for the Snail Kite (*Rostrhamus sociabilis*) to 172 m for the Bald Eagle (*Haliaeetus leucocephalus*). Average flush distances among herons ranged from 65 m for the Tricolored Heron (*Egretta tricolor*) to 113 m
for the Great Egret (*Ardea alba*). Larger species generally exhibited greater average flush
distances. A comparison of the flush distances elicited by a fast moving outboard-powered boat
and an airboat indicated that all nine researched species exhibited significantly greater flush
distances to the approach of an airboat. This research recommended species-specific no-entry
buffer distance ranges from 130 m to over 300 m to avoid disturbing nesting, roosting, and
foraging waterbirds such as snail kites and bald eagles (Rodgers and Schwikert 2003).

If animals are not able to adjust to the additional energy, outlay caused by disturbance:
survival, reproduction, and growth may be negatively affected (DOI 1992). Some studies have
found that some wildlife can adapt to environmental disruptions and learn to limit their energy
expenditure in relation to human recreational activity. Harassing activity, which cause alarm and
the expenditure of avoidance energy include: 1) unfamiliar or unpredictable behavior, 2) quick
movements, sudden noises, loud noises and 3) close and direct approach. It was found that if
the harassing activity was constant, the animal would become adapted to it and learn to adjust
to the threat or permanently leave the area for other habitat. However, the animal may end up in
less quality habitat than what it gave up and potentially suffer less reproductive success or a
lower survival rate. An occasional disturbance caused by motorboats could constitute a
harassing activity and would elicit an alarm response from most wildlife. Avoidance behavior
involves moving to another location or defiance activities. This energy expenditure could be
detrimental to wildlife over time (DOI 1992).

**Epiphytes and Periphyton:** Leaf loss and epiphytic plant displacement can occur from airboat
propeller wind. There are a number of listed epiphytes growing in the Refuge. The loss of leaves
on tree islands can cause the remaining epiphytes to be exposed to greater amounts of light
than is optimal (DOI 1999). Periphyton is the critical base of the Everglades food web and can
be damaged by airboats through disruption and displacement of algal mats, especially in wet
prairies (Duever et al. 1981 and 1986). A rich diversity of desmids (green algae associated with
low nutrient freshwater) not found elsewhere in the Everglades have been identified at the
Refuge (USGS, unpublished data) and could be impacted by physical disturbance of periphyton
assemblages, as well as the addition of nutrients, that could result from motorboat activity.

**Exotics:** Motorboats and boat trailers are a known vector for transporting exotic plants into
different waterways (Halloran et. al. 2013; Hutchinson and Langeland 2006). Motorboat use
near invasive exotics like melaleuca and Old World climbing fern could contribute to the spread
of seeds or spores. These plants’ microscopic seeds and spores are easily blown and or
transported to new germination sites (tree islands, floating peat islands). During periods of low
water in the Refuge, peat mats in wet prairies and in well-traveled airboat trails tend to break
free from the underlying substrate and float to the surface and become potential fertile
seedbeds for exotic plants. Limiting the areas of exposed peat reduces the potential for exotic
plant establishment.

Some invasive exotics, such as azolla, water lettuce, and hyacinth are primarily limited to canals
and deeper trails near the perimeter of the Refuge. Cuts through dense vegetation and trails
created by airboats can act as conduits for exchange of these species between the marsh
interior and canals. Many invasive animals, such as Cuban tree frogs and curly tailed lizards,
are not currently known to be present in the interior portion of the Refuge. Increased airboat
activity and the introduction of additional motorboats that are used in multiple natural areas,
increase the likelihood of transferring invasive exotic plants or animals deeper into the marsh
interior of the Refuge through direct transfer of ‘stowaways’ or indirectly by creating trails that
facilitate the spread of aggressive species. Additional spread of invasive species into the marsh interior will result in both ecological impacts and financial costs for management efforts.

**Methods to Reduce Impacts of Use:**

Noise Disturbance: A 2011 study conducted by the National Park Service in Everglades and Dry Tortugas National Parks determined that motorized watercraft (all types) average and typical maximum levels are at higher than thresholds for disrupting interpretive activities with airboat use having the loudest noise sources (NPS 2011). The study recommended that restricting the use, creating motorboat no-wake zones or requiring airboat speed limits can produce large decreases in the noise levels and can be applied to sensitive areas to minimize impacts (NPS 2011). Additionally, regulation passed in 2011 requires that all airboats must have an automotive-style factory muffler per Florida Statute 327.391 (less than or equal to 90 decibels (dBs) at a distance of 50 feet). An inspection and certification process will be required of all permitted airboats on the refuge to ensure compliance with regulation. Additionally, all motorboat operations will be restricted from sensitive areas of the Refuge.

A low nutrient system such as the northern Everglades will not provide as productive foraging opportunities or as large prey as estuarine habitats, mangroves, coastal shores, or high nutrient fresh water marshes. The disturbance factor associated with unlimited use of motorboats should be weighed more heavily in the Refuge, as the disturbance to wildlife may carry a higher energetic cost than in more productive areas. Operators are encouraged through best management practices to avoid disturbance to deer, alligators and other sensitive wildlife. Rodgers and Schwikert (2003) recommended species-specific no-entry buffer distance ranges from 130 m to over 300 m to avoid disturbing nesting, roosting, and foraging waterbirds such as snail kites and bald eagles. Carney and Sydeman (1999) includes at least 50 m buffers from nesting colonial waterbirds. Additionally, a buffer of 500 m from nesting snail kites and an inner protective zone of 130 m during the breeding season (January through May) and roosting areas is recommended by the Vero Beach Ecological Services Conservation Measures for Everglade Snail Kite 2018. A voluntary avoidance program by the public may be adequate to curtail some instances of boat disturbance to waterbirds (Kenow et al. 2003). Rodgers and Schwikert (2003) recommended that conservation personnel monitor changes in species composition at regulated sites to adjust buffer distances to reflect the presence of new, more sensitive species with larger flush distances and requiring large buffer distances. Implementation of a buffer zone should include periodic evaluation of the effectiveness of the buffer zones and corrective measures based on a comparison of the numbers and distribution of birds before and after its implementation (Rodgers and Schwikert 2003). Best management practices on the Refuge will include buffers and monitoring to reduce wildlife disturbance. Additionally, the use of motorboats and specifically airboats at times will be further limited in seasonality, location, and number.

Vegetation and Soil: The degree of impact is strongly driven by water levels (Pernas 1995). The resiliency of the system to fully recover from impacts created by the use of airboats is expected as long as their use is limited to high water periods. Although wet prairie areas may not have the visible impact of sawgrass areas, they are the most susceptible to impacts with repeated use at lower water levels. Special conditions requirements will be developed based on water levels that minimize as many impacts as possible to vegetation and soils. Pernas et al 1995 found that higher water depths eliminated or significantly reduced any impact caused by airboats during the research period. Permit holders of airboats will be required to adhere to restrictions based on water level stages and locations on the Refuge. A monitoring system will be implemented on the Refuge to ensure the impact results of Pernas 1995, Duever et al. 1981, and Duever et al.
1986 are sustained locally as well. If soil and vegetation conditions are not responding in similar fashion to expectations, the use of motorized watercraft may be further restricted or removed entirely from the Refuge.

The Refuge has a lot of variation in the elevation of the variety of habitats found in the interior marsh. Although water levels may seem generally high enough to prevent habitat impacts, there will be other areas where water levels and vegetation may not be protected. For this reason, the use of best management practices and robust monitoring program will be implemented. For example, a typical best management practice includes operating motorized watercraft (including airboats) in a manner that avoids sawgrass areas and focuses operations in emergent sloughs dominated by spike rush, lily pads, and bladderwort/periphyton.

Openings “Cuts” Into the Interior: Due to the loss of resistance in locations were dense vegetation between the canal and interior marsh has been removed (Douglas-Mankin and Surratt 2018) and the potential to spread exotics from existing canals into the interior portion of the Refuge, best management practices ensure all motorized (and non-motorized) watercraft operators are aware of the impacts and refrain from “cutting” new trails or operating on trails during low water conditions.

Motorboat operators should be encouraged to practice good “invasive species hygiene” to reduce the spread of Lygodium spores and other exotics (Hutchinson and Langeland 2006). Practices include: prior to leaving known invasive species infested areas: all equipment, boats, trailers and vehicles should be sprayed down by high-pressure sprayer using water or compressed air with specific focus on all openings cracks, crevices, treads, underside of trailers, vehicles and boats; cleaning should occur along the edge of infestation area to avoid spreading invasive species seeds/spores to new areas; all clothing and accessories should be brushed off and washed daily and disposable suits should be removed prior to leaving infested sites and placed in plastic bag (Hutchinson and Langeland 2006).

When designating areas open to motorized watercraft, close attention is given to modeling after areas within Big Cypress National Preserve and Everglades National Park that have recently developed and implemented new airboat regulations. The regulations restrict open access for airboats and limits the number of commercial airboat tours on established trails.

**Determination (check one below):**

- [ ] Use is Compatible
- [X] Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Limiting motorboat operation to specific areas and limiting the number of airboats and operations to times when wading birds are not nesting will generally coincide with higher water levels that will be protective of habitats. Additionally, monitoring of habitat conditions and wildlife response will document impacts from airboats and other motorized watercraft. Best management practices on the Refuge will include wildlife buffers, restricting operations to higher water level conditions, prohibiting the establishment of new trails/routes of travel through heavily vegetated areas, requirement of mufflers on all airboats, restricting the number, location and duration of the use of airboats, exercising good invasive species hygiene, and the monitoring of wildlife response and habitat conditions. If conditions indicate significant resource impacts, the use of motorized watercraft may be further restricted or removed entirely from the Refuge.
Each airboat permittee must comply with Special Conditions attached to their Special Use Permit (SUP) to ensure compatibility. At minimum, the following Special Conditions will be included.

- Permittees must be 18 years of age and provide proof of general liability insurance coverage with the Refuge named as co-insured prior to the issuance of the SUP.
- Permittee or designated representative will be required to sign and date a waiver and release of liability form.
- Permits are non-transferable and apply to the designated boat and can be operated by any operators listed on the SUP.
- Permittees will attend an airboat orientation workshop prior to receiving their SUP.
- Permittees will adhere with all ecological considerations such as traveling in open water and avoiding sawgrass and areas with low water depths, and avoiding the disturbance of wildlife.
- All airboats, while operating within the boundaries of the Refuge, must utilize a Global Positioning System (GPS) unit or GPS Tracker, and maintain an active track of all of the movements of the airboat. Upon the request of a Federal or state law enforcement officer, the captain of the vessel will produce the GPS Device for an inspection of the track and route of the airboat. By signing this permit, the permit holder agrees to the above conditions for any and all captains operating the airboat, and constitutes irrevocable consent to the search of the GPS Device by Federal and state law enforcement officers. By signing this permit the permit holder is agreeing to forfeit their permit in the event the Captain(s) fail to comply with the conditions of this permit, in addition to any criminal or civil liabilities.
- All airboats issued permits must meet the following conditions:
  a. Hull Length 16’ max excluding grass rake
  b. Width 8’ max
  c. Must have an automotive-style factory muffler per Florida Statute 327.391 passed in 2011 requires less than or equal to 90 decibels (dBs) at a distance of 50 feet.
- Access may be restricted or suspended at Refuge Management’s discretion for any reason deemed necessary, such as nesting wildlife, water levels, research, wildfire suppression, prescribe fire management, or invasive species treatments.
- All Refuge regulations will be adhered to by the permittee(s) and participants including but not limited to prohibition of harassing wildlife, leaving trash and debris, and damaging vegetation by creating new trails/routes of travel.
- A copy of the permit will be carried by the permittee(s) or designated representative during each visit and presented upon request to any Refuge official.
- Entry will be authorized only during normal operating hours and into designated areas unless specific authorization has been granted by the Refuge Manager.
- The use of non-hunting airboating will only be permitted on weekends (Friday, Saturday, and Sunday) from July-November except during waterfowl hunting dates.

**Justification:** Motorboat use supports all of the National Wildlife Refuge System’s wildlife-dependent priority uses identified by the Improvement Act (1997) as appropriate and compatible. This proposed activity meets multiple objectives and strategies stated in the Refuge’s CCP, particularly to “Develop and implement appropriate and compatible wildlife-dependent environmental education and interpretation programs and recreation opportunities that lead to enjoyable experiences and greater understanding of the Everglades and south Florida ecosystems” and to “Provide opportunities to connect urban audiences with nature.”
While operating motorboats on the Refuge, visitors participate in wildlife-dependent recreational opportunities exposing them to habitats of the Greater Everglades ecosystem and contribute to a greater understanding and appreciation of natural resources. This Compatibility Determination is based on best available science and best professional judgement.

**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.
- [ ] Categorical Exclusion without Environmental Action Statement
- [ ] Categorical Exclusion and Environmental Action Statement
- [ √ ] Environmental Assessment and Finding of No Significant Impact
- [ ] Environmental Impact Statement and Record of Decision

**References:**


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Mandatory 10 Year Re-evaluation Date:
Use: Concessionaire Operation

Description of Use:

(a) **What is the use? Is it a priority public use?** This use is a fee-based concessionaire service and visitor contact station providing recreational, educational, or interpretive enjoyment of Refuge lands and waters to the visiting public such as transportation, interpretation, educational materials, equipment rental/sales, and guided boat tour programs. The services must aim to enhance the visitor’s knowledge and enjoyment of the key natural resources and mission of the Refuge and the USFWS, or other uses otherwise determined appropriate and compatible with the purposes for Refuge establishment, including wildlife observation or photography, natural history or cultural history tours, transport of individuals or groups (most commonly by pontoon or airboat) to or from Refuge lands for recreational fishing, wildlife observation or photography, nature study or interpretation, and other wildlife-oriented activities.

Concessionaire services are not priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. § 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). While not a priority use, this use does support several wildlife-dependent priority uses including fishing, wildlife observation and photography, environmental education, and interpretation.

(b) **Where would the use be conducted?** The concessionaire service and visitor contact station would be located on the south end of the Refuge at the Hillsboro Parking/Boat Ramp. Access to the site is by vehicle via S.R. 827 (Loxahatchee Road). During 2017, the Refuge recorded approximately 405,342 visitors to the Refuge. Of this total, Hillsboro accommodated approximately 136,000 visitors. Originating from this location, visitors using the services of the concessionaire would have access to multiple public use activities similar to those not using the concessionaire, in accordance with the established Refuge's public uses and regulations (i.e. fishing, wildlife observation and photography, hiking/biking, etc.).

In addition to the main concessionaire headquartered at Hillsboro, the operation would be allowed to develop small satellite operations at three other Refuge public access sites located at the Lee Road Boat Ramp, ACME Pump Station, and the 20 Mile Bend Boat Ramp. These satellite stations would have similar concessionaire amenities available, relevant to the need of each individual location, but on a smaller scale.

(c) **When would the use be conducted?** The use would take place year-round, subject to the Refuge-specific regulations or laws governing the individual public use. Commercial boat guiding tours would only occur during daylight hours (one-half hour before sunrise until one-half hour after sunset). The Refuge must approve any requests for guiding outside of these hours. If approved, the hours permitted would be included in a Special Use Permit (SUP).

(d) **How would the use be conducted?** The proposed operation supports a framework for guided tours and a concession where boats (canoes, kayaks, motorized johnboats), bicycles, food and refreshments, outdoor gear, and fishing equipment rentals/sales would be offered. To facilitate this operation, the Refuge would construct a small building...
that can support space for the concessionaire, interpretative exhibits, a Refuge office, partner office space, Refuge cooperating association, volunteers, and bathrooms.

By limiting the number of rentals, potential impacts to wildlife in this area should be minimal. To assist in everyone's safety, designated water speed areas would be assigned for motorboats. Boats traveling within 1 mile on either side of the headquarters boat ramp or the ACME 1 and 2 stations and north to the “first bend going north from Hillsboro,” would show courtesy to others and operate at “slow speed, minimum wake.” In any other area, boaters would be in compliance with all applicable Refuge, U.S. Coast Guard, and State of Florida laws. The Refuge Interior public use area (including the waterfowl and alligator hunt zone) is currently accessible by all visiting public, including canoeists, kayakers, poleboaters, and anglers during all months of the year.

Special Use Permits or other agreements will document details such as:

Hunting and fishing guides: The concessionaire may be approved to provide guided fishing along the Refuge perimeter canals or into the interior public use area by motorboat. Because of the harmful effects of mercury-laden fish in the Refuge, fishing by catch and release would be encouraged. Guided hunting would also be evaluated.

Interpretive Pontoon Shuttle: An interpretive boat tour from Hillsboro to the Headquarters Area, and Headquarters Area to Strazzulla would be established. Each boat would have an interpretive guide to assist visitors in seeing and hearing wildlife, interpret the surroundings, and educate passengers about the issues associated with the Everglades. A slow, quiet pontoon type boat would be used.

Interpretive Airboat Tours: An interpretive airboat tour on a designated trail from Hillsboro to the non-hunting airboat zone would be established to provide visitors access to portions of the Refuge Interior where outboard motorboats have difficulty traversing. The tour would be accompanied with an interpretive guide to assist visitors in seeing and hearing wildlife, interpret the surroundings, and educate passengers about the issues associated with the Everglades.

(e) Why is this use being proposed? In 2013, the Refuge was designated as one of 14 priority Refuges in the Urban Wildlife Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S.. The goal of the Program is to develop a strong outreach program that engages South Florida’s diverse youth, on their terms and through their languages, which is essential in advancing this discussion nationally and creating a prototype for future youth-in-conservation planning.

We propose the concessionaire operation to facilitate and enhance the experience of visitors while participating in wildlife-dependent priority public uses because many visitors may not have the knowledge, skills, confidence, or equipment to explore the Refuge and engage in these activities on their own. Commercial guides would help provide a safe and high-quality priority public use experience, and facilitate observation and appreciation by participants and observers of the Refuge’s wildlife and habitats. Because it would generate a minimal amount of economic activity, this use is also likely
to be supported by the local communities, and as such generate support for the Refuge. Because commercial guiding is considered an economic use, per Federal law (see 16 USC 715s) and Service regulations (50 CFR 29.1), we may only allow economic uses of a Refuge natural resource where the use contributes to achieving Refuge purposes or the Refuge System mission.

Availability of Resources:
The Refuge has minimally sufficient resources for managing the expected volume for these uses at current staffing levels. Significant changes in staffing levels may reduce resources to an inadequate level to support this use. Administration would primarily involve issuing contracts/permits, enforcement of regulations, and monitoring of impacts.

The following initial/annual costs would be required to administer and manage the activities as described:

<table>
<thead>
<tr>
<th>Item</th>
<th>One-Time Cost</th>
<th>Annual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of visitor contact station and concessionaire</td>
<td>$1,000,000 - $3,000,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Development of satellite concessionaire stations</td>
<td>$100,000 (each)</td>
<td>$5,000 (each)</td>
</tr>
<tr>
<td>Develop environmental and interpretative materials</td>
<td>$300,000 - $500,000</td>
<td>$2,000</td>
</tr>
<tr>
<td>Administration/Staffing</td>
<td>$0</td>
<td>$50,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$1,600,000 - $3,800,000</td>
<td>$87,000</td>
</tr>
</tbody>
</table>

(a). Resources involved in the administration and management of the use: Refuge staff would need to evaluate potential qualified concessionaires, administer contracts and permits, and oversee the day-to-day operations of the selected vendor. Federal Wildlife Officers would spend time enforcing Refuge regulations. Additional public use staff may be needed to oversee the contact station’s day-to-day operations. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.

(b). Special equipment, facilities, or improvements necessary to support the use: Existing Refuge facilities that support this use include boat ramps, boat dock, fishing pier, parking lots, trails, and restrooms. In addition to existing infrastructure, the Refuge would construct a small building that can support space for the concessionaire, interpretative exhibits, a Refuge office, partner office space, Refuge cooperating association, volunteers, and bathrooms at the Hillsboro parking lot. At a minimum, if the fully described facility cannot be developed, the concessionaire would be provided enough space to construct the necessary infrastructure to support its own operation independent of the Refuge and partners’ footprint.

(c). Maintenance costs: Routine maintenance associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, signage, parking areas, structure maintenance (boat ramps), law enforcement, and trash removal. Additional resources (infrastructure maintenance and cleaning) would be needed for the upkeep of the newly
constructed facility at the Hillsboro parking lot, similar to expenditures for the headquarters office and Visitor Center, but on a smaller scale.

(d). Monitoring costs: Refuge staff would need to monitor the impacts of this use to ensure it is not causing negative impacts to wildlife, habitat, and other public uses. Through the SUP process, the Refuge will request that the concessionaire submit an annual report.

(e). Offsetting revenue: The concessionaire would provide a percent of all proceeds rendered by sales to the Refuge. Additionally, entrance fees would be used to offset cost of regulation enforcement and monitoring biological impacts. Refuge entrance fees collected annually are approximately $150,000, of that up to 3% may support this use.

**Anticipated Impacts of the Use:**

Continuation of the existing programs for fishing, environmental education and interpretation, wildlife observation and photography would have negligible impacts on wildlife and habitats. Development of these facilities to support these uses should have a minimal impact since the location would be built on an existing parking lot. There would be a reduction in parking spaces; however, adequate parking would still be available on site without any additional clearing required. Some disturbance to wildlife may occur during the construction of the facility, but due to the low quality habitat of the site, large human presence, and limited time to construct the building, impacts are expected to be minor and limited in scale.

Impacts from individual concession users are expected to be similar to other public use activities already approved/being considered for use on the Refuge (see relevant compatibility determinations for details). Accommodating larger groups may increase the likelihood of disturbances related to noise, trampling, compaction, or longer duration of continuous activity.

Regular scheduled tours to specific areas may displace wildlife use at certain locations to a greater extent than random visitor use. Wildlife may be temporarily disturbed by tour groups or could possibly avoid some of the areas used repeatedly by the groups.

Several studies have examined the effects of recreation on birds using shallow water habitats adjacent to trails and roads through wildlife Refuges in the eastern United States (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreational activities always has at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

**Presence:** Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998).

**Distance:** Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported.

Type and Speed of Activity: Landscapers caused birds to flush more than anglers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and birds likely perceive these activities as less threatening (Burger 1981, 1986, 1991, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed, but may flush if the activity stops or slows (Burger et al. 1995).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, 1991, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

Trash left on the Refuge facilities and natural areas, particularly food or wrappers, can attract predators that prey on nesting, loafing, roosting birds and other wildlife. Impacts of commercial tours, guides, and outfitters are likely to be minimal if conducted in accordance with Refuge regulations. The Refuge would manage Refuge closures that restrict public access to minimize disturbance to priority avian species during critical times of the year. Closures can be expanded or decreased as needed, depending on bird activity and results of further disturbance studies. The Refuge is a leave-no-trace, carry-in-carry-out facility, except for parking lot facilities. We encourage all outfitters and guides to pack in and pack out all food containers, bottles, wrappers, trash, and other waste and refuse. Littering, dumping, and abandoning property are prohibited by Federal regulation at 50 CFR 27.93 and 50 CFR 27.94.

As a business, the concession is concerned over the long-term with making a profit and expanding their customer base. Promotion of their services may bring greater numbers of visitor groups and individuals to the Refuge and thus, greater disturbance to the resources may occur. Long-term use of an area would be monitored as visitation increases and adaptive management strategies developed to address significant impacts. Monitoring would include an evaluation of changes in wildlife use patterns, trampling of vegetation, and compaction of the soil around the activity area. The Refuge and concession operator would work collaboratively to manage group size and distribute groups to various sites to minimize the impacts resulting from this use.

Determination (check one below):

- Use is Compatible
- Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
- Concession users must follow the general regulations set forth for the general public.
- Concessionaire must provide personal flotation devices (PFDs) for participants.
• Absolutely no landing of recreational watercraft shall be allowed on any Refuge tree islands. It shall be the responsibility of the concessionaire to ensure that the public is notified of, and (to the extent practicable) complies with this requirement.
• Any recreational activities, tours, and events that the concessionaire may propose to conduct or offer outside the normal hours of operation require the prior written approval of the Refuge Manager.
• Tour and guide boat operators would use only designated boat landing sites.
• Rental boats would not operate at night or in dense fog conditions (1/4-mile visibility or less) when a visitor could easily become disoriented and unknowingly violate a posted closed area. However, through the use of a SUP, guided boat tours may be authorized to conduct night time operations. Regulations to ensure the safety of all participants would be included with permits or concession contracts; specific conditions that may apply to the requested activity would be addressed through the SUP or concession contract.
• Concessionaire is required to educate watercraft renters about safe boating operations, and the prohibition against disturbing wildlife and trespassing.
• Refuge visitor information services and products would be required to distribute from the concessionaire to emphasize the importance of staying on trails, public access areas, closed areas, along with providing “leave no trace” principles, practices and watercraft/biking tips.
• No physical items, including litter, would be placed or left on the Refuge.
• No items would be removed from the Refuge.
• All canoes/kayaks/boats shall be well maintained and clean.
• Programs, tours, and events shall be periodically attended/monitored by Refuge personnel for compliance to Refuge standards. The concessionaire shall provide space in tour vessels for monitoring personnel at no cost to the Government.

Justification:
The concessionaire is allowed to operate on the Refuge to provide recreational opportunities to a wide spectrum of individuals with various levels of outdoor skills. They can also provide a needed service for those visitors that do not possess appropriate equipment or did not bring their own. The concession staff increases contacts with the visitors, providing an opportunity to present educational information about the Refuge, the Everglades ecosystem, and regulatory information.

Establishment of concessions for commercial guiding and outfitting does not significantly impact biological resources for which the Refuge was established. The administrative requirement is minimal. This activity has a positive effect on the overall interpretive, environmental education, and wildlife observation programs of the Refuge, reaching a much larger audience. It would also produce a greater appreciation of wildlife resources in participants, and build relationships between the Refuge and area businesses. We do not expect the addition of a concessionaire to materially interfere with or detract from the mission of the Refuge System, nor diminish the purpose for which the Refuge was established. It would not pose significant adverse effects on Refuge resources, interfere with public use of the Refuge, or cause an undue administrative burden. These uses would contribute to achieving Refuge purposes and the Refuge System mission because they facilitate fishing, wildlife observation and photography and provide compatible recreational opportunities for visitors to observe and learn about wildlife and habitats firsthand.
**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.

- [ ] Categorical Exclusion without Environmental Action Statement
- [ ] Categorical Exclusion and Environmental Action Statement
- [X] Environmental Assessment and Finding of No Significant Impact
- [ ] Environmental Impact Statement and Record of Decision

**References:**


**Mandatory 10-year Re-evaluation Date:**
Use: Commercial Guided Hunting

Description of Use:

(a) What is the use? Is it a priority public use? The use of commercial guided hunting is for hunting of white-tailed deer, migratory birds, and alligators. Migratory birds includes ducks, coots, moorhen, rail, and snipe. The Refuge would authorize commercial hunting guide operations within the Refuge, and regulate such use through the implementation of a hunting guide management program, including issuance of Special Use Permits with conditions. This activity provides recreational opportunity for hunters who desire a successful, quality experience, but who may lack the necessary equipment, skills or knowledge to hunt within the environment of the Refuge.

(b) Where would the use be conducted? This use would be conducted in areas specified in the issuance of a Special Use Permit (SUP).

(c) When would the use be conducted? Hunting guides operate on the Refuge in accordance with federal and state regulations. Hunting would occur within the hunting season framework established by the Florida Fish and Wildlife Conservation Commission (FWS). Guiding would occur during the various hunting seasons. The Refuge Manager may restrict both hunting and guided hunting opportunities if it conflicts with other, higher priority Refuge programs or endangers Refuge resources or public safety. Legal shooting hours vary by species, however most game may be hunted from one-half hour before sunrise until one-half hour after sunset. This use would take place during normal operating hours of the Refuge when conditions (water levels, wildlife activity) are such that impacts to habitats and wildlife are minimal. This use could be suspended or terminated at any time at the discretion of the Refuge Manager for Refuge management, safety, or other reasons. Guides would be required to report their activities monthly as required under the terms of their Special Use Permits.

(d) How would the use be conducted? Title 50, Code of Federal Regulations, 27.97, Private Operations, prohibits soliciting business or conducting a commercial enterprise on any national wildlife refuge except as may be authorized by special permit. Thus, commercial hunting guides would require a SUP from the Refuge Manager. Guides are competitively selected to operate on Refuge lands through a formal process established by regional policy. This policy manages commercial guiding activities at a level that is compatible with Refuge purposes and ensures high-quality guiding services are available for the public. Guide use areas on the Refuge will be defined in the SUP. All SUPs would outline the conditions under which the use can be conducted, and Refuge staff would ensure that each permittee maintains compliance with the SUP.

(e) Why is this use being proposed? Though commercial guided hunting is not a priority public use, it helps facilitate hunting which supports Secretarial Order 3356 with specific directives to “to support and expand hunting and fishing, enhance conservation stewardship, improve wildlife management, and increase outdoor recreation opportunities for all Americans” (DOI 2017).
Availability of Resources:

Resources involved in the administration and management of the use – Resources required for this use would be within the resources available through the Visitor Services, Law Enforcement, and Biology programs at the Refuge. Refuge staff responsibilities for commercial guided hunting would primarily be limited to the following: review of proposals, preparation of SUPs and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time. It is necessary for the permittee to provide appropriate support staff, equipment, and resources to accomplish commercial guided hunt objectives. If a permittee requires assistance from Refuge staff, the permittee must request the assistance in writing when applying for the SUP. Staff and resource availability would be determined by the Refuge Manager based on current Refuge priorities and work plans. The Refuge would not directly supply personnel or equipment for the proposed use unless arrangements have been made prior to the issuance of the SUP and the Refuge Manager has deemed it to benefit of the Refuge. The Refuge has sufficient resources for managing uses associated with commercial guided hunting. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.

Special equipment, facilities, or improvements necessary to support the use – Existing facilities that support this use include boat ramps, boat docks, parking lots, and restrooms. No additional facilities are proposed to support this use.

Maintenance costs – Maintenance associated with this use would be performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include: mowing, trail/levee maintenance, signage, parking areas, structure maintenance (boat ramps, fishing piers), and trash removal. This use should not incur any additional maintenance needs; however, it may influence the timing of when and how often maintenance should be performed. Staff and volunteers spend around 40 hours a week performing this maintenance in support of multiple refuge objectives and uses.

Monitoring costs – Existing Refuge staff and Federal Wildlife Officers monitor effects of and compliance with current operations during the normal course of their duties. An increase in law enforcement time would also be required due to the amount of acreage that would need to be patrolled more diligently for public safety and hunter compliance. The SUP will request that guides submit an annual report.

Offsetting revenue – A permit-term administrative fee may be required in addition to the standard Service commercial rate for entrance to the Refuge. Should the permit include multiple visits throughout the term of the permit, only entrance fees would be collected for subsequent visits. Administrative fees would be assessed on a case-by-case basis and may vary, depending on the size and complexity of the use, number and frequency of demands for this use, and other applicable details. Although there is no standard fee schedule at this time, fees would be comparable to other use fees on the Refuge and Refuges in the vicinity. The Refuge would observe all future guidance and policies relating to fees on Refuges.

Anticipated Impacts of the Use: Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed. In general, impacts from commercial guided hunting would be similar to those expected from similar non-commercial hunting. Short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting
birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Consistent disturbance to wildlife may cause shifts in habitat use, abandonment of habitat, increased energy demands on affected wildlife, changes in nesting and reproductive success, and singing behavior (MacDonald 2015, Snetsinger and White 2009, Reed and Merenlender 2008, Gill et al. 2001, Miller et al. 1998, Gill et al. 1996, Schulz and Stock 1993, Knight and Cole 1991, Arrese 1987). Hammitt and Cole (1998) note that females with young are more likely to flee from a disturbance than those without young. Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981; Burger 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1995, 1997; Burger & Gochfeld 1998). Hammitt and Cole (1998) conclude that the frequent presence of humans in "wildland" areas can dramatically change the normal behavior of wildlife mostly through "unintentional harassment." Overall, the existing research clearly demonstrates that disturbance from recreation activities always has at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1997; Burger & Gochfeld 1998). Stipulations may be placed on the size of the group or modes of transportation to reduce the potential for negative impacts, depending on the activity. Special needs would be considered on a case-by-case basis and are subject to the Refuge Manager's approval and may be modified to ensure compatibility (if appropriate). Any approved SUP would outline the conditions in which the use may be conducted, and Refuge staff would ensure compliance with the permit. All guides will be required by SUP to submit a report on harvests.

Determination:

_____ Use is Not Compatible

___ X Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
Each request must comply with Special Conditions attached to their SUP to ensure compatibility. At a minimum, the following standard SUP Special Conditions would be included.

- Proof of general liability insurance coverage with the Refuge named as co-insured must be provided prior to the issuance of the SUP.
- The Refuge Manager, or his/her designated representative, has the right to accompany any commercial visit, with proper notice, as an observer.
- The permittee(s) would disclose during all guided hunts that this area is part of the NWRS administered by the Service. The Service’s and NWRS’s missions would also be summarized. Leaflets and brochures would be provided through the Visitor Center or headquarters prior to scheduled tours.
- All Refuge regulations would be adhered to by the permittee(s) and all commercial guided hunt participants. Any violations of regulations witnessed by the permittee(s) would be reported to the Refuge Manager.
- Permittee(s) or designated commercial representative would notify the Refuge at least two weeks in advance of any scheduled guided hunts and give expected arrival time, date, number of participants, and the name of the tour leader. A copy of the permit would be carried by the permittee(s) or designated representative during each tour and presented on request to any Refuge official.
• Entry would be authorized only during normal operating hours and into open public use areas unless special permission has been granted by the Refuge Manager.
• The permittee(s) would provide the Refuge with a summary of guided hunts, including harvest numbers, number of participants, and fees assessed for the period covered by the SUP. This summary report is due to the Refuge’s administration office no later than one month after permit expires. Failure to provide a timely summary report may result in the denial of future permits.
• Permittee or designated representative would be required to sign and date a waiver and release of liability form.
• All stipulations listed in the Refuge Recreational Hunt CD would apply.

Justification: The National Wildlife Refuge System Improvement Act of 1997 identified hunting as one of the six priority, wildlife-dependent recreational uses to receive enhanced consideration over other public uses in planning and management. The Service attempts to provide opportunities for this use in the NWRS where compatible. Hunting, in some form, has been deemed compatible on the Refuge since its establishment in 1951. Continuing to offer and expand hunting opportunities (where possible and compatible) supports the Service’s goal of Connecting People with Nature in addition to multiple objectives and strategies stated in the Refuge’s CCP. Hunting allows visitors to enjoy the outdoors and connect with nature in a natural setting, which is not only healthy mentally and physically, but can build a life-long appreciation for wildlife and their habitats. Commercially guided hunting would help facilitate hunting as a priority public use. When wildlife populations are managed carefully and monitored, allowing commercially guided hunting on the Refuge would not materially detract from or interfere with the purposes for establishment of the Refuge and the mission of the NWRS. This CD is based on best available science and sound professional judgement.

NEPA Compliance for Refuge Use Description:

Categorical Exclusion without Environmental Action Statement
Categorical Exclusion and Environmental Action Statement
X Environmental Assessment and Finding of No Significant Impact
Environmental Impact Statement and Record of Decision

References:


**Mandatory 10-year Re-evaluation Date:**
Use: Commercial Recording

Description of Use:

(a) What is the use? Is it a priority public use? The use is commercial recording (digital or film) including videography, photography, and audio recording [collectively called “commercial recording” for the purposes of this compatibility determination (CD)]. Commercial recording is an existing economic use on the Refuge that is not a priority public use; however, it promotes and facilitates certain priority public uses. The use typically involves recording (both still and motion) wildlife or natural landscapes or recording natural sounds for commercial or educational purposes. “Commercial recording” means the film, electronic, magnetic, digital, or other recording of a moving image by a person, business, or other entity for a market audience that involves the advertisement of a product or service, the creation of a product for sale, or the use of actors, models, sets, or props (43 CFR 5.12). For the purposes of this definition, creation of a product for sale includes a film, video, television broadcast, or documentary of historic events, wildlife, natural events, features, subjects, or participants in a sporting or recreation event created for the purpose of generating income, such as for a documentary, television or feature film, advertisement, radio, print, audio, or similar project. “Still photography” conducted on lands managed by Department of the Interior (DOI) agencies requires a permit when it involves models or props that are not a part of the site’s natural or cultural resources or administrative facilities, or when it takes place at a location where members of the public generally are not allowed, or where additional administrative costs are likely. The land use fee for still photography would apply only to still photography that requires a Special Use Permit (SUP).

Commercial recording is guided by the following policies:

• 16 U.S.C. 668dd, 50 CFR 27.71. Motion or Sound Pictures The taking or filming of any motion or sound pictures on a national wildlife refuge for subsequent commercial use is prohibited except as may be authorized under the provisions of 43 CFR part 5.
• 16 U.S.C. 668dd, 50 CFR 27.97. Private Operations Soliciting business or conducting a commercial enterprise on any national wildlife refuge is prohibited except as may be authorized by special permit.
• 16 U.S.C. 668dd, 50 CFR, Subpart A, 29.1 Allowing Economic Uses on National Wildlife Refuges. We may only authorize public or private economic use of the natural resources of any national wildlife refuge, in accordance with 16 U.S.C. 715s, where we determine that the use contributes to the achievement of the national wildlife refuge purposes or the Refuge System mission.
• 8 RM 16, Audio Visual Productions 5 RM 17, Commercial & Economic Uses on National Wildlife Refuges
• 43 CFR Part 5, Making Pictures, Television Productions or Sound Tracks on Certain Areas Under the Jurisdiction of the Department of the Interior
• Public Law 106-206, Commercial Filming

Commercial recording projects that are in support of conservation, Refuge purposes, the National Wildlife Refuge System (NWRS) mission, or for educational and interpretation purposes will be given first priority. Other filming may be approved if it does not interfere with Refuge operations or the Refuge’s mission and goals. Requests that do not directly support these will be considered on a case-by-case basis to see if a secondary component can be considered to ensure compatibility and appropriateness.
Recordings of a non-commercial nature are addressed under a separate CD for Wildlife observation, photography, environmental education and interpretation. Additionally, this CD does not apply to news media activities, which are regulated by 8 RM 16.

(b) Where would the use be conducted? The Refuge is comprised of over 145,188 acres encompassing the northern limit of the greater Everglades ecosystem. The Refuge is completely enclosed by a system of levees and canals that extend over 58 miles. A majority of the Refuge is managed under a license agreement with the state of Florida that makes up 141,374 acres known as “the Refuge Interior”. The USFWS owns an estimated 3,688 acres in fee title on the east side and adjacent to the Refuge Interior. Natural communities found at the Refuge are characteristic of wetland habitats and include wet prairie, slough, sawgrass marsh, tree islands, and cypress swamp. The Refuge provides important roosting, foraging, and nesting habitats for many birds, mammals, reptiles, and amphibians. In addition to the various migratory birds and other wildlife commonly found in wetland habitats, keystone species that inhabit the Refuge include alligators, white-tailed deer, bobcats, wading birds, waterfowl, and secretive marsh birds. Threatened or endangered species that regularly utilize the Refuge include the Everglades snail kites and wood storks. Common temperate fresh water fish that occur regularly on the Refuge include mosquitofish, topminnow, largemouth bass, gar, and bowfin. Commercial recording activities that do not require a Refuge staff escort may be conducted in areas open to the public.

(c) When would the use be conducted? Recording may occur during the public operating hours of the Refuge, may take from one day to multiple days, and may involve multiple periods throughout the year. Requests for nighttime or after hours recording will be considered on an individual basis and reviewed carefully to minimize impacts on wildlife. Requests for recording during periods of nesting for threatened or endangered species or shore birds may be denied, scheduled to a more appropriate time, or permitted with a SUP outlining additional restrictions to maintain compatibility.

(d) How would the use be conducted? Commercial recording projects are required to apply for a SUP reviewed by the Refuge Manager. Special needs (e.g. access to closed areas or night recording) will be considered on a case-by-case basis, are subject to the Refuge Manager's approval, and may include a secondary component negotiated to ensure compatibility (if appropriate). All SUPs will have outlined the conditions in which the use can be conducted, and Refuge staff will ensure that each permittee maintains compliance with the SUP. A diversity of equipment may be used to record images and sounds, which may also include unmanned aerial systems (UAS or drones). The use of UAS may be authorized when in compliance of FAA regulations and with stipulations included in the SUP. Use of UAS will be conducted according to the USFWS 603 FW 1 (Appropriate Use), 50 CFR 27.34 (Harassment of Wildlife) and other applicable laws, regulations and policies. Access around sensitive resources (e.g. wading bird colonies, bald eagle nest sites, snail kite nests) may be granted and shall require Refuge staff accompaniment to ensure protection of the resources from inadvertent harm or harassment. Recording activities may occur in publicly accessible areas via biking, hiking, motorboat, kayak, canoe, or other approved means. The Refuge Manager may approve other requested modes of travel if deemed appropriate and compatible. Recording in areas closed to the public may require staff or their designees to be
present to escort the group via approved modes of transportation when resources are available.

(e) Why is this use being proposed? This use is an existing use being re-evaluated on Refuge. Commercial recording activities have been an approved use on the Refuge since the late 1980s, re-evaluated and deemed compatible in 1994 and again in 2001 (USFWS 1994, USFWS 2001). Since the previous analysis, environmental conditions have not changed substantially. The USFWS provides the general public opportunities to participate in compatible wildlife-dependent recreation to appreciate the value of and need for fish and wildlife conservation. The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape. Commercial recording endeavors can be an excellent platform for exposing young people and urban dwellers to the unique sounds of the marsh, the beauty of nature, and the unique settings of the Refuge. Because of their accessibility to major urban areas, the Refuge is attractive to commercial operations. Additionally, in 2013, the Refuge became one of 14 priority Refuges in the Urban Refuge Conservation Program (Program) that will increase the USFWS’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for creating new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S. Commercial recording on the Refuge will benefit and promote the goals of the Program. This CD updates and replaces the Refuge’s 2001 CD for Commercial Filming (USFWS 2001).

Availability of Resources: Issuing and monitoring SUPs for this use is within the resources available through the Visitor Services program at the Refuge, Law Enforcement personnel, and/or the Refuge Manager of the Refuge. Based on the history of requests and number of SUPs in relation to this activity, the Refuge has sufficient resources for managing current and expected levels of uses associated with commercial recording.

Resources involved in the administration and management of the use – Staff responsibilities for projects by non-USFWS entities will primarily be limited to the following: review of proposals, preparation of permits and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of project implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time. Compliance with the terms of the permit is within the regular duties of Refuge staff and law enforcement officers. It is assumed that the permittee will provide appropriate support staff, equipment, and resources to accomplish tasks and objectives. If a permittee will need assistance from Refuge staff, the permittee must request the assistance in writing when applying for the SUP. Staff and resource availability will be determined by the Refuge Manager based on current Refuge priorities and work plans. The Refuge will not directly supply personnel or equipment for the proposed use unless arrangements have been made prior to the issuance of the SUP and the Refuge Manager has deemed it to benefit of the Refuge. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3 percent of staff time.

Special equipment, facilities, or improvements necessary to support the use – None proposed.

Maintenance costs – None. Maintenance that may be associated with this use is already performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, signage, parking areas, structure
maintenance (observation blind, kiosks, boat ramps, boardwalks). This use should not incur any additional maintenance needs. Staff and volunteers spend around 40 hours a week performing this maintenance in support of multiple Refuge objectives and uses.

Monitoring costs – None. Existing staff monitors effects of current operations during the normal course of their duties such as compliance checks of permit conditions and periodic inspections by staff. Voluntary evaluations are provided to teachers and visitors for feedback on educational programs and experiences.

Offsetting revenue – Fees associated with the SUP will be determined and assigned on a case-by-case basis, which will likely offset any incidental costs incurred. The proposed fee schedule for Commercial Filming and Photography may be used as guidance (Congressional Research Service 2014).

Anticipated Impacts of the Use: Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed. Possible impacts from this use include disturbance to nesting and resting birds and disturbance to other wildlife and visitors. The potential to disturb any threatened or endangered species on the Refuge during this use is extremely low, unless they are a focus of the product, in which case, further review will be required and addressed in the issuance of a SUP. Commercial recording can result in both positive and negative impacts. Conducting this use will cause negligible or short-term impacts to localized soils and waters, and may cause short-term impacts/disturbance to flora or fauna. This use should not result in long-term impacts that adversely affect the purposes for which the Refuge was established or alter any existing or proposed uses as stipulated in its Comprehensive Conservation Plans (CCP).

Some requests may require further analysis of the impacts of the proposed activity which may also require additional compliance with the National Environmental Policy Act (NEPA) and consultation under any other relevant laws. It is important to note that wildlife recording by professionals or amateurs can often cause disturbance depending on the manner in which it is pursued. SUP conditions and associated monitoring of permitted activities would be designed to minimize wildlife and habitat impacts of this use.

Wildlife photography can negatively impact wildlife by altering wildlife behavior, reproduction, distribution, and habitat (Purdy et al. 1987, Knight and Cole 1995). Of the wildlife observation techniques, photographers tend to have the largest disturbance impacts (Klein 1993, Morton 1995, Dobb 1998). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even a slow approach by photographers tends to have behavioral consequences to wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time in an attempt to habituate the wildlife subject to their presence (Dobb 1998), and the tendency of casual photographers, with low power lenses, to get much closer to their subjects than other activities would require (Morton 1995), including wandering off trails. This can result in increased disturbance to wildlife and habitat and/or trampling of vegetation. Klein (1993) recommended that Refuges provide observation and photography blinds to reduce these disturbances by visitors. Lighting for nighttime recording could potentially impact wildlife, including disorienting, momentary blindness, migration (in birds), circadian rhythms, preventing movement through the landscape, and even melatonin production to name a few (NIH 2017).
This use will have minimal impacts to water quality because commercial recording will be managed in a way that ensures minimal physical disruption to natural resources. Unless required by the production, commercial recording will be conducted in areas away from waterways and bodies of water. In instances where close proximity to water is required, stringent permit conditions and careful monitoring will limit impacts.

UAS/Drones are increasingly being tested or used as wildlife management tools across the globe (Goebel et al., 2015; Hodgson et al., 2013; Koh and Wich, 2012; Mulero-Pazmany et al., 2014; Sarda-Palomera et al., 2011). Yet, the science regarding wildlife effects associated with use of UAS remains young. Vas et al. (2015) studied the behavioral effects of a quadricopter drone on mallards (Anas platyrhynchos), flamingos (Phoenicopterus roseus), and common greenshanks (Tringa nebularia). The birds had no significant reactions to different drone speeds or different colored drones, and there appeared to be no cumulative effects of successive flights. Also, the birds had very little reaction to lower approach angles, but consistently reacted when the drones approached from directly overhead. These results are consistent with those of Sarda-Palomera et al. (2011) who monitored the effects among gulls of a UAS used for population monitoring; and with results of Goebel et al. (2015) who found no reaction among penguins or seals of UAS used for population monitoring. More powerful drones of larger size that make more noise may have a greater effect on birds and other wildlife. In addition to reviewing potential impacts on wildlife species in general the Refuge staff initiated a consultation with the South Florida Ecological Services Field Office. With the implementation of Best Management Practices (BMP), a no effect determination was found to be appropriate and no further consultation was needed under section 7 of the Endangered Species Act. The above determination can be found in a “Note to File” Memorandum in the Refuge digital files. BMPs include, but are not limited to, following the recommended buffers around all nesting sites during flight operations, conducting flights outside of nesting season if required, and systematic review of all photography or video documentation taken during flights. Should any unanticipated behavior be observed indicating adverse effects, the project approach will be reassessed and a Section 7 consultation will be initiated immediately.

Commercial activities may also result in long-term beneficial impacts to the visitor experience. Indirectly, the products (films, photographs, and educational media) of these activities will expose more people to the purpose, mission, and resources of the Refuge. Commercial operators could bring new visitors to the Refuge and enhance the experience of repeat visitors by providing them with high quality, environmental education, interpretation, wildlife photography, and wildlife observation programs. These activities will increase the participant’s understanding and appreciation of wildlife and their habitat as well as the role of the NWRS in resource conservation.

There are no anticipated adverse cumulative impacts resulting from commercial recording. This activity will result in beneficial cumulative impacts by increasing public awareness about conservation issues and the NWRS. Ultimately, this will benefit the USFWS’s mission, the Refuge purposes, and the Refuge visions.

**Determination (check one below):**

- [ ] Use is Compatible
- √ Use is Compatible with Following Stipulations
Stipulations Necessary to Ensure Compatibility: Each request must comply with Special Conditions attached to their SUP to ensure compatibility. At minimum, the following standard SUP Special Conditions will be included. Additional stipulations can and will be identified for each individual request in the SUP. The Refuge will modify or eliminate any use that results in unacceptable impacts.

1. Any person(s) or entities conducting a commercial recording operation on the Refuge must possess a SUP issued by the Refuge Manager. This requirement ensures that private businesses are not unfairly making a profit from public lands and provides a mechanism to regulate where and when commercial activities occur.
2. Permittee shall provide a detailed written proposal on company letterhead including specifics such as site-specific location, support equipment, number of persons involved, client name, description of the project theme and key messages, and other details that would allow for evaluation of the project.
3. All activities must comply with 8 RM 16 and 43 CFR, Subtitle A, Section 5.1 and may require completion of a Commercial Audio-Visual Production Application and posting of a bond.
4. The permit is not transferable except for sub-contractors that have contact information included with the permit.
5. Production company must give at least a 72-hour advance notice of recording date following issuance of an SUP.
6. Failure to comply with all SUP conditions may result in the suspension or revocation of the permit, including the possible loss of future SUP privileges. Permit fees are not refundable.
7. The Refuge reserves the right to postpone or cancel any activity that may interfere with public safety or Refuge management activities.
8. Permittee must have the SUP in their possession at all times while on the Refuge. A copy of the permit must also be prominently displayed on the dash of permittee’s vehicle(s) at all times while on the Refuge. The permit must be presented to Refuge personnel upon request.
9. Permittee’s vehicle(s) must remain on designated roads and be parked in designated Refuge lots.
10. Recordings taken in areas of the Refuge closed to the public may require staff or their designees to be present to escort the group.
11. Production company will limit the crew size to the smallest number possible and necessary for recording.
12. Permittee(s), designated representatives, and associates will comply with all Refuge rules, regulations, and the conditions of the SUP as provided by the Refuge Manager.
13. Production activities will be conducted so as not to impact or interfere with the resource. Plants and animals will not be disturbed, harassed, or injured. Any damage to landscape (tire rutting, damage to plants, etc.) or facilities will be repaired at the expense of the permittee and to the satisfaction of the Refuge Manager within ten working days after expiration of the permit.
   a. No domestic or foreign plants or animals will be introduced into the Refuge.
14. Permittee is responsible for acquiring and/or renewing any necessary state and federal permits prior to beginning or continuing the project.
15. Additional stipulations and documentation may be required when requesting the use of drones.
16. Staging of equipment for use on the project must be approved by the Refuge Manager.
17. All methodologies, e.g., aerial photography via drone or helicopter, must be requested and approved through the SUP process prior to recording.
18. Permittee will be responsible for keeping the Refuge clear of all associated trash or litter.
19. All disturbances, including light and sound, should be minimized to the greatest extent possible.
20. Disturbing, injuring, destroying or collecting or attempting to disturb, injure, destroy or collect any plant or animal is prohibited without specific written permission from the Service.
21. Permittee will not capture or retain wildlife without specific written permission from the Service, as well as having all required permits.
22. Permittee will not clear, trim, cut, or disturb vegetation nor erect any facilities or structures, whether temporary or permanent, without written approval of the Refuge Manager.
23. Priority consideration is extended to producers of wildlife and natural resource related audio or visual materials. Producer’s credentials will be verified by the appropriate Refuge personnel.
24. Production activities will be conducted so as to minimize impact or interference with Refuge visitors, public use programs, wildlife or natural and/or cultural resources within the Refuge.
25. If a prop firearm is used, it must be clearly identified as a prop and kept cased when not in use.
26. Permittee may be required to provide public safety assets such as crowd or traffic control in coordination with the Refuge Manager.
27. Proper credit will be given for all commercial recording, including commercial recording of images and sounds collected on the Refuge. Permittee will give credit to the DOI, USFWS, and Refuge through the use of an appropriate title or announcement. The use of the logo of the USFWS will be consistent with the purpose, mission and goals of the USFWS, as well as any and all applicable laws, and will only be used with permission from the Service. It is not permissible for use of the logo in any combination with the business products or services of the permitted company or its subsidiaries, brands, affiliates, partners, or customers. The permitted company shall take all reasonably necessary steps to avoid endangering the validity or goodwill of the logo and use all reasonable efforts to maintain the validity and distinctiveness of the logo and to enhance the goodwill symbolized by the logo.
28. The USFWS is not responsible for any mishaps or injuries that may occur during recording and associated activities. The permittee acknowledges and agrees to provide appropriate safety equipment and training to all people participating in the recording and associated activities with regard to hazards likely to be encountered on the Refuge.
29. Permittee assumes full responsibility for themselves, their associates, and their representative’s production equipment and gear in the event of loss or damage. Permittee agrees to strictly follow safety procedures and any other protocols as requested orally and in writing by USFWS employees. Failure to follow any protocols, oral or written, may result in immediate termination of the issued SUP. Should a situation occur in which USFWS deems participation by permittee and associates as inappropriate or unsafe, the permittees and associates shall immediately defer to any and all instructions given by USFWS. Attendance and participation to all safety briefings given by USFWS will be required by permittee crew members for the shoot because of the nature of the equipment involved.
30. Permittee shall provide the Refuge Manager with a copy of the final product of the commercial recording project within 180 days of completion of the project.
31. Footage shot with the assistance of the USFWS shall not be reused for or sold to other production companies without specific USFWS government approval.

32. Indemnification: The permittee shall save, hold harmless, defend and indemnify the United States of America, its agents, and employees for losses, damages, or judgments and expenses on account of fire or other peril, bodily injury, death, or property damage, or claims for bodily injury, death, or property damage of any nature whatsoever, and by whomever made, arising out of the activities of the permittee, its employees, subcontractors, or agents under this SUP.

33. Insurance
   a. The permittee shall purchase at a minimum the types and amounts of insurance coverage as stated herein and agrees to comply with any revised insurance limits that the Refuge Manager may require during the term of this SUP.
   b. Upon request of the Refuge Manager, the permittee shall provide a statement of Insurance and Certificate of Insurance.
   c. The U.S. Fish and Wildlife Service will not be responsible for any omissions or inadequacies of insurance coverages and amounts if such prove to be inadequate or otherwise insufficient for any reason whatsoever.

34. Public Liability. The permittee shall provide comprehensive general liability insurance against claims occasioned by actions or omissions of the permittee or its designees in carrying out the activities and operations authorized hereunder. Such insurance shall be in the amount commensurate with the degree of risk and the scope and size of such activities authorized herein, but in any event, the limits of liability shall not be less than ($300,000) per occurrence covering both bodily injury and property damage. If claims reduce available insurance below the required per occurrence limits, the permittee shall obtain additional insurance to restore the required limits. An umbrella or excess liability policy, in addition to a comprehensive general liability policy, may be used to achieve the required limits.
   a. All liability policies shall specify that the insurance company shall have no right of subrogation against the United States of America or shall provide that the United States of America is named an additional insured.
   b. The permittee agrees that the U.S. Fish and Wildlife Service does not take any responsibility or liability for the security, loss, damage, or otherwise of any vehicle, machinery, equipment, or other goods or property owned by, or under the control of, the permittee.

35. All other Refuge rules and regulations remain in force.

Additional Special Conditions for UAS – the below conditions may be altered as new policies and directives are approved

- To minimize disturbance to plants, wildlife, and habitats, all UAS activities involving recording wildlife will be coordinated with the Senior Wildlife Biologist (or designee) or Refuge Manager. Specifically, the permittee(s) shall be very well organized, know exactly what they will do and how to do it before they initiate recordings.
- UAS activities may not occur within one-half mile of the Visitor Center, Refuge housing, any inhabited dwelling adjacent to the Refuge, boardwalk trails, marsh trail, observation tower or blind, and canoe trail without specific consent of the Refuge Manager.
- No threatened or endangered species may be monitored without appropriate federal or state permits and specific consent of the Refuge Manager.
- When the purpose of the project is to monitor wildlife during critical times (i.e. nesting), the use of UAS must be the less disrupting option than other methods of monitoring.
• Copies of the following documents are required at a minimum of 36 hours in advance of the first UAS flight:
  a) Pictures and specs of the specific UAS platform employed.
  b) A copy of the Federal Aviation Administration (FAA)-approved Certificate of Authorization (COA), Section 333 Exemption, or Remote Pilot Certification.
  c) Aviation Risk Management or a Project Aviation Safety Plan document.

• UAS operators are responsible for meeting and following the minimum FAA rules and requirements in accordance with their certification: (a) keep the aircraft in sight (visual line-of-sight); (b) fly under 400 feet; (c) fly during daytime only; (d) fly at or below 100 mph; (e) yield right of way to manned aircraft; (f) do NOT fly over people, and (g) do NOT fly from a moving vehicle. Additional or varying stipulations may apply per the specific certification being used. These regulations are subject to change and permitees are responsible for keeping apprised of regulation changes.

• Service personnel may be present for any UAS mission conducted on the Refuge.

• UAS operators shall report any wildlife disturbance to Refuge personnel and provide a narrative similar to a “white paper”, photography or videography (captured during the flight) within 3 days after completion of the UAS flight.
  a) If there are any sensitive species in the area when performing any authorized activity, the activity shall cease until the animal(s) depart the area, except as permitted for specific management of that species.
  b) During descent, the UAS operator will ensure that no sensitive species are in the retrieval area.
  c) Interactions with birds and other wildlife will be closely monitored; should significant interactions occur, operations will be halted.
  d) Wildlife impacts will be assessed and analyzed on site and protocols modified accordingly.
  e) In the event of a bird strike, the UAS should immediately return to ground control station to remove the threat of disturbance and assess damage to the aircraft.

• In the instance of a crash, the UAS operator is responsible for reporting it per FAA policy and shall provide copies of any documentation to the Refuge.

• Additional special conditions shall be stipulated in the SUP as needed to further minimize impacts. If adverse impacts to Refuge resources associated with UAS activities are identified in future years, modifications to that part of the program in question will be implemented immediately to minimize that impact. All current or future Refuge specific rules and regulations apply to the proposed use.

Justification: Compatible commercial recording in its various forms provides an excellent opportunity to inform and educate the public and promote the Refuge and the NWRS. Since production activities would be greatly limited, any disturbances associated with recording would be minimal and readily controlled through the proper selection of locations, timing of production, and stringent SUP conditions and monitoring. While commercial recording is a secondary public use, it may support and enhance the priority public uses of wildlife photography, environmental education, and interpretation. By allowing commercial recording, the public may gain a better understanding and appreciation for America’s flora and fauna, wildlife conservation, and the USFWS’s role in managing and protecting natural resources. Furthermore, permitting appropriate and compatible commercial recording is consistent with the goals of the NWRS, the intent and purposes of the Refuge, and supports the CCPs’ educational, interpretive, and recreational goals and objectives. The actions or effects of this use are not expected to interfere with or detract from the mission of the NWRS nor diminish the purposes for which the Refuge
was established. This use will not pose substantial adverse effects on Refuge resources, interfere with public use of the Refuge, nor cause an undue administrative burden. This activity is a compatible use of the Refuge. This CD is based on sound professional judgement.

**NEPA Compliance for Refuge Use Decision:** *(Place a √ in appropriate space)*

√ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

___ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

**Categorical Exclusion:** The use described in this CD can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusion 43 CFR §46.210 (j): activities, which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The use triggers no response to any extraordinary circumstances (43 CFR §46.215). It is also covered by the following USFWS Categorical Exclusions (516 DM 8.5).

- A(2) - Personnel training, environmental interpretation, public safety efforts, and other educational activities, which do not involve new construction or major additions to existing facilities.
- B(7) - Minor changes in the amounts or types of public use on Service or State-managed lands, in accordance with existing regulations, management plans, and procedures.
- B(9) - Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices.
- C(3) - The issuance of special regulations for public use of Service-managed land, which maintain essentially the permitted level of use and do not continue a level of use that has resulted in adverse environmental effects.
- C(5) - The issuance or reissuance of SUPs for the administration of specialized uses, including agricultural uses, or other economic uses for management purposes, when such uses are compatible, contribute to the purposes of the Refuge system unit, and result in no or negligible environmental effects.

**References:**


Mandatory 10-year Re-evaluation Date:
Use: Commercial Tours

Description of Use:

(a) What is the use? Is it a priority public use? Commercial tours for non-consumptive use directed toward environmental education, interpretation, and/or observation of wildlife and habitats is an existing, economic use on the Refuge. The use is not a priority public use; however, it promotes and facilitates several priority public uses. Commercial tours include, but are not limited to, wilderness excursions, wildlife observation/photography excursions, environmental education, camping, and guided field trips. Non-consumptive commercial tours generally involve larger groups and more organized transportation services than consumptive uses; therefore, they may be limited in size, type or number of commercial vehicles. A majority of commercial tours are conducted during agreeable weather months, so the Refuge may have up to five tours some months and none during others, but totaling less than 30 tours annually. Should the Refuge Manager decide demand for this activity is sufficient, it may be necessary to convert to a concession contract by open competitive bids.

(b) Where would the use be conducted? The Refuge is comprised of over 145,188 acres encompassing the northern limit of the greater Everglades ecosystem. A majority of the Refuge is managed under a license agreement with the state of Florida that makes up 141,374 acres known as “the Refuge Interior”. The Service owns an estimated 3,815 acres in fee title on the east side and adjacent to the Refuge Interior. The Refuge Interior is completely enclosed by a system of levees (unimproved road) and canals that extend over 58 miles. Commercial tours that do not require a Refuge staff escort may be conducted in all areas open to the public. Approximately 137,929 acres or 95% of the Refuge is accessible with proper equipment. Commercial tours in some circumstances may require concession contracts, Special Use Permits (SUP), Cooperative Agreements, or Memorandums of Understanding. With proper notice, the Visitor Center Theater, Cypress Swamp Pavilion, C6 Pavilion, Marsh Trail Educational Pavilion, or Interpretive Area may be reserved.

(c) When would the use be conducted? Tours may take place year-round during the public operating hours of the Refuge, may take from one day to multiple days, and may occur throughout the year. Requests for nighttime or afterhours tours would be considered on an individual basis and reviewed carefully to minimize impacts on wildlife. Requests for tours near known locations of threatened or endangered species or during periods of nesting may be denied, scheduled to a more appropriate time, or permitted with a SUP outlining additional restrictions to maintain compatibility.

(d) How would the use be conducted? Title 50, Code of Federal Regulations, 27.97, Private Operations, prohibits soliciting business or conducting a commercial enterprise on any national wildlife refuge except as may be authorized by special permit. Thus, commercial tours are required to obtain a SUP from the Refuge Manager. Special requests (e.g. access to closed areas or night tours) would be considered on a case-by-case basis, are subject to the Refuge Manager’s approval, and may include a secondary component negotiated to ensure compatibility (if appropriate). All SUPs would outline the conditions in which the use would be conducted, and Refuge staff would ensure that each permittee maintains compliance with the SUP. Bus, tram, bicycle, motorboat,
kayak, canoe, or hiking are some of the modes of transportation that may be used at the Refuge. The Refuge Manager may approve other requested modes of travel if deemed appropriate and compatible. Additionally, it is anticipated that use of SUPs would provide the Refuge a tool for managing uses; protecting natural and cultural resources; reducing user conflicts; and mitigating disturbance impacts. The SUP would also create an opportunity for communication and outreach between staff and commercial guides or tour groups to increase knowledge and awareness of Refuge regulations and ethical wildlife observation behavior.

(e) **Why is this use being proposed?** This use is an existing use being re-evaluated at the Refuge. Commercial tours have been occurring on the Refuge since the 1960s, although consumptive uses were also included at the time. The allowable use for commercial tours has been modified over the years to allow only tours of a non-consumptive nature. This particular use had been re-evaluated in the mid-80s and mid-90s and deemed compatible in 2001 (USFWS 2001). Since the previous analysis, environmental conditions have not changed substantially. The Service provides the public with opportunities to participate in compatible wildlife-dependent recreation to appreciate the value of and need for fish, wildlife, and plant conservation. The Refuge is the last remnant of the once vast northern Everglades ridge and slough landscape. Visitors participating in commercial tours are educated about the mission, habitats, and the ecosystem in such a manner as to leave them with a better understanding of resources. The experience can instill an appreciation for future stewards of the environment. Commercial tours can be an excellent interpretive activity, exposing young people, urban dwellers, and the community to the unique sounds of the marsh, the beauty of nature, and the distinctive setting of the Refuge and may expand the reach of the Refuge’s environmental education programs. Additionally, in 2013, the Refuge was designated as one of 14 priority refuges in the Urban Refuge Conservation Program (Program) that would increase the Service’s relevancy to nearby communities and local citizens. This Program has established measures to help define and achieve excellence, create a framework for developing new community partnerships, and establish a Refuge presence in demographically and geographically varied cities across the U.S. The goal of the Program is to develop a strong outreach program that engages South Florida’s diverse youth, on their terms and through their languages, which is essential in advancing this discussion nationally and creating a prototype for future youth-in-conservation planning. Commercial tours on the Refuge would benefit and promote the goals of the Program. This compatibility determination (CD) updates and replaces the Refuge’s 2001 CD for Commercial Tours (USFWS 2001).

**Availability of Resources:**

*Resources involved in the administration and management of the use* – Resources required for this use is within the resources available through the Visitor Services program at the Refuge. Refuge staff responsibilities for commercial tours would primarily be limited to the following: review of proposals, preparation of SUPs and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time. It is necessary for the permittee to provide appropriate support staff, equipment, and resources to accomplish tour objectives. If a permittee would need assistance from Refuge staff, the permittee must request the assistance in writing when applying for the SUP. Staff and resource availability would be determined by the Refuge
Manager based on current Refuge priorities and work plans. The Refuge would not directly supply personnel or equipment for the proposed use unless arrangements have been made prior to the issuance of the SUP and the Refuge Manager has deemed it to benefit of the Refuge. Based on the history of requests and number of SUPs in relation to this activity, the Refuge has sufficient resources for managing current and expected levels of uses associated with commercial tours. Administration of SUPs associated with this activity consists of approximately 10 staff days or less than 3% of staff time.

Special equipment, facilities, or improvements necessary to support the use – Special equipment, facilities, or improvements to support this use are not proposed. Facilities currently accessible on site would be available, including restrooms and pavilion(s).

Maintenance costs – Maintenance that may be associated with this use is already being performed by staff and/or volunteers throughout the year, during the normal course of their duties. Examples include mowing, trail/levee maintenance, boardwalk maintenance, signage, parking areas, structure maintenance (observation blind, kiosks, boat ramps), and trash removal. This use should not incur any additional maintenance needs; however, it may influence the timing of when and how often maintenance should be performed. Staff and volunteers spend around 40 hours a week performing this maintenance in support of multiple refuge objectives and uses.

Monitoring costs – Existing Refuge staff monitors effects of current operations during the normal course of their duties such as compliance checks of permit conditions and periodic inspections by staff. Voluntary evaluations are provided to teachers and visitors for feedback on educational programs and experiences.

Offsetting revenue – A permit-term administrative fee may be required in addition to the standard Service commercial rate for entrance to the Refuge. Should the permit include multiple visits throughout the term of the permit, only entrance fees would be collected for subsequent visits. Administrative fees would be assessed on a case-by-case basis and may vary, depending on the size and complexity of the tour, number and frequency of demands for this use, and other applicable details. Although there is no standard fee schedule at this time, fees would be comparable to other use fees on the Refuge and Refuges in the vicinity. The Refuge would observe all future guidance and policies relating to fees on Refuges.

Anticipated Impacts of the Use: Any public use activity has the potential for impacts; however, the Refuge attempts to minimize any potential impacts to negligible or acceptable limits for all uses allowed. In general, impacts from commercial tours would be similar to those expected from similar non-commercial recreational uses, however commercial uses could be more disturbing because commercial uses tend to occur in larger groups of people. Short-term impacts may be realized to wildlife, vegetation, or soil including temporary damage resulting from trampling, disturbance to nesting birds, and disturbance to feeding or resting birds or other wildlife in the proximity. Consistent disturbance to wildlife may cause shifts in habitat use, abandonment of habitat, increased energy demands on affected wildlife, changes in nesting and reproductive success, and singing behavior (MacDonald 2015, Snetsinger and White 2009, Reed and Merenlender 2008, Gill et al. 2001, Miller et al. 1998, Gill et al. 1996, Schulz and Stock 1993, Knight and Cole 1991, Arrese 1987). Hammitt and Cole (1998) note that females with young are more likely to flee from a disturbance than those without young. Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern United States (Burger 1981; Burger 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith
1995, 1997; Burger & Gochfeld 1998). Hammitt and Cole (1998) conclude that the frequent presence of humans in “wildland” areas can dramatically change the normal behavior of wildlife mostly through “unintentional harassment.” Overall, the existing research clearly demonstrates that disturbance from recreation activities always has at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986; Klein 1993; Burger et al. 1995; Klein et al. 1995; Rodgers & Smith 1997; Burger & Gochfeld 1998). The potential to disturb any threatened or endangered species on the Refuge during this use is extremely low, unless they are a focus of the tour, in which case, further review and oversight would be required by Refuge staff. This use should not result in long-term impacts that adversely affect wildlife, wildlife populations, or the purposes for which the Refuge was established. With a conservative approach in allowing this use on the Refuge, cumulative impacts on the habitat are expected to be minimal or negligible and within acceptable limits. Cumulative impacts are not anticipated on wildlife, their behaviors, or their habitat. Travel would occur on ruderal communities that can withstand repetitive use. A slight increase in gas emissions may occur due to the increase in vehicular traffic. The Refuge Manager would use professional judgment in ensuring that the request would have no considerable negative impacts; would not violate Refuge regulations; and that it would contribute to the achievement of the Refuge purpose and the NWRS mission. Stipulations may be placed on the size of the group or modes of transportation to reduce the potential for negative impacts, depending on the activity. Special needs would be considered on a case-by-case basis and are subject to the Refuge Manager’s approval and may be modified to ensure compatibility (if appropriate). Any approved SUP would outline the conditions in which the use may be conducted, and Refuge staff would ensure compliance with the permit.

**Determination (check one below):**

- [ ] Use is Compatible
- **√** Use is Compatible with Following Stipulations

**Stipulations Necessary to Ensure Compatibility:** Each permittee must comply with Special Conditions attached to their SUP to ensure compatibility. At minimum, the following standard SUP Special Conditions would be included.

- Proof of general liability insurance coverage with the Refuge named as co-insured must be provided prior to the issuance of the SUP.
- The Refuge Manager, or his/her designated representative, has the right to accompany any commercial tour visit, with proper notice, as an observer.
- The permittee(s) would disclose during all tours that this area is part of the NWRS administered by the Service. The Service’s and NWRS’s missions would also be summarized. Leaflets and brochures would be provided through the Visitor Center or headquarters prior to scheduled tours.
- All Refuge regulations would be adhered to by the permittee(s) and all commercial tour participants. Any violations of regulations witnessed by the permittee(s) would be reported to the Refuge Manager.
- For youth environmental education commercial visits, the Refuge requires that the students be supervised by a ratio of one adult for every ten students. Youth being defined as all minors under the age of 18.
- Permittee(s) or designated commercial representative would notify the Refuge at least two weeks in advance of any scheduled tours and give expected arrival time, date,
number of participants, and the name of the tour leader. A copy of the permit would be carried by the permittee(s) or designated representative during each tour and presented on request to any Refuge official.

- Entry would be authorized only during normal operating hours and into open public use areas unless special permission has been granted by the Refuge Manager.
- The permittee(s) would provide the Refuge with a summary of visits conducted, number of participants, fees assessed, and tour or curriculum presented for the period covered by the SUP. This summary report is due to the Refuge’s administration office no later than one month after permit expires. Failure to provide a timely summary report may result in the denial of future permits.
- Advertisements concerning events must be approved by the Refuge Manager prior to printing or distribution.
- Permittee or designated representative would be required to sign and date a waiver and release of liability form.

**Justification:** The approved objectives of commercial tours on the Refuge – environmental education, interpretation, and wildlife observation – have been identified by the Improvement Act of 1997 as appropriate and compatible priority uses. This proposed activity of commercial tours supports the Service’s goal of Connecting People with Nature in addition to multiple objectives and strategies stated in the Refuge’s CCP. Commercial tours provide visitors an organized and educational opportunity to view wildlife safely under the use stipulations. Commercial tours provide a safe and informative educational experience for visitors that have no or little experience in nature and desire a more controlled and informative visit to the refuge. Commercial tours provide a mechanism to educate large groups of visitors about refuge resources, management and conservation. With limited staff at the Refuge commercial tours are a way to inform and educate the public in a cost effective way. Thus, the use would not materially interfere with or detract from the NWRS mission, or the purposes for which the Refuge was established. This CD is based on sound professional judgement.

**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.

√ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

___ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

**Categorical Exclusion:** The use described in this CD can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusion 43 CFR §46.210 (j): activities which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The use triggers no response to any extraordinary circumstances (43 CFR §46.215). It is also covered by the following Service Categorical Exclusions (516 DM 8.5).

- A(2) - Personnel training, environmental interpretation, public safety efforts, and other educational activities, which do not involve new construction or major additions to existing facilities.
• B(7) - Minor changes in the amounts or types of public use on Service or State-managed lands, in accordance with existing regulations, management plans, and procedures.
• B(9) - Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices.
• C(3) - The issuance of special regulations for public use of Service-managed land, which maintain essentially the permitted level of use and do not continue a level of use that has resulted in adverse environmental effects.
• C(5) - The issuance or reissuance of special use permits for the administration of specialized uses, including agricultural uses, or other economic uses for management purposes, when such uses are compatible, contribute to the purposes of the Refuge system unit, and result in no or negligible environmental effects.

References:


**Mandatory 10-year Re-evaluation Date:**
Use: Scientific Research

Description of Use:

(a) **What is the use? Is it a priority public use?** The use is scientific research conducted by agencies, organizations, and research entities other than USFWS staff. Research is the planned, organized, and systematic gathering of data to discover or verify facts. The Refuge receives periodic requests from non-USFWS entities to conduct scientific research including, but not limited to: survey, monitoring, sampling, collecting, wildlife capture, banding, electrofishing, and biological control (or biocontrol) releases. The Refuge would support, for example, research of exotic plant and animal surveys and control techniques, Everglades snail kites, wading birds, wood storks, neotropical migratory birds, sand pine scrub amphibians and reptiles, mangroves, fisheries, offshore habitats, mosquito impoundments, beach re-nourishment, manatee protection, and seagrass bed surveys, just to name a few. Occasionally, research activities may include the use of drones or unmanned aerial systems (UAS), where needed, for the project, and in compliance with all USFWS policies related to drone use.

Research activities allowed under this determination must not result in long-term, negative alterations to wildlife behavior (e.g. result in wildlife leaving previously occupied areas for long periods; modifying their habitat use; or causing nest or young abandonment). Research-associated activities that would generally not be allowed include, but are not limited to, those that would result in widespread or long-term effects of soil compaction or erosion, significant negative impacts to plant or animal populations, degradation of water quality, cause public health or safety concerns, or result in conflicts with other compatible refuge uses.

Support of research directly related to Refuge goals and objectives may take the form of funding, in-kind services such as housing or use of other facilities, vehicles, boats or equipment, direct staff assistance with the project in the form of data collection, provision of historical records, conducting of management treatments, or other assistance as appropriate.

Research conducted by non-USFWS personnel is not a priority public use under the National Wildlife Refuge System (NWRS) Administration Act of 1997. However, research on the Refuge can provide information to help meet refuge purposes and goals, as well as support the NWRS mission and priority public uses such as hunting and fishing. Additionally, two provisions of the National Wildlife Refuge System Improvement Act of 1997 that supports research are to “maintain biological integrity, diversity, and environmental health” and to conduct “inventory and monitoring.”

(b) **Where would the use be conducted?** The Refuge is comprised of over 145,188 acres encompassing the northern limit of the greater Everglades ecosystem. The Refuge is completely enclosed by a system of levees and canals that extend over 58 miles. A majority of the Refuge is managed under a license agreement with the state of Florida that makes up 141,374 acres known as “the Refuge Interior”. The USFWS owns an estimated 3,815 acres in fee title on the east side and adjacent to the Refuge interior. Natural communities found at the Refuge are characteristic of wetland habitats and include wet prairie, slough, sawgrass marsh, tree islands, and cypress swamp. The Refuge provides important roosting, foraging, and nesting habitats for many birds,
mammals, reptiles, and amphibians. In addition to the various migratory birds and other wildlife commonly found in wetland habitats, keystone species that inhabit the Refuge include alligators, white-tailed deer, bobcats, wading birds, waterfowl, and secretive marsh birds. Threatened or endangered species that regularly utilize the Refuge include the Everglades snail kites and wood storks. Common temperate fresh water fish that occur regularly on the Refuge include mosquitofish, topminnow, largemouth bass, gar, and bowfin.

Research locations will vary depending on the individual research project that is proposed. A specific research project is usually limited to a particular location, habitat type, plant, or wildlife species. Scientific research activities may potentially occur in all areas and habitats on the Refuge. Access may be allowed within all areas owned and/or managed by the USFWS as part of the Refuge, including any lands acquired in the future pursuant to modified comprehensive conservation plans. Locations will be limited to those areas of the Refuge that are necessary to conduct the research project. The Refuge may limit areas and restrict times available to research, as necessary, to ensure the protection of trust resources or reduce conflict with other compatible refuge uses. Access around sensitive resources (ex. wading bird colonies, snail kite nests, turtle nests) and research sites will be granted only to those researchers directly involved with those resources or projects and only for the purposes of approved research. Appropriate access points to study locations may be identified by Refuge staff.

(c) **When would the use be conducted?** The timing of the research will depend entirely on the approved design of individual research projects. Scientific research will be allowed to occur on the Refuge throughout the year. An individual research project could be short-term in design, requiring only one or two visits over the course of a few days, or be a multiple year study that may require regular visits to the study site(s). Visits will be coordinated with Refuge staff to minimize conflicts with other user groups and to maintain safety during hunt seasons or dry down conditions when access becomes increasingly hazardous.

(d) **How would the use be conducted?** The objectives, methods, and approach of each research project will be carefully scrutinized by USFWS biology staff and/or the Refuge Manager before it will be allowed on the Refuge. A Research and Monitoring Special Use Permit (SUP) application is required from parties interested in conducting research on the Refuge. Research applicants would outline the potential impacts their study may have on Refuge habitats and/or wildlife, including disturbance (short- and long-term), injury, or mortality. If the proposed research methods would impact or potentially impact Refuge resources (habitat and/or wildlife), it must be demonstrated that the research is necessary or directly contributes to Refuge goals or management questions, and the researcher must identify the issues in advance of the impact. Potential impacts would be explained by the applicant and reviewed by Refuge staff. Mitigation measures to minimize potential impacts would be developed. Staff may determine that previously approved research SUPs be terminated due to impacts. Each request will be considered independently and if approved will be issued a SUP by the Refuge Manager that includes the stipulations in this determination. The Refuge Manager will use their best sound, professional judgment and ensure that the request will not materially interfere with or detract from the fulfillment of the NWRS mission or the purpose(s) of the Refuge. The following are some of the things that would be considered in the determination of whether to issue a SUP:
The methods of the research will depend entirely on the individual research project that is conducted. In addition to walking and hiking, other modes of transportation for access will vary. It is often necessary to access remote parts of the Refuge via airboat, motor boat, ATV/Utility task vehicle (UTV), argo, hydratrek, fixed-wing aircraft, or helicopter. Other modes for access may be approved on a case-by-case basis. A vast amount of acreage at Refuge is inaccessible via established roads that can be traveled using commonly used means. The use of UAS may be authorized for research projects when in compliance of FAA and USFWS regulations and with stipulations included in the SUP. Use of UAS will be also conducted according to the USFWS 603 FW 1 (Appropriate Use), 50 CFR 27.34 (Harassment of Wildlife) and other applicable laws, regulations and policies. Access around sensitive resources (e.g. wading bird colonies, bald eagle nest sites, snail kite nests) and research sites will be granted only to those researchers directly involved with those resources or projects and have obtained required permits.

Research proposals that raise concern for any of the following criteria are less likely to be approved for a SUP:

- Cause negative impacts to water, soils, native fish, wildlife, and habitats or cultural, archaeological, or historical resources beyond acceptable levels of impact.
- Detract from fulfilling the Refuge’s purposes or conflicts with Refuge goals and objectives.
- Raise public health or safety concerns.
- Conflict with other compatible Refuge uses.
- Are unmanageable within the Refuge’s available staff or budget time.
- Deviate from the approved study proposal such that impacts to Refuge resources are more severe or extensive than originally anticipated.
- SUP holder fails to follow Special Conditions, or observe and obey laws and regulations.
- Are not conducive to or interfere with other Refuge management activities.

Projects with unknown, unacceptable, or negative impacts will either be denied or have modifications suggested to achieve compatibility or acceptable levels of impact as determined by the Refuge Manager. A project may also be terminated if evidence suggests any of the above circumstances exist after commencement of the project. If the Refuge Manager decides to deny, modify, or halt a specific research project, the Refuge Manager will explain the rationale and conclusions supporting their decision in writing.
(e) **Why is this use being proposed?** Scientific research activities are existing uses on the Refuge and require re-evaluation every 10 years. Although scientific research conducted by non-USFWS personnel is not identified as a priority public use, the information provided is inherently valuable to the USFWS in benefiting Refuge resources and facilitating informed, science-driven management decisions. Allowing scientific research facilitates success of critical projects that may not be realized otherwise, thereby providing more scientific information available to the USFWS to aid in managing and conserving Refuge resources. Furthermore, the USFWS’s Research and Management Studies (4 RM 6) and Appropriate Refuge Uses (603 FW1.10D(4)) policies indicate priority for scientific investigatory studies that contribute to the enhancement, protection, use, preservation, and management of native wildlife populations and their habitat as well as their natural diversity. Projects that contribute to Refuge-specific needs for resource and/or management goals and objectives, where applicable, would be given a higher priority over other requests. The Refuge also considers research for other purposes, which may not be directly related to Refuge-specific objectives, but contribute to the broader enhancement, protection, use, preservation and management of native populations of fish, wildlife and plants, and their natural diversity within the system, region, or flyway. These proposals must comply with the Service’s compatibility policy.

The latest research, utilizing new techniques such as UAS and biocontrols, has the potential to provide greater advantages than previous methods in being more economical, less impacting to wildlife, less obtrusive, safer, and more efficient.

**Availability of Resources:**

*Resources involved in the administration and management of the use* – The resources necessary to provide and administer this use are available within current and anticipated budgets. Refuge staff responsibilities for projects by non-Service entities will primarily be limited to the following: review of proposals, preparation of SUPs and other compliance documents (e.g., Section 7 of the Endangered Species Act of 1973, Section 106 of the National Historic Preservation Act), and monitoring of project implementation to ensure that impacts and conflicts remain within acceptable levels (compatible) over time. In some cases, a research project may only require one day or less of staff time to write a SUP. In other cases, a research project may take many weeks, as the Refuge staff must coordinate with students and advisors and accompany some researchers’ onsite visits. Additional administrative, logistical, and operational support, including transport, may also be provided depending on each specific request and benefit to the Refuge. These responsibilities are accounted for in budget and staffing plans. Administration and monitoring of SUPs associated with this use consists of roughly 30 staff days or less than 15 percent of staff time, which costs approximately $9,000 annually. This cost is miniscule compared to the time and cost it would require for research that directs management activities to be done by USFWS staff.

*Special equipment, facilities, or improvements necessary to support the use* – None. Equipment required for research may be approved in the SUP at the cost of the researcher(s).

*Maintenance costs* – None.

*Monitoring costs* – Existing Refuge staff monitors permittee activities and their effects on the Refuge during the normal course of their duties. Additional monitoring may be required to
ensure compliance with SUP stipulations and is estimated at 5 staff days or less than 2% of staff time.

Offsetting revenue – None. The Refuge does not anticipate charging fees for this use.

**Anticipated Impacts of the Use:**

Similar to impacts from recreational use, disturbance to wildlife, vegetation, water, soils, or cultural resources could occur while researchers are accessing study sites or while they are engaged in their project. Potential impacts include:

- Introducing or spreading seeds or spores of exotic invasive vegetation (McNeely 2001).
- Soil compaction, soil erosion, and changes in hydrology from hiking on and off trail (Kuss 1986, Roovers et al. 2004).

Impacts would be project- and site-specific, where they will vary depending upon nature and scope of the fieldwork. Data collection techniques will generally have minimal animal mortality or disturbance, habitat destruction, no introduction of contaminants, or no introduction of non-indigenous species. In contrast, projects involving the collection of biotic samples (plants or animals) or requiring intensive ground-based data or sample collection will have short-term impacts.

Impacts may also occur from infrastructure necessary to support a projects (e.g., permanent transects or plot markers, enclosure devices, monitoring equipment, solar panels to power unattended monitoring equipment). Some level of disturbance is expected with these projects, especially if investigator(s) enter areas closed to the public and collect samples or handle wildlife. However, wildlife disturbance (including altered behavior) will usually be localized and temporary in nature. Where long-term or cumulative unacceptable effects cannot be avoided, the project will not be found compatible and no permit will be issued. Project proposals will be reviewed by Refuge staff and others, as needed, to assess the potential impacts (short, long-term, and cumulative) relative to benefits of the investigation into Refuge management issues and understanding of natural systems.

Investigator(s) obtaining required State and Federal collecting permits will also ensure minimal impacts to fish, wildlife, plants, and their habitats. A Section 7 consultation under the Endangered Species Act (16 U.S.C. 1531-1544, 87 Stat. 884, as amended Public Law 93-205) will be required for activities that may affect a federally listed species and/or critical habitat.

The investigator(s) must identify methods estratégies in advance that will minimize or eliminate the potential impact(s) and conflict(s). If unacceptable impacts cannot be avoided, then the project will be deemed incompatible and will not be approved. Projects that represent public or private economic use of the natural resources of any national wildlife refuge (e.g., bioprospecting), in accordance with 16 U.S.C. 715s, must contribute to the achievement of the national wildlife refuge purposes or the National Wildlife Refuge System mission to be
compatible (50 C.F.R. 29.1).

Spread of invasive plants and/or pathogens is possible from ground disturbance and/or transportation of project equipment and personnel. The probability of this will be minimized or eliminated through SUP stipulations requiring proper cleaning of investigator equipment and clothing as well as quarantine methods, where necessary.

Scientific research activities are expected to have negligible adverse cumulative impacts. On any given year, the Refuge may have approximately 20 on-going research projects and receives less than five new project requests annually. Research activities are generally limited by seasons (i.e. wet, dry, nesting) and visits on the Refuge are largely not consecutive which provides wildlife and habitat long periods for recovery and respite.

Determination (check one below):

______ Use is Compatible

√ Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility: Each request must comply with Special Conditions attached to the SUP to ensure compatibility. At minimum, the following standard SUP Special Conditions will be included. Additional stipulations relevant to the project can and will be identified for each individual request in the SUP. The Refuge will modify or eliminate any use that results in unacceptable impacts. Annual or other short-term SUPs are preferred; however, permits may be issued for longer terms (up to five years), if needed, to allow completion of the project. All SUPs will have a definite termination date in accordance with 5 RM 17.11. Renewals will be subject to Refuge Manager review and approval based on timely submission of and content in progress reports, compliance with SUP stipulations, and required permits.

Minimum Special Conditions for SUPs

- All Refuge regulations apply unless otherwise stated.
- Projects will adhere to scientifically defensible protocols for data collection, where available and applicable.
- Permittee may not conduct any activity not related to the purposes for which this permit was issued while on the Refuge.
- Permittee must notify Refuge headquarters at least 24 hours in advance of each daytime entry and shall observe posted public entry hours unless otherwise allowed. Nighttime entry requires 72 hours advance notification.
- Permittee and designated sub-permittees shall keep a copy of this permit with him/her while on the Refuge and engaging in activities authorized by this permit. A copy of the fully signed SUP shall be placed on the vehicle dashboard when onsite.
- Refuge staff may accompany the permittee or investigator(s) in the field at any time.
- The permittee must: inform the Refuge regarding what equipment/supplies/chemicals will be brought onto the Refuge; be responsible for safe storage, transport, and removal of all materials brought onto the Refuge; obtain permission to temporarily store any materials or leave any equipment (traps, gauges, poles, supplies, etc.) onsite and/or in the Refuge Interior; and must adhere to further Refuge guidance regarding resources brought onto the Refuge.
• Sampling equipment as well as investigators’ clothing and vehicles (e.g., ATV, boats) will be thoroughly cleaned (free of dirt and plant material) before being allowed for use on Refuge lands to prevent the introduction and/or spread of pests.
• Upon completion of the project or annually, all equipment and markers (unless required for long-term projects), must be removed and sites must be restored to the Refuge Manager’s satisfaction. Conditions for clean-up and removal of equipment and physical markers will be stipulated in the SUP(s).
• Progress reports are required at least annually for multiple-year projects. The minimum required elements for a progress report will be provided to investigator(s).
• A Project Abstract (summary) shall be submitted at the completion of each calendar year's-worth of data collection. Details will be provided in the SUP.
• The NWRS, specific Refuge, names of Refuge staff and other USFWS personnel that supported or contributed to the project will be appropriately cited and acknowledged in all written and oral presentations resulting from projects on Refuge lands.
• The Refuge will be provided with copies of any final reports, publications, or manuscripts resulting from a Refuge project in electronic form.
• Any changes to the protocol or personnel shall be submitted for approval by the Refuge 30 days prior to change; otherwise, the SUP is voided.
• Renewals shall be requested in writing at least three weeks in advance of the end of the SUP.
• If unacceptable impacts to natural resources or if conflicts arise or are documented by Refuge staff, then the Refuge Manager can suspend, modify conditions of, or terminate an on-going project already permitted by SUP(s) on a Refuge(s).
• All federal and state collection permits shall be current and a copy shall be submitted to the Refuge.
• All vehicles must be clearly identified as official research vehicles.

Additional Special Conditions for Boat or Airboat Use
• All access shall be coordinated with Refuge staff within these time restrictions; Airboat/boat access- 24 hours; Night access- 72 hours.
• A float plan must be filed at the Refuge administration building prior to conducting activities in the Refuge Interior. Nighttime access to the Refuge Interior will require a float plan filed with the Refuge contact as well as a paper copy displayed in the dashboard of the vehicle.
• Airboats must be driven by properly trained individuals. Evidence of training must be provided upon request.
• Permittee will make every effort to minimize airboat impacts by staying on existing trails, traveling in more open water areas, and avoiding driving through dense vegetation whenever practical.
• Airboats must fly an orange flag that extends 10 feet from the marsh surface and is at least 10 x 12 inches.
• All state, federal, and Coast Guard boating regulations must be obeyed.
• Collection activities should be planned to minimize the number of trips necessary to complete the tasks outlined in the project proposal.

Additional Special Conditions for Specimen Collection
• The permittee may use specimens collected under this permit, any components of any specimens (including natural organisms, enzymes, genetic materials or seeds), and research results derived from collected specimens for scientific or educational purposes
only, and not for commercial purposes unless the permittee and USFWS have entered into a Cooperative Research and Development Agreement (CRADA). We prohibit the sale of collected research specimens or transfers to third parties for commercial purposes. Breach of any of the terms of this permit will be grounds for revocation of this permit and denial of future permits. Furthermore, if the permittee sells or otherwise transfers for commercial purposes collected specimens, any components thereof, or any products or research results developed from such specimens or their components without a CRADA, the permittee will pay USFWS a royalty rate of 20 percent of gross revenue from such sales. In addition to such royalty, we may seek other damages and injunctive relief against you.

Additional Special Conditions for Air Access
• All SUP holders who use aircraft to access the Refuge must provide, at least 48 hours in advance of the flight:
  o Type of aircraft and identification number
  o Name and contact information for the researchers
  o Name and phone number of the aircraft company or contractor
  o Expected flight elevation, duration of flight, time of flight, and date of flight
  o A map (or coordinates) of where the aircraft will be flying
• All pilots will use AM frequency 123.025 to announce when entering and exiting the Refuge.
• Refuge aviation operations may take precedence over other non-Refuge operations if airspace or other conflicts arise.

Additional Special Conditions for UAS – the below conditions may be altered as new policies and directives are approved:
• To minimize disturbance to plants, wildlife, and habitats, all activities will be coordinated with the Senior Wildlife Biologist (or designee) or Refuge Manager. Specifically, the permittee(s) shall have a plan describing what they will be doing and how they plan to do it before they initiate the proposed study or research.
• UAS activities by researchers may not occur within one-half mile of the Visitor Center, Refuge housing, any inhabited dwelling adjacent to the Refuge, boardwalk trails, marsh trail, observation tower or blind, and canoe trail without specific consent of the Refuge Manager.
• No threatened or endangered species may be monitored without appropriate federal or state permits and specific consent of the Refuge Manager.
• Copies of the following documents are required at a minimum of 36 hours in advance of the first UAS flight:
  d) Pictures and specs of the specific UAS platform employed.
  e) A copy of the Federal Aviation Administration (FAA)-approved Certificate of Authorization (COA), Section 333 Exemption, or Remote Pilot Certification.
  f) Aviation Risk Management or a Project Aviation Safety Plan document.
• UAS operators are responsible for meeting and following the minimum FAA rules and requirements in accordance with their certification: (a) keep the aircraft in sight (visual line-of-sight); (b) fly under 400 feet; (c) fly during daytime only; (d) fly at or below 100 mph; (e) yield right of way to manned aircraft; (f) do NOT fly over people, and (g) do NOT fly from a moving vehicle. Additional or varying stipulations may apply per the specific certification being used. These regulations are subject to change and permittees are responsible for keeping apprised of regulation changes.
• Service personnel may be present for any UAS mission conducted on the Refuge.
• UAS operators shall report any wildlife disturbance to Refuge personnel and provide a narrative (similar to a “white paper”), photo or video (captured during the flight) within 3 days after completion of the UAS flight.
  a) If there are any sensitive species in the area when performing any authorized activity, the activity shall cease until the animal(s) depart the area, except as permitted for specific management of that species.
  b) During descent, the UAS operator will ensure that no sensitive species are in the retrieval area.
  c) Interactions with birds and other wildlife will be closely monitored; should significant interactions occur, operations will be halted.
  d) Wildlife impacts will be assessed and analyzed on site and protocols modified accordingly.
  e) In the event of a bird strike, the UAS should immediately return to its ground control station to remove the threat of disturbance and assess damage to the aircraft. The permittee must immediately notify Refuge staff in the event the UAS strikes any animal.
• In the instance of a crash, the UAS operator is responsible for reporting it per FAA policy and shall provide copies of any documentation to the Refuge.
• Additional special conditions shall be stipulated in the SUP as needed to further minimize impacts. If adverse impacts to Refuge resources associated with UAS activities are identified in future years, modifications to that part of the program will be implemented immediately to minimize future impacts.
• All current or future Refuge specific rules and regulations apply to the proposed use.

Justification: Use of the Refuge to conduct scientific research will generally provide information that would benefit fish, wildlife, plants, and their habitats. Scientific findings gained through these projects provide important information regarding life-history needs of species and species groups as well as identify or refine management actions to achieve resource management objectives in Refuge management plans. Reducing uncertainty regarding wildlife and habitat responses to Refuge management actions in order to achieve desired outcomes reflected in resource management objectives is essential for adaptive management in accordance with 522 DM 1. Scientific research on the Refuge is inherently valuable to the USFWS because it will expand scientific information available for resource management decisions. Additionally, only projects that contribute (directly or indirectly) to the enhancement, protection, use, preservation, and management of wildlife populations and their habitats will be authorized. Permitting scientific research by non-USFWS personnel facilitates success of critical projects that may not be realized otherwise, thereby providing more scientific information available to the USFWS to aid in managing and conserving Refuge resources. By allowing the use to occur under the stipulations described above, it is anticipated that wildlife species which could be disturbed during the use would find sufficient food resources and resting places so their abundance and use will not be measurably lessened on the Refuge. Furthermore, it is anticipated that monitoring, as needed, will prevent unacceptable or irreversible impacts to fish, wildlife, plants, and their habitats. As a result, these projects will not materially interfere with or detract from fulfilling Refuge purpose(s); contributing to the Mission of the NWRS; and maintaining the biological integrity, diversity, and environmental health of the Refuge. This determination is based on best sound professional judgement.
To assist with the decision on NEPA compliance, please place a √ in the appropriate space:

√ Categorical Exclusion without Environmental Action Statement

___ Categorical Exclusion and Environmental Action Statement

___ Environmental Assessment and Finding of No Significant Impact

___ Environmental Impact Statement and Record of Decision

**NEPA Compliance for Refuge Use Decision:** Place a √ in appropriate space.

**Categorical Exclusions:** The use described in this CD can be categorically excluded from further NEPA analysis under the DOI Categorical Exclusions 43 CFR §46.210 (e) and (j), respectively: nondestructive data collection, inventory (including field, aerial, and satellite surveying and mapping), study, research, and monitoring activities; and activities, which are educational, informational, advisory, or consultative to other agencies, public, and private entities, visitors, individuals, or the general public. The use triggers no response to any extraordinary circumstances under 43 CFR §46.215. Scientific research is also excluded by the following USFWS Categorical Exclusions (516 DM 8.5).

- **A(1)** - Changes or amendments to an approved action when such changes have no or minor potential environmental impact.
- **B(1)** - Research, inventory, and information collection activities directly related to the conservation of fish and wildlife resources which involve negligible animal mortality or habitat destruction, no introduction of contaminants, or no introduction of organisms not indigenous to the affected ecosystem.
- **B(8)** - Consultation and technical assistance activities directly related to the conservation of fish and wildlife resources.
- **B(9)** - Minor changes in existing master plans, comprehensive conservation plans, or operations, when no or minor effects are anticipated. Examples could include minor changes in the type and location of compatible public use activities and land management practices.
- **C(1)** - The issuance, denial, suspension, and revocation of permits for activities involving fish, wildlife, or plants regulated under 50 CFR Chapter 1, Subsection B, when such permits cause no or negligible environmental disturbance. These permits involve endangered and threatened species, species listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), marine mammals, exotic birds, migratory birds, eagles, and injurious wildlife.
- **C(3)** - The issuance of special regulations for public use of Service-managed land, which maintain essentially the permitted level of use and do not continue a level of use that has resulted in adverse environmental effects.
- **C(6)** - The denial of special use permit applications, either initially or when permits are reviewed for renewal, when the proposed action is determined not compatible with the purposes of the Refuge system unit.

For further review and NEPA analysis of UAS use in conjunction with scientific research on the Refuge, staff initiated a consultation with the South Florida Ecological Services Field Office. All listed species potentially being studied with the use of UAS were considered in review of various projects and uses for UAS. With the implementation of Best Management Practices, a no effect determination was found to be appropriate and no further consultation was needed under
section 7 of the Endangered Species Act. The above determination can be found as a Note to File Memorandum in the Refuge’s digital files.

References:


Mandatory 10 Year Re-evaluation Date:
APPENDIX E: List of Other Visitor Services Related Documents
Below is a list of related visitor services documents and their locations.

Comprehensive Conservation Plan – (Dated 2000) (In office)
Hunt Plan – (Dated 2012) Management Plan Binder (In office)
Fishing Plan – (Dated 2014) Management Plan Binder (In office)
APPENDIX F: Section 7 Intra-Service Consultation
REGION 4
INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM
[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is need, attach additional sheets, or set up this form to accommodate you responses.]

Originating Person: Rolf E. Olson

Telephone Number: (561) 735-6022   Email: Rolf_Olson@fws.gov

Fax Number: (561) 369-7190

Date: 07/23/18


I. Service Program:
  ___ Ecological Services
  ___ Federal Aid
  ____ Clean Vessel Act
  ____ Coastal Wetlands
  ____ Endangered Species Section 6
  ____ Partners for Fish and Wildlife
  ____ Sport Fish Restoration
  ____ Wildlife Restoration
  ____ Fisheries
  _X_ Refuges/Wildlife

II. State/Agency: Florida, U.S. Fish and Wildlife Service

III. Station Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge (FF04RFLX00)

IV. Description of Proposed Action:
Develop and implement a Visitor Services Plan (VSP) for Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge) (Appendix A; Figure 1). See the VSP and Environmental Assessment (EA) for complete details on proposed actions.

Expansion of public use opportunities are anticipated at designated entrances and access points including the Visitor Center and facilities at Lee Rd, Hillsboro Rd., 20-Mile Bend, the Strazzulla parcel east of the L-40 canal and north of the Cypress Swamp, and the Refuge Interior, west of the L-40 canal.

Activities that are dependent on wildlife, known as the Big 6 priority public uses—fishing, hunting, wildlife photography, wildlife observation, environmental education, and wildlife interpretation are considered appropriate activities on national wildlife refuges under the National Wildlife Refuge Improvement Act of 1997. All proposed public use options (Figure 2) support Big 6 activities and include non-Big 6 activities such as expanding Refuge hours, updating signs, kiosks, and Refuge brochures, restructuring fees, establishing additional access points along perimeter canals, and expanding areas of...
motorized (including airboats) and non-motorized access. Proposed changes to expand wildlife observation opportunities include construction of facilities such as a new photo blind and boardwalks in Strazzulla, constructing new or raising existing observation towers, converting some impoundments to suitable wading bird nesting habitat, and providing concessionaire services such as boat rentals, airboat and tram tours, and food/bait sales. Hunting and fishing opportunities are expanded to include more species (deer, hog, migratory birds, frogs) and methods (gigging, etc.), as well as allow hunting and fishing in additional areas. Additional proposed public use opportunities include the addition of new walking and canoe trails, camping, horseback riding on some levees, the use of airboats in designated areas or for designated uses (e.g., hunting), and allowing small ceremonies or group activities. Regulations and special conditions for all proposed actions are described in detail in the VSP and the associated EA. Maps of proposed uses can be found in the VSP and are included here in Appendix A.

The proposed actions would require resources ranging from additional staff and education programming to construction of facilities such as visitor contact centers, education centers, concessions, observation towers, boardwalks and photo blinds. All public-use options being considered would be implemented consistent with the goals and objectives outlined in the Refuge’s Comprehensive Conservation Plan (USFWS 2000). Once the Draft VSP has been approved, it will update and amend the visitor service program in the 2000 Comprehensive Conservation Plan.

Many proposed uses are not expected to impact Refuge resources except for potentially some small, temporary disturbances during implementation/construction, or minor additional impacts from increased visitation. Proposed changes/additions/expansion of public use opportunities with no, or minor and temporary, expected impacts include restructuring entrance fees, updating education/interpretive materials, and expanding Refuge hours. Other uses such as camping, concessions, construction of facilities, expanded motorized/non-motorized access, and hunting have the potential for more impacts. All uses were carefully considered for benefit to the public and impacts to the resource.

Proposed permitted primitive camping (Figure 3) would be allowed at campsites located at designated points along the L-7 levee and on two platforms constructed on a proposed southern canoe trail. Camping sites on the levees will be mowed, however no facilities or amenities will be available at any camping sites. The proposed new canoe trail would take advantage of existing open water areas and would not require significant habitat manipulation to implement beyond placement of signs marking the route and installation of platforms. Some vegetation maintenance may be required in the future.

Waterfowl and alligator hunting is currently allowed in portions of the Refuge Interior and/or in the canals. Proposed hunting includes new, small-scale lottery hunts for white-tailed deer and incidental take of feral hog as well as expanded opportunity for hunting alligators and waterfowl/migratory birds (Figures 4 - 6). New deer hunts (with incidental hog take) would be implemented throughout the entire Refuge Interior and Strazzulla, as well as specialty deer hunts in Strazzulla and the Cypress Swamp/A Impoundments (Figure 5). Deer and feral hogs may be harvested using archery, crossbows, airguns, or shotguns during all general hunts. Centerfire rifles may be approved for hunting in the Refuge Interior and the specialty hunt in the Cypress Swamp/A impoundments. The proposed waterfowl hunt would include migratory birds (coot, moorhens, snipe, and rails) and be allowed throughout the entire Refuge Interior (Figure 6). Alligator hunts would be expanded to include the motorized zone of the Refuge Interior as well as all perimeter
canals (Figure 4). Other hunting regulations would remain the same. Permits may be increased dependent upon population survey information.

Fishing is currently allowed in some locations on the Refuge, but would be expanded to include the entire Refuge Interior (Figure 7), plus additional methods (fish gigging, bowfishing) and frog gigging are proposed. Other fishing regulations would remain the same.

Proposed expansion of motorized and non-motorized access (Figure 8) would allow non-motorized access for hunting and fishing to all designated areas of the Refuge Interior and fee title lands. The proposed expansion of motorized access includes non-hunting airboating in designated areas of the Refuge Interior and some airboating allowed for hunts throughout the Refuge Interior (Figure 9).

Facilities would be constructed to accommodate proposed concessionaires, which would be located at designated entrances and include motorboat and airboat tours, tram tours, boat rentals, bait and food sales, and other supplies (Figure 10). These services would be supplied by a contractor, with contract management by Refuge staff. All tours and services would be developed with best management practices to limit disturbance to habitats and wildlife. Airboat tours would occur on a designated trail and include an interpretive guide to assist visitors in seeing and hearing wildlife, interpret the surroundings, and educate passengers about the issues associated with the Everglades. Other tours (e.g., on levee or canal to Lee Rd. and Strazzulla) would be developed to minimize any impacts to habitat and wildlife, dependent upon the season and location.

The public use options being proposed would take advantage of existing roads/levees and trails in and around the Refuge, wherever possible. Any new fishing piers, boat launches, access points, etc. would be placed to maximize public access for fishing and boating opportunities while having no anticipated impact to the Refuge’s environment and wildlife. Infrastructure, including facilities (visitor center, education center), trails, boardwalks, and campsites, would be sited only after a detailed site evaluation, with particular attention to the location of trust species nests, vegetation and habitat characteristics, and existing infrastructure and access trails. All construction would use best practices and environmentally sensitive materials.

All public use activities would be excluded from known trust species nesting areas. Public use activity within all units of the Refuge would avoid active nests of snail kite, wood stork, and any other trust species (e.g., Florida scrub jay, gopher tortoise) (species-specific details outlined below). When any such trust species nest is detected, an appropriate buffer would be placed around each nest. If any protected species are actively nesting within the Refuge during planned events, the Refuge would coordinate restrictions and necessary communications with user groups and place signs surrounding the areas at the edges of buffer zones. The Refuge would place “Area Closed” signs delineating levees or within water areas that need to be closed to avoid adverse disturbance effects to snail kite and wood stork nests. Enforcement of restrictions would be performed by Federal Wildlife Officers.

V. Pertinent Species and Habitat:
Arthur R. Marshall Loxahatchee NWR, Palm Beach County, Florida has the following Federally listed species: Snail kite (Rostrhamus sociabilis plumbeus), wood stork (Mycteria americana), eastern indigo snake (Drymarchon corais couperi), Florida scrub jay (Aphelocoma coerulescens), and Gopher tortoise (Gopherus polyphemus). The entire refuge is critical habitat for the Everglades snail kite.
A. Include species/habitat occurrence map: Maps identifying species locations within the project area are available at the South Florida Field Office. Distribution maps are available in the South Florida Multi Species Recovery Plan (USFWS 1999).

The Refuge is comprised of five different habitat types: open sloughs, wet prairies, sawgrass communities, tree islands; and cypress swamp. All the vegetative components found in the Refuge can provide habitat for the snail kite and wood stork. The entire area, however, is not used by either species at all times. Only when water levels, prey base, and vegetative structure are optimal do the snail kite and the wood stork forage or attempt to nest. Both of these species could be found in the Refuge if water levels, prey base, and vegetative structure are optimal.

Strazzulla is located on the eastern side of the Refuge along the L-40 canal and levee. A 2013 Land Assessment completed by the South Florida Water Management District (SFWMD) documented the vegetation communities in Strazzulla as “transition[ing] from cypress in the east to sawgrass marsh in the west and…wet prairie towards the center of the site.” Similarly, the National Wetlands Inventory (USFWS 2014) documents Strazzulla as transitioning from forested/shrub wetland in the east to emergent wetland in the west. Strazzulla is primarily rainfall driven and serves as habitat for wildlife in the region.

B. Complete the following table:

<table>
<thead>
<tr>
<th>SPECIES/Critical Habitat</th>
<th>STATUS1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite (Rostrhamus sociabilis plumbeus)</td>
<td>E, CH</td>
</tr>
<tr>
<td>Wood stork (Mycteria americana)</td>
<td>T</td>
</tr>
<tr>
<td>Eastern indigo snake (Drymarchon corais couperi)</td>
<td>T</td>
</tr>
<tr>
<td>Florida scrub jay (Aphelocoma coerulescens)</td>
<td>T</td>
</tr>
<tr>
<td>Gopher tortoise (Gopherus polyphemus)</td>
<td>C</td>
</tr>
</tbody>
</table>

1STATUS: E=endangered, T=threatened, CH=critical habitat, C=candidate species.

VI. Location (attach map): See Figure 1.

A. Ecoregion Number and Name: Ecoregion 76 (15.41), Southern Florida Coastal Plain

B. County and State: Palm Beach, FL

C. Section, township, and range (or latitude and longitude):
26°29.9’N 80°12.7’W (Headquarters Area)

D. Distance (miles) and direction to nearest town:
10 miles west of Boynton Beach, FL
E. Species/habitat occurrence:
The Refuge is located within the Species Consultation Area for two trust species: Everglade snail kite and Florida scrub jay. Based upon historic information and general distribution information for these species, Refuge staff is aware that listed species may occur within the vicinity of the project area. Pertinent management information is described in Section VII B for each of the listed species.

**Snail Kite**
The Refuge is designated as critical habitat for the snail kite (*Rostrhamus sociabilis plumbeus*). Snail kites forage and sometimes nest in the Refuge Interior and impoundments of the Refuge with a preference for wet prairie and slough habitats. However, snail kites are highly nomadic, and usually are not abundant on the Refuge unless environmental conditions are optimal, including abundant apple snail populations and water levels that maximize forage potential. Snail kites usually are encountered during the winter months as this coincides with the period when water levels are receding from annual maximums within the interior marsh. Breeding in the Everglades, including the Refuge, generally takes place from January to July, although breeding can occur year round (Sykes 1987). Nesting has been documented in the Refuge Interior and C Impoundments located at Headquarters, although not in great numbers. Snail kites do not typically nest in large numbers in the Refuge, but there can be spikes in the number of nests in years when conditions in the rest of the system are not suitable. Habitats found in Strazzulla and other fee title lands are not preferred snail kite nesting habitats, although there is some suitable foraging habitat in the western half of Strazzulla, in particular. Foraging may occur in these areas, but has not been confirmed.

**Wood Stork**
Wood storks (*Mycteria americana*) forage in the Refuge Interior during periods of low water encountered during the Spring recession (April through early-June) leading up to hurricane season, or during extreme droughts as experienced in 2001 and 2011. The time frame for optimal wood stork foraging, breeding, and roosting is even shorter than that observed with the snail kite. Wood storks are extremely susceptible to water level fluctuations and generally disperse with the onset of summer rains (late-May or early-June). Historically, before the Everglades ecosystem was modified for water management purposes, wood storks began to nest as early as November. However, wood storks currently nest from February to May due to habitat and hydrologic pattern modifications, which have disrupted the natural synchronization between forage availability and energetic requirements of reproductive birds. As such, even minor fluctuations in water levels can cause wood storks to abandon their nests. Wood storks are known to use the Refuge for foraging but generally not for nesting. The only report of a small number of wood storks nesting in the Refuge Interior between 2005 and 2010 was from SFWMD in 2009. Some foraging may occur in fee title lands, such as Strazzulla, but has not been documented.

**Eastern Indigo Snake**
In south Florida, eastern indigo snakes (*Drymarchon corais couperi*) range over large areas and use various habitats throughout the year, with most activity occurring in the summer and fall (Moler 1985a; Smith 1987). Over most of its range, this species frequents habitat types that include tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, and human-altered habitats. Underground refugia used by this species include gopher tortoise burrows, other natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and the crevices of rock-lined ditch
walls (Layne and Steiner 1996). Adult males have larger home ranges than adult females and juveniles (Moler 1985b). At the Archbold Biological Station (ABS) located in central Florida, average home range size for males was determined to be 185 acres and females to be 47 acres (Layne and Steiner 1996). Although the range of this species includes the Refuge Interior and fee title lands, no individuals have been documented, even during regular surveys on some perimeter levees.

**Florida Scrub Jay**
Florida scrub jays (*Aphelocoma coerulescens*) are non-migratory, extremely sedentary, and reside only in oak scrub on fine white, drained sand (Cox 1984). Territory is well defined and defended, particularly during spring nesting. The size of the defended area varies depending on factors including habitat characteristics and family size, averaging about 9 ha (25 ac) (Woolfenden and Fitzpatrick 1984). Scrub jays primarily consume insects, found within the oak foliage or along the bare-sand understory, and acorns, either freshly gathered during late summer and fall or recovered from caches in the sand. Scrub jay seldom are found outside of habitat with up to 50% dense, short (less than 3 m) scrub oak thicket interspersed with scattered areas of open, bare sand; jays avoid forests and marshes (USFWS 1990c). As such, their distribution tends to fall outside the Refuge, nearer to the eastern Florida coast (USFWS 1990c). Although the fee title lands some of the Refuge Interior are within the Florida scrub jay Consultation Area, there are no documented sightings and the scrub jay is not likely to occur there.

**Gopher Tortoise**
The gopher tortoise (*Gopherus polypemus*) is the only tortoise indigenous to the southeastern U.S. (USFWS 1990a). Their preferred upland habitat is generally defined by the following characteristics: (1) well-drained sandy soils for their burrow(s), (2) herbaceous ground cover for food, and (3) generally open canopy for egg incubation. They feed on a range of grasses, grass-like plants, and legumes (Garner and Landers 1981). Gopher tortoises are most active in temperatures ranging from 28 to 31 °C (82 to 88 °F), less active above 32 °C (90 °F), and rarely active below 22 °C (72 °F). Surface activities are centered around the burrow, which have a single entrance and are excavated to a size appropriate for the individual, with adult burrows averaging 4.5 m (15 ft.) in length and 1.8 m (6 ft.) in depth. Females typically select the mound of excavated sand at the burrow entrance for egg incubation. Size of the home range is related both to forage availability and breeding forays, with the average colony typically using 4 ha (10 ac) or less (USFWS 1990a). McRae et al. (1981) observed movement to follow a nearly circular pattern around the burrow, which indicates that a 4 ha range generally falls within a 113 m (370 ft.) radius of the home burrow. Refuge soils are typically too wet and too organic for gopher tortoise burrows and no observations of this species or its burrow has been reported.

**Overall Determination**
It is not anticipated that the expanded public use opportunities proposed in the VSP will cause significant adverse impacts to or affect designated critical habitat of any threatened and endangered species. In addition, when appropriate, the Refuge will use conservation guidelines (below) for the snail kite, wood stork, eastern indigo snake, Florida scrub jay, and gopher tortoise, and any future consultation under Section 7 of the Endangered Species Act for activities or projects that may be proposed for the Refuge.
**VII. Determination of Effects:**

**A. Effects of the action on species and critical habitats in item V. B, (attach additional pages as needed):**

<table>
<thead>
<tr>
<th>SPECIES/CRITICAL HABITAT</th>
<th>IMPACTS TO SPECIES/CRITICAL HABITAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>“Not likely to adversely affect”</td>
</tr>
<tr>
<td></td>
<td>Direct impacts such as collision, to snail kites are unlikely, however indirect impacts such as disturbance from increased activity resulting from proposed expansion of public use opportunities are more likely. Snail kites are not easily disturbed by human presence or airboats at distances greater than 49 m (161 ft.; Rodgers and Schwikert 2003), although those that nest near airboat trails are frequently flushed from their nest. However, snail kites can have heightened sensitivity to disturbance during early stages of nesting (see Steenhof and Kochert 1982, Steenhof 1987, Bennetts and Kitchens 1997). Some limited and temporary disturbance or degradation of foraging habitat due to increased activity levels (e.g., hunting, fishing, airboating, canoeing) in areas that were previously closed to the public may occur.</td>
</tr>
<tr>
<td>Wood stork</td>
<td>“Not likely to adversely affect”</td>
</tr>
<tr>
<td></td>
<td>Wood storks are more sensitive to disturbance than other wading birds and exhibit a greater flushing distance when foraging than when nesting (Rodgers and Smith 1995 and 1997). Although wood storks do not typically nest in the Refuge (SFWMD), some foraging does occur. As a result, some disturbance could occur from increased visitation resulting from expanded public use opportunities. Some limited and temporary disturbance or degradation of foraging habitat due to increased activity levels (e.g., hunting, fishing, airboating, canoeing) in areas that were previously closed to the public may occur.</td>
</tr>
</tbody>
</table>
Eastern indigo snake | “No affect”  
Although the range of this species includes the Refuge, no individuals have been documented, even during regular surveys on some perimeter levees.

Florida scrub jay | “No affect”  
Although the range of this species includes the Refuge, no individuals have been documented. The long hydroperiod, Cypress Swamp/wetland marsh habitat of the Refuge is not the pine upland habitat preferred by this species.

Gopher tortoise | “No affect”  
Although the range of this species includes the Refuge, no individuals have been documented. The long hydroperiod, Cypress Swamp/wetland marsh habitat of the Refuge is not the upland habitat preferred by this species.

<table>
<thead>
<tr>
<th>SPECIES/CRITICAL HABITAT</th>
<th>ACTIONS TO MINIMIZE ADVERSE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>A 500 m (1,640 ft.) no-entry zone and other closures, as needed, will be enacted in areas being actively used by snail kites to protect nests and foraging habitats. These areas will be identified through coordination with the Service’s snail kite recovery lead (South Florida Ecological Services Office, 772-562-3909) and marked by Refuge biology staff. Implement: Snail kite Recovery Plan (USFWS 1999)</td>
</tr>
<tr>
<td>Wood stork</td>
<td>A 150 m (492 ft.) no-entry zone will be enacted in areas being actively used by wood storks. Known areas will be identified by Refuge biology staff and individual/groups of birds will be avoided when encountered. Implement: Habitat Management Guidelines for the Wood Stork in the Southeastern Region (USFWS 1990b)</td>
</tr>
<tr>
<td>Eastern indigo snake</td>
<td>Will avoid ring and fast moving fires that could potentially kill indigo snakes. Implement: Standard Protection Measures for the Eastern Indigo Snake (USFWS 2013)</td>
</tr>
<tr>
<td>Florida scrub jay</td>
<td>A 150 m (492 ft.) no-entry zone will be enacted around each identified Florida scrub jay nest. These areas will be identified by Refuge biology staff. Implement: Recovery Plan for the Florida Scrub Jay (USFWS 1990c)</td>
</tr>
</tbody>
</table>
A 150 m (492 ft.) no-entry zone will be enacted around each identified gopher tortoise burrow. These areas will be identified by Refuge biology staff. Implement: *Gopher Tortoise Recovery Plan* (USFWS 1990a)

Public Use activities will be managed to avoid active nests of snail kite, wood stork, and any other trust species (e.g., Florida scrub jay, gopher tortoise). When a nest is detected, a 500-meter (1,640 ft.) no-entry buffer zone will be placed around each snail kite nest and a 150-meter no-entry (492 ft.) buffer zone will be placed around each nest or area of active use of the other species. If snail kites and wood storks are actively nesting within the Refuge during planned recreational events, the Refuge will meet with Service staff prior to the event to discuss any restrictions, area closures, outreach materials, and sign placement. Refuge staff will coordinate restrictions and necessary communications with user groups and the placement of signs surrounding Refuge areas at the edges of buffer zones. The Refuge will place “Area Closed” signs delineating levees or within water areas that need to be closed to avoid adverse disturbance effects to snail kite and wood stork nests. Enforcement of restrictions will be performed by Federal Wildlife Officers.

### VIII. Effect Determination and Response Requested:

<table>
<thead>
<tr>
<th>SPECIES/CRITICAL HABITAT</th>
<th>DETERMINATION</th>
<th>RESPONSE REQUESTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>NE x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Wood stork</td>
<td>NA</td>
<td>concurrence</td>
</tr>
<tr>
<td>Eastern indigo snake</td>
<td>AA x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Florida scrub jay</td>
<td>NE x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Gopher tortoise</td>
<td>NE x</td>
<td>concurrence</td>
</tr>
</tbody>
</table>

1DETERMINATION/RESPONSE REQUESTED:
NE=no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response. Requested is optional but a “Concurrence: is recommended for a complete Administrative Record.

NA= not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a “Concurrence”.

AA= likely to adversely affect. This determination is appropriate when the proposed caution is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is “Formal Consultation”. Response Requested for proposed or candidate species is “Conference”.

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IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence _________

B. Formal consultation required_________

C. Conference required_________

D. Informal conference required _________

E. Remarks (attach additional pages as needed):

_________________________        __________________
Signature                           Date

Title

X. Literature Cited:


APPENDIX A

Refer to G. Visitor Services Maps (pg. 25) in the draft VSP for all applicable maps.
Appendix B

Strazzulla Public Use Recreational Opportunities
Environmental Assessment
Approved 2015
APPENDIX B: Section 7 Intra-Service Consultation

REGION 4

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is need, attach additional sheets, or set up this form to accommodate you responses.]

Originating Person: Rolf E. Olson

Telephone Number: (561) 735-6022   Email: Rolf_Olson@fws.gov

Fax Number: (561) 369-7190

Date: 06/18/15

PROJECT NAME: Strazzulla Public Use Recreational Opportunities

I. Service Program:
   ___ Ecological Services
   ___ Federal Aid
      ___ Clean Vessel Act
      ___ Coastal Wetlands
      ___ Endangered Species Section 6
      ___ Partners for Fish and Wildlife
      ___ Sport Fish Restoration
      ___ Wildlife Restoration
      ___ Fisheries
   ___ Refuges/Wildlife

II. State/Agency: Florida, U.S. Fish and Wildlife Service

III. Station Name: Arthur R. Marshall Loxahatchee National Wildlife Refuge
     (FP04RFLX00)

IV. Description of Proposed Action:
   The purpose of this action is to evaluate public use recreational opportunities on the Strazzulla parcel to be managed by the Arthur R. Marshall Loxahatchee National Wildlife Refuge (Refuge). The Strazzulla parcel is a total of 2,586 acres (Figure 1). The Refuge’s current Comprehensive Conservation Plan (USFWS 2000) and associated Environmental Assessment included Strazzulla in its 15-year plan for managing the Refuge. The preferred alternative management plan (referred to as the “Ecosystem Emphasis Alternative 2”) included opening Strazzulla to the public on a limited basis and managing Strazzulla for trust species. Consultation and coordination on this plan included five meetings of the 23-member interagency planning team, a public scoping
meeting, and a period of public review and consideration (USFWS 2000). Future uses for Strazzulla are being considered in relation to the environmental assessment currently being drafted.

Recreational activities that are dependent on wildlife, known as the Big Six priority public uses—fishing, hunting, wildlife photography, wildlife observation, environmental education, and wildlife interpretation—are automatically considered to be appropriate activities on a National Wildlife Refuge. Recreational activity within the Strazzulla parcel will avoid active nests of snail kite, wood stork, and any other trust species (e.g., Florida scrub jay, gopher tortoise). When such a trust species nest is detected, a 500-meter no-entry buffer zone will be placed around each nest site, and a 150-meter no-entry buffer zone will be placed around each nest of other species. If snail kite and wood storks are actively nesting within the Refuge during planned recreational events, the Refuge will coordinate restrictions and necessary communications with user groups and placement of signs surrounding the Refuge areas at the edges of buffer zones. The Refuge will place “Area Closed” signs delineating levees or within water areas that need to be closed to avoid adverse disturbance effects to snail kite and wood stork nests. Enforcement of restrictions will be performed by the Refuge Law Enforcement Officers.

The proposed action, Alternative B in the Environmental Assessment, includes the following public-use options: environmental education, wildlife observation, boardwalks, interpretive trails, photo blinds, and observation towers. In addition, the Refuge would carefully consider a small-scale hunt (white-tailed deer, feral hog), bike riding (on existing trails), canoeing, fishing, and limited camping for youth groups in designated areas. Additional public-use options were considered under Alternative C, including primitive camping for the general public in designated areas and access for horseback riding on existing levees.

**Pertinent Species and Habitat:**

**A. Location Map**

Strazzulla is located on the eastern side of the Refuge along the L-40 canal and levee (Figure 1). A 2013 Land Assessment effort completed by the South Florida Water Management District (SFWMD) documented the vegetation communities in Strazzulla as “transition[ing] from cypress in the east to sawgrass marsh in the west and...wet prairie towards the center of the site.” Similarly, the National Wetlands Inventory (USFWS 2014) documents Strazzulla as transitioning from forested/shrub wetland in the east to emergent wetland in the west (Figure 2). Strazzulla has a direct hydrologic connection to portions of the Refuge’s 400 acre cypress swamp and serves as habitat for wildlife in the region. The United States Fish and Wildlife Service (USFWS) entered an agreement with the SFWMD in May 2015 to acquire Strazzulla. The final agreement will take place sometime between March and June 2016. Acquiring Strazzulla will provide permanent protection for this parcel ensuring the habitat remains available to support Everglades’ wildlife, including threatened and endangered species.
Figure 1. Location of the Strazzulla Marsh tract (orange line), adjacent to the eastern Refuge boundary (green line). [Aerial image from Google Earth (Accessed 06/22/15).]

All public-use options being considered for Strazzulla would be implemented consistent with the goals and objectives outlined in the Refuge’s Comprehensive Conservation Plan (USFWS 2000). All construction will use best practices and environmentally sensitive materials.

Public-use infrastructure, including trails, boardwalks, and campsites, would be sited only after a detailed site reconnaissance, with particular attention to location of trust species nests, vegetation and habitat characteristics, and existing infrastructure and access trails. All public-use activities would be excluded from known trust species nesting areas (species-specific details outlined below).
Figure 2. Vegetation map for Strazzulla (approximate boundary indicated by orange line) from the USFWS National Wetlands Inventory, showing transition from forested/shrub wetland in the east (dark green) to emergent wetland in the west (light green) (USFWS 2014).

The public-use options being proposed will take advantage of existing roads/levees and trails in Strazzulla, wherever possible (e.g., Figure 3 shows proposed horseback riding trail). Hunting would be limited to small-scale lottery hunts for deer and feral hog using archery and crossbow. Camping disturbance would be minimal to moderate, depending on limitations/restrictions on the number of people and locations of primitive campsites designated for use. A proposed fishing pier and canoe launch (Figure 4) would be located in the L-40 canal to maximize public access for fishing and boating opportunities, but would have no impact to Strazzulla’s environment and wildlife.
Figure 3. Potential location of horseback riding trail on an existing levee along the northern border of Strazzulla.

Figure 4. Potential location of fishing pier and canoe launch in northwest corner of Strazzulla.

B. Complete the following table:
<table>
<thead>
<tr>
<th>SPECIES/CRITICAL HABITAT</th>
<th>STATUS¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite (<em>Rostrhamus sociabilis plumbeus</em>)</td>
<td>E, CH</td>
</tr>
<tr>
<td>Wood stork (<em>Mycteria americana</em>)</td>
<td>T</td>
</tr>
<tr>
<td>Eastern indigo snake (<em>Drymarchon corais couperi</em>)</td>
<td>T</td>
</tr>
<tr>
<td>Florida scrub jay (<em>Aphelocoma coerulescens</em>)</td>
<td>T</td>
</tr>
<tr>
<td>Gopher tortoise (<em>Gopherus polyphemus</em>)</td>
<td>C</td>
</tr>
</tbody>
</table>

STATUS: E-endangered, T-threatened, CH-critical habitat, C-candidate species.

VI. Location (attach map): See Figure 1.

A. Ecoregion Number and Name: Ecoregion 76, Southern Florida Coastal Plain

B. County and State: Palm Beach, FL

C. Section, township, and range (or latitude and longitude):
26E30.00N 80E14.00W (Headquarters Area)

D. Distance (miles) and direction to nearest town:
10 miles west of Boynton Beach, FL

E. Species/habitat occurrence:
Strazzulla is located within the Species Consultation Area for two trust species: Everglade snail kite and Florida scrub jay (Figure 5).

**Snail Kite**
The Refuge is designated as critical habitat for the snail kite (*Rostrhamus sociabilis plumbeus*). Snail kites forage and sometimes nest in the interior marsh of the Refuge with a preference for wet prairie and slough habitats. However, snail kites are highly nomadic, and usually are not abundant on the Refuge unless environmental conditions are optimal, including abundant apple snail populations and water levels that maximize forage potential. Snail kites usually are encountered during the winter months (December to March), as this coincides with the period when water levels are the highest within the interior marsh and snail kites can more effectively forage on apple snails. If breeding occurs, it generally takes place from January to March. Snail kites are known to use the area, and foraging and nesting may occur on the Strazzulla Tract.
**Figure 5.** Shows the Species Consultation Areas that overlap the Refuge management boundary.

**Wood Stork**
Wood storks (*Mycteria americana*) forage in the interior marsh during periods of low water encountered during the Spring recession (April through early June) leading up to hurricane season, or during extreme droughts as experienced in 2001 and 2011. The time frame for optimal wood stork foraging, breeding, and roosting is even shorter than that observed with the snail kite. Wood storks are extremely susceptible to water level fluctuations and generally disperse with the onset of summer rains (late May or early June). Historically, before the Everglades ecosystem was modified for water management purposes, wood storks began to
nest as early as November. However, wood storks now nest from February to May due to habitat and hydro pattern modifications, which have disrupted the natural synchronization between forage availability and energetic requirements of reproductive birds. As such, even minor fluctuations in water levels can cause wood storks to abandon their nests. Wood storks are known to use the area, and foraging and nesting may occur in the Strazaulla Tract.

**Eastern Indigo Snake**
In south Florida, eastern indigo snakes (*D. corrals couperi*) range over large areas and use various habitats throughout the year, with most activity occurring in the summer and fall (Moler 1985a; Smith 1987). Over most of its range, this species frequent habitat types that include tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, and human-altered habitats. Underground refugia used by this species include natural ground holes, hollows at the base of trees or shrubs, ground litter, trash piles, and the crevices of rock-lined ditch walls (Layne and Steiner 1996). Adult males have larger home ranges than adult females and juveniles (Moler 1985b). At the Archbold Biological Station (ABS) located in central Florida, average home range size for males was determined to be 183 acres and females to be 47 acres (Layne and Steiner 1996). The presence of eastern indigo snake may occur on the Strazaulla Tract, but such observation has not been documented to date.

**Florida Scrub Jay**
Florida scrub jays (*A. coeruleus*) are non-migratory, extremely sedentary, and reside only in oak scrub on fine white, drained sand (Cox 1984). Scrub jays primarily consume insects, found within the oak foliage or along the bare-sand understory, and acorns, either freshly gathered during late summer and fall or recovered from caches in the sand. Scrub jays are found outside of habitat with up to 50% of their diet consisting of oak thicket interspersed with scattered areas of open, bare sand; jays avoid forests and marshes (USFWS 1990c). As such, their distribution tended to fall outside Strazaulla, nearer to the eastern Florida coast (USFWS 1990c). Territory is well defined and defended, particularly during spring nesting, with area that varies depending on factors including habitat characteristics and family size, averaging about 9 ha (25 ac) (Woolfenden and Fitzpatrick 1984). Although Strazaulla Marsh falls with the Florida scrub jay Consultation Area (Figure 5), there are no documented sightings and the scrub jay is not likely to occur on the Strazaulla Tract.

**Gopher Tortoise**
The gopher tortoise (*G. polyphemus*) is the only tortoise indigenous to the southeastern U.S. (USFWS 1990a). Their habitat is generally defined by the following characteristics: (1) well-drained sandy soils for their burrow(s), (2) herbaceous ground cover for food, and (3) generally open canopy for egg incubation. They feed on a range of grasses, grass-like plants, and legumes (Garner and Landers 1981). Gopher tortoises are most active in temperatures ranging from 28 to 31 °C (82 to 88 °F), less active above 32 °C (90 °F), and rarely active below 22 °C (72 °F). Surface activities are centered around the burrow, which have a single entrance and are excavated to a size appropriate for the individual, with adult burrows averaging 4.5 m (15 ft) length and 1.8 m (6 ft) depth. Females typically select the mound of excavated sand at the burrow entrance for egg incubation. Size of the home range is related both to forage availability and breeding forays, with the average colony typically using 4 ha.
(10 ac) or less (USFWS 1990a). McRae et al. (1981) observed movement to follow a nearly circular pattern around the burrow, which indicates that a 4-ha range generally falls within a 113 m (370 ft.) radius of the home burrow. The presence of gopher tortoise may occur on the Strazzulla Tract, but such observation has not been documented to date.

**Overall Determination**

It is not anticipated that public use opportunities and management of the Strazzulla Tract will cause adverse impacts to or affect designated critical habitat of any threatened and endangered species. In addition, when appropriate, the Refuge will use conservation guidelines (below) for the snail kite, wood stork, Eastern indigo snake, Florida scrub jay, and gopher tortoise, and any future consultation under Section 7 of the Endangered Species Act for activities or projects that may be proposed for the Strazzulla Tract.

VII. Determination of Effects:

A. Effects of the action on species and critical habitats in item V. B, (attach additional pages as needed):

<table>
<thead>
<tr>
<th>SPECIES/ CRITICAL HABITAT</th>
<th>IMPACTS TO SPECIES/Critical HABITAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>“May affect, not likely to adversely affect”</td>
</tr>
<tr>
<td>Wood stork</td>
<td>“May affect, not likely to adversely affect”</td>
</tr>
<tr>
<td>Eastern indigo snake</td>
<td>“May affect, not likely to adversely affect”</td>
</tr>
<tr>
<td>Florida scrub jay</td>
<td>“May affect, not likely to adversely affect”</td>
</tr>
<tr>
<td>Gopher tortoise</td>
<td>“May affect, not likely to adversely affect”</td>
</tr>
</tbody>
</table>

B. Actions to be implemented to reduce adverse effects:

<table>
<thead>
<tr>
<th>SPECIES/ CRITICAL HABITAT</th>
<th>ACTIONS TO MINIMIZE ADVERSE EFFECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>A 500 meter no-entry zone and other closures, as needed, will be enacted in areas being actively used by snail kites. These areas will be identified through coordination with the Service’s snail kite recovery lead (South Florida Ecological Services Office, 772 562-3909) and marked by Refuge biology staff.</td>
</tr>
<tr>
<td>Wood stork</td>
<td>A 150 meter no-entry zone will be enacted in areas being actively used by wood storks. These areas will be identified by Refuge biology staff. Implement: <em>Habitat Management Guidelines for the Wood Stork in the Southeastern Region</em> (USFWS 1990b)</td>
</tr>
<tr>
<td>Florida scrub jay</td>
<td>A 150 meter no-entry zone will be enacted around each identified Florida scrub jay nest. These areas will be identified by Refuge biology staff. Implement: <em>Recovery Plan for the Florida Scrub Jay</em> (USFWS 1990c)</td>
</tr>
<tr>
<td>Gopher tortoise</td>
<td>A 150 meter no-entry zone will be enacted around each identified gopher tortoise burrow. These areas will be identified by Refuge biology staff. Implement: <em>Gopher Tortoise Recovery Plan</em> (USFWS 1990a)</td>
</tr>
</tbody>
</table>

Recreational activity within the Strazzulla will avoid active nests of snail kite, wood stork, and any other trust species (e.g., Florida scrub jay, gopher tortoise). When a nest is detected, a 500-meter no-entry buffer zone will be placed around each snail kite nest and a 150-meter no-entry buffer zone will be placed around each nest of each of the other species. If snail kites and wood storks are actively nesting within the Refuge during planned recreational events, the Refuge will meet with Service staff prior to the event to discuss any restrictions, area closures, outreach materials, and sign placement within the Refuge. Refuge staff will coordinate restrictions and necessary communications with user groups and the placement of signs surrounding Refuge areas at the edges of buffer zones. The Refuge will place “Area Closed” signs delineating levees or within water areas that need to be closed to avoid adverse disturbance effects to snail kite and wood stork nests. Enforcement of restrictions will be performed by the Refuge Law Enforcement Officers.

VIII. **Effect Determination and Response Requested:**

<table>
<thead>
<tr>
<th>SPECIES/CRITICAL HABITAT</th>
<th>DETERMINATION</th>
<th>RESPONSE REQUESTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snail kite</td>
<td>x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Wood stork</td>
<td>x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Eastern indigo snake</td>
<td>x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Florida scrub jay</td>
<td>x</td>
<td>concurrence</td>
</tr>
<tr>
<td>Gopher tortoise</td>
<td>x</td>
<td>concurrence</td>
</tr>
</tbody>
</table>
DETERMINATION RESPONSE REQUESTED:

NE = no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response: Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA = not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA = likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence [X]
B. Formal consultation required
C. Conference required
D. Informal conference required
E. Remarks (attach additional pages as needed):

Signature
Date

Title

[Signature]
Date

Title
### APPENDIX G: National Visitor Services’ Standards

Table 6. National Visitor Services standards from USFWS Policy 605FW1 and 610FW2

<table>
<thead>
<tr>
<th>National Visitor Services Standards</th>
<th>Policy Directives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STANDARD 1.</strong> Develop a Visitor Services Plan</td>
<td>Refuge Managers will develop a VSP that addresses all compatible wildlife-dependent recreational uses on their refuge. Managers should familiarize themselves with the Visitor Services Requirements Handbook.</td>
</tr>
<tr>
<td><strong>STANDARD 2.</strong> Welcome and Orient Visitors</td>
<td>We will assure that our refuges are welcoming, safe, and accessible. We will provide visitors with clear information so they can easily determine where they can go, what they can do, and how to safely and ethically engage in recreational and educational activities. Facilities will meet the quality criteria defined in 605 FW 1, Section 1.6 of the Service Manual. We will treat visitors with courtesy and in a professional manner.</td>
</tr>
<tr>
<td><strong>STANDARD 3.</strong> Provide Quality Hunting Opportunities</td>
<td>Provide quality hunting opportunities. Hunting is a wildlife-dependent recreational use and, when compatible, an appropriate use of resources in the Refuge System. Hunting programs will meet the quality criteria defined in section 1.6 and, to the extent practicable, be carried out consistent with State laws, regulations, and management plans (see 605 FW 2).</td>
</tr>
<tr>
<td><strong>STANDARD 4.</strong> Provide Quality Fishing Opportunities</td>
<td>Fishing is a wildlife-dependent recreational use and, when compatible, an appropriate use of resources in the Refuge System. Fishing programs will meet the quality criteria defined in section 1.6 and, to the extent practicable, be carried out consistent with State laws, regulations, and management plans (see 605 FW 3).</td>
</tr>
<tr>
<td><strong>STANDARD 5.</strong> Provide Quality Wildlife Observation and Photography Opportunities</td>
<td>Visitors of all ages and abilities will have an opportunity to observe and photograph key wildlife and habitat on the refuge when it is compatible with refuge purpose(s). Viewing and photographing wildlife in natural or managed environments should foster a connection between visitors and natural resources (see 605 FW 4 and 605 FW 5, respectively). Wildlife observation and photography programs will meet the quality criteria defined in section 1.6.</td>
</tr>
<tr>
<td><strong>STANDARD 6.</strong> Develop and Implement a Quality Environmental Education Program</td>
<td>Through curriculum-based environmental education packages based on national and State education standards, we will advance public awareness, understanding, appreciation, and knowledge of key fish, wildlife, plant, and resource issues. Each refuge will assess its potential to work with schools to provide an appropriate level of environmental education. We may support environmental education through the use of facilities, equipment, educational materials, teacher workshops, and study sites that are safe, accessible, and conducive to learning (see 605 FW 6). Environmental education programs will meet the quality criteria defined in section 1.6.</td>
</tr>
</tbody>
</table>
STANDARD 7. Provide Quality Interpretation of Key Resources and Issues
We will communicate fish, wildlife, habitat, and other resource issues to visitors of all ages and abilities through effective interpretation. We will tailor core messages and delivery methods to provide interpretation to refuge visitors and present them in appropriate locations. Interpretive programs will meet the quality criteria defined in section 1.6.

STANDARD 8. Manage for Other Recreational Use Opportunities
We may allow other recreational uses that support or enhance one of the wildlife-dependent recreational uses or minimally conflict with any of the wildlife-dependent recreational uses when we determine they are both appropriate and compatible. We will allow uses that are either legally mandated or occur due to special circumstances.

STANDARD 9. Communicate Key Issues with Off-site Audiences
Effective outreach depends on open and continuing communication and collaboration between the refuge and its many publics. Effective outreach involves determining and understanding the issues, identifying audiences, listening to stakeholders, crafting messages, selecting the most effective delivery techniques, and evaluating effectiveness. If conducted successfully, the results we achieve will further refuge purpose(s) and the Refuge System mission.

STANDARD 10. Build volunteer programs and partnerships with Friends organizations.
Volunteer and Friends organizations fortify refuge staffs with their gifts of time, skills, and energy. They are integral to the future of the Refuge System. Where appropriate, refuge staff will initiate and nurture relationships with volunteers and Friends organizations and will continually support, monitor, and evaluate these groups with the goal of fortifying important refuge activities. The National Wildlife Refuge System Volunteer and Community Partnership Enhancement Act of 1998 strengthens the Refuge System’s role in developing effective partnerships with various community groups. Whether through volunteers, Friends organizations, or other important partnerships in the community, refuge personnel will seek to make the refuge an active community member, giving rise to a stronger Refuge System.

11. Recreation Fee Program
“The Federal Lands Recreation Enhancement Act of 2004 (FLREA) allows land management agencies, such as the National Wildlife Refuge System, to charge fees for entry and certain amenities (user fees). The charging of entrance and user fees at national wildlife refuges can be a helpful management tool if the program is well-managed and implemented.”

12. Concessions
Concession Contracts, discusses the Service’s current policy for concession management and provides guidance for permitting and administering concession operations on Service lands. We use concessions to assist us in providing wildlife-dependent recreation activities to the visiting public. The concessions are managed through contracts between the Service and a private entity, where the private entity is allowed to charge a fee for services provided at a field station to the visiting public.
13. Commercial Recreational Uses

A commercial recreational use is a use that generates revenue or that results in a commodity which is or can be sold for income or revenue. Before considering compatibility, the use must be determined to contribute to the achievement of the refuge purpose or the mission of the Refuge System, as outlined in Title 50 Code of Federal Regulations, 29.1. To be allowed on a refuge, a commercial use must go beyond the “not materially interfere with…” requirement and must contribute to the achievement of the refuge purpose or mission of the Refuge System. The contribution must be clearly defined in the justification section of the compatibility determination for any commercial use. Title 50, Code of Federal Regulations, 27.97, Private Operations, prohibits an unauthorized commercial enterprise on any national wildlife refuge. Thus, commercial tours are required to apply for a special use permit (SUP) from the Refuge Manager. By establishing a SUP system, the refuge staff is able to set sustainable limits on the number of permits issued. In determining if a commercial recreational use is compatible, one way to connect it to the mission of the System is to determine if the commercial recreation use will facilitate one of the wildlife-dependent priority public use activities which are “directly related to the mission of the System.” (Refuge Improvement Act – 1997).

14. Wilderness

We provide opportunities for appropriate and compatible use and enjoyment of wilderness areas in a manner that will preserve their wilderness character and that will “leave them unimpaired for future use and enjoyment as wilderness” (Wilderness Act, section 2 (a)). Refuges are generally closed to public access and use unless opened, following an appropriateness finding and a compatibility determination, through the applicable process (e.g., compatibility determination, NEPA and planning process, special use permit, regulation, etc.) (see 50 CFR 25.21). If we open a refuge, we may impose conditions or restrictions on any activity to ensure that it is appropriate and compatible and, for wilderness areas, preserves wilderness character and values. We emphasize providing “opportunities for solitude or a primitive and unconfined type of recreation” (Wilderness Act, section 2(c)).
APPENDIX H: LIST OF PREPARERS

Veronica Kelly, Park Ranger, A.R.M. Loxahatchee NWR
Laura Housh, Natural Resource Planner, Crystal River NWR
Rolf Olson, Project Leader, A.R.M. Loxahatchee NWR
Steven S. Henry, Deputy Project Leader, A.R.M. Loxahatchee NWR
Rebekah Gibble, Wildlife Biologist, A.R.M. Loxahatchee NWR
Melissa Juntunen, Wildlife Biologist, A.R.M. Loxahatchee NWR
Andrew Eastwick, Wildlife Biologist, A.R.M. Loxahatchee NWR
Kathleen Burchett, Area Supervisor, Southeast Region
Serena Rinker, Park Ranger, A.R.M. Loxahatchee NWR
David Vela, Park Ranger, A.R.M. Loxahatchee NWR
Ana Maria Castillo Ruiz, Park Ranger, A.R.M. Loxahatchee NWR
Morgan Mooney, Education Outreach Associate, A.R.M. Loxahatchee NWR