

Question 4. (included in Question 2)**Question 5. Have you ever visited the refuge?**

N=216, Yes = 90.74% No = 2.78% Unknown = 6.48%.

All comment sheets and letters were used. If no reference was made in letters or in open comment sheets or the question was unanswered this was analyzed as unknown.

Question 6. Listed below are some of the recreational activities occurring on the refuge. Please check which activities, if any, you would like to do.**Question 7. What other activities, if any, would you like to do at the refuge?**

Activities (Question 6)	N	Percentage
Wildlife Observation (Question 6)	178	22.39%
Canoeing/Kayaking (Question 6)	83	10.44%
Boating (Motorized) (Question 6)	31	3.90%
Interpretation/Environmental	119	14.97%
Education (Question 6)		
Photography or Paining (Question 6)	104	13.08%
Running/Jogging (Question 6)	14	1.76%
Fishing (Question 6)	58	7.29%
Hunting (Question 6)	31	3.90%
Hiking (Question 6)	113	14.21%
Activities (Question 7)		
Other (Question 7)	30	3.77%
Biking (Question 7)	12	1.51%
Expanded Canoeing (Question 7)	1	0.13%
Frogging (Question 7)	8	1.01%
Airboating (Question 7)	10	1.26%
Horseback Riding (Question 7)	3	0.38%
<i>Total (Q6 & Q7)</i>	<i>795</i>	<i>100.00%</i>

All packet and open comment sheets, plus letters stating any activities enjoyed on the Refuge were used to answer the above questions. If answers in Question 7, were the same category as in Question 6, they were integrated and analyzed as Question 6. If answers in Question 7 were something else than categories already listed in Question 6, they were analyzed separately and are listed as such. There were some (N =30) answers that did not fit into any of these categories, they are listed as Other. Note: the large N value is because of the many different answers most people gave for this question.

Question 8. What activities, if any, should not be allowed at the refuge?

Activities	N	Percentage
Airboat	44	13.66%
Motorized boats	52	16.15%
Hunting	63	19.57%
Fishing	10	3.10%
Land vehicles	31	9.63%
New activities	11	3.42%
Camping	16	4.97%
Commercialization	14	4.35%
Picnicking	10	3.10%
Biking	13	4.04%
Horseback riding	8	2.48%
Canoe/kayak	2	0.62%
Hiking/run	3	0.93%
Anything harmful to the environment	29	9.01%
Other	16	4.97%
Total	322	100.00%

All complex comment packet sheets, open comment sheets, and letters were used. Each activity listed by individuals was counted separately, thus the high N value.

Question 9 Where do you reside most of the year?

City/Town	N	Percentage
Unknown	9	4.17%
Boca	22	10.19%
Boynton	30	13.89%
Coconut Creek	2	0.93%
Deerfield	6	2.78%
Delray	25	11.57%
Ft. Lauderdale	16	7.40%
Greenacres	4	1.85%
Juno	2	0.93%
Jupiter	2	0.93%
Lantana	10	4.63%
Lake Park	2	0.93%
Lake Worth	25	11.57%
Loxahatchee	6	2.78%
Margate	3	1.39%
Miami	3	1.39%
Ocean Ridge	1	0.46%
Palm Beach Gardens	1	0.46%
Pompano	4	1.85%
Royal Palm Beach	4	1.85%

Appendix I - Summary: Comment Sheets

Stuart	2	0.93%
Tallahassee	1	0.46%
Tequesta	1	0.46%
Wellington	1	0.46%
North Palm Beach	1	0.46%
West Palm Beach	22	10.19%
Other (including other States)	11	5.09%
<i>Total</i>	<i>216</i>	<i>100.00%</i>

All complex comment packet sheets, open comment sheets, and all letters were used in the analysis of the above question. Only one address counted for each comment sheet or letter, therefore, the N equals the exact amount of responses.

Question 10. Are you attending the public meeting as member of an organization? Yes/No If yes, what is its name?

N = 216 Yes = 21.76% No = 43.98% Unknown = 34.26%

Organization	N	Percentage
Airboat & Halftrack Conservation Club	2	4.26%
Audubon Society	9	19.14%
Coalition for Wilderness Islands	1	2.13%
Concerned Citizen	1	2.13%
Ducks Unlimited	1	2.13%
FL Consumer Action Network	1	2.13%
FL Outdoor Writers Association	1	2.13%
FL Sportsman Conservation Association	3	6.38%
FL Trail Association	3	6.38%
Gator Bass Masters	1	2.13%
Lake Worth Drainage District	1	2.13%
A.R.M. Loxahatchee NWR Refuge	3	6.38%
Loxahatchee Groves Landowners Association	1	2.13%
Loxahatchee Natural History Association	7	14.89%
Nature & Heritage Tourism Association	3	6.38%
Palm Beach College Environmental Coalition	2	4.26%
Sierra Club	4	8.50%
Storm Boats	1	2.13%
Other	2	4.26%
<i>Total</i>	<i>47</i>	<i>100.00%</i>

All complex comment packet sheets, open comment sheets, and letters were used in Question 10 analysis. Not all responses were associated with the August 17, scoping meeting (where some people acquired the complex comment packet sheets). Open comment sheets were given out before the scoping meeting and letters were usually in response to newspaper articles about the refuge Comprehensive Conservation Plan.

Question 11. Where did you obtain the comment sheet?

Options	N	Percentage
Scoping Meeting	32	16.75%
Audubon Society	8	4.19%
Friend	20	10.47%
Mail	32	16.75%
Native Plant Society	1	0.53%
Palm Beach College Environmental Coalition	7	3.66%
Sierra Club	1	0.53%
Visitor Center/ A.R.M. Loxahatchee NWR	76	39.79%
Other	3	1.57%
Unknown/Unanswered	11	5.76%
<i>Total</i>	<i>191</i>	<i>100.00%</i>

Only complex comment packet sheets and open comment sheets were used in the analysis since the question refers to obtaining a comment sheet. Additionally, 25 letters were also received, but not included in this question.

Public Issues Addressed but Not Allowed or are Pending

Frog Gigging Impacts

The following reasons outline why frog gigging was not included in the Draft Comprehensive Conservation Plan or Environmental Assessment.

Frog gigging, requested by some of the public comments, uses a spotlight, a spear, and an airboat. It is considered a traditional recreational use in the Everglades, and in the past was allowed in the refuge. According to historical narratives written by refuge staff, the numbers of pig frogs (*Rana grylio*), commonly known as “bull frogs” dwindled significantly under commercially driven hunting pressures in the 1950s.

Frogs are an important link in the food web of the Everglades traditionally poor nutrient system. The loss of frogs and associated tadpoles from the refuge interior would be considered significant and negatively impact wildlife which depend upon them for prey. Research has shown a wide spread of age classes in the refuge alligator population and the population appears to be healthier than in other areas of the Everglades ecosystem. This may be due in part to an abundant food supply (frogs and tadpoles) for these animals, in comparison to other areas of the ecosystem where gigging is allowed.

The use of spotlights and night airboat activity disrupts wildlife in the refuge interior during their normal night-time activities, such as resting or catching prey. At a minimum, the animals that would be impacted by the disruption associated with this activity include alligators, night herons (a species of concern), bats, and owls.

If gigging were allowed in a specific area of the refuge interior, the ability of refuge officers to enforce the regulations containing giggers to an area are poor. Because the refuge interior is large (approximately 150,000 acres) and airboats allow access to any and all portions of the refuge interior, there would be little ability to contain hunters in specific hunt areas. In Big Cypress National Preserve Management Plan, the inability to regulate airboaters to restricted areas was noted.

Airboat Impacts

Refuge staff initially considered, under the Public Use Alternative, allowing the public to use airboats within a designated area of the refuge on a seasonal basis. However, due to incompatible impacts of noise, disturbance, and habitat loss from the creation of airboat trails this use was withdrawn from consideration. Furthermore, the Service is reviewing the use of airboats and jet skis nationwide for consistency throughout the National Wildlife Refuge System.

As more and more land is lost to development in south Florida, increasing pressure is put on tracts set aside as “natural lands” from both wildlife populations and from humans seeking recreation. The increasing numbers of people and the increasing popularity of airboating, and outdoor activities in general, have resulted in more human-related disturbances to wildlife

“natural areas.” As natural area managers respond to these threats of disturbance to resident, migratory, and wintering wildlife, more and more areas are being protected from the possibility of human disturbances (Rodgers and Smith, 1995). Some land managers are prohibiting the use of swamp buggies and airboats because of disturbance factors. As indicated below, airboats can impact the environment that visitors come to enjoy (noise factors), the substrates upon which they operate (soil, water and vegetation), and the wildlife near their operation.

Described below is the pertinent research regarding the positive and negative impacts of airboats on the environment. These impacts were identified by south Florida biologists from the National Audubon Society, South Florida Water Management District, Everglades National Park, Fish and Wildlife, and the Florida Fish and Wildlife Conservation Commission. Airboats impact vegetation by promoting the breakdown of organic matter, adding habitat diversity, and creating pathways for invasion of exotic plants. Airboats impact fauna by: creating a means of fish dispersal; destroying apple snail eggs; colliding with and striking birds, alligators and other animals; displacing foraging birds; and creating noise disturbance. Also, airboat trails result in unnatural water movement and these trails can act as fire breaks (Johnston 1983).

Noise

Studies have shown 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). The position of airboat engines and propellers high above the water surface and most vegetation, causes noise from these sources to travel much farther than noise from other types of off-road-vehicles, including outboard motorboats (Duever et. al.,1981). In the refuge, airboat engines can be heard at least one to two miles away from the noise source.

In another study, detectable off-road-vehicle noise was determined to be generally unacceptable to persons who desired a wilderness experience (Harrison 1974a, 1974b). It was recognized in these studies; when airboats are in an area there is no acceptable ‘natural quiet’ Airboats have the unique ability to bring a substantial amount of noise to some of the quietest areas remaining in South Florida.

The refuge is not an area where hearing vehicle noise is considered the norm, rather it is a place set aside because of its unique biological resources. It is managed for the protection of wildlife while allowing quality, compatible, wildlife-dependent recreational opportunities for visitors in a manner that does not negatively impact wildlife population levels or the natural diversity of the area.

Horseback Riding

In response to comments expressed during the public scoping process, refuge staff took a close look at the feasibility of allowing horseback riding on a portion of the levee. National wildlife refuges are special places set aside specifically for the conservation of our Nation's wildlife resources. The National Wildlife Refuge System Administration Act of 1966, amended by the National Wildlife Refuge System Improvement Act of 1997, requires the Service to first manage for wildlife conservation and second, when compatible, facilitate wildlife-dependent recreational uses; i.e., hunting, fishing, wildlife observation, wildlife photography, and environmental education and interpretation. Wildlife-dependent recreational uses are dependent upon healthy populations of wildlife and, therefore, are directly related to the refuge system mission and most refuge purposes. Wildlife-dependent recreational uses have a legitimate, appropriate, and recognized association with national wildlife refuges; the same cannot be said of other forms of recreational activities. National wildlife refuges are not multiple-use public lands and cannot be all things to all people.

Some recreational activities, while wholesome and enjoyable, are not dependent on the presence of wildlife, nor dependent on the expectation of encountering wildlife. These non-wildlife-dependent recreational activities are more appropriately conducted on private lands or other public lands not specifically dedicated for wildlife conservation. Horseback riding on the refuge would primarily be recreational in nature and would not support one of the six priority uses. Several opportunities exist in the form of riding trails adjacent to the refuge as well as throughout the county.

Safety, resource threats, and parking also pose concerns. Because of the narrow width of the perimeter levee (16 feet at the top), it is not suited to support the three major user groups at the same time and, in fact, could pose a safety hazard. In addition, the eastern side is the only area that provides the most direct access to the refuge. However, because of existing hiking or bicycle use on sections of the east side, as well as safety concerns at the northernmost section of the L-40 levee (construction of Storm Water Treatment Area 1E and very steep levee slopes), the only area that could be reasonably studied is around the ACME District pump stations.

Impacts to the resource were also considered. The possible negative effects of cowbirds on certain resident birds would need to be considered. Because cowbirds eat undigested grain in horse "patties" and lay their eggs in nests of other birds during the breeding season, they have the potential to undermine the reproductive efforts of resident songbirds.

Another negative effect of horse use is the possible spread of exotic plants. This may happen in two ways. Exotic and invasive plant seeds may be deposited on the refuge levee from horse "patties." Conversely, plants and seeds eaten by horses while on the levee may be deposited off the refuge. The only alternative to reduce these impacts would be to require that all horses accessing the refuge wear diapers, an apparatus worn by horses used for carriage tours, in order to keep "patties" off the levee and keep invasive and exotic plants from being deposited on the refuge. However, in discussions with knowledgeable horse owners, it is difficult to get a trail horse to use this type of apparatus.

Another limiting factor was trailer parking for equestrians bringing their horses in from a distance. Refuge property at each ACME District pump station location would provide only limited parking and would best serve as a loading/unloading area. Parking would have to be provided off refuge. Presently, each area is accessed by only a two-lane, dirt road. The potential exists, at any given time, for a large number of users (35-50 vehicles) to access the refuge just for hiking, fishing, or wildlife observation. The refuge would have to partner with the Village of Wellington to provide parking space. When a refuge considers the opening of a recreational use, it must allow for users from the local area as well as the Nation. The refuge cannot open up a section of the levee just for the immediate surrounding area. In addition, impacts to existing users must be considered. Information concerning public uses, listed on refuge brochures and on the Internet, is available to persons worldwide. Therefore, reasonable expectations of access, parking, and a quality wildlife experience should be expected.

Vegetation

General Information

Many, if not all, types of plant communities can be negatively impacted by airboat operation. Continuous airboat operation through the edge of sawgrass and wet prairies damages both emergent vegetation (e.g., spike rush, maidencane, and white water lily) and submergent vegetation (e.g., bladderwort and periphyton). Continuous operation of airboats through sawgrass eventually causes the sawgrass to die and results in the formation of trails. Anecdotal evidence supports the notion that airboats can remove vegetation and in fact are used in frog-gigging to open up vegetation.

Commonly used airboat trails in the Water Conservation Areas 2, 3, and in the refuge interior remain open with use. As noted in the Big Cypress National Preserve Management Plan, the greater the numbers of airboats and airboat users, the greater the number of airboat trails (Department of the Interior, National Park Service, 1999). Conversations with recreational airboat operators confirm that they, like many airboat drivers, like to explore areas other than an established trail. This tendency to create yet another trail impacts more vegetation and wildlife. Aerial photos and infrared imagery of Water Conservation Areas 2 and 3 shows the number of trails (both new and old trails) created by and maintained by airboats through the vegetation. A comparison between the refuge and these Water Conservation Areas shows differences between a relatively pristine marsh and an airboat-impacted marsh.

Studies by Duever et.al., 1981 and the Department of the Interior 1999, showed airboats directly affect vegetation by: breaking or crushing plants (as they are run over); defoliation due to high wind energy (created by the propeller); and soil erosion (due to the energy of the wake being higher than the surrounding vegetation, especially during low water conditions). It has also been reported that airboats traveling at high speeds caused greater damage to vegetation than did slower traveling airboats.

Epiphytes and Periphyton

Leaf loss and epiphytic plant displacement occurs 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 (Department of the Interior 1999). Woody plants such as wax myrtle and willow are more severely impacted by moderate airboat use than other shrubby plants are.

Airboats damage periphyton by disrupting and displacing the algal mats, especially in wet prairies (Duever et al., 1981, 1986). Although periphyton looks different in the refuge compared to the rest of the Everglades, it is the critical base of the Everglades food web.

An airboat impact study, begun on the refuge in 1983, by a Service biologist, identified that airboat operation in sawgrass causes a reduction in stem densities and could result in permanent trails in the marsh. These trails can change drainage patterns. It was the opinion of the refuge staff in the 1980s, that airboat operation in wet prairies (to avoid damaging more dense vegetation) will also cause reduction in stem density, specifically in beak and spike rushes. Operation of airboats within the refuge inevitably results in apple snail egg clusters being destroyed, possibly to the detriment of the apple snail population and to some of the listed species (limpkin, snail kite, and alligator) dependent upon the snails.

The channels created by airboat usage could allow high nutrient water and exotic floating plants into the relatively pristine refuge interior. If any number of trails are created into the refuge interior via airboat use, water quality would deteriorate and cattail growth would proliferate in these areas as long as high levels of nutrients are in the canal waters.

Exotics

It is a known fact that motorboats and boat trailers carry exotic plants into different waterways, including the refuge. Airboats used in other areas would contribute to this transference. Additionally, airboat use near invasive exotics like melaleuca and Old World climbing fern could contribute to the spread of seeds or spores. These plant's microscopic seeds and spores would be easily blown to new germination sites (tree islands, floating peat islands) by the forceful winds generated by the airboat propeller. During periods of low water in the refuge, peat in wet prairies and in well traveled airboat trails tend to "float to the surface" and potentially become fertile seed beds for exotic plants. Limiting the areas of exposed peat will reduce the potential for exotic plant establishment.

Wildlife

Documentation of human disturbance on wildlife has been conducted by many researchers. 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). Research has also shown that a minimum non-approach distance should be 300 meters in an airboat for nesting, roosting, and foraging waterbirds (Rodgers and Smith 1995).

Secretive birds, especially listed species such as the bitterns and rails breeding and wintering in the transition area between the wet prairies, sloughs, and sawgrass are negatively impacted by airboat disturbance and habitat damage. Additional species of wildlife using wet prairies, sloughs, and sawgrass marshes may be run over, disrupted, or may be forced to abandon their habitat due to numerous disruptions.

In another study, visual disturbances from the presence of an airboat were found to occur with the sporadic but repeated operation through an area that is a primary foraging or roosting site. This disruption can cause the animals to relocate to a less desirable site. If the disturbed area is one of the few that is available at the time or is a prime location, the disturbance may adversely impact the species. Direct impacts to wildlife caused by airboat collisions include adult and fledgling birds, alligators, snail egg clusters, and bird nests. The severity of these impacts on the species is not known as no known study has addressed this issue (Johnston 1983).

From December to June the refuge has low water and it is also the nesting season for a wide variety of wading birds and the endangered Florida snail kite. In the past, refuge staff observed anglers fishing at wading bird colony islands. The islands are usually surrounded by deeper water which is where the fish have taken refuge. Fishing at such locations has caused significant disturbance to the nesting wading birds, eggs, and/or chicks. Since these airboats were observed tied or anchored within a few feet of nests, it is likely that eggs and nestlings were dislodged from nests as a result of this activity. In at least one instance, an airboat was driven through a colony, causing the colony to be abandoned. Thousands of wading birds, most of which are in decline, nest in the refuge.

A study on energy depletion in wildlife notes, disruption of normal activities in wildlife is considered a disturbance. This disturbance has negative effects on the energy and nutrient budgets and the disturbance contributes to the potential decline of an individual (Bromley 1985). Adverse affects of environmental disruptions (e.g., motorboat, airboat, off-road recreational vehicles) including flight, avoidance, or interference with movement uses up energy that could be used for reproduction and growth. If animals are not able to adjust to the additional energy outlay caused by the disturbance: survival, reproduction, and growth may be negatively affected (Department of the Interior, National Park Service, Crocodile Study).

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. However, types of 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 an airboat 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 would be detrimental to wildlife over time (Department of the Interior, National Park Service, Crocodile Study).

It should be noted that 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. Thus the disturbance factor associated with unlimited airboating should be weighed more heavily in all Water Conservation Areas, including the refuge, as the disturbance to wildlife may carry a higher energetic cost than in more productive areas.

Water Quality

In another study, concentrated airboat usage has been found to negatively affect water quality. Airboats create water channels as a result of energy generated by airboat wakes and hull displacement, and in areas of constant use, the channel effect is magnified (Department of the Interior, National Park Service, 1999). A dye trace study determined water flows are accelerated in airboat trails (Pernas et al., 1995).

Airboat 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 (Department of the Interior, National Park Service, 1999).

Soils

Other studies have shown soil erosion can be caused by the energy of the airboat wake (Department of the Interior, National Park Service, 1999). Hull displacement and boat weight can cause peat compaction, and concentrated use of airboats in trails can loosen soil and organic particles and eliminate vegetative regrowth. As the suspended particles wash out of the trail, the trail becomes deeper and deeper thus inhibiting vegetative recruitment. During the dry season, the loss of vegetative cover allows the water temperature in the trail to become 6-10 degrees higher than surrounding surface water, adjacent soils and vegetation (Schemnitz and Schortemeyer 1972).

Other Areas to Airboat

There are number of opportunities available to people wishing to experience airboating. Opportunities for private airboating or ORV use include hundreds of thousands of acres in: Water Conservation Areas 2 and 3; Lake Okeechobee; Big Cypress National Preserve; a portion of Everglades National Park; Holey Land, as well as J.W. Corbett, Rotenberger and Cecil M. Webb State Wildlife Management Areas and other local marshes. Also, numerous areas to the north and south of the refuge offer public airboat rides. Because these other areas are open to airboating, prohibiting recreational airboating on the refuge would not significantly restrict the public's ability to find airboat access.

Flora & Fauna

Table 20. Fauna of A.R.M. Loxahatchee National Wildlife Refuge (Exclusive of Birds)

*This is a partial list of faunal species found on the refuge which have been documented and verified by refuge biologists. Exotic species are designated by the * symbol.*

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>
MAMMALS		
	<i>Didelphis virginiana</i>	Opossum
	<i>Tadarida brasiliensis</i>	Mexican Free-tailed Bat
	<i>Procyon lotor</i>	Raccoon
	<i>Lutra canadensis</i>	River Otter
	<i>Urocyon cinereoargenteus</i>	Gray Fox
	<i>Lynx rufus</i>	Bobcat
	<i>Sciurus carolinensis</i>	Eastern Gray Squirrel
	<i>Peromyscus gossypinus</i>	Cotton Mouse
	<i>Oryzomys palustris</i>	Marsh Rice Rat
	<i>Sigmodon hispidus</i>	Hispid Cotton Rat
	<i>Neofiber alleni</i>	Round-tailed Muskrat
	<i>Rattus rattus</i>	Black Rat*
	<i>Mus musculus</i>	House Mouse*
	<i>Rattus norvegicus</i>	Norway Rat*
	<i>Sylvilagus floridanus</i>	Eastern Cottontail
	<i>Sylvilagus palustris</i>	Marsh Rabbit
	<i>Odocoileus virginianus</i>	White-tailed Deer
	<i>Dasypus novemcinctus</i>	Nine-banded Armadillo*
	<i>Sus scrofa</i>	Feral Hog*
	<i>Canis familiaris</i>	Feral Dog*
	<i>Felis domesticus</i>	Feral Cat*
	<i>Felis jaguarundi</i>	Jaguarundi*
	<i>Vulpes vulpes</i>	Red Fox*
REPTILES		
Crocodylians:	<i>Alligator mississippiensis</i>	American Alligator
Turtles:	<i>Chelydra serpentina osceola</i>	Florida Snapping Turtle
	<i>Sternotherus odoratus</i>	Stinkpot (Common Musk Turtle)
	<i>Kinosternon subrubrum steindachneri</i>	Florida Mud Turtle
	<i>Kinosternon baurii</i>	Striped Mud Turtle
	<i>Terrapene carolina bauri</i>	Florida Box Turtle
	<i>Pseudemys floridana peninsularis</i>	Peninsula Cooter
	<i>Pseudemys nelsoni</i>	Florida Redbelly Turtle
	<i>Gopherus polyphemus</i>	Gopher Tortoise
	<i>Apalone ferox</i>	Florida Softshell
	<i>Kinixys homeana</i>	Home's Hinge-back Tortoise*

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>
Lizards:	<i>Hemidactylus garnotii</i>	Indo-Pacific Gecko*
	<i>Anolis carolinensis</i>	Green Anole
	<i>Anolis sagrei sagrei</i>	Cuban Brown Anole*
	<i>Cnemidophorus sexlineatus sexlineatus</i>	Six-lined Racerunner
	<i>Scincella lateralis</i>	Ground Skink
	<i>Eumeces inexpectatus</i>	Southeastern Five-lined Skink
	<i>Ophisaurus ventralis</i>	Eastern Glass Lizard
	<i>Ophisaurus compressus</i>	Island Glass Lizard
	<i>Leiocephalus carinatus</i>	Northern Curly-tailed Lizard*
	<i>Iguana iguana</i>	Green Iguana*
		Monitor Lizard spp.*
Snakes:	<i>Nerodia cyclopion floridana</i>	Florida Green Water Snake
	<i>Nerodia taxispilota</i>	Brown Water Snake
	<i>Nerodia fasciata pictiventris</i>	Florida Banded Water Snake
	<i>Regina alleni</i>	Striped Crayfish Snake
	<i>Seminatrix pygaea cyclas</i>	South Florida Swamp Snake
	<i>Storeria dekayi vieta</i>	Florida Brown Snake
	<i>Thamnophis sirtalis sirtalis</i>	Eastern Garter Snake
	<i>Thamnophis sauritus sackeni</i>	Peninsula Ribbon Snake
	<i>Diadophis punctatus punctatus</i>	Southern Ringneck Snake
	<i>Farancia abacura abacura</i>	Eastern Mud Snake
	<i>Coluber constrictor priapus</i>	Southern Black Racer
	<i>Coluber constrictor paludicola</i>	Everglades Racer
	<i>Opheodrys aestivus</i>	Rough Green Snake
	<i>Drymarchon corais couperi</i>	Eastern Indigo Snake
	<i>Elaphe guttata guttata</i>	Corn Snake (Red Rat Snake)
	<i>Elaphe obsoleta quadrivittata</i>	Yellow Rat Snake (Chicken Snake)
	<i>Elaphe obsoleta rossalleni</i>	Everglades Rat Snake
	<i>Lampropeltis triangulum elapsoides</i>	Scarlet Kingsnake
	<i>Micrurus fulvius fulvius</i>	Eastern Coral Snake
	<i>Agkistrodon piscivorus conanti</i>	Florida Cottonmouth
	<i>Sistrurus miliarius barbouri</i>	Dusky Pygmy Rattlesnake
	<i>Crotalus adamanteus</i>	Eastern Diamondback Rattlesnake
	<i>Boa constrictor</i>	Boa Constrictor*Ball Python*

Appendix K - Flora & Fauna

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>
AMPHIBIANS		
Salamanders:	<i>Amphiuma means</i>	Two-toed Amphiuma (Congo Eel)
	<i>Siren lacertina</i>	Greater Siren
	<i>Pseudobranchius striatus belli</i>	Everglades Dwarf Siren
	<i>Notophthalmus viridescens piaropicola</i>	Peninsula Newt
Frogs & Toads:	<i>Eleutherodactylus planirostris planirostris</i>	Greenhouse Frog *
	<i>Bufo terrestris</i>	Southern Toad
	<i>Bufo quercicus</i>	Oak Toad
	<i>Bufo marinus</i>	Giant Marine Toad*
	<i>Acris gryllus dorsalis</i>	Florida Cricket Frog
	<i>Hyla cinerea</i>	Green Treefrog
	<i>Hyla squirella</i>	Squirrel Treefrog
	<i>Osteopilus septentrionalis</i>	Cuban Treefrog*
	<i>Limnaoedus ocularis</i>	Little Grass Frog
	<i>Rana grylio</i>	Pig Frog
	<i>Rana sphenoccephala</i>	Southern Leopard Frog
INSECTS		
Butterflies: Swallowtails	<i>Papilio polyxenes</i>	Black Swallowtail
	<i>Papilio cresphontes</i>	Giant Swallowtail
	<i>Papilio palmedes</i>	Palamedes Swallowtail
Whites	<i>Appias drusilla</i>	Florida White
	<i>Pontia protodice</i>	Checkered White
	<i>Ascia monuste</i>	Great Southern White
Sulphurs	<i>Phoebis sennae eubule</i>	Cloudless Sulphur
	<i>Phoebis philea</i>	Orange-barred Sulfur
	<i>Eurema nicippe</i>	Sleepy Orange Sulfur
	<i>Nathalis iole</i>	Dainty Sulfur
	<i>Eurema lisa</i>	Little Yellow
Blues	<i>Leptotes cassius</i>	Cassius Blue
Hairstreaks	<i>Strymon melinus</i>	Gray Hairstreak
	<i>Calycopis cecrops</i>	Red-banded Hairstreak
Brushfoots	<i>Agraulis vanillae nigrior</i>	Gulf Fritillary
	<i>Dryas iulia</i>	Julia
	<i>Heliconius charitonius</i>	Zebra (Zebra Longwing)
	<i>Phyciodes phaon</i>	Phaon Crescent
	<i>Phyciodes tharos</i>	Pearl Crescent
	<i>Vanessa atalanta</i>	Red Admiral
	<i>Junonia coenia</i>	Common Buckeye
	<i>Anartia jatrophae guantanamo</i>	White Peacock

Appendix K - Flora & Fauna		
	<i>Scientific Name</i>	<i>Common Name</i>
Brushfoots (continued)	<i>Siproeta stelenes</i>	Malachite
	<i>Limenitis archippus floridensis</i>	Viceroy
	<i>Marpesia petreus</i>	Ruddy Daggerwing
Milkweed Butterflies	<i>Danaus plexippus</i>	Monarch
	<i>Danaus gilippus</i>	Queen
	<i>Danaus eresimus</i>	Soldier
Spreadwinged Skippers	<i>Urbanus proteus</i>	Long-tailed Skipper
	<i>Urbanus dorantes</i>	Dorantes Longtail
	<i>Pyrgus oileus</i>	Tropical Checkered
Grass Skippers	<i>Copaeodes minimus</i>	Southern Skipperling
	<i>Ancyloxypha numitor</i>	Least Skipper
	<i>Hylephila phyleus</i>	Fiery Skipper
	<i>Polites vibex</i>	Whirlabout
	<i>Anatrytone logan</i>	Delaware Skipper
	<i>Lerodea eufala</i>	Eufala Skipper
	<i>Asbolis capucinus</i>	Monk Skipper
	<i>Oligoria maculata</i>	Twin-spot Skipper
DRAGONFLIES		
Darners - Aeshnidae	<i>Anax junius</i>	Common Green Darner
	<i>Coryphaeschna adnexa</i>	Blue-faced Darner
	<i>Coryphaeschna ingens</i>	Regal Darner
	<i>Gynacantha nervosa</i>	Twilight Darner
	<i>Nasiaeschna pentacantha</i>	Cyrano Darner
Emeralds - Corduliidae	<i>Epitheca stella</i>	Florida Baskettail
Skimmers - Libellulidae	<i>Brachymesia gravida</i>	Four-spotted Pennant
	<i>Celithemis eponina</i>	Halloween Pennant
	<i>Crocothemis servilia</i>	Scarlet Skimmer
	<i>Erythemis plebeja</i>	Black Pondhawk
	<i>Erythemis simplicicollis</i>	Eastern Pondhawk
	<i>Erythemis vesiculosa</i>	Great Pondhawk
	<i>Erythrodiplax connata minuscula</i>	Blue Dragonlet
	<i>Erythrodiplax umbrata</i>	Band-winged Dragonlet
	<i>Libellula exusta deplanata</i>	Corporal Skimmer
	<i>Libellula needhami</i>	Needham's Skimmer
	<i>Miathyria marcella</i>	Greater Hyacinth Glider
	<i>Orthemis ferruginea</i>	Roseate Skimmer
	<i>Pachydiplax longipennis</i>	Blue Dasher
	<i>Pantala flavescens</i>	Wandering Glider
	<i>Tramea abdominalis</i>	Vermillion Glider
	<i>Tramea carolina</i>	Violet-masked Glider
	<i>Tramea lacerata</i>	Black-mantled Glider

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>
FISH		
	<i>Scientific Name</i>	<i>Common Name</i>
	<i>Lepisosteus osseus</i>	Longnose Gar
	<i>Lepisosteus platyrhincus</i>	Florida Gar
	<i>Amia calva</i>	Bowfin
	<i>Anguilla rostrata</i>	American Eel
	<i>Dorosoma cepedianum</i>	Gizzard Shad
	<i>Dorosoma petenense</i>	Threadfin Shad
	<i>Esox americanus</i>	Redfin Pickerel
	<i>Esox niger</i>	Chain Pickerel
	<i>Notemigonus crysoleucas</i>	Golden Shiner
	<i>Opsopoeodus emiliae</i>	Pugnose Minnow
	<i>Notropis petersoni</i>	Coastal Shiner
	<i>Notropis maculatus</i>	Taillight Shiner
	<i>Erimyzon sucetta</i>	Lake Chubsucker
	<i>Ictalurus punctatus</i>	Channel Catfish
	<i>Ameiurus catus</i>	White Catfish
	<i>Ameiurus natalis</i>	Yellow Bullhead
	<i>Ameiurus nebulosus</i>	Brown Bullhead
	<i>Noturus gyrinus</i>	Tadpole Madtom
	<i>Clarias batrachus</i>	Walking Catfish*
	<i>Hypostomus spp.</i>	Suckermouth Catfish*
	<i>Aphredoderus sayanus</i>	Pirate Perch
	<i>Fundulus seminolis</i>	Seminole Killifish
	<i>Fundulus chrysotus</i>	Golden Topminnow
	<i>Fundulus lineolatus</i>	Lined Topminnow
	<i>Lucania goodei</i>	Bluefin Killifish
	<i>Cyprinodon variegatus</i>	Sheepshead Minnow
	<i>Floridichthys carpio</i>	Goldspotted Killifish
	<i>Fundulus confluentus</i>	Marsh Killifish
	<i>Fundulus grandis</i>	Gulf Killifish
	<i>Jordanella floridae</i>	Flagfish
	<i>Poecilia latipinna</i>	Sailfin Molly
	<i>Gambusia holbrooki</i>	Mosquitofish
	<i>Heterandria formosa</i>	Least Killifish
	<i>Labidesthes sicculus</i>	Brook Silverside
	<i>Elassoma evergladei</i>	Everglades Pygmy Sunfish
	<i>Pomoxis nigromaculatus</i>	Black Crappie

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>
FISH <i>(continued)</i>		
	<i>Enneacanthus gloriosus</i>	Blue-spotted Sunfish
	<i>Micropterus salmoides</i>	Largemouth Bass
	<i>Lepomis gulosus</i>	Warmouth
	<i>Lepomis punctatus</i>	Spotted Sunfish
	<i>Lepomis macrochirus</i>	Bluegill
	<i>Lepomis microlophus</i>	Redear Sunfish
	<i>Lepomis marginatus</i>	Dollar Sunfish
	<i>Etheostoma fusiforme</i>	Swamp Darter
	<i>Astronotus ocellatus</i>	Oscar*
	<i>Tarpon atlanticus</i>	Tarpon+
	<i>Cichlasoma bimaculatum</i>	Black Acara*
	<i>Strongylura marina</i>	Atlantic Needlefish+
	<i>Centropomus undecimalis</i>	Snook+
	<i>Mugil cephalus</i>	Striped Mullet+
	<i>Dormitator maculatus</i>	Fat Sleeper+
	<i>Gobiomorus dormitor</i>	Bigmouth Sleeper
	<i>Lophogobius cyprinoides</i>	Crested Goby+
	<i>Microgobius gulosus</i>	Clown Goby+
* <i>exotic species</i>		
+ <i>salt water species (generally not observed in refuge since the levees were installed in the 1950's)</i>		

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge.

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Gaviiformes	<i>Gavia immer</i>	Common loon
	<i>Podilymbus podiceps</i>	Pied-billed grebe
	<i>Podiceps auritus</i>	Horned grebe
	<i>Podiceps nigricollis</i>	Eared grebe
Pelecaniformes	<i>Pelecanus erythrorhynchos</i>	American white pelican
	<i>Pelecanus occidentalis</i>	Brown pelican
	<i>Phalacrocorax auritus</i>	Double-crested cormorant
	<i>Anhinga anhinga</i>	Anhinga
Ciconiiformes	<i>Fregata magnificens</i>	Magnificent frigatebird
	<i>Botaurus lentiginosus</i>	American bittern
	<i>Ixobrychus exilis</i>	Least bittern
	<i>Ardea herodias</i>	Great blue heron
	<i>Ardea alba</i>	Great egret
	<i>Egretta thula</i>	Snowy egret
	<i>Egretta caerulea</i>	Little blue heron
	<i>Egretta tricolor</i>	Tricolored heron
	<i>Bubulcus ibis</i>	Cattle egret
	<i>Butorides virescens</i>	Green heron
	<i>Nycticorax nycticorax</i>	Black-crowned night heron
	<i>Nyctanassa violacea</i>	Yellow-crowned night-heron
	<i>Eudocimus albus</i>	White ibis
	<i>Plegadis falcinellus</i>	Glossy ibis
	<i>Eudocimus ruber</i>	Scarlet ibis
	<i>Ajaia ajaja</i>	Roseate spoonbill
	<i>Mycteria americana</i>	Wood stork
	<i>Coragyps atratus</i>	Black vulture
	<i>Cathartes aura</i>	Turkey vulture
Anseriformes	<i>Dendrocygna bicolor</i>	Fulvous whistling-duck
	<i>Cygnus columbianus</i>	Tundra swan
	<i>Chen caerulescens</i>	Snow goose
	<i>Anas crecca</i>	Green-winged teal
	<i>Anas rubripes</i>	American Black duck
	<i>Anas fulvigula</i>	Mottled duck
	<i>Anas platyrhynchos</i>	Mallard
	<i>Anas bahamensis</i>	White-cheeked pintail
	<i>Anas Acuta</i>	Northern Pintail
	<i>Anas Discors</i>	Blue-winged Teal

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Anseriformes (continued)	<i>Anas cyanoptera</i>	Cinnamon teal
	<i>Anas clypeata</i>	Northern shoveler
	<i>Anas strepera</i>	Gadwall
	<i>Anas americana</i>	American wigeon
	<i>Aythya valisineria</i>	Canvasback
	<i>Aythya americana</i>	Redhead
	<i>Aythya collaris</i>	Ring-necked duck
	<i>Aythya marila</i>	Greater scaup
	<i>Aythya affinis</i>	Lesser scaup
	<i>Bucephala clangula</i>	Common goldeneye
	<i>Bucephala albeola</i>	Bufflehead
	<i>Lophodytes cucullatus</i>	Hooded merganser
	<i>Mergus merganser</i>	Common merganser
	<i>Mergus serrator</i>	Red-breasted merganser
	<i>Nomonyx dominicus</i>	Masked duck
	<i>Oxyura jamaicensis</i>	Ruddy duck
Falconiformes	<i>Pandion haliaetus</i>	Osprey
	<i>Elanoides forficatus</i>	Swallow-tailed kite
	<i>Elanus leucurus</i>	White-tailed kite
	<i>Rostrhamus sociabilis</i>	Snail kite
	<i>Haliaeetus leucocephalus</i>	Bald eagle
	<i>Circus cyaneus</i>	Northern harrier
	<i>Accipiter striatus</i>	Sharp-shinned hawk
	<i>Accipiter cooperii</i>	Cooper's hawk
	<i>Buteo lineatus</i>	Red-shouldered hawk
	<i>Buteo platypterus</i>	Broad-winged hawk
	<i>Buteo brachyurus</i>	Short-tailed hawk
	<i>Buteo swainsoni</i>	Swainson's hawk
	<i>Buteo jamaicensis</i>	Red-tailed hawk
Falconiformes	<i>Caracara plancus</i>	Crested caracara
	<i>Falco sparverius</i>	American kestrel
	<i>Falco columbarius</i>	Merlin
	<i>Falco peregrinus</i>	Peregrine falcon
Galliformes	<i>Meleagris gallopavo</i>	Wild turkey
	<i>Colinus virginianus</i>	Northern bobwhite

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Gruiformes	<i>Coturnicops noveboracensis</i>	Yellow rail
	<i>Laterallus jamaicensis</i>	Black rail
	<i>Rallus elegans</i>	King rail
	<i>Rallus limicola</i>	Virginia rail
	<i>Porzana carolina</i>	Sora
	<i>Porphyryula martinica</i>	Purple gallinulelli
	<i>Gallinula chloropus</i>	Common moorhen
	<i>Aramus guarauna</i>	Limpkin
	<i>Grus canadensis</i>	Sandhill crane
	<i>Grus americana</i>	Whooping crane
Charadriiformes	<i>Pluvialis squatarola</i>	Black-bellied plover
	<i>Charadrius semipalmatus</i>	Semipalmated plover
	<i>Charadrius vociferus</i>	Killdeer
	<i>Himantopus mexicanus</i>	Black-necked stilt
	<i>Recurvirostra americana</i>	American avocet
	<i>Tringa melanoleuca</i>	Greater yellowlegs
	<i>Tringa flavipes</i>	Lesser yellowlegs
	<i>Tringa solitaria</i>	Solitary sandpiper
	<i>Catoptrophorus semipalmatus</i>	Willet
	<i>Actitis macularia</i>	Spotted sandpiper
	<i>Limosa fedoa</i>	Marbled godwit
	<i>Calidris canutus</i>	Red knot
	<i>Calidris pusilla</i>	Semipalmated sandpiper
	<i>Calidris mauri</i>	Western sandpiper
	<i>Calidris minutilla</i>	Least sandpiper
	<i>Calidris fuscicollis</i>	White-rumped sandpiper
	<i>Calidris melanotos</i>	Pectoral sandpiper
	<i>Calidris alpina</i>	Dunlin
	<i>Calidris himantopus</i>	Stilt sandpiper
	<i>Limnodromus griseus</i>	Short-billed dowitcher
	<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
	<i>Gallinago gallinago</i>	Common snipe
	<i>Scolopax minor</i>	American woodcock
	<i>Larus atricilla</i>	Laughing gull
	<i>Larus philadelphia</i>	Bonaparte's gull
	<i>Larus delawarensis</i>	Ring-billed gull
	<i>Larus argentatus</i>	Herring gull

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Charadriiformes (continued)	<i>Sterna nilotica</i>	Gull-billed tern
	<i>Sterna caspia</i>	Caspian tern
	<i>Sterna forsteri</i>	Forster's tern
	<i>Sterna antillarum</i>	Least tern
	<i>Chlidonias niger</i>	Black tern
	<i>Rynchops niger</i>	Black skimmer
	<i>Columba livia</i>	Rock dove
	<i>Streptopelia decaocto</i>	Eurasian-collared-dove
Columbiformes	<i>Zenaida asiatica</i>	White-winged dove
	<i>Zenaida macroura</i>	Mourning dove
	<i>Columbina passerina</i>	Common ground-dove
Cuculiformes	<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo
	<i>Coccyzus americanus</i>	Yellow-billed cuckoo
	<i>Crotophaga ani</i>	Smooth-billed ani
Strigiformes	<i>Tyto alba</i>	Barn owl
Strigiformes	<i>Otus asio</i>	Eastern screech-owl
	<i>Bubo virginianus</i>	Great horned owl
	<i>Athene cunicularia</i>	Burrowing owl
	<i>Strix varia</i>	Barred owl
	<i>Asio flammeus</i>	Short-eared owl
Caprimulgiformes	<i>Chordeiles acutipennis</i>	Lesser Nighthawk
	<i>Chordeiles minor</i>	Common Nighthawk
	<i>Caprimulgus carolinensis</i>	Chuck-will's-widow
	<i>Caprimulgus vociferus</i>	Whip-poor-will
Apodiformes	<i>Chaetura pelagica</i>	Chimney swift
Apodiformes	<i>Archilochus colubris</i>	Ruby-throated hummingbird
Coraciiformes	<i>Ceryle alcyon</i>	Belted kingfisher
Piciformes	<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker
	<i>Melanerpes carolinus</i>	Red-bellied woodpecker
	<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker
	<i>Picoides pubescens</i>	Downy Woodpecker
	<i>Picoides villosus</i>	Hairy Woodpecker
	<i>Colaptes auratus</i>	Northern flicker
	<i>Dryocopus pileatus</i>	Pileated woodpecker
	<i>Contopus virens</i>	Eastern wood-pewee
	<i>Empidonax virescens</i>	Acadian flycatcher
	<i>Empidonax traillii</i>	Willow flycatcher

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Passeriformes (continued)	<i>Empidonax minimus</i>	Least flycatcher
	<i>Sayornis phoebe</i>	Eastern phoebe
	<i>Myiarchus crinitus</i>	Great crested flycatcher
	<i>Tyrannus melancholicus</i>	Tropical kingbird
	<i>Tyrannus vociferans</i>	Cassin's kingbird
	<i>Tyrannus verticalis</i>	Western kingbird
	<i>Tyrannus tyrannus</i>	Eastern kingbird
	<i>Tyrannus dominicensis</i>	Gray kingbird
	<i>Tyrannus forficatus</i>	Scissor-tailed flycatcher
	<i>Lanius ludovicianus</i>	Loggerhead shrike
	<i>Vireo griseus</i>	White-eyed vireo
	<i>Vireo bellii</i>	Bell's vireo
	<i>Vireo solitarius</i>	Blue-headed vireo
	<i>Vireo Flavifrons</i>	Yellow-throated vireo
	<i>Vireo philadelphicus</i>	Philadelphia vireo
	<i>Vireo olivaceus</i>	Red-eyed vireo
	<i>Vireo altiloquus</i>	Black-whiskered vireo
	<i>Cyanocitta cristata</i>	Blue jay
	<i>Aphelocoma coerulescens</i>	Florida scrub-jay
	<i>Corvus brachyrhynchos</i>	American crow
	<i>Corvus ossifragus</i>	Fish crow
	<i>Eremophila alpestris</i>	Horned lark
	<i>Progne subis</i>	Purple martin
	<i>Tachycineta bicolor</i>	Tree swallow
	<i>Stelgidopteryx serripennis</i>	Northern rough-winged swallow
	<i>Riparia riparia</i>	Bank swallow
	<i>Petrochelidon pyrrhonota</i>	Cliff swallow
	<i>Hirundo rustica</i>	Barn swallow
	<i>Thryothorus ludovicianus</i>	Carolina wren
	<i>Troglodytes aedon</i>	House wren
	<i>Cistothorus platensis</i>	Sedge wren
	<i>Cistothorus palustris</i>	Marsh wren
	<i>Regulus calendula</i>	Ruby-crowned kinglet
	<i>Polioptila caerulea</i>	Blue-gray gnatcatcher
	<i>Catharus fuscescens</i>	Veery
	<i>Catharus minimus</i>	Gray-cheeked thrush

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Passeriformes (continued)	<i>Catharus ustulatus</i>	Swainson's thrush
	<i>Catharus guttatus</i>	Hermit thrush
	<i>Turdus migratorius</i>	American robin
	<i>Dumetella Carolinensis</i>	Gray catbird
	<i>Mimus polyglottos</i>	Northern mockingbird
	<i>Toxostoma rufum</i>	Brown thrasher
	<i>Anthus rubescens</i>	American pipit
	<i>Bombycilla cedrorum</i>	Cedar waxwing
	<i>Sturnes vulgaris</i>	European starling
	<i>Vermivora pinus</i>	Blue-winged warbler
	<i>Vermivora chrysoptera</i>	Golden-winged warbler
	<i>Vermivora peregrina</i>	Tennessee warbler
	<i>Vermivora celata</i>	Orange-crowned warbler
	<i>Vermivora ruficapilla</i>	Nashville warbler
	<i>Parula americana</i>	Northern parula
	<i>Dendroica petechia</i>	Yellow warbler
	<i>Dendroica pensylvanica</i>	Chestnut-sided warbler
	<i>Dendroica magnolia</i>	Magnolia warbler
	<i>Dendroica tigrina</i>	Cape may warbler
	<i>Dendroica caerulescens</i>	Black-throated blue warbler
	<i>Dendroica coronata</i>	Yellow-rumped warbler
	<i>Dendroica virens</i>	Black-throated green warbler
	<i>Dendroica fusca</i>	Blackburnian warbler
	<i>Dendroica dominica</i>	Yellow-throated warbler
	<i>Dendroica pinus</i>	Pine warbler
	<i>Dendroica discolor</i>	Prairie warbler
	<i>Dendroica palmarum</i>	Palm warbler
	<i>Dendroica castanea</i>	Bay-breasted warbler
	<i>Dendroica striata</i>	Blackpoll warbler
	<i>Mniotilta varia</i>	Black-and-white warbler
	<i>Setophaga ruticilla</i>	American redstart
	<i>Protonotaria citrea</i>	Prothonotary warbler
	<i>Helmitheros vermivorus</i>	Worm-eating warbler
	<i>Limnothlypis swainsonii</i>	Swainson's warbler
	<i>Seiurus aurocapillus</i>	Ovenbird
	<i>Seiurus noveboracensis</i>	Northern waterthrush
	<i>Seiurus motacilla</i>	Louisiana waterthrush

Table 21. Birds of A.R.M. Loxahatchee National Wildlife Refuge. (continued)

<i>Order</i>	<i>Scientific Name</i>	<i>Common Name</i>
Passeriformes (continued)	<i>Oporornis formosus</i>	Kentucky warbler
	<i>Geothlypis trichas</i>	Common yellowthroat
	<i>Wilsonia citrina</i>	Hooded warbler
	<i>Wilsonia pusilla</i>	Wilson's warbler
	<i>Wilsonia canadensis</i>	Canada warbler
	<i>Icteria virens</i>	Yellow-breasted chat
	<i>Piranga rubra</i>	Summer tanager
	<i>Piranga olivacea</i>	Scarlet tanager
	<i>Pipilo erythrophthalmus</i>	Eastern towhee
	<i>Spizella passerina</i>	Chipping sparrow
	<i>Spizella pallida</i>	Clay-colored sparrow
	<i>Poocetes gramineus</i>	Vesper sparrow
	<i>Chondestes grammacus</i>	Lark sparrow
	<i>Passerculus sandwichensis</i>	Savannah sparrow
	<i>Ammodramus savannarum</i>	Grasshopper sparrow
	<i>Melospiza lincolnii</i>	Lincoln's sparrow
	<i>Melospiza georgiana</i>	Swamp sparrow
	<i>Cardinalis cardinalis</i>	Northern cardinal
	<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak
	<i>Guiraca caerulea</i>	Blue grosbeak
	<i>Passerina cyanea</i>	Indigo bunting
	<i>Passerina ciris</i>	Painted bunting
	<i>Spiza americana</i>	Dickcissel
	<i>Dolichonyx oryzivorus</i>	Bobolink
	<i>Agelaius phoeniceus</i>	Red-winged blackbird
	<i>Sturnella magna</i>	Eastern meadowlark
	<i>Xanthocephalus xanthocephal</i>	Yellow-headed blackbird
	<i>Euphagus carolinus</i>	Rusty blackbird
	<i>Quiscalus quiscula</i>	Common grackle
	<i>Quiscalus major</i>	Boat-tailed grackle
	<i>Molothrus ater</i>	Brown-headed cowbird
	<i>Icterus pectoralis</i>	Spot-breasted oriole
	<i>Icterus spurius</i>	Orchard oriole
	<i>Icterus galbula</i>	Baltimore oriole
	<i>Carduelis pinus</i>	Pine siskin
	<i>Carduelis tristis</i>	American goldfinch
	<i>Passer Domesticus</i>	House Sparrow

Table 22. Listed Species at A.R.M. Loxahatchee National Wildlife Refuge

Listed species (Federal and State listed endangered, threatened, or species of special concern; US Fish and Wildlife Service species of management concern; and the Convention of International Trade in Endangered Species) known to occur or could occur on A.R.M. Loxahatchee National Wildlife Refuge.

<i>Scientific Names</i>	<i>Common Names</i>	<i>Federal</i>	<i>FWS smc</i>	<i>Florida GFW-FC</i>	<i>Florida Dpt.of Ag.</i>	<i>CITES</i>	<i>FNAI</i>
BIRDS							
<i>Botaurus lentiginosus</i>	American bittern		*				
<i>Elanoides forticatus</i>	American swallow-tailed kite		*				S2S3
<i>Falco peregrinus tundrius</i>	Arctic peregrine falcon			E		*	S2
<i>Haliaeetus leucocephalus</i>	Bald eagle	T		T		*	S3
<i>Laterallus jamaicensis</i>	Black rail		*				S3
<i>Dolichonyx oryzivorus</i>	Bobolink		*				
<i>Tyto alba</i>	Common barn owl		*				
<i>Columbina passerina</i>	Common ground-dove		*				
<i>Polyborus plancus audubonii</i>	Crested caracara	T		T			S2
<i>Sturnella magna</i>	Eastern meadowlark		*				
<i>Grus canadensis pratensis</i>	Florida sandhill crane			T		*	S2S3
<i>Sterna antillarum</i>	Least tern			T			S3
<i>Ixobrychus exilis</i>	Least bittern		*				S4
<i>Aramus guarauna</i>	Limpkin			SSC			S3
<i>Egretta caerulea</i>	Little blue heron			SSC			S4
<i>Lanius ludovicianus migrans</i>	Loggerheaded shrike, migrant	*					
<i>Falco columbarius</i>	Merlin					*	SU
<i>Colaptes auratus</i>	Northern flicker		*				
<i>Circus cyaneus</i>	Northern harrier		*			*	
<i>Pandion haleaetus</i>	Osprey					*	S3S4
<i>Colaptes auratus</i>	Painted bunting		*				S3
<i>Dendroica discolor</i>	Prairie warbler		*				S3
<i>Egretta rufescens</i>	Reddish egret			SSC			S2
<i>Ajaia ajaja</i>	Roseate spoonbill			SSC			S2S3
<i>Passerulus sandwichensis</i>	Savannah sparrow		*				
<i>Cistothorus platensis</i>	Sedge wren		*				
<i>Buteo brachyurus</i>	Short-tailed hawk		*				S3
<i>Rostrhamus sociabilis</i>	Snail kite	E		E			S1
<i>Egretta thula</i>	Snowy egret			SSC			S4
<i>Falco sparverius paulus</i>	Southeastern kestrel			T		*	S3
<i>Buteo swainsoni</i>	Swainson's hawk			SSC			
<i>Egretta tricolor</i>	Tricolored heron			SSC			S4
<i>Bartramia longicauda</i>	Upland sandpiper		*				
<i>Eudocimus albus</i>	White ibis			SSC			S4

Appendix K - Flora & Fauna

<i>Scientific Names</i>	<i>Common Names</i>	<i>Federal</i>	<i>FWS smc</i>	<i>Florida GFW-FC</i>	<i>Florida Dpt.of Ag.</i>	<i>CITES</i>	<i>FNAI</i>
<i>Grus americana</i>	Whooping crane	XN		SSC			SXC
<i>Mycteria americana</i>	Wood stork	E		E			S2
<i>Helmitheros vermivorus</i>	Worm-eating warbler		*				S1
<i>Coturnicops noveboracensis</i>	Yellow rail		*				
<i>Coturnicops noveboracensis</i>	Yellow-billed cuckoo		*				
MAMMALS							
<i>Lynx rufus</i>	Bobcat					*	
<i>Felis concolor coryi</i>	Florida panther	E		E		*	S1
<i>Lutra canadensis</i>	River otter					*	
REPTILES							
<i>Alligator mississippiensis</i>	American alligator	TS/A		SSC		*	S4
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T		T			S3
<i>Gopherus polyphemus</i>	Gopher tortoise			SSC			S3
PLANTS							
<i>Ionopsis utricularioides</i>	Delicate ionopsis			E		*	S1
<i>Thelypteris interrupta</i>	Fern, aspidium			T			
<i>Thelypteris kunthii</i>	Fern, aspidium			T			
<i>Thelypteris palustris</i>	Fern, aspidium			T			
<i>Osmunda cinnomomea</i>	Fern, cinnamon				CE		
<i>Acrostichum danaeifolium</i>	Fern, giant leather				CE		
<i>Nephrolepis biserrata</i>	Fern, giant sword				T		
<i>Azolla caroliniana</i>	Fern, mosquito				T		
<i>Phlebodium aureum</i>	Fern, polyploidy				T		
<i>Actinostachys pennula</i> <i>Schizaea germanii</i>	Fern, ray or Spike-ray fern also known as Tropical curly-grass fern			E			S1
<i>Osmunda regalis</i>	Fern, royal			SCC	CE		
<i>Campyloneurum latum</i>	Fern, strap				E		
<i>Psilotum nudum</i>	Fern, whisk				T		
<i>Salvinia rotundifolia</i>	Water spangles				T		
<i>Tillandsia fasciculata</i>	Wild pine, cardinal (stiff-leaved)				E		
<i>Tillandsia utriculata</i>	Wild pine, giant				E		
<i>Tillandsia balbisiana</i>	Wild pine, reflexed (inflated)				T		
<i>Tillandsia flexuosa</i>	Wild pine, twisted				E		
* FWS species of management concern	S3	Either very rare and local throughout its range or found locally in a restricted range or vulnerable to extinction from other factors.		SXU	Believed to be extinct throughout its range in Florida, being reestablished.		
CE Commercially exploited				T	Threatened		
E Endangered				T(S/A)	Threatened due to similarity of appearance.		
S1 Critically imperiled in Florida because of extreme rarity or of extreme vulnerability to extinction due to some natural or manmade factors.	S4	Apparently secure in Florida, may be rare in parts of its range.		XN	Nonessential experimental population in Florida, is listed as Endangered elsewhere in the US.		
	SSC	Species of special concern in State of Florida (FFWCC)					
S2 Imperiled in Florida because of rarity or of vulnerability to extinction due to some natural or man-made factor.	SU	Due to lack of information no range can be given					

Table 23. Exotic animals of A.R.M. Loxahatchee National Wildlife Refuge*Exotic Animals reported from, or expected to be present on A.R.M. Loxahatchee NWR.**Those noted with ** are pending threats to the refuge.*

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Breeding Status</i>
Birds			
	Melopsittacus undulatus	Budgerigar	no
	Nymphicus hollandicus	Cockatiel	no
	Anas platyrhynchos	Domestic mallard	no
	Streptopelia decaocto	Eurasian collared-dove	no
	Sturnis vulgaris	European starlin	yes
	Passer domesticus	House sparrow	no
	Myiopsitta monachus	Monk parakeet	no
	Cairina moschata	Muscovy duck	no
	Amazona spp.	Parrot sp.	no
	Columbia livia	Rock dove or common pigeon	no
	Molothrus bonariensis	Shiny cowbird	no
Mammals			
	Rattus rattus	Black rat	yes
	Canis latrans	Coyote**	no
	Canis familiaris	Feral dog	no
	Sus scrofa	Feral hog	yes
	Felis domesticus	Feral cat	no
	Mus musculus	House mouse	yes
	Felis yagouaroundi	jaguarundi	no
	Dasypus novemcinctus	Nine-banded armadillo	yes
	Rattus norvegicus	Norway rat	yes
	Vulpes fulva	Red fox	no
Reptiles			
	Boa constrictor	Boa constrictor	no
	Anolis sagrei sagrei	Brown anole	yes
	Iguana iguana	Green iguana	no
	Kinixys homeana	Home's hinge-back tortoise	no
	Hemidactylus garnotii	Indo-Pacific gecko	yes
	Hemidactylus turcicus turcicus	Mediterranean gecko	yes
		Monitor lizard spp.	no
	Leiocephalus carinatus	Northern curly-tailed lizard	no
		python spp.	no
Amphibians			
	Osteopilus septentrionalis	Cuban treefrog	yes
	Bufo marinus	Giant marine toad	no

<i>Group</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Breeding Status</i>
Invertebrates			
	<i>Aedes albopictus</i>	Asian tiger mosquito	yes
	<i>Viviparus georgianus</i>	Banded mystery snail	yes
	<i>Metamasius callizona</i>	Bromeliad beetle**	?
		crayfish spp.	?
	<i>Apis mellifera mellifera</i>	European honeybee	yes
	<i>Marissa cornuarietis</i>	Goldenhorn marissa**	?
	<i>Solenopsis invicta</i> imported	Red fire ant	yes
	<i>Plectiscus nearcticus</i>	Love bug	yes
	<i>Pseudomyrmex gracilis</i>	Mexican elongate twig ant	yes
	<i>Pomacea bridgesis</i> spike-topped	Apple snail	yes
Fish			
	radiated pteropod	Armour-plated catfish	yes
	<i>Monopterus albus</i>	Asian swamp eel**	no
	<i>Trichopsis vittata</i>	Croaking gourami	?
	<i>Ctenopharyngodon idella</i>	Grass carp	?
	<i>Xiphophorus helleri</i>	Green swordtail	?
	<i>Liposarcus multiradiatus</i>	Sailfin catfish	?
	<i>Hoplosternum littorale</i>	South American armored catfish **	no
	<i>Xiphophorus maculatus</i>	Southern platyfish	?
	<i>Hypostomus</i> spp.	Suckermouth catfish	yes
	<i>Hypostomus</i> spp.	Suckermouth catfish	?
	<i>Xiphophorus variatus</i>	Variable platyfish	?
	<i>Liposarcus disjunctivus</i>	Vermiculated sailfin catfish	?
	<i>Clarias batrachus</i>	Walking catfish	yes
Fish:			
Cichlid Family	<i>Hemichromis letourneauxi</i>	Black aracara	?
	<i>Cichlasoma bimaculatum</i>	Black acara	yes
	<i>Sarotherodon melanotheron</i>	Blackchin tilapia	?
	<i>Oreochromis aureus</i>	Blue tilapia	yes
	<i>Cichlasoma meeki</i>	Firemouth	?
	<i>Cichlasoma octofasciatum</i>	Jack Dempsey	?
	<i>Cichlasoma urophthalmus</i>	Mayan cichlid	?
	<i>Cichlasoma citrinellum</i>	Midas cichlid	?
	<i>Oreochromis mossambicus</i>	Mozambique tilapia	?
	<i>Astronotus ocellatus</i>	Oscar	yes
	<i>Geophagus surinamensis</i>	Redstriped eartheater	?
	<i>Cichlasoma cyanoguttatum</i>	Rio Grande cichlid	?
	<i>Tilapia mariae</i>	Spotted tilapia	yes

Table 24. Category I Exotic Plants found on A.R.M. Loxahatchee National Wildlife Refuge

<i>Scientific Name</i>	<i>Common Name</i>
<i>Casuarina equisetifolia</i>	Australian pine
<i>Lygodium microphyllum</i>	Old World climbing fern
<i>Bischofia javanica</i>	Bishchofia
<i>Bauhinia variegata</i>	Orchid tree
<i>Schinus terebinthifolius</i>	Brazilian pepper
<i>Rhoeo spathacea</i>	Oyster plant
<i>Acacia auriculiformis</i>	Earleaf acacia
<i>Brachiaria mutica</i>	Para grass
<i>Psidium guajava</i>	Guava
<i>Abrus precatorius</i>	Rosary pea
<i>Hydrilla verticillata</i>	Hydrilla
<i>Ardisia elliptica</i>	Shoebutton ardisia
<i>Syzygium cumini</i>	Java plum
<i>Eugenia uniflora</i>	Surinam cherry
<i>Lantana camara</i>	Lantana
<i>Nephrolepis cordifolia</i>	Sword fern
<i>Ficus microcarpa</i>	laurel fig
<i>Panicum repens</i>	Torpedo grass
<i>Melaleuca quinquenervia</i>	Melaleuca
<i>Eichhornia crassipes</i>	Water hyacinth
<i>Pistia stratiotes</i>	Water lettuce

Table 25. Category II Exotic Plants found on A.R.M. Loxahatchee National Wildlife Refuge

<i>Scientific Name</i>	<i>Common Name</i>
<i>Alternanthera philoxeroides</i>	Alligatorweed
<i>Syngonium podophyllum</i>	Arrowhead vine
<i>Nephrolepis multiflora</i>	Asian sword fern
<i>Urena lobata</i>	Caesar's weed
<i>Murraya paniculata</i>	Orange-jasmine
<i>Tribulus terrestris</i>	Puncture vine
<i>Terminalia catappa</i>	Tropical almond
<i>Wedelia trilobata</i>	Wedelia
<i>Ficus benjamina</i>	Weeping fig

Table 26. Plants of the Cypress Swamp Boardwalk of A.R.M. Loxahatchee National Wildlife Refuge (Partial List)

<i>Scientific Name</i>	<i>Common Name</i>
TREES & SHRUBS	
<i>Aster carolinianus</i>	Aster, Climbing
<i>Annona glabra</i>	Apple, Pond
<i>Taxodium distichum</i>	Bald-cypress
<i>Persea boronia</i>	Bay, Red
<i>Myrica cerifera</i>	Bayberry, Southern (Wax Myrtle)
<i>Cephalanthus occidentalis</i>	Buttonbush, Common
<i>Ilex cassine</i>	Dahoon (Dahoon Holly)
<i>Sambucus canadensis</i>	Elder, American (Elderberry)
<i>Ficus aurea</i>	Fig, Strangler
<i>Psidium guajava</i>	Guava
<i>Ficus microcarpa</i>	Laurel, Indian (Laurel Fig)
<i>Acer rubrum</i>	Maple, Red
<i>Rapanea punctata</i> (Myrsine guianensis*)	Myrsine
<i>Schinus terebinthifolius</i>	Pepper, Brazilian
<i>Chrysobalanus icaco</i>	Plum, Coco
<i>Taxodium ascendens</i>	Pond-cypress
<i>Ludwigia peruviana</i>	Primrosewillow, Peruvian
<i>Baccharis glomerulifera</i>	Silvering (Saltbush)
<i>Salix caroliniana</i>	Willow, Carolina (Coastal Plain Willow)
<i>Itea virginica</i>	Willow, Virginia
HERBS	
<i>Alternanthera philoxeroides</i>	Alligatorweed
<i>Sagittaria lancifolia</i>	Arrowhead, Bulltongue
<i>Peltandra virginica</i>	Arum, Green Arrow
<i>Erechtites hieracifolia</i>	Burnweed, American (Fireweed)
<i>Urena lobata</i>	Caesarweed
<i>Typha</i> spp.	Cattail
<i>Commelina diffuse</i>	Dayflower
<i>Spirodela punctata</i> (=S. oligorhiza)	Duckweed, Dotted
<i>Chromolaena odorata</i> (=Eupatorium odoratum)	Jack-in-the-bush
<i>Ludwigia repens</i>	Primrosewillow, Creeping (Red Ludwigia)
<i>Kosteletzkya virginica</i>	Mallow, Virginia Saltmarsh
<i>Hydrocotyle umbellata</i>	Marshpennywort, Manyflower
<i>Boehmeria cylindrica</i>	Nettle, False
<i>Pontederia cordata</i>	Pickernelweed
<i>Hydrolea corymbosa</i>	Skyflower

Table 26. Plants of the Cypress Swamp Boardwalk of A.R.M. Loxahatchee National Wildlife Refuge (continued)

<i>Scientific Name</i>	<i>Common Name</i>
HERBS (continued)	
<i>Nuphar lutea</i>	Spatterdock (Yellow Pondlily)
<i>Crinum americanum</i>	String-lily
<i>Pluchea odorata</i>	Sweetscent (Saltmarsh Fleabane)
<i>Saururus cernuus</i>	Tail, Lizard's
<i>Polygonum hydropiperoides</i>	Waterpepper, Mild (Smartweed)
VINES	
<i>Momordica charantia</i>	Balsampear (Wild Balsam Apple)
<i>Parthenocissus quinquefolia</i>	Creeper, Virginia
<i>Smilax laurifolia</i>	Greenbrier (Bamboo Vine)
<i>Mikania scandens</i>	Hempvine, Climbing
<i>Ipomoea alba</i>	Moonflowers
<i>Ipomoea sagittate</i>	Morningglory, Saltmarsh
<i>Vitis rotundifolia</i>	Muscadine (Fox Grape)
<i>Ampelopsis arborea</i>	Peppervine
<i>Sarocostemma clausum</i>	Twinevine, White (Whitevine)
SEDGES	
<i>Cyperus</i> spp.	Flat Sedge
FERNS & FERN-ALLIES	
<i>Azolla caroliniana</i>	Carolina Mosquito Fern
<i>Osmunda cinnamomea</i> (C)	Cinnamon Fern
<i>Acrostichum danaeifolium</i>	Giant Leather Fern
<i>Nephrolepis biserrata</i> (T)	Giant Sword Fern
<i>Phlebodium aureum</i>	Golden Polypody (Cabbage Palm Fern)
<i>Thelypteris interrupta</i>	Hottentot Fern (Tri-vein Fern)
<i>Campyloneurum phyllitidis</i>	Long Strap Fern
<i>Pleopeltis polypodioides</i> (=Polypodium p.)	Resurrection Fern
<i>Osmunda regalis</i> (C)	Royal Fern
<i>Nephrolepis exaltata</i>	Sword Fern (Wild Boston Fern)
<i>Blechnum serrulatus</i>	Toothed Midsorus Fern (Swamp Fern)
<i>Salvinia minima</i> (=S. rotundifolia*)	Water Spangles
<i>Psilotum nudum</i>	Whisk-fern
<i>Thelypteris kunthii</i> (=T. normalis)	Widespread Maiden Fern

Table 26. Plants of the Cypress Swamp Boardwalk of A.R.M. Loxahatchee National Wildlife Refuge (continued)

<i>Scientific Name</i>	<i>Common Name</i>
BROMELIADS	
<i>Tillandsia recurvate</i>	Ballmoss
<i>T. fasciculata</i> (E)	Cardinal Airplant
<i>T. utriculata</i> (E)	Giant Airplant
<i>T. floridana</i> (= <i>T. polystachya</i> *)	Hybrid Airplant (Reddish Wildpine)
<i>T. balbisiana</i> (T)	Northern Needleleaf (Reflexed Wildpine)
<i>T. setacea</i>	Southern Needleleaf (Needle-leaved Wildpine)
<i>T. usneoides</i>	Spanish Moss
LICHENS	
<i>Cryptothecia rubrocincta</i> (= <i>Chiodecton sanguineum</i>) (= <i>Herpothallon</i> s.)	Baton Rouge (Red Stick; Red Blanket)
<i>Usnea strigosa</i>	Old Man's Beard

(E) Endangered

(T) Threatened

(C) Commercially Exploited

(*) Name Changed

Table 27. Wildflowers of A.R.M. Loxahatchee National Wildlife Refuge (Partial List)

<i>Scientific Name</i>	<i>Common Name</i>
<i>Tillandsia fasciculata</i>	Air-plant, Cardinal (Stiff-leaved Wild-pine)
<i>Peltandra virginica</i>	Arum, Arrow (Green Arum)
<i>Sagittaria lancifolia</i>	Arrowhead
<i>Thalia geniculata</i>	Arrowroot (Alligator Flag)
<i>Aster carolinianus</i>	Aster, Climbing (Carolina Aster)
<i>Momordica charantia</i>	Balsam Apple, Wild
<i>Senecio glabellus</i>	Butterweed (Golden Ragwort)
<i>Cephalanthus occidentalis</i>	Buttonbush
<i>Urena lobata</i>	Caesar-weed
<i>Typha</i> spp.	Cattail
<i>Vigna luteola</i>	Cow-pea
<i>Melothria pendula</i>	Cucumber, Climbing
<i>Commelina erecta</i>	Dayflower
<i>Sambucus canadensis</i> (<i>S. simpsonii</i>)	Elderberry
<i>Eupatorium capillifolium</i>	Fennel, Dog

Table 27. Wildflowers of A.R.M. Loxahatchee National Wildlife Refuge (continued)

<i>Scientific Name</i>	<i>Common Name</i>
<i>Pluches odorata</i>	Fleabane, Salt-marsh
<i>Erigeron queroifolius</i>	Fleabane, Southern
<i>Lippia (Phyla) nodiflora</i>	Frog-fruit (Carpetweed)
<i>Gaura augustifolia</i>	Gaura, Southern
<i>Mikania scandens</i>	Hempweed, Climbing
<i>Lantana camaraana</i>	Lantana
<i>Lactuca graminifolia</i>	Lettuce, Wild
<i>Hymenocoallis</i> spp.	Lily, Spider
<i>Crinum americanum</i>	Lily, String
<i>Saururus cernuus</i>	Lizard's-tail
<i>Kosteletzkya virginica</i>	Mallow, Saltmarsh
<i>Ipomoea alba</i>	Moonflower
<i>Hydrocotyle umbellata</i>	Pennywort, Marsh
<i>Lepidium virginicum</i>	Pepper-grass
<i>Ampelopsis arborea</i>	Pepper-vine
<i>Catharanthus roseus</i>	Periwinkle, Madagascar
<i>Pontederia cordata</i>	Pickereelweed
<i>Plantago lanceolata</i>	Plantain, English
<i>Poinsettia cyathophora</i>	Poinsettia, Wild (Painted-leaf)
<i>Tribulus cissoides</i>	Puncture-weed (Burnut)
<i>Rivina humilis</i>	Rouge-plant (Bloodberry)
<i>Cenchrus incertus</i>	Sandspur, Coast
<i>Dichromena colorata</i>	Sedge, White-top (Star Rush)
<i>Sida</i> sp.	Sida
<i>Bidens alba</i> (B. pilosa)	Spanish Needles
<i>Nuphar luteum</i> (N. lutea)	Spatterdock (Yellow pond-lily)
<i>Emilis fosbergii</i>	Tasselflower
<i>Coreopsis</i> spp.	Tickseed
<i>Desmodium</i> spp.	Tick-trefoil
<i>Linaria canadensis</i>	Toadflax, Blue
<i>Nymphaea odorata</i>	Waterlily, White
<i>Wedelia trilobata</i>	Wedelia (Creeping Oxeye)
<i>Sarcostemma clausum</i>	White-vine (Climbing milkweed)
<i>Ludwigia peruviana</i>	Willow, Primrose
<i>Itea virginica</i>	Willow, Virginia

Subtropical Florida Partners-in-Flight Bird Conservation Plan: Section 2 Avifaunal Analysis

Table 28. Priority bird species for subtropical Florida: entry criteria and selection rationale

Priority Entry Criteria ¹	Species	Total PIF Priority Species Score	Concern Area Importance	Score Population Trend	Percent of BBS Population	Local Migratory Status	Geographic or Historical Notes
Ia.	Snail Kite ⁵ (Everglade)	34	5	4 ⁴	100?	D	
	Seaside Sparrow ⁵ (Cape Sable)	34	5	4	100 ³	D	
	Snowy Plover (SE US)	34	5	5		D	Gulf side only
	Red Knot (SE US)	32	5	5		C	
	Crested Caracara ⁵ (Florida pop.)	32	3 ⁴	5 ⁴		D	
	Florida Scrub-Jay ⁵	32	2	5		R	Presently extipated?
	Grasshopper Sparrow ⁵ (Florida)	32	2	5		R	Presently extipated?
	Piping Plover ⁵	31	4	5		C	
	Roseate Tern ⁵ (N. Am. Pop.)	31	4	4		B	
	Burrowing Owl (Florida)	31	5	4 ⁴		D	
	Wood Stork ⁵ (SE US)	30	5	4		D	
	Short-tailed Hawk (Florida pop.)	30	5 ⁴	3		D	
	Prairie Warbler (Florida)	30	5 ⁴	4 ⁴		D	
	Painted Bunting (Eastern)	30	4	5		C	
	Swallow-tailed Kite (SE US)	29	5 ⁴	3		B	
	Red-cockaded Woodpecker ⁵	29	3 ⁴	3		R	
	Great Blue Heron (Great White)	28	5	3	100 ³	R	
	Mottled Duck	28	5	3		D	
	American Oystercatcher (Eastern NA pops.)	28	5	3		D	
	Yellow Warbler (Cuban)	28	3 ⁴	4 ⁴	“100”	R	
Ib.	American Kestrel (SE US)	27	2	5 ⁴		R	Extirpated?
	Black Rail	27	4	3		D	
	Sandhill Crane (Florida)	27	4 ⁴	3		R	
	Wilson’s Plover	27	4	3		D	
	White-crowned Pigeon	27	4 ⁴	4 ⁴	100?	D	
	Nelson’s Sharp-tailed Sparrow	27	3	3		C	
	Audubon’s Shearwater (Caribbean)	26	5	3		P	
	Reddish Egret	26	4	3		D	
	Brown-headed Nuthatch	26	2	5		R	Nearing extirpation?
	Bicknell’s Thrush	26	5	3		A	
	Henslow’s Sparrow	26	2	4		C	Formerly more regular
	Yellow Rail	25	3	3		C	
	Buff-breasted Sandpiper	25	3	4		A	Most southbound migration
	Black-whiskered Vireo	25	5	4 ⁴	100?	B	
	Black-throated Blue Warbler	25	5	3		A	
	Bachman’s Sparrow	25	2	3		D	More frequent winter?
	Brown Pelican (SE US)	24	5	1 ⁴		D	

Appendix L - Avifaunal Analysis

Priority Entry Criteria ¹	Species	Total PIF Priority Species Score	Concern Area Importance	Score Population Trend	Percent of BBS Population	Local Migratory Status	Geographic or Historical Notes
	Marbled Godwit	24	3	4		C	
	Short-eared Owl (Greater Antillean)	24	1	1		PB	Status and taxonomy unclear
	Gray Kingbird	24	5	3	95.5?	B	
	Bobolink	24	5	5		A	
	White Ibis	23	5	4 ⁴		D	
	Solitary Sandpiper	23	5	3		A	
	Whimbrel	23	3	5		A	
	Stilt Sandpiper	23	4	3		A	
	Mangrove Cuckoo	23	4 ⁴	3	100?	D	
	Cape May Warbler	23	5	3		A	
	Connecticut Warbler	23	5	3		A	
	American Bittern	22	5	5		C	
	Clapper Rail	22	4	3		R	
	Semipalmated Sandpiper	22	5	5		A	
	Short-billed Dowitcher	22	5	5		C	
	Black Tern	22	5	5		A	
	Black Skimmer	22	5	5 ⁴		D	
	Sedge Wren	22	4	2		C	
	Palm Warbler	22	5	5		C	
II a.	Magnificent Frigatebird	21	5	3		D	
	Black-bellied Plover	21	4	5		D	
	Willet	21	5	3		D	
	Western Sandpiper	21	5	3		C	
	White-eyed Vireo	21	5		33.2	D	
	Veery	21	4	5		A	
	Grasshopper Sparrow (Eastern)	21	5	5		C	
	Least Bittern	20	5 ³		26.2?	D	
	Bald Eagle ⁵	20	5 ⁴	3		D	
	Northern Harrier	20	4	4		C	
	Limpkin	20	5	3	66.8?	R	
	King Rail	20	5	3		D	
	Ruddy Turnstone	20	3	4		D	
	Least Sandpiper	20	5	5		C	
	Dunlin	20	4	5		C	
	Least Tern	20	5	4 ⁴	B		
	Common Ground-Dove	20	5	4	4.2?	R	
	Smooth-billed Ani	20	5	4 ⁴	79.2?	R	
	Tricolored Heron	19	5	3	15.7?	D	
	Yellow-crowned Night-Heron	19	5	3		D	
	Roseate Spoonbill	19	5	3		D	
	Red-shouldered Hawk	19	5	3	4.7	D	
	American Avocet	19	3	3		C	
	Greater Yellowlegs	19	5	3		C	
	Sanderling	19	3	5		C	
	Pectoral Sandpiper	19	5	3		A	

Appendix L - Avifaunal Analysis

Priority Entry Criteria ¹	Species	Total PIF Priority Species Score	Concern Area Importance	Score Population Trend	Percent of BBS Population	Local Migratory Status	Geographic or Historical Notes
	Royal Tern	19	5	3		D	
	Barn Owl	19	5 ⁴	3		D	
	Gray Catbird	19	4	5		C	
III.	Chuck-will's-widow	20	3	3		D	
IV.	Scissor-tailed Flycatcher	21	2	3		C	
	Yellow-throated Warbler	21	4	3		C	
	Prothonotary Warbler	21	2	3		B	Breeding?
	American White Pelican	20	4	1		C	
	Redhead	20	2	4		C	
	American Woodcock	20	2	4		D	
	Cave Swallow	20	2	1 ⁴		B	Expanding range?
	Red-headed Woodpecker	20	2	3		D	Extirpated?
	Peregrine Falcon	19	5	1		A	Winters in small numbers
	Sooty Tern	19	4	3		B	Dry Tortugas
	Antillean Nighthawk	19	2	3		B	
	Florida Keys Loggerhead Shrike	19	4	3		D	
	Common Loon	18	4	3		C	
	Wood Duck	18	3	3		D	
	Ring-necked Duck	18	3	2		C	
	Lesser Scaup	18	3	5		C	
	Northern Bobwhite	18	3	3		R	
	Brown Noddy	18	4	3		B	Dry Tortugas
	Yellow-billed Cuckoo	18	3	3		B	
	Northern Parula	18	3	3		C	
	Rusty Blackbird	18	2	5		C	
	Little Blue Heron	17	5	3		D	
	Blue-winged Teal	17	5	3		A	
	Summer Tanager	17	2	3		B	Extirpated?
	Eastern Towhee	17	4	3		D	
	Eastern Meadowlark	17	4	4		D	
	Northern Pintail	16	3	5		C	
	Brown Thrasher	16	2	3		D	
	Black-and-white Warbler	17	3	3		C	
	Eastern Kingbird	15	3	3		B	
	Blue-gray Gnatcatcher	15	5	1		C	
	Northern Flicker	13	3	3		D	

¹Entry criteria (Area Importance [AI] scores roughly mean “1” irregular and unpredictable occurrence, “2” rare to uncommon but regular occurrence, “3” low relative abundance, “4” moderate to high relative abundance, “5” highest relative abundance; Population Trend [PT] scores roughly mean “1” definite increase, “2” stable or possible increase, “3” trend unknown, “4” possible decrease, “5” definite decrease):

- Ia. Overall Highest Priority Species. Species with total score 28-35. Ordered by total score. Consider deleting species with AI < 2 confirmed to be of peripheral occurrence and not of local conservation interest, but retain species potentially undersampled by BBS or known to have greatly declined during this century.
- Ib. Overall High Priority Species. Species with total score 22-27. Ordered by total score. Consider deleting species with AI < 2 confirmed to be of peripheral occurrence and not of local conservation interest, but retain species potentially undersampled by BBS or known to have greatly declined during this century.
- II. Area Priority Species. Species with slightly lower score total 19-21 with PT+AI=8+(a) or with high percent BBS population (b). Ordered by total score. These are overall moderate priority species.
- III. Additional Species of Global Priority. Add WatchList species (Partners in Flight-National Audubon Society priority species at national level), not already listed in either I or II, with AI=2+. Order by total score. Consider deleting species with AI=2 if confirmed to be of peripheral occurrence and not of local conservation interest, but retain if a local population is viable and/or manageable. These are also overall moderate priority species.
- IV. Local or Regional Interest Species. Includes game or nongame species identified by State Working Groups. Also, may include species often meeting criteria for I or II within other physiographic areas and therefore of regional interest for monitoring throughout the Southeast. These are overall low priority species within physiographic area, but may be more important within one or more States (especially where multiple states have designated some special protective status on the species).

² Local Migratory Status, codes adapted from Texas Partners in Flight as follows:

- A = Breeds in temperate or tropical areas outside of region, and winters in temperate or tropics outside of region (i.e., passage migrant).
- B = Breeds in temperate or tropical areas including the region, and winters exclusively in temperate or tropics outside the region (i.e., includes both breeding and transient populations).
- C = Breeds in temperate or tropical areas outside of region, and winters in both the region and in temperate or tropical areas beyond area (i.e., includes both transient and wintering populations).
- D = Breeds and winters in the region, with perhaps different populations involved, including populations moving through to winter beyond the region in temperate or tropical areas (i.e., populations may be present throughout year, but may include a large number of passage migrants).
- E = Species reaching distributional limits within the region, either as short-distance or long-distance breeding migrants, but at population levels above peripheral status.
- F = Same as E except for wintering (non-breeding) migrants.
- R = Resident, generally non-migratory species (though there may be local movements).
- RP= Resident, non-migratory species, reaching distributional limits within the region, but at population levels above peripheral status.
- P = Pelagic, breeding grounds outside of region, but can occur during breeding season.
- PB = Post-breeding dispersal or non-breeding resident; species present during breeding season, but not known to be breeding in the region proper.

³ Highest percent of breeding population recorded in temperate North America; numbers in “ ” are likely projections; ? indicates species widespread outside of temperate North America and/or waterbirds poorly sampled by Breeding Bird Survey within physio. area.

⁴ AI or PT score revised from what was derived by BBS data, or lack thereof, based on better local information.

⁵ Species listed as either Federal Endangered or Threatened.

Table 29. Species suites for A.R.M. Loxahatchee National Wildlife Refuge based on present and potential habitat

<i>Priority Level</i>	<i>Shrub-Scrub</i>	<i>Forested Wetlands/ Hammocks₁</i>	<i>Transient Landbirds</i>	<i>Emergent Wetlands²</i>	<i>Colonial Nesting Waders</i>	<i>Shorebirds³</i>
<i>Extremely High</i>	Painted Bunting	Short-tailed Hawk Swallow-tailed Kite Snail Kite		Wood Stork Mottled Duck Snail Kite	Wood Stork	
<i>High</i>	Gray Kingbird Palm Warbler Prairie Warbler		Bicknell's Thrush Black-throated Blue Warbler Bobolink Cape May Warbler Connecticut Warbler	Black Rail Florida Sandhill Crane Yellow Rail White Ibis Am. Bittern Black Tern Sedge Wren Wood Duck	White Ibis	Solitary Sandpiper Stilt Sandpiper Buff-breasted Sandpiper Short-billed Dowrtcher Semipalmated Sandpiper
<i>Moderate</i>	White-eyed Vireo Common Ground-Dove Smooth-billed Ani Gray Catbird	Bald Eagle Limpkin Red-shouldered Hawk	Veery	Least Bittern Bald Eagle Northern Harrier Limpkin King Rail Tricolored Heron Yellow-crowned Night-Heron Roseate Spoonbill Barn Owl Least Tern Lesser Scaup Grasshopper Sparrow	Tricolored Heron Yellow-crowned Night-Heron Roseate Spoonbill	American Avocet Greater Yellowlegs Western Sandpiper Least Sandpiper Pectoral Sandpiper

Table 29. Species suites for A.R.M. Loxahatchee National Wildlife Refuge based on present and potential habitat (continued)

<i>Priority Level</i>	<i>Shrub-Scrub</i>	<i>Forested Wetlands/ Hammocks¹</i>	<i>Transient Landbirds</i>	<i>Emergent Wetlands²</i>	<i>Colonial Nesting Waders</i>	<i>Shorebirds³</i>
<i>Local or Regional Interest</i>	Eastern Towhee Brown Thrasher	Yellow-throated Warbler Yellow-billed Cuckoo Northern Parula Black-and-white Warbler Black-and-white Warbler Blue-gray Gnatcatcher Wood Duck		Peregrine Falcon Eastern King-bird Little Blue Heron Snowy Egret Am. White Pelican Short-eared Owl Loggerhead Shrike Common Nighthawk Blue-winged Teal Northern Pintail Redhead Ring-necked Duck		

¹ Includes Tree Islands and Cypress Swamp, habitats that also support many colonial nesting waders and transient landbirds (along with Shrub-scrub)

² Includes Wetland Sloughs, Wet Prairies, Sawgrass, and Cattail, as well as open water and drier grasslands

³ In addition to other birds using impoundments, shorebirds require special management attention and priority species are listed here.

Existing & Potential Partners

Federal, State, and Local Agencies

ACME Drainage District
 City of Boca Raton
 City of Boynton Beach
 City of Delray Beach
 Florida Fish and Wildlife Conservation Commission
 Florida Division of Forestry
 Florida Department of Environmental Protection
 Florida Department of Tourism
 Florida Park Service
 Lake Worth Drainage District
 Palm Beach County Planning Department
 Palm Beach County Environmental Resources Management
 Palm Beach County Cooperative Extension Service
 South Florida Water Management District
 Town of Lantana
 Town of Royal Palm Beach
 Town of Palm Springs
 Town of Loxahatchee
 United States National Park Service (Everglades National Park)
 United States Corps of Engineers
 United States Geological Survey-Biological Research Division (Florida Cooperative Fish and Wildlife Research Unit)
 Village of Wellington
 West Palm Beach Convention and Visitors Bureau
 West Palm Beach County Commission

Landowners in the Everglades Agricultural Area

Agricultural Community Groups
 Sugar Cane League
 Surrounding Land Owners

Universities and Other Learning Institutions

Environmental Sciences and Technology at Forest Hill High School
 Environmental Academy at Jupiter High School
 Florida State University
 Florida International University
 Florida Atlantic University
 Lynn University
 Miami-Dade School Board
 Nova University
 Palm Beach County School Board
 Palm Beach Community College
 Palm Beach Atlantic College
 Region 5 - Regional Service Project (Broward Community College)
 School Board of Broward County
 University of Florida (Department of Wildlife Ecology and Conservation)
 (Institute of Food and Agricultural Sciences)
 (Department of Recreation, Parks and Tourism)

Organizations

1000 Friends of Florida
 4-H Club
 Arthur R. Marshall Foundation
 Atala Chapter of the North American Butterfly Association
 Audubon Society of the Everglades
 Big Reel Bassmasters of Margate
 Boys and Girls Club of Palm Beach County
 Christian Bass Anglers Association
 Ducks Unlimited
 Everglades Coordinating Council
 FLEPPC - Florida Exotic Pest Plant Council
 Florida Greenways
 Florida Trail Association
 Florida Wildlife Federation
 Florida Wildlife Society
 Florida Greenways

Friends of the Everglades
 Governor's Council
 Graves Museum (Broward County Archaeological Society)
 Gulfstream Boy Scout Council
 Local Media Contacts - Television, Newspaper, Radio
 Loxahatchee Natural History Association
 Miami Geological Society
 Miccosukee Tribe of Indians of Florida
 National Audubon Society
 Everglades Conservation Office
 Native Plant Society
 Outdoor Media Writers
 Palm Beach Heritage and Tourism Association
 Palm Beach County Parks and Recreation
 Palm Beach County's Environmental Sensitive Lands Acquisition Committee (ESLASC)
 Palm Beach County Horse Industry Council, Inc.
 Palm Glades Girl Scout Council
 Palm Beach Pack and Paddle Club
 PalmNet - Palm Beach County Environmental Network
 Renegade Bass Club
 Royal Palm Audubon Society
 Seminole Tribes of Florida
 Sierra Club
 South Florida Sportsmen and Conservation Association
 Southeast Archaeological Society
 Southeast Exotic Pest Plant Council (SEEPPC)
 The Nature Conservancy
 Treasure Coast Regional Planning Council
 Waterfowl USA

COOPERATIVE AND LICENSE AGREEMENT
BETWEEN
THE CENTRAL AND SOUTHERN FLORIDA
FLOOD CONTROL DISTRICT
AND
THE UNITED STATES OF AMERICA

THIS AGREEMENT, made and entered into between Central and South Florida Flood Control District, (hereinafter referred to as the District) pursuant to Chapters 25209 and 25214, Laws of Florida, Acts of 1949, and the United States Department of the Interior, acting by and through the Fish and Wildlife Service (hereinafter referred to as the Service), pursuant to the Act of August 14, 1946, (60 Stat. 1080).

WITNESSETH:

The parties hereto, for themselves and their respective successors and assigns, do hereby mutually covenant and agree as follows:

1. The District hereby grants a license upon, and makes available to the Service for the purposes and subject to the terms and conditions hereinafter set forth, all those portions of the real property, or interests therein, acquired or to be acquired by District in connection with the area designated as Conservation Area Number One, a part of the Central and Southern Florida Flood Control District, in Palm Beach County, Florida, together with all improvements which are located thereon (hereinafter referred to as the property). Those portions of the property already acquired by the District in connection with Conservation Area Number One, which are to be made subject to the terms and conditions of this license and agreement, are described in "Exhibit A", and those portions of the property to be acquired by the District in connection with Conservation Area Number One, which are to be made subject to the terms and conditions of this license and agreement, are described in "Exhibit B", such exhibits being attached hereto and expressly made a part hereof. The property described in "Exhibit B", or any part of such property, shall become subject to all of the terms and conditions of this license and agreement, or any renewal thereof, when any interest or title thereto has vested in the District, but not before such time. The District shall notify the Service in writing when title to any of the property described in "Exhibit B" has vested in the District.
2. The Service shall use said property as a Wildlife Management Area, to promote the conservation of wildlife, fish and game, and for other purposes embodying the principles and objectives of planned multiple land use.

These objectives are to be attained through the following management practices covering the wildlife and recreational phases of land use represented by this area.

- (a) Wildlife: Adequate provisions shall be made to maintain the wildlife resources in a productive condition, through:
 - (1) Maintaining as closed areas for breeding and feeding grounds so much of the unit as will ensure maximum stocks of game, fish and furbearers and thus permit the harvesting of surpluses.
 - (2) Maintenance and development of wildlife environments and habitat where such use is not inconsistent with the use of the land for flood control and water retention purposes.
 - (3) Planting of cultivated crops and natural wildlife foods to increase the carrying capacity of the area for wildlife.
 - (4) Construction, operation, and maintenance of such canals, ditches, and subimpoundments as may be deemed necessary by the Service for the purposes of creating conditions suitable for wildlife species using the area. Provided, that such construction, operation and maintenance shall be consistent with the objectives of flood control and other allied purposes in the area.

- (5) Opening by regulation of the Service of portions of the area to controlled public hunting, fishing and trapping, whenever the Service determines such procedure to be necessary for the harvesting of surplus stocks of game, fish and furbearers. Open only for harvesting the surplus stock and shall conform to State law and regulations.
 - (b) Recreation:
Recreational facilities existing or to be developed, shall be operated, maintained, and administered according to the following principles and objectives:
 - (1) The recreational facilities shall be available for the use and benefit of the general public.
 - (2) Fees charged for the use of the facilities shall be non-discriminatory and consistent with the public non-profit character of the area. Such controlled public hunting and fishing as is allowed by the Service shall be made available to the general public without charge.
 - (3) All recreational facilities which may be developed in the future shall be located where their use will not interfere with the use of the land for flood control and water retention purposes.
 - (c) Monies obtained from the sale or granting of permits by the Service for trapping and other economic uses are to be retained by the Service for deposit and distribution under Section 401 of the Act of June 15, 1935 (49 Stat. 383-16 U.S.C. 715s).
3. The use of said property by the Service shall be subject to the requirements and uses by the Corps of Engineers and the District for flood control and other salient purposes and the Service shall not be obligated in any manner for costs, charges, expenses, or other obligations as are properly chargeable to the maintenance and development of the flood control activities. The use of said property shall be further subject all valid easements, rights-of-way, licenses, and outstanding interests in, upon, across, or through said property.
 4. The District reserves all right not vested in private persons, corporations or other public agencies, to the oil, gas, coal and other mineral ores whatsoever, upon, in or under said property, together with the using mineral rights, powers and privileges, including the right of access to the use of such parts of the surface of the promises as may be necessary for mining and saving said minerals. The Service, however, shall have the right to use stone, marl, sand or peat and similar substances from, said property, provided such materials are used for construction purposes upon or in connection with said property. The license herein granted to the Service is subject to the rights of the District and to the rights heretofore vested in private persons and public agencies, as the same appear of record, to mine, explore for and develop, any mineral in, under or upon said lands, including oil and gas, and including the right of ingress and egress on, upon or across such lands as may be necessary for the purposes stated.

In the event the District determines that the exercise of the said mining rights are necessary and not inconsistent with the purposes referred to in Section 2 above, it agrees that the exploration by the District, its successors or assigns, the drilling for, development of, and the transportation or removal of mineral resources, including oil, and the control of abandoned wells or wells taken out of production, shall be conducted by the most approved methods. Paramount consideration shall be given to the prevention both of pollution and contamination by oil or field brine and of other oil field contamination or damage of the lands for wildlife refuge purposes. Human occupancy and housing facilities therefor and structures erected for drilling, development, transportation removal of mineral resources, will be held to a minimum. Any inevitable waste in proximity to the sources will be so confined as to prevent escape that might otherwise occur as a result of rains or high water.

Suitable provisions will be made for the removal of oil field brine from the area, by pipe line or any other approved method, so as not to contaminate the lands or the water in the ponds or lakes now created or that may thereafter be created.

5. The terms of this license and agreement shall be fifty (50) years beginning on the 1st day of January, 1951, and ending on the 1st day of January, 2001, and shall automatically be renewed for three (3) successive terms of fifteen (15) years unless written notice to the contrary is given by either party to the other not less than ninety (90) days prior to the termination of this instrument, or any renewal thereof, and each renewal shall be subject to all of the terms and conditions of this license and agreement.
6. The Service shall not use or permit to be used, and shall take such measures as may be necessary to prevent the use or occupancy of said property, or any portion thereof, for any purpose which is inconsistent or incompatible with the purposes set forth in Section 2 above; nor shall the Service, except with the written consent of the District, assign any of its rights or obligations under this license and agreement, or any renewal thereof, or grant or create any rights in favor of third persons with reference to said property. This provision shall not be construed to apply to such employees of the Service as are engaged in the administration of said property during the period they are actually so engaged.

The Service shall not, except with the written consent of the District, authorized or permit third persons, including employees of the Service engaged in the administration of the area, to erect structures or dwellings on the property, whether such authorization or permission creates any rights in such third persons or not. This provision shall not be construed as requiring a permit from the Service to mine, explore or develop the minerals, including oil and gas, as provided for in Section 4.
7. The Service shall assume and defray all costs, charges, expenses, and other obligations except as otherwise provided for under Section 3, incident to the use of said property for the purposes provided herein, shall maintain said property in good condition and repair, making all repairs and replacements necessary caused by deterioration, damage, use, negligence, or any other cause whatsoever, and shall not remove any improvements except in accordance with Section 12 below, or alter any major improvements without the written consent of the District.
8. The obligations of the Service under this agreement are conditioned upon the passage of an appropriation by Congress from which expenditures thereunder may be made and shall not obligate the Service upon the failure of Congress to so appropriate.
9. The District agrees to hold and save the Service free from damages due to the right to operate under the terms of this license and agreement. The Service agrees to hold and save the District free from damages due to operations under the terms of this license and agreement.
10. The Service shall submit, not later than one year after the effective date of this license and agreement, a general plan of operation and development, setting forth the measures to be taken by the service to effectuate the purposed of this license and agreement. The Service shall also permit at all times, any duly authorized representative or representatives of the District to enter upon and inspect said property.
11. Upon the expiration or termination of this license and agreement, or any renewal thereof, the service shall quietly and peaceably vacate said property and surrender possession thereof, and the District may immediately, or at any time thereafter, re-enter and take possession of the property and remove all persons therefrom.
12. Upon the expiration or termination of this license and agreement, or any renewal thereof, the Service shall have the right to remove only those improvements which have been erected exclusively with funds specifically or generally appropriated by the Congress of the United states. Provided, however, that no such right for removal shall extend to, or include, any works constructed as a part of the flood control program.
13. The invalidity or any provision of this instrument, or of any part thereof, shall not affect the validity of the remaining provisions or the rights and obligations of the parties thereunder.

14. The failure of the District to insist upon the strict performance of any of the terms, covenants, agreements and conditions herein contained shall not constitute a waiver or relinquishment of the right of the District to enforce thereafter such terms, covenants, agreements, or conditions, but the same shall continue in full force and effect.
15. Any notice, consent, or other action to be given or done by the District under this license and agreement, or any renewal thereof, shall be valid only if in writing and executed by the Chairman of the Board of Governors of the Central and Southern Florida Flood Control District, or his duly authorized representative, or in the case of a successor to the rights of the Central and Southern Florida Flood Control District, by the chief administrative officer of such successor, or his duly authorized representative. All notices to be given by the District under this license and agreement, or any renewal thereof, shall be delivered or forwarded by mail to the Director, Fish and Wildlife Service, United States Department of the Interior, Washington, D.C.

Any notice, consent, or other action to be given by the Service under this license and agreement, or any renewal thereof, shall be valid only if in writing and executed or performed by the Secretary of the Interior or his duly authorized representative, or in the case of a successor to the rights of the Department of the Interior, by the chief administrative officer of such successor or his duly authorized representative. All notices to be given by the Service under this license and agreement, or any renewal thereof, shall be delivered or forwarded by mail, addressed the Central and Southern Florida Flood Control District, West Palm Beach, Florida, or its successor hereunder.
16. No member of or delegate to Congress or Resident Commissioner shall be admitted to any share or part of this license and agreement, or any renewal thereof, or to any benefit to arise therefrom.
17. This license and agreement shall become effective when duly executed by all parties indicated below, but possession of the said property shall not be granted until January 1, 1951, the beginning of the 50-year primary term provided for in paragraph 5 hereof.
18. It is understood and agreed that in the operation and management of the Conservation area lands for the primary purpose of flood control and other allied purposes, the lands and waters will be managed and operated in the manner most consistent with Section 2 hereof, so far as it is not inconsistent with the said primary purpose.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the date indicated.

CENTRAL AND SOUTHERN FLORIDA
FLOOD CONTROL DISTRICT

Date _____ BY _____
Chairman of the Board of Governors

THE UNITED STATES OF AMERICA

Secretary of the Interior

Date _____ BY _____
Director, Fish and Wildlife Service

*NOTE: THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS RE-TYPED FOR THIS
CCP. THE DOCUMENT WAS RE-TYPED IN ITS ENTIRETY.*

AMENDMENT TO COOPERATIVE LICENSE AGREEMENT BETWEEN THE
CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
AND
UNITED STATES OF AMERICA

WHEREAS, a cooperative license agreement was entered into between Central and Southern Florida Flood Control District and the United States of America acting by and through the Fish and Wildlife Service of the Department of Interior, pertaining to Conservation Area No. 1, which, among other things, provided for the southerly and southwesterly boundary of said Conservation Area No. 1 as described therein to be generally the northeastern canal bank of the Hillsboro Canal in Palm Beach Country, Florida, and

WHEREAS, it is desirable to establish the southerly and southwesterly boundary of said Conservation Area No. 1, as described in said agreement and "Exhibit A" and "Exhibit B" attached thereto, as the centerline of Levee L-39 to be hereafter constructed along the southerly and southwesterly side of said Hillsboro Canal, and

WHEREAS, such a boundary line for said conservation area will conform to the boundary line between Conservation Area No. 1 and Conservation Area No. 2 as provided in the flood control project document, namely, House Document No. 643, 80th Congress, 2d Session.

NOW, THEREFORE, in consideration of the premises, and the mutual covenants and agreements hereinafter set forth, the parties hereto for themselves and their respective successors and assigns do hereby amend the said cooperative license agreement to provide therein that the southerly and southwesterly boundary of Conservation Area No. 1 comprising the lands that are described in "Exhibit A" and Exhibit B" of said agreement shall henceforth be the centerline of Levee L-39 to be constructed along the southerly and southwesterly side of the Hillsboro Canal and that except for the establishment of the new southerly and southwesterly boundary line for said Conservation Area No. 1, as provided herein, all of the terms, provisions and covenants contained in said cooperative and license agreement shall remain in full force and effect.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the dates indicated.

CENTRAL AND SOUTHERN FLORIDA
FLOOD CONTROL DISTRICT, AND ITS
GOVERNING BOARD

Date _____

BY _____
Chairman

ATTEST

Secretary
THE UNITED STATES OF AMERICA

*NOTE: THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS RE-TYPED FOR THIS
CCP. THE DOCUMENT WAS RE-TYPED IN ITS ENTIRETY.*

SECOND AMENDMENT TO COOPERATIVE AND LICENSE AGREEMENT
BETWEEN THE
CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
AND
THE UNITED STATES OF AMERICA

WHEREAS, on June 8, 1951, the United States of America, acting by and through the Fish and Wildlife Service of the Department of the Interior, did enter into a cooperative and license agreement with the Central and Southern Florida Flood Control District, for the use of certain property in Palm Beach County, Florida, known as Conservation Area No. 1, for a wildlife management area, and

WHEREAS, by amendment dated July 8, 1953, the said parties extended the southerly and southwesterly boundary to the centerline of Levee L-39, which has been constructed along the southerly and southwesterly side of the Hillsboro Canal, and

WHEREAS, because of changes in construction plans south of the Palm Beach Canal, the original northern boundary of the Loxahatchee National Wildlife Refuge is impractical to administer, and it is desirable to revise said boundaries to permit posting on the ground, and

WHEREAS, the Central and Southern Florida Flood Control District, the Florida Game and Fresh Water Fish Commission, and the Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, propose to authorize a joint recreational concession on the Hillsboro Canal in the vicinity of Structure S-39, and

WHEREAS, in order to establish the proposed concession, it is necessary to further amend the boundary of land included in the Loxahatchee National Wildlife Refuge so as to clarify the line between Conservation Areas No. 1 and No. 2, and to add a small area of land not now included in the aforesaid cooperative license agreement, as amended,

NOW, THEREFORE, in consideration of the premises, and the mutual covenants heretofore set forth, the parties hereto, for themselves, their respective successors and assigns, do hereby further amend the said cooperative and license agreement to provide that the following-described portions of the boundary shall henceforth replace the respective lines described in Exhibits "A: and "B" of said agreement, as amended, and that except for this change in boundary, all of the terms, provisions, and covenant contained in said cooperative and license agreement shall remain in full force and effect.

DESCRIPTION - NORTH BOUNDARY

The following description is a revision to and the reestablishment of the north boundary of that part of Conservation Area No. 1, in sec. 32, T. 43 S., R. 40E., under the cooperative and license agreement between the Central and Southern Florida Flood Control District and the United States Fish and Wildlife Service.

From the Southwest corner of said Section 32, bear South 88°16'55" East along the South line of said Section, a distance of 537.69 feet to the intersection thereof with a line that is 32 feet Northwesterly of and parallel to the centerline of Levee L-7; said point of intersection being the point of BEGINNING.

Thence, North 34°28'58" East, a distance of 852.78 feet to the point of curvature of a curve to the right, having a central angle of 57°06'31" and a radius of 1,032.00 feet;

Thence, Northeasterly, along the arc of said curve, a distance of 1,028.63 feet to the point of tangency;

Thence, continuing along a line that is 32 feet Northerly and parallel to the centerline of Levee L-7 on a bearing of South 88°24'31" East, a distance of 1,668.42 feet to the centerline of Levee L-12;

Thence, South 28°48'13" East, along said centerline, a distance of 37.10 feet to the centerline of Levee L-7;

Thence, South 88°24'31" East, a distance of 185.32 feet to the intersection with a line that is 25 feet Southeasterly of and parallel to the Southerly face of the Structure S-5A Pump Station building;

Thence, North 46°31'41" East, a distance of 347.19 feet to the centerline of a connecting levee embankment;

Thence, along said centerline of levee embankment and its easterly projection, South 80°49'13" East, a distance of 966.81 feet to a point, said point being on a line that is 30 feet southerly of the centerline of Structure S-5A South;

Thence, South 89°02'36" East, a distance of 321.17 feet to the East line of the right-of-way of Levee L-40 and the end of the specifically described line; said point being North 0°57'24" East, a distance of 1,287.85 feet from Southeast corner of Section 32.

DESCRIPTION - SOUTH BOUNDARY

The following description is a revision to and the reestablishment of the south boundary of that part of Conservation Area No. 1, in sec. 13, T. 47 S., R. 40 E. and sec. 19, T. 47 S., R. 41E. Under the cooperative and license agreement between the Central and Southern Florida Flood Control District and that United states Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife.

Beginning at the intersection of the west right-of-way line of Levee L-36 and the centerline of Levee L-39;

Thence, South 72°11'31" East, a distance of 383.4 feet, more or less, along the centerline of Levee L-39, extended, to the intersection therefor with the centerline of Levee L-36;

Thence, East a distance of 175 feet, more or less, to the East bank of Levee L-36 Borrow Canal;

Thence, South along the East bank of said Borrow Canal, a distance of 985.4 feet;

Thence, East a distance of 112 feet, more or less, to the East line of sec. 13, T. 47 S., R. 40 E.,

Thence, North 0°03'33" West along the East line of said Section 13, a distance of 978.83 feet;

Thence, South 72°11'31" East, along a line parallel to the centerline of the Hillsboro Canal, a distance of 347.12 feet;

Thence, North 17°11'31" West, a distance of 415.6 feet, more or less, to the intersection thereof with the East right-of-way line of Levee L-40 and the end of the said portion of description.

The bearings in the above descriptions refer to the standard plane rectangular coordinate system for the East Zone of Florida.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the dates indicated.

CENTRAL AND SOUTHERN FLORIDA FLOOD
CONTROL DISTRICT, BY ITS GOVERNING
BOARD

Date _____

By _____
Vice Chairman

Attest _____
Secretary

THE UNITED STATES OF AMERICA

Date _____

FRED A. SEATON
Secretary of the Interior

By _____
Regional Director Bureau of Sport
Fisheries and Wildlife

NOTE; THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS
RE-TYPED FOR THIS CCP. THE DOCUMENT WAS RE-TYPED IN ITS
ENTIRETY.

THIRD AMENDMENT TO COOPERATIVE AND LICENSE AGREEMENT
BETWEEN THE
CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL DISTRICT
AND
THE UNITED STATES OF AMERICA

WHEREAS, on June 8, 1951, the United States of America, acting by and through the Fish and Wildlife Service of the Department of the Interior, did enter into a cooperative and license agreement with the Central and Southern Florida Flood Control District, for the use of certain property in Palm Beach county, Florida, known as Conservation Area No. 1, for a wildlife management area, and

WHEREAS, by amendment dated July 8, 1953, the said parties extended the southerly and southwesterly boundary to the centerline of Levee L-39, which has been constructed along the southerly and southwesterly side of the Hillsboro Canal, and

WHEREAS, by second amendment dated December 15, 1959, the said parties further modified the southwesterly and northern boundaries in order to establish a proposed concession, to clarify the line between Conservation Areas Nos. 1 and 2, and to add a small area of land to the refuge, and

WHEREAS, it is desirable to establish an administrative boundary along the southwest side of United States Tract (10 so as to include a portion of the right-of-way of the Hillsboro Canal held by said Central and Southern Florida Flood Control district which is not now included in the aforesaid cooperative and license agreement as amended.

NOW, THEREFORE, in consideration of the premises and the mutual covenants heretofore set forth, the parties hereto, for themselves, their respective successors and assigns, do hereby further amend said cooperative and license agreement to include that portion of the Hillsboro Canal right-of-way in Palm Beach County, Florida, extending from the northeast bank of said canal northeasterly to the right-of-way line in Lot 4, Hiatus Township 45-46 South, Range 39 East, and in Section 4, Township 46 South, Range 30 East, which is more particularly described as follows:

A strip of land about 220 feet wide and 9,147.5 feet long lying between the northeast bank of the Hillsboro Canal and the northeast right-of-way line of said Hillsboro Canal, and bounded: On the northeast by U.S. tract (10); on the east by the east line of sec. 4, T. 46 S., R. 39 E.; on the southwest by the bank of said Hillsboro Canal; and on the west by the west line of Lot 4, Hiatus T. 45-46 S., R. 39 E.; containing 46.20 acres, more or less.

The lands contained in this amendment are hereby added to and made a part of the Cooperative and License Agreement dated June 8, 1951, as amended, and the terms, provisions, and covenants contained in said Cooperative and License Agreement as amended shall apply to the lands hereinbefore described.

This Amendment may be revoked at anytime upon 6 months' written notice of the Central and Southern Florida Flood Control District to the United States of America.

IN WITNESS WHEREOF, the parties hereto have hereunto subscribed their names as of the dates indicated.

CENTRAL AND SOUTHERN FLORIDA FLOOD
CONTROL DISTRICT, BY ITS GOVERNING
BOARD

Date July 23, 1962

By _____
Chairman

Attest _____
Secretary

THE UNITED STATES OF AMERICA

Date _____
Secretary of the Interior

STEWART L. UDALL

By _____
Regional Director, Bureau of
Sport Fisheries and Wildlife

NOTE; THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS
RE-TYPED FOR THIS CCP. THE DOCUMENT WAS RE-TYPED IN ITS
ENTIRETY.

C-3359-A4

Revised 4/5/93

AMENDMENT NO. 4
TO THE COOPERATIVE AND LICENSE AGREEMENT
BETWEEN THE
SOUTH FLORIDA WATER MANAGEMENT DISTRICT
AND
THE UNITED STATES OF AMERICA

This AMENDMENT NO. 4 entered into on the 7th Day of Jan. 1994 to that Cooperative and License Agreement ("AGREEMENT"), dated June 8, 1951, as amended July 8, 1953, December 15, 1959, and July 23, 1962 between the "Parties", the South Florida Water Management District, ("DISTRICT") formerly known as Central and Southern Florida Flood Control District and the United States of America, acting by and through the Fish and Wildlife Service of the Department of The Interior ("the USA");

WHEREAS, on June 8, 1951, the USA, did enter into a certain Cooperative and License Agreement, hereinafter referred to as the "License Agreement", with the Central and Southern Florida Flood Control District, n/k/a the South Florida Water Management District, for the use of certain property in Palm Beach County, Florida, known as Conservation Area No. 1, hereinafter referred to as the "Refuge", for a wildlife management area, and

WHEREAS, by amendment to the AGREEMENT, dated July 8, 1953, the parties extended the southerly and southwesterly boundary to the centerline of Levee 39, which has been constructed along the southerly and southwesterly side of the Hillsboro Canal, and

WHEREAS, by second amendment to the AGREEMENT, dated December 15, 1959, the parties further modified the southwesterly and northern boundaries in order to establish a proposed concession, to clarify the line between Conservation Areas Nos. 1 and 2, and to add a small area of land to the Refuge, and

WHEREAS, by third amendment to the AGREEMENT, dated July 23, 1962, the parties established an administrative boundary along the southwest side of United States tract (10) so as to include a portion of the right-of-way of the Hillsboro Canal held by the DISTRICT, and

WHEREAS, it is desirable to modify and adjust the boundaries of the Refuge, so as to exclude certain lands from the Refuge which are currently included in the License Agreement; and

WHEREAS, the DISTRICT and the USA desire that the USA perform management services for certain additional lands similar to services provided for the Refuge; and

Amendment No. 4 to Contract No. C-3359, Page 1 of 5

WHEREAS, the Governing Board of the DISTRICT, at it April 15, 1993 meeting, has authorized entering into this AMENDMENT NO. 4 and has authorized the DISTRICT'S Executive Director, or his designee, to execute this AMENDMENT NO. 4:

NOW, THEREFORE, in consideration of the premises and the mutual covenants heretofore set forth, the parties hereto, for themselves, their respective successors, and assigns, do hereby further amend the License Agreement as follows:

1. EXCLUSION OF PROPERTY

The property described in Exhibit "A: and depicted in Exhibit "B" both Exhibits being attached hereto and made a part hereof (the "Excluded Property") is hereby removed, released and excluded from the Refuge and from the License Agreement and the terms, provisions and covenants contained therein.

2. ADDITIONAL PROPERTY

The property described in Exhibit "C" and depicted in Exhibits "D", "E" and "F" all Exhibits being attached hereto and made a part hereof (the "Additional Property") is hereby made subject to the License Agreement, as modified by this AMENDMENT, and shall become a part of the Refuge, subject to the provisions herein, including but not limited to paragraphs 10, 11, and 13, below.

3. MALRITE LEASE

The Strazzulla Property is subject to the existing lease with Malrite of Florida, Inc. attached hereto and made a part hereof as Exhibit “G”. All rental payments due under the terms of said lease shall remain payable to the DISTRICT. Representatives of Malrite of Florida, Inc. Shall have the full right of access to the Strazzulla Property for the purposes set forth in said lease.

4. FUTURE EXCLUSION OF PROPERTY

The parties hereby agree that the hatched area, depicted on Exhibit “H” attached hereto and made a part hereof, and any other minor boundary adjustments related thereto which the parties deem desirable to make (the “Future Excluded Property”), shall be automatically removed, released and excluded from the License Agreement and the terms, provisions and covenants contained therein in the future, upon the sending by the District to the USA of a detailed legal description of the Refuge boundary and the Additional Land Boundary which excludes the Future Excluded Property (the “New Boundary Description”). The New Boundary Description shall be prepared by the District after completion of proposed Levee 101 and after consultation with the USA.

Amendment No. 4 to Contract No. C-3359, Page 2 of 5

5. EFFECTIVE DATE

The effective date of this amendment shall be the date that the last party hereto executes this AMENDMENT. The effective date of the removal, release and exclusion of the future Excluded Property shall be the date that the USA receives the New Boundary Description. The New Boundary Description shall be effective without further consent or approval by the DISTRICT’S Governing Board or the USA.

6. RIGHT TO CONTINUE REFUGE ADMINISTRATION

Prior to the receipt of the New Boundary Description by the USA, the USA shall have the right to continue with the administration on the Future Excluded Property, including but not limited to the right to patrol and enforce the rules and regulations thereon pursuant to the License Agreement as hereby amended.

7. RIGHT OF ENTRY TO CONSTRUCT AND MAINTAIN

USA hereby grants the DISTRICT, its agents and contractors, the right to enter the Refuge for the purpose of constructing and maintaining Levee 101 and its associated borrow canal, as shown on Exhibit “H”, together with any other associated facilities. USA agrees to execute and all other instruments that may be reasonably required to acknowledge the USA’s consent to the DISTRICT’S construction and maintenance of Levee 101 and borrow canal and any associated structures.

8. APPROVAL OF PLANS AND SPECIFICATIONS

The DISTRICT agrees to consult with USA in the development and preparation of the plans and specifications for the construction of Levee 101, its associated borrow canal, and any related structures. The plans and specifications will be submitted to the United States Army Corps of Engineers District Engineer, Jacksonville District for review, permitting, and approval prior to the DISTRICT commencing construction.

9. DOCK INSTALLATION

USA agrees to install a dock at a suitable location on the south side of Levee 30 for the use of airboaters patronizing the Hillsboro Recreation Area Concession. The DISTRICT retains the unrestricted right to use the dock.

Amendment No. 4 to Contract No. C-3359, Page 3 of 5

10. MANAGEMENT AND USE OF ADDITIONAL LANDS

USA agrees to manage the Strazzulla Property in accordance with the environmental restoration and protection goals and objectives of Florida's Save Our Rivers program and to permit public access and use of the Strazzulla Property for recreational activities consistent with those goals and objectives and the needs of the Refuge. USA recognizes the DISTRICT'S rights, duties, and obligations with respect to the Strazzulla Property under the Save Our Rivers program, and acknowledges that said rights, duties, and responsibilities and use of the Strazzulla Property related thereto are in no way diminished by the addition of the Strazzulla Property to the License Agreement for purposes of management by USA. USA further acknowledges the unrestricted right of the DISTRICT to use the Strazzulla Property for any purposes consistent with the DISTRICT mission and goals including but not limited to the unrestricted right to flow water on, over and across the Strazzulla Property as the DISTRICT deems necessary.

11. INTENT OF THE PARTIES

The parties believe that management of the Strazzulla Property can be provided more efficiently and economically by the USA as a part of the Refuge than by the DISTRICT. The USA can provide on-site presence, public use opportunities, security, exotic control, as well as other public benefits, using nearby available resources while the DISTRICT would have to bring that effort from a remote location. The parties recognize that the Strazzulla Prepaid provides a good transition between the Refuge to the west and the development area to the east.

The parties also recognize that large amounts of fresh water are being lost to tide each year, and that plans/projects which would provide for repeated cycling of fresh water of appropriately high quality to the everglades would be in the public interest. To that end, the DISTRICT is considering a number of options to reduce loses to tide and increase flows to the Everglades. One or more of those options could involve the use of appropriate lands east of the everglades as transition or buffer areas. Further, it is understood and agreed that such uses of the Strazzulla Property by the DISTRICT may be considered by the USA to be incompatible with the continued inclusion of the Strazzulla Property as a part of the Refuge.

It is the express intent of the parties that this AMENDMENT not be used as the basis for limiting or restricting options available to the DISTRICT regarding the ultimate use of the Strazzulla Property.

12. ACCESS TO LEVEES 39 AND 7

USA acknowledges the need for and agrees to access along and over Levee 39 and Levee 7 by personnel of the Florida Game and Fresh Water Fish Commission in carrying out their duties and responsibilities.

Amendment No. 4 to Contract No. C-3359, Page 4 of 5

13. TERMINATION

This AMENDMENT shall be subject to termination by either party as to the Strazzulla Property as follows:

In the event continued inclusion of the Strazzulla Property as a part of the Refuge is or may become incompatible, or if for any other reason either of the parties choose to terminate this portion of this AMENDMENT, the sole remedy available to both parties shall be to revoke this portion of this AMENDMENT so as to remove the Strazzulla Property from the Refuge and void any continued responsibility of USA for management of the Strazzulla Property.

14. AGREEMENT REMAINS IN FORCE

All other terms of the AGREEMENT, as amended, shall remain in full force and effect.

The parties or their duly authorized representatives hereby execute the AMENDMENT No. 4 on the date first written above.

Legal Form Approved
SFWMD Office of Counsel

SOUTH FLORIDA WATER MANAGEMENT
DISTRICT, formerly known as CENTRAL AND
SOUTHERN FLORIDA FLOOD CONTROL
DISTRICT, BY ITS GOVERNING BOARD

By: _____
Date: _____

By: _____
Assistant Executive Director

THE UNITED STATES OF AMERICA

By _____
Regional Director, Bureau of Sport
Fisheries and Wildlife n/k/a U.S. Fish and Wildlife
Service

Amendment No. 4 to Contract No. C-3359, Page 5 of 5

*NOTE: THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS RE-TYPED FOR THIS
CCP. THE DOCUMENT WAS RE-TYPED IN ITS ENTIRETY.*

C-3359-A4

EXHIBIT "A"

DESCRIPTION

EXCLUDED PROPERTY
WATER CONSERVATION AREA 1

A parcel of land situate in Section 13, Township 47 South, Range 40 East and in Section 19, Township 47 South, Range 41 East, Palm Beach County, Florida; said parcel of land more specifically described as follows:

COMMENCE at the northeast corner of said Section 13; thence, South 00°03'48" East, along the east line of said Section 13, a distance of 3091.73 feet to the POINT OF BEGINNING; thence, South 72°11'31" East, along a line 130.00 feet southerly of and parallel with the center line of the Hillsboro Canal, a distance of 347.37 feet; thence, North 17°48'29" East, a distance of 65 feet, more or less, to a line which approximates the north edge of paving of State Road 827; thence, North 72°11'31" West, along said line, a distance of 630.00 feet; thence, South 17°48'29" West, a distance of 51.52 feet to the easterly prolongation of the physical center line of South Florida Water Management District Levee L-39; thence, South 71°55'25" East, along said easterly prolongation of the physical center line of South Florida Water Management District Levee L-39, a distance of 162.05 feet to a line which approximates the easterly edge of water of South Florida Water Management District Levee L-36 Borrow Canal; thence, South 00°00'00" East, along said line, a distance of 1027.82 feet; thence, North 90°00'00" East, a distance of 112 feet, more or less, to said east line of Section 13; thence, North 00°03'48" West along said east line, a distance of 978.83 feet to the POINT OF BEGINNING.

Bearings based on the Florida State Plane Coordinate System Transverse Mercator East Zone North American Datum 1927, 1972 free adjustment.

Exhibit "A" to Contract No. C-3359, Page 1 of 1

THIS DOCUMENT WAS RE-TYPED IN ITS ENTIRETY FOR THIS CCP.

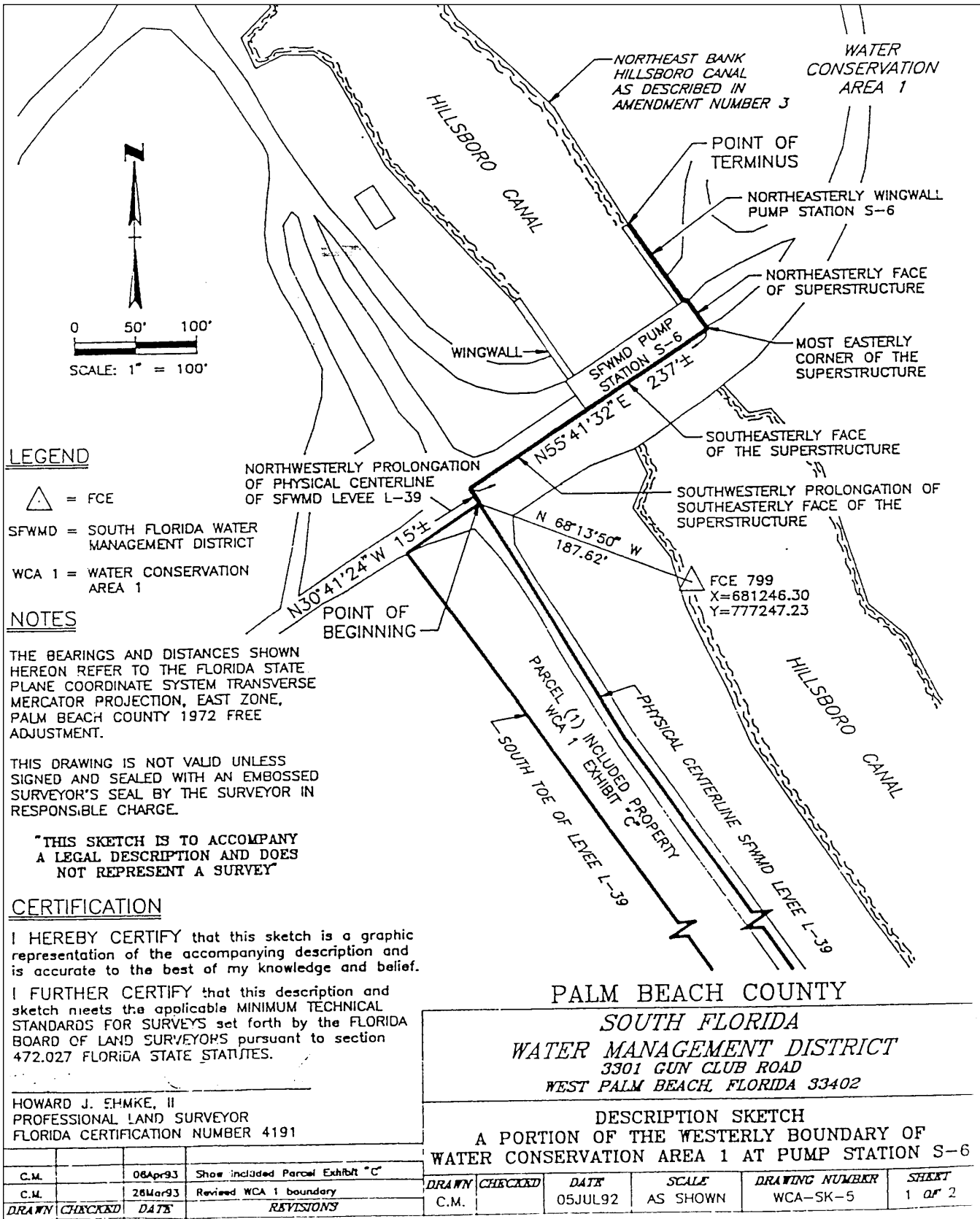


EXHIBIT "C"
DESCRIPTION
INCLUDED PROPERTY
WATER CONSERVATION AREA 1

(1) A parcel of land situate in Township 46 South, Range 39 East and Township 46 South, Range 40 East and Township 47 South, Range 40 East, more particularly described as follows:

Commence at the Northeast corner of Section 13, Township 47 South, Range 40 East, Palm Beach County, Florida; thence,

South 00°03'48" East, along the East line of said Section 13, a distance of 3078.95 feet to the southeasterly projection of the physical center line of South Florida Water Management District's Levee L-39; thence,

North 71°55'25" West, along said projection, a distance of 278.71 feet to the Northerly projection of a line which approximates the easterly toe of South Florida Water Management District's Levee L-36 and the POINT OF BEGINNING; thence,

South 00°00'00" West, along said projection and said line which approximates the easterly toe of said Levee L-36, a distance of 577.00 feet; thence,

North 90°00'00" West, a distance of 121.67 feet to a line which approximates the easterly water's edge of Water Conservation Area 2; thence,

North 02°35'34" West, along said line, a distance of 208.14 feet; thence,

North 04°11'03" East, continuing along said line, a distance of 257.50 feet to a line approximating the northerly water's edge of said Water Conservation Area 2; thence,

North 68°03'54" West, along said line, a distance of 188.39 feet; thence,

North 60°38'19" West, continuing along said line, a distance of 184.57 feet; thence,

North 69°29'54" West, continuing along said line, a distance of 370.09 feet; thence,

North 73°47'44" West, continuing along said line, a distance of 480.62 feet; thence,

North 18°04'35" East, departing said line, a distance of 40.35 feet to a line approximating the southerly toe of said Levee L-39; thence, along said line by the following courses;

North 71°51'59" West, a distance of 1488.64 feet; thence,

North 72°08'56" West, a distance of 1780.30 feet to the beginning of a curve from which the radius point bears South 17°51'04" West a distance of 236.04 feet; thence,

Northwesterly, along the arc of said curve, a distance of 145.11 feet through a central angle of 35°13'25" to a point of reverse curvature from which the radius point bears North 17°23'21" West, a distance of 341.00 feet; thence,

Northwesterly along the arc of said curve, a distance of 310.32 feet through a central angle of 35°20'16"; thence,

North 72°02'05" West, a distance of 515.47 feet to the beginning of a curve from which the radius point bears North 17°57'55" East, a distance of 337.39 feet; thence,

northwesterly, along the arc of said curve, a distance of 211.43 feet through a central angle of 35°54'21" to a point of reverse curvature of a curve from which the radius point bears South 53°52'16" West, a distance of 234.34 feet; thence,

northwesterly, along the arc of said curve, a distance of 145.94 feet through a central angle of $35^{\circ}40'55''$; thence,

North $71^{\circ}48'39''$ West, a distance of 2031.43 feet; thence,

North $71^{\circ}51'59''$ West, a distance of 2000.00 feet; thence,

North $72^{\circ}04'15''$ West, a distance of 2999.88 feet; thence,

North $72^{\circ}09'02''$ West, a distance of 5534.10 feet to the beginning of a curve from which the radius point bears South $17^{\circ}50'58''$ West, a distance of 230.59 feet; thence,

northwesterly, along the arc of said curve, a distance of 145.85 feet through a central angle of $36^{\circ}14'22''$ to a point of reverse curvature from which the radius point bears North $18^{\circ}23'24''$ West, a distance of 336.53 feet; thence,

northwesterly, along the arc of said curve, a distance of 213.53 feet through a central angle of $36^{\circ}21'19''$; thence,

North $72^{\circ}02'05''$ West, a distance of 516.00 feet to the beginning of a curve from which the radius point bears North $17^{\circ}57'55''$ East, a distance of 357.90 feet; thence,

northwesterly, along the arc of said curve, a distance of 207.31 feet through a central angle of $33^{\circ}11'16''$ to a point of reverse curvature from which the radius point bears South $51^{\circ}09'11''$ West, a distance of 240.32 feet; thence,

northwesterly, along the arc of said curve, a distance of 136.30 feet through a central angle of $32^{\circ}29'47''$; thence,

North $71^{\circ}20'36''$ West, a distance of 275.92 feet; thence,

North $73^{\circ}16'14''$ West, a distance of 5964.05 feet to the beginning of a curve from which the radius point bears North $16^{\circ}43'46''$ East, a distance of 644.00 feet; thence,

northwesterly, along the arc of said curve, a distance of 428.37 feet through a central angle of $38^{\circ}06'40''$; thence,

North $35^{\circ}09'34''$ West, a distance of 4139.23 feet to the beginning of a curve from which the radius point bears South $54^{\circ}50'26''$ West, a distance of 259.11 feet; thence,

northwesterly, along the arc of said curve, a distance of 152.53 feet through a central angle of $33^{\circ}43'42''$ to a point of reverse curvature from which the radius point bears North $21^{\circ}06'44''$ East, a distance of 351.34 feet; thence,

northwesterly, along the arc of said curve, a distance of 207.26 feet through a central angle of $33^{\circ}47'57''$; thence,

North $35^{\circ}05'19''$ West, a distance of 4309.15 feet; thence,

North $35^{\circ}11'10''$ West, a distance of 32,808.70 feet to the end of said line approximating the southerly toe of Levee L-39; thence,

North $54^{\circ}46'00''$ East, a distance of 72.35 feet to a line which approximates the physical centerline of said Levee L-39; thence, along said line by the following courses:

South $30^{\circ}41'24''$ East, a distance of 233.43 feet; thence,

South $35^{\circ}10'06''$ East, a distance of 36,885.21 feet to the beginning of a curve from which the radius point bears North $54^{\circ}49'54''$ East, a distance of 301.34 feet; thence,

southeasterly, along the arc of said curve, a distance of 174.11 feet through a central angle of $33^{\circ}06'14''$ to a point of reverse curvature from which the radius point bears South $21^{\circ}43'40''$ West, a distance of 301.11 feet; thence,

southeasterly, along the arc of said curve a distance of 174.10 feet through a central angle of $33^{\circ}07'40''$; thence,

South $35^{\circ}08'40''$ East, a distance of 4149.33 feet to the beginning of a curve from which the radius point bears North $54^{\circ}51'20''$ East, a distance of 600.00 feet; thence,

southeasterly, along the arc of said curve, a distance of 399.26 feet through a central angle of 38°07'34"; thence,

South 73°16'14" East, a distance of 6231.53 feet to the beginning of a curve from which the radius point bears South 16°43'46" West, a distance of 293.32 feet; thence,

southeasterly, along the arc of said curve, a distance of 176.35 feet through a central angle of 34°26'53" to a point of reverse curvature from which the radius point bears North 51°10'34" East, a distance of 304.90 feet; thence,

southeasterly, along the arc of said curve, a distance of 176.74 feet through a central angle of 33°12'44"; thence,

South 72°02'05" East, a distance of 516.00 feet to the beginning of a curve from which the radius point bears North 17°57'55" East, a distance of 283.53 feet; thence,

southeasterly, along the arc of said curve, a distance of 179.86 feet through a central angle of 36°20'43" to a point of reverse curvature from which the radius point bears South 18°22'48" East, a distance of 283.89 feet; thence,

southeasterly, along the arc of said curve, a distance of 179.87 feet through a central angle of 36°18'07"; thence,

South 72°04'41" East, a distance of 8391.84 feet; thence,

South 71°55'25" East, a distance of 4172.83 feet to the beginning of a curve from which the radius point bears South 18°04'35" West, a distance of 286.34 feet; thence,

southeasterly, along the arc of said curve, a distance of 178.89 feet through a central angle of 35°47'43" to a point of reverse curvature from which the radius point bears North 53°52'18" East, a distance of 285.39 feet; thence,

southeasterly, along the arc of said curve, a distance of 178.85 feet through a central angle of 35°54'23"; thence,

South 72°02'05" East, a distance of 515.47 feet to the beginning of a curve from which the radius point bears North 17°57'55" East, a distance of 289.00 feet; thence,

southeasterly, along the arc of said curve, a distance of 178.25 feet through a central angle of 35°20'18" to a point of reverse curvature from which the radius point bears South 17°22'23" East, a distance of 288.04 feet; thence,

southeasterly, along the arc of said curve, a distance of 178.21 feet through a central angle of 35°26'58"; thence,

South 71°55'25" East, a distance of 4539.85 feet to the POINT OF BEGINNING.

Bearings based on the Florida State Plane Coordinate System Transverse Mercator East Zone NAD 1927.

(2) Section 4, Township 45 South, Range 41 East, Palm Beach County, Florida:

Less that portion lying southwesterly of the easterly line of South Florida Water Management District Levee 40 as described in Deed Book 942, Page 241, Public Records of said Palm Beach County, and

Less the North 80.00 feet of the East 50.00 feet of said Section 4.

For the purpose of the description, all references to Section 4, Township 45 South, Range 41 East, will include that portion of the Hiatus known as Township 44-1/2 South, Range 41 East which may have been historically described as said Section 4.

Together with:

Section 3, Township 45 South, Range 41 East, Palm Beach County, Florida:

Less those portions of said Section 3 lying southwesterly of the easterly line of said Levee 40 as described in Deed Book 929, Page 24 and Deed Book 934, Page 488, said Public Records, and

Less all that portion of said Section 3 lying southerly of the South line of hiatus Tract 39, Township 44-1/2 South, Range 41 East, and northerly of a line 592.45 feet South of said South line of Hiatus Tract 39 and easterly of the southerly prolongation of a line 2243.56 feet easterly of and parallel with the westerly line of said Hiatus Tract 39.

Together with:

All that portion of said Hiatus Tract 39 lying westerly of a line 2243.56 feet Easterly of and parallel with the westerly line of said Hiatus Tract 39.

Less the North 80.00 feet thereof.

Said Hiatus Tract 39 has also been known as the North 224.04 acres of Section 3, Township 45 South, Range 41 East.

Together with:

All that portion of Section 10, Township 45 South, Range 41 East, Palm Beach County, Florida lying northeasterly of the easterly line of said Levee 40.

Subject to easements of records.

Containing 1603.82 acres, more or less.

(3) All that portion of Water Conservation Area No.1 as bounded by lines defined and amended up to and including Amendment Number 3 to The Cooperative and License Agreement between the Central and Southern Florida Flood Control District and the United States of America, dated July 23, 1962, also bounded by the following described line:

Begin at a point on the physical centerline of South Florida Water Management District Levee L-39, which bears North 68°13'50" West, a distance of 187.62 feet from concrete monument known as FCE 799, having coordinates of X=681246.30 and Y=777247.23; thence,

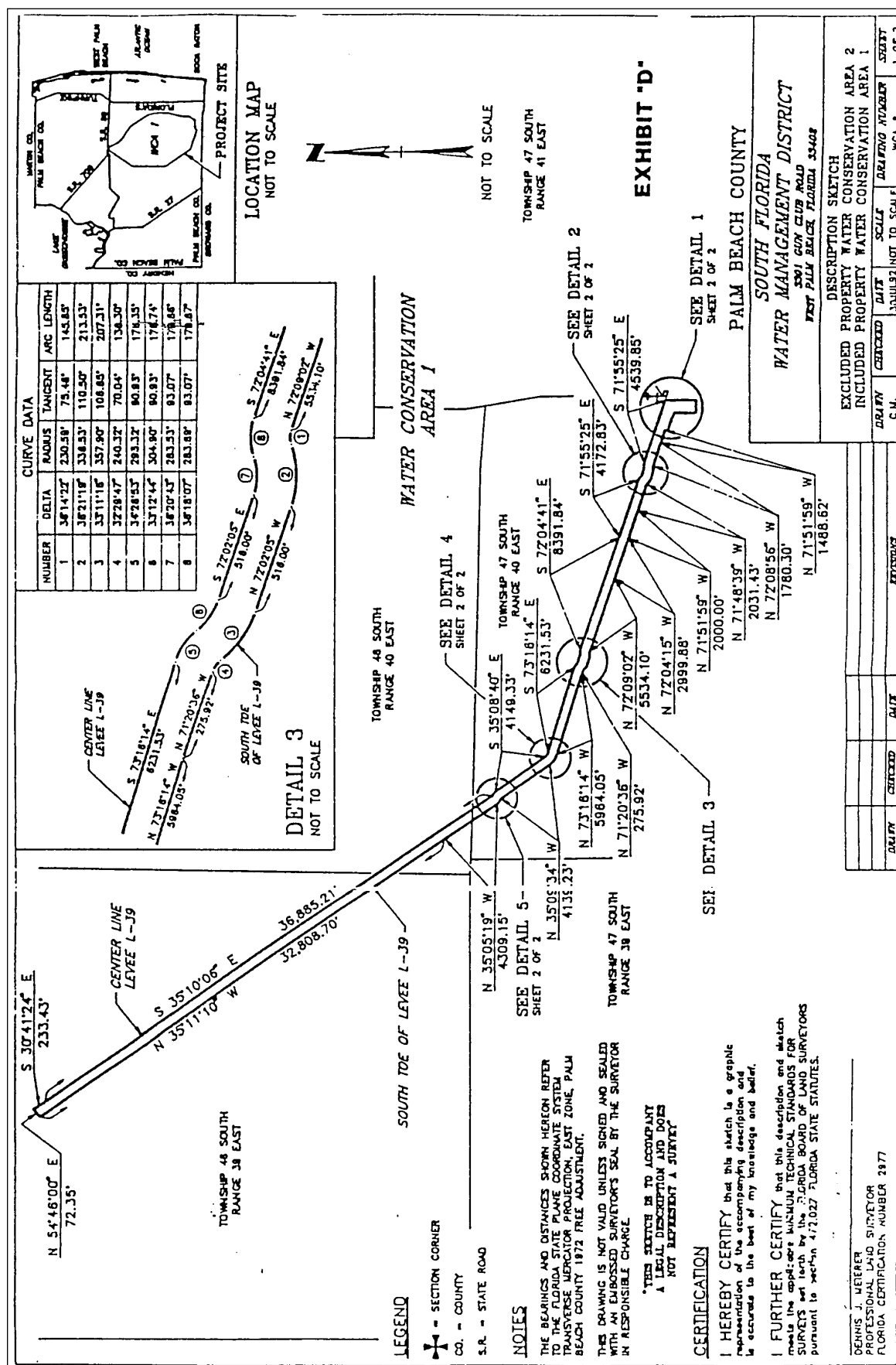
North 30°41'24" West, along the northwesterly prolongation of said centerline, a distance of 15 feet, more or less, to the southwesterly prolongation of the southeasterly face of the superstructure of South Florida Water Management District Pump Station S-6; thence,

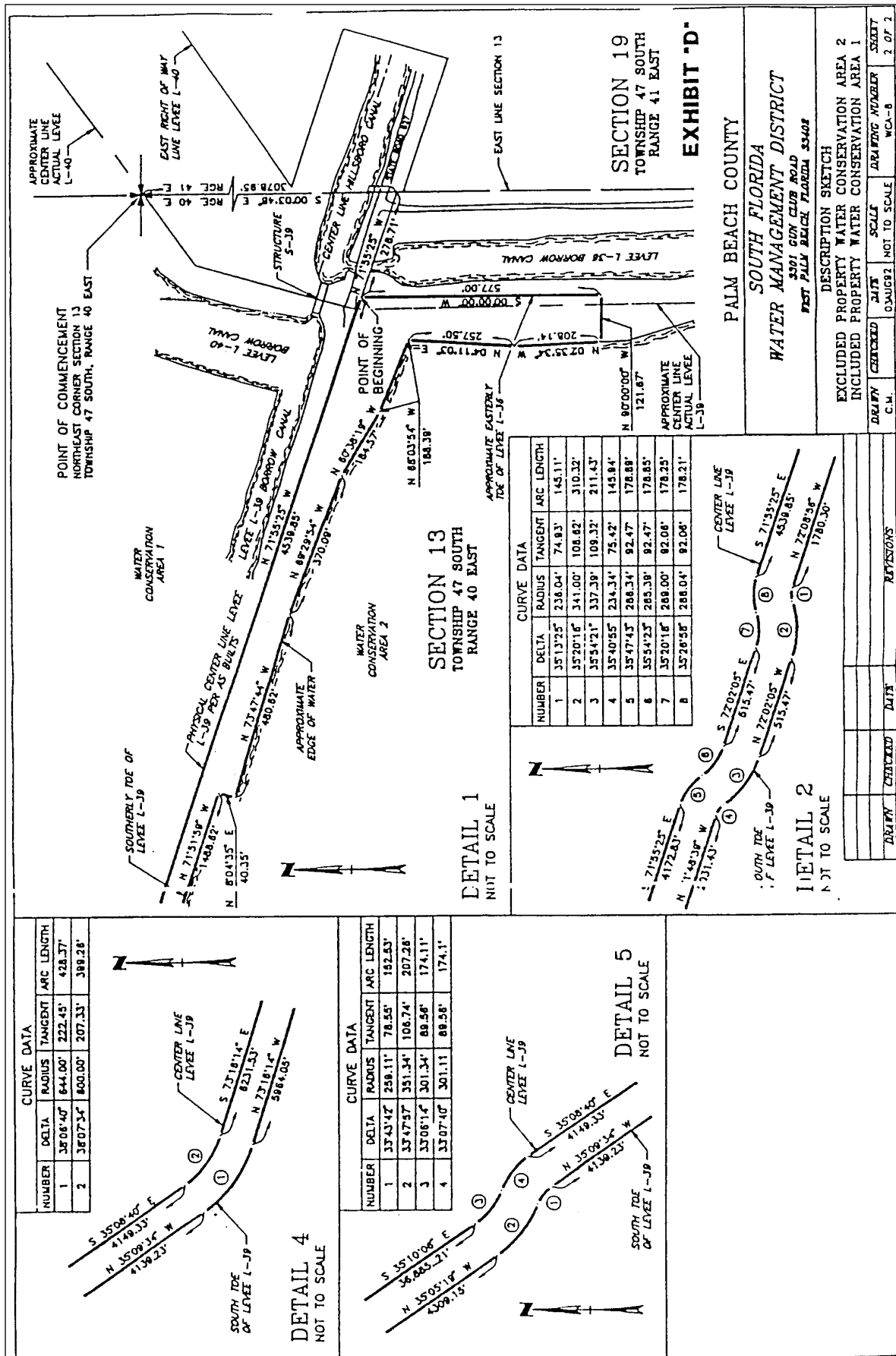
North 55°41'32" East, along said southwesterly prolongation line and the southeasterly face of said superstructure, a distance of 237 feet, more or less, to the most easterly corner of said superstructure; thence,

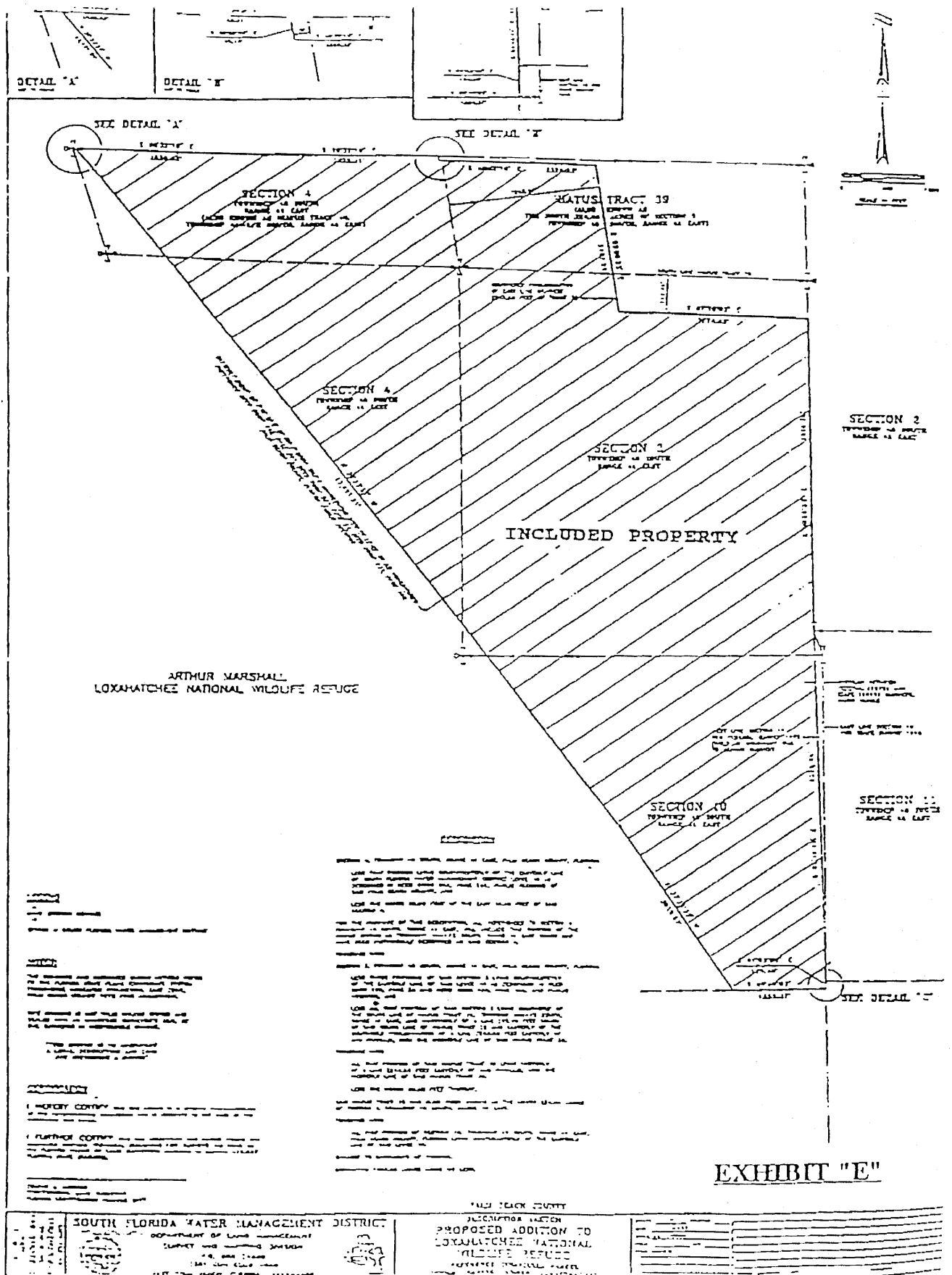
Northwesterly along the northeasterly face and the northeasterly wingwall of said Pump Station S-6, to the northeast bank of Hillsboro Canal as described in said Amendment Number 3 and the POINT OF TERMINUS of said described line.

Bearings based on the Florida State Plane Coordinate System, Transverse Mercator East Zone, NAD 1927. Palm Beach County 1972 Free Adjustment.

THIS DOCUMENT WAS RE-TYPED IN ITS ENTIRETY FOR THIS CCP.







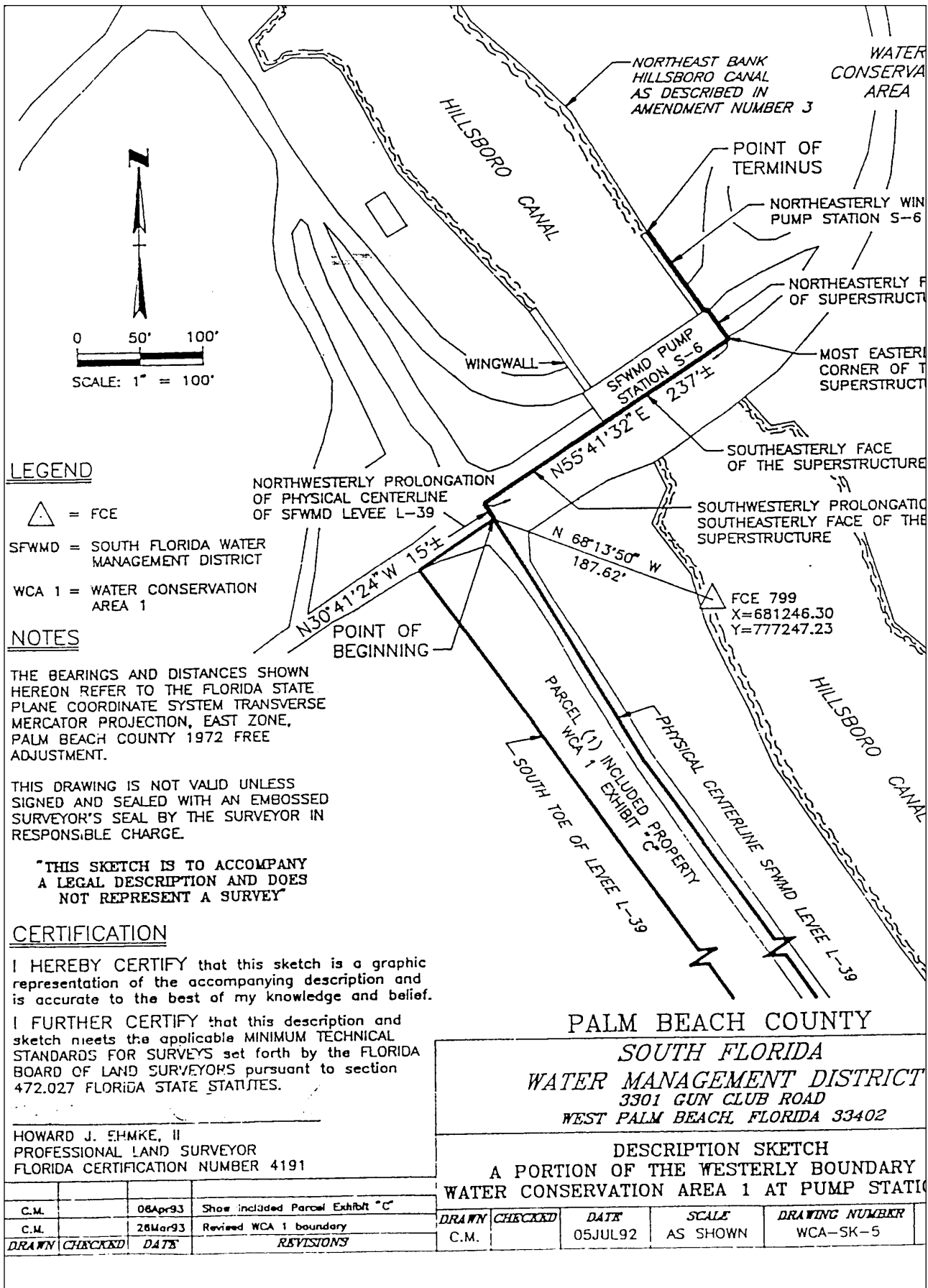


EXHIBIT "G"

LEASE

THIS LEASE AGREEMENT made this 21st day of April, 1981, between STRAZZULLA BROS. CO., INC., a Florida corporation, LESSOR, and MALRITE OF FLORIDA, INC., a Florida corporation, LESSEE.

WITNESSETH: That LESSOR does hereby lease to LESSEE the property described in that certain survey dated June 9, 1978, prepared by Mock, Roos and Searcy, as per the attached copy of said survey marked Exhibit A, together with a thirty-foot non-exclusive easement for ingress and egress to and from the leased property in Section 3, Township 45 South, Range 41 East, Palm Beach County, Florida, which easement is described as follows:

The South 30 feet of the North 589.68 feet of the East 130 feet of said Section 3, and the West 30 feet of the East 130 feet, less the North 589.68 feet of the NE1/4 of said Section 3. Extending southerly to its intersection with the North line of the parcel described on said attached survey.

1. Said lease to be upon the following terms and conditions:
The term of this lease shall be for an initial five-year term beginning April 1, 1981 at an annual rental of Thirty Thousand Dollars (\$30,000.00) per year; plus Florida sales tax, payable quarterly in advance, the first quarterly payment of Seventy-five Hundred Dollars (\$7,500.00) due upon execution of the Lease by LESSEE.
2. Provided the Lease is in good standing and all prior payments have been timely made, LESSEE shall have the option to renew this Lease for nine (9) additional five-year terms, each of said five-year terms to be exercised independently in writing by notification by LESSEE to LESSOR within sixty (60) days of the expiration of the previous five-year term. If

LEASE - Page Two

each of said renewal terms is exercised by LESSEE then the lease payments for the fifty-year period of this lease shall be as follows:

TERM	CONSIDERATION
1st through 5th years	\$ 30,000.00 per year
6th through 10th years	35,000.00 per year
11th through 15th years	40,000.00 per year
16th through 20th years	50,000.00 per year
21st through 25th years	55,000.00 per year
26th through 30th years	60,000.00 per year
31st through 35th years	65,000.00 per year
36th through 40th years	70,000.00 per year
41st through 45th years	75,000.00 per year
46th through 50th years	80,000.00 per year

Any applicable Florida sales tax shall be added to the rental payments during the term of this lease and shall be paid by LESSEE to LESSOR and all lease payments shall be made on a quarterly basis in advance during the term of this lease and during any renewal terms hereof.

3. LESSEE agrees to pay all real estate taxes assessed during the term of this Lease and to pay any insurance on said premises.

4. The parties hereto recognize the firm of PHILIP D. LEWIS, INC., 31 West 20th Street, Riviera Beach, Florida, as the broker in this transaction and LESSOR agrees to pay to said broker a fee of six percent (6%) of all rentals received during the initial five-year term of this Lease, and six percent (6%) of all rentals received during all subsequent renewal terms hereof. Said brokerage commission shall be paid upon receipt by LESSOR of each quarterly lease payment provided for herein, after bank clearance of each rental payment.
5. On or before July 1, 1981, LESSOR agrees to provide a \$200,000.00 title insurance policy to LESSEE issued by Lawyers Title Guaranty Fund, Orlando, Florida, evidencing the title to the leased premises described herein to be free and clear of any mortgages and liens. Said title insurance policy

LEASE - Page Three

shall guarantee to LESSEE vehicular access to the leased premises and will contain no restrictions which will prevent use of the leased premises for broadcast tower purposes.

6. Upon receipt of all necessary approvals by LESSEE, LESSEE shall construct and install a 1,533 foot high broadcasting tower at LESSEE's expense. LESSEE agrees to pay for all utilities utilized on the leased premises.
7. LESSEE shall not operate more than two (2) television broadcasting stations and three (3) F.M. broadcasting stations from said tower.

If all of the covenants contained herein are performed by LESSEE, then during the term of this Lease LESSOR covenants that LESSEE shall have quiet enjoyment of the premises during the lease period and any renewals hereof.

EXECUTED by LESSOR, this 21st day of April, 1981.

STRAZZULLA BROS. CO., INC.
a Florida corporation,

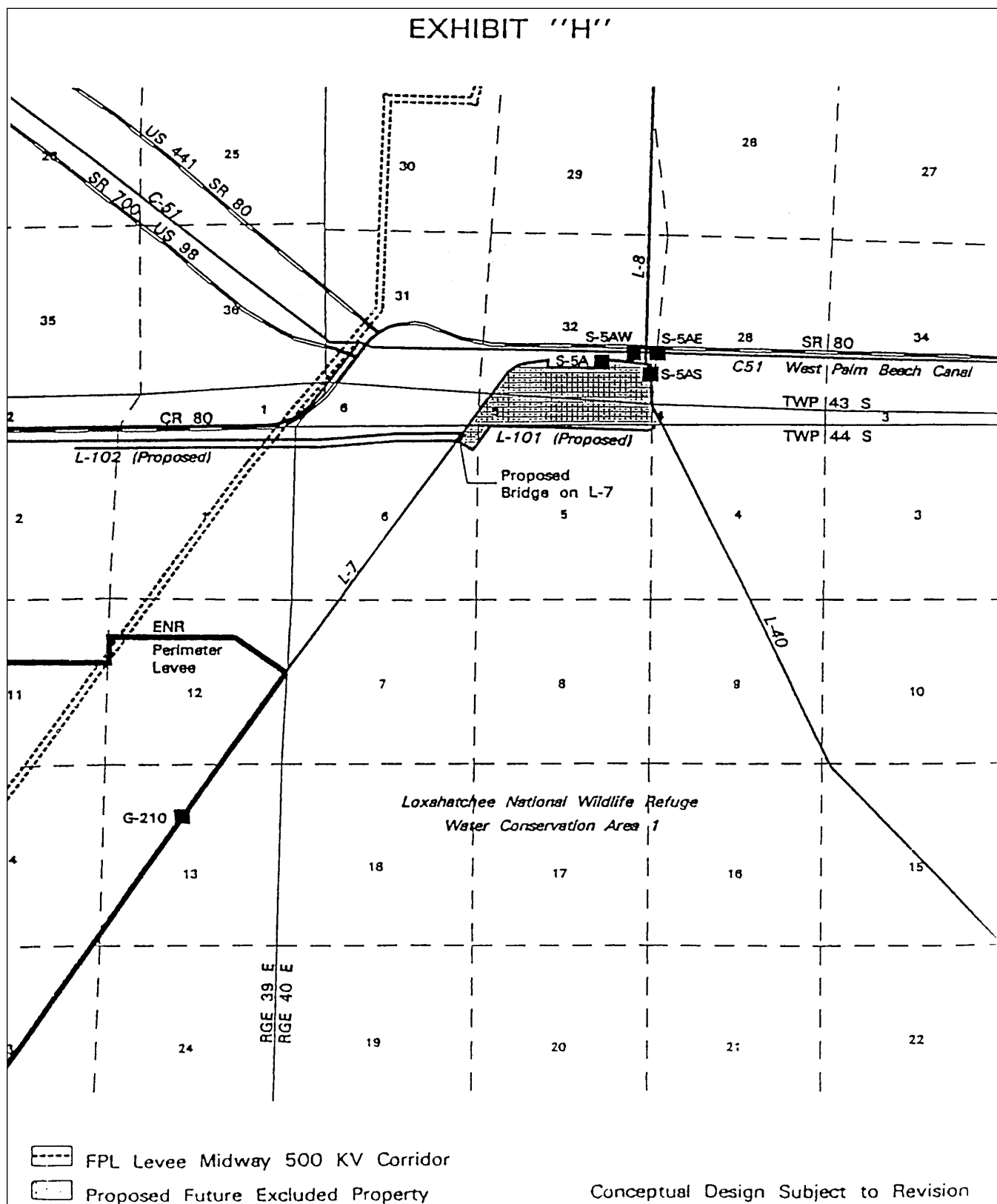
By _____
Its President LESSOR

EXECUTED by LESSEE, this 21st day of April, 1981.

MALRITE OF FLORIDA, INC.

By _____
Its Chief Executive Officer LESSEE

*NOTE: THE SIGNATURES ARE MISSING BECAUSE THIS DOCUMENT WAS RE-TYPED FOR THIS
CCP. THE DOCUMENT WAS RE-TYPED IN ITS ENTIRETY.*



Staff Inventory and Monitoring Efforts

This appendix outlines a list of biological monitoring, inventory, and research efforts that were (past two years) or are currently in progress on A.R.M. Loxahatchee National Wildlife Refuge. This limited list does not intend to show the comprehensive biological efforts that have occurred on the refuge in previous years. Rather, this list gives an indication of the recent efforts to provide biological data to be used in refuge management. Key: c=currently occurring, h=historically occurring

Bird Surveys

Snail Kite Survey (c=monthly during breeding season)
 Interior Waterfowl Survey (was monthly for years, c=once per mid-winter)
 Waterfowl Hunt Results (c=during hunt season)
 Wading Bird Nest Attempts (c=comprehensive survey during spring)
 Wading Bird Foraging Survey; Standard Reconnaissance Flights over Interior (c=annually by the University of Florida)
 Impoundments (was monthly, c=tied to specific impoundment management)
 National Christmas Bird Count (c=annually)
 North American Migratory Bird (c=Spring and Fall)
 Florida Migratory Landbird (Pond Cypress Route) (c=weekly during Spring and Fall seasons)
 Tree Island Migratory Bird (Interior Route) (c=weekly)
 Wood Duck Box Productivity (c=annual)

General Surveys

Alligator- Interior and Canals (h=annually; c=quarterly)
 Deer (aerial and airboat) (as funded)
 Frog Calls (impoundments, cypress swamp and now interior) (c=seasonal)
 Alligator Nest (c=annually)
 North American Annual Butterfly (c=annually)
 American Bittern Sightings; Cooperative Fish and Wildlife Service Effort (in 1998)
 Mussel; U.S. Department of Agriculture (scheduled)
 Estrongillis (fish collection and testing) (periodically by permit)

General Tree Island Projects (data evaluation in progress)

Drift Fence Trapping (c=2x week for 1 year)
 Small Mammal Trapping (once)
 Bat Survey (once, scheduled to do in migration)
 Fish Trapping (minnow) (once)
 Survey for Animal Tracks (once)

Specific Tree Island Projects

Flooding and Drought Impacts on Trees of Interior Tree Islands (c=in progress)
 Forage Availability for Passerines on Bayhead vs. Melaleuca Infested vs. Old World Climbing Fern Tree Islands (c=in progress)
 Impacts of Old World Climbing Fern on Tree Island Vegetation Composition (c=in progress)

Vegetation

Exotic Plant Mapping; Surveillance and Reconnaissance Flights over Interior (h=every 3 years; c=scheduled for 2000)

Exotic Control Monitoring Plots-Old World Climbing Fern and Melaleuca (c=in progress)

Herbicide Efficacy Study on Melaleuca (h=one time effort)

Old World Climbing Fern Growth along Interior Sign Line (h=monthly; discontinued)

Herbarium Collection (c=continual)

Prescribed Fire Monitoring Plots-Interior and Impoundments (as treatment occurs; pre/post burn)

Water and Sediment Quality and Contamination Testing

Four Atmospheric Deposition Stations (c=weekly)

Water Quality Sampling-Interior 16 Stations by helicopter (c=monthly)

Water Quality Sampling-ACME Stations 1 and 2 (h=monthly; discontinued)

Water Quality Sampling-ENR (h=monthly; discontinued)

Water Quality Sampling- Cypress Swamp (as funding available)

Sediment Sampling (Contaminants)- Cypress Swamp (as funding available)

Sediment Sampling (Contaminants)-Impoundment sediments (as funding available)

Fish Body Burden Sampling (Mercury Contamination)-Impoundments (as funding available)

Non-staff Efforts

Phosphorus Dosing by FIU (c=weekly)

Phosphorus Dosing at South Florida Water Management District Mesocosm Site (c=daily)

Special Use Permitted Research Projects*(an example but not comprehensive list from 1998-2000)*

Mazzotti/Woodmansee-41560-98006	To establish and study permanent monitoring plots to determine projected rates of expansion of Old World climbing fern populations.
Shanholtzer-41560-99020	Collect baseline data via wildlife (bird, amphibian, etc.) surveys in Strazzulla Marsh and the Cypress Swamp to assist in the restoration of the Loxahatchee Mitigation Bank site.
Rice-41560-99024	Capture alligators in the refuge for analysis of growth and condition for parameter estimation in support of Everglades restoration.
Martens-41560-99034	To collect surface water at 16 sites monthly on the refuge and evaluate water quality status and trends.
Gilmour-41560-99035	To study the mercury methylation process, particularly how mercury methylation and its product, methylmercury, is distributed within soils and periphyton in the refuge.
McCormick-41560-99036	To operate mesocosm chambers and conduct transect surveys for the purpose of characterizing spatial variation in ecosystem sensitivity to phosphorus enrichment as support for defining a Class III phosphorus criterion (funded by South Florida Water Management District).
Pratt-41560-00005	Study the establishment and spread of the snout beetle <i>Oxops vitilosa</i> , a biological control agent of exotic tree <i>Melaleuca quinquenervia</i> .
William-41560-00006	To collect soil samples (cores) on tree islands to develop a vegetational and geochemical history of tree islands as described in the project proposal: "Evolution of Everglades Tree Islands" prepared by Debra Willard and William Orem.
Lange-41560-00008	Evaluation of long-term trends of mercury in largemouth bass, sunfish and gambusia in the refuge.
Frederick-41560-00009	A long-term (4-year) study on white ibis reproductive biology in the Everglades ecosystem.
Kitchens-41560-00011	To continue the long-term, population demographic research on the endangered snail kites at the refuge.
Percival-41560-00015	To find and open alligator nests and capture alligators for the purposes of determining differences in alligator nesting characteristics and success between marsh and canal habitats.

Budget Requests under Refuge Operating Needs System and Maintenance Management System

This is a list of budget requests for RONS (Refuge Operating Needs System) and MMS (Maintenance Management System) projects. The projects found in these lists will correlate to the formal refuge projects list found in Section V. Plan Implementation, Project Summaries (see the left side column). There are some seemingly duplicate requests for funding, but each of the following budget requests have differing monetary values and represent portions of a full project. Breaking a project up into many smaller segments often allows partial funding.

For example, to expect full funding from Congress for Project #1 Exotic Plant Control (\$3,000,000) in a single allotment may be unrealistic. So the project has been divided into different funding requests.

<i>Management Project Number (CCP Management Direction Section)</i> primary project / support projects	<i>Refuge Operating Needs System (RONS); Project Subject</i>	<i>Cost (in thousands)</i>
1 / 2,5,7,9,14,16	Invasive Exotic Control	\$2000, 1000, 68, 250, 250, 100, 100, 23
4 / 11,13,14,15	Expand Environmental Education and Outreach	\$133,150
4 / 13,14,15,18	Enhance Visitor Experiences	\$122
5 / 7,8,9	Initiate Prescribed Fire Program	\$60, 248
6 / 2,5,7,8	Provide Scientific Data for Management Decisions	\$50
2 / 5,6,7,8	Computer Model for Hydrologic Patterns to Evaluate Landscape Changes	\$200
8 / 6,7,12	Restore Forested Wetland Habitat (Cypress)	\$70
2 / 5,6,7,8,12	Monitor Harmful Contaminants and Nutrient Levels in Water, Soils and Wildlife	\$75, 60
1,7 / 4,5,6,8,10	Monitor and Map Vegetation Changes, Native Plant Communities and Exotic Vegetation	\$280, 191
3 / 4,11,13,14,15	Refuge Operations Support (infrastructure, projects)	\$255
15 / 3	Headquarters Area - Recreation Opportunities	\$352
9 /	Expand Hunting and Fishing	\$111
10 / 7,5,12,1	Boundary Survey	\$75

Appendix P - RONS and MMS Projects

<i>Management Project Number (CCP Management Direction Section) primary project / support projects</i>	<i>Refuge Operating Needs System (RONS); Project Subject</i>	<i>Cost (in thousands)</i>
3 / 11,13,14,15	Restroom Facilities for Visitor Areas	\$177
8 / 3	Compartment (Impoundment) Management and Pumps	\$120, 95
6 / 1,2,4,5,7,8	Compile and Analyze Existing Data for Management Decisions	\$60
6 / 8	Everglades Success Monitoring	\$191
7 / 1,2,4,6,5,8,10,12	GIS/Mapping	\$123
11 / 3,14	Hillsboro Contact Station/Interpretive Center, Parking and Kiosks	\$485
4 / 5,6,7,11,13	Enhance Media Outreach	\$40
13 /	Strazzulla Marsh Public Use	\$305
3 /	Repair Damaged Roof/Ceiling of Headquarters Visitor Center	\$60
3 /	Remove and/or Replace Dilapidated Boat House	\$30
3 / 15	Building 5 Renovation	\$150
3 / 8	Replace Worn Engine for Pump Station P-1, P-2, P-3	\$25, 40, 300
8 /	Replace S-2, S-7, S-8 Water Control Structures	\$20,20,80
8 / 15	Replace Only Tractor - Worn 1978 Model	\$90
3 / 8	Replace 24" and 16" Water Pump	\$80,60
3 / 8	Replace Dragline	\$246
3 / 8	Replace Worn Roller Chopper	\$7
8 /	Replace Disk Harrow	\$7
3 / 4,8	Repair Brakes on Bulldozer	\$6
3 /	Repair Vegetation Cutting Machine	\$20
5 / 7,6,9,10	Repair Airboats (2)	\$5,5
1 / 2,3,5,9	Replace Work Boat (Airboat)	\$28
5 / 9,10	Replace Law Enforcement Vehicles (3 trucks)	\$29, 29,29
1 /	Removing Exotic Ficus Trees Which Are Damaging Residences	\$9
3 / 15	Resurface Paving Around Administrative Buildings and Quarters	\$75
3 / 4,15	Pave Poorly Surfaced Marsh Trail Parking Lot	\$120
14 /	Hillsboro- Build Multi-Agency Contact Station/Visitor Center	\$1000
3 / 15	Expand/Enhance HQ Visitor Center to Meet Needs	\$2000

Intra-Service Section 7 Biological Evaluation

January, 1999

REGION 4

[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:

Mark Musaus

Telephone Number: 561-732-3684

Email: Mark_Musaus@fws.gov

Date: 4/6/00

PROJECT NAME (Grant Title/Number):

A.R.M. Loxahatchee National Wildlife Refuge

Comprehensive Conservation Plan

(a 15 year management plan for the refuge)

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:

A.R.M. Loxahatchee NWR

IV. Description of Proposed Action (attach additional pages as needed):

See attached Summary Document. There are four alternatives proposed, however only Alternative 2, Ecosystem Emphasis, describes the proposed management actions.

V. Pertinent Species and Habitat:

A. Include species/habitat occurrence map:

Figure 14 shows the refuge interior (marsh) and Strazzulla Marsh. These areas and the vegetative components found in these areas can provide habitat for the snail kite and wood stork. The entire area is not used by either species at all times. Only when water levels, prey base, and vegetation structure are optimal do the kite and stork forage or attempt to nest. Both of these species could be found in the impoundments if water levels, prey base and vegetation structure are optimal.

B. Complete the following table:

<i>Species/Critical Habitat</i>	<i>Status¹</i>
Wood stork	E
Snail kite	E

¹Status

E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species.

VI. Location (attach map):*A. Ecoregion Number and Name:*

South Florida Eco-region

B. County and State:

Palm Beach, Florida

C. Section, township, and range (or latitude and longitude):

26°30.00N 80°14.00W (Headquarters Area)

D. Distance (miles) and direction to nearest town:

10 miles west of Boynton Beach, Florida

E. Species/habitat occurrence:

- Snail kites forage and sometimes nest in the open marsh areas of the main portion of the refuge. Kites could use the refuge year round, however in the recent past few kites have been observed on the refuge during monthly surveys.
- Wood storks could use the refuge habitat year round. However they seem to require low water levels to concentrate food resources. This combination of factors usually occurs in the refuge interior during the late winter/early spring dry down. In the impoundments, it can occur at various times of the year.

VII. Determination of Effects:*A. Explanation of effects of the action on species and critical habitats in item V. B, (attach additional pages as needed):*

<i>Species/Critical Habitat</i>	<i>Impacts to Species/Critical Habitat</i>
Snail kite	The Preferred Alternative of the refuge's Comprehensive Conservation Plan calls for the implementation of a prescribed burning program in the main portion (interior) and in Compartments A,B,C, and D of the refuge. This management action will assist in opening the marsh and creating more preferred habitat for this species to forage and nest.
Wood storks	The preferred alternative of the refuge's Comprehensive Conservation Plan calls for the implementation of a prescribed burning program in the main portion (interior) and in Compartments A,B,C, and D of the refuge. This will assist in creating more habitat for this species to forage. Additionally, some of the wetland impoundments in Compartments A, B, and C will be drawn down to enact vegetation control (by rollerchopping, discing or root cutting). This activity will result in better quality foraging habitat.

B. Explanation of actions to be implemented to reduce adverse effects:

<i>Species/Critical Habitat</i>	<i>Actions to Mitigate/Minimize Impacts</i>
Snail kite	A nest survey would be conducted in the proposed burn area approximately 1 week prior to the scheduled burn date. If a nest of this species is found, the burn would not be conducted to reduce any chance of chick loss. Foraging adults or juveniles will fly from the area as flames or smoke approaches them and would not be permanently impacted. It is thought that kites would quickly return to the burn site to forage.
Wood stork	<p>Foraging adults or juveniles will fly from the area as flames or smoke approaches them. No mitigation activity is needed.</p> <p>This species has attempted to nest only 2 or 3 times in the last 15 years, however a preliminary survey of the proposed burn area for nests would be conducted. If nests are found, a burn would not be conducted near that area.</p> <p>Drawing water down in select impoundments will concentrate fish and invertebrates, thus providing excellent albeit temporary foraging area for the storks. After vegetation treatment, reflooding the impoundment will allow the prey to repopulate and provide foraging opportunity for the storks. Only a few of the 12 impoundments will be managed in this manner per year. The other nearby impoundments will be maintained with water to provide foraging areas for these birds while the manipulation of the select impoundments occur.</p>

<i>Species/Critical Habitat</i>	<i>Status¹</i>	<i>Determination²</i>			<i>Response Requested³</i>
		<i>NE</i>	<i>NA</i>	<i>AA</i>	
Snail Kite	E		X		concurrence
Wood Stork	E		X		concurrence

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 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".

Mark Musano
signature (originating station)

5/9/00
date

Refuge Manager
title

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence X Nonconcurrence

B. Formal consultation required

C. Conference required

D. Informal conference required

E. Remarks (attach additional pages as needed):

Thomas E Dahl
signature

5/31/00
date

Acting Field Supervisor
title

Comments and Service Responses to the Draft Plan

Section A: Comment Process

Comment Period

An Executive Summary or an entire Draft of the A.R.M. Loxahatchee National Wildlife Refuge Comprehensive Conservation Plan was sent to more than 700 individuals, non-profit organizations, government and non-government agencies, and the Florida Clearinghouse in April 2000. An introductory letter announced the 30-day comment period. In reality, comments were accepted for 40 days because of a delay with the Florida Clearinghouse. The availability of the plan and the date for the Public Meeting, April 26, 2000, were announced in local newspapers, the Federal Register, and via flyers placed in many local store fronts.

Refuge Manager Mark Musaus presented and explained the Draft Comprehensive Conservation Plan to approximately 85 citizens at the public meeting which was held at the Delray Beach Civic Center. A professional transcriptionist recorded all verbal comments for that evening. Following the Refuge Manager's presentation, 25 individuals voiced their comments regarding the draft plan. In addition, 109 letters and comment cards from individuals, agency representatives, organizational heads or representatives, conservation organizations, outdoor recreation associations, special interest groups, school participants, educational groups, and sports association leaders or members were sent or hand delivered to the refuge within the comment period.

Summary of the Draft Comprehensive Conservation Plan

Comment Coding Process

All responses were held until the comment period was over. They were then assigned a random 4-digit number starting with 0001. Comments were read and comment phrases were placed in a category. Some sentences containing multiple-ideas were divided, or retyped to allow the thought to be placed in appropriate categories. Sometimes a number of pertinent phrases were used from lengthy comments. Every attempt was made to retain the integrity of each of the ideas and to tie the assigned number to each idea.

Natural categories seemed to develop in support of or against specific ideas, concepts, projects and opportunities presented within the draft plan. After the comments were grouped into categories, they were reviewed, discussed, and analyzed by the planning team.

First the planning team considered the content and tone as a whole, obtaining an overall feel for public sentiments. It then considered the comments by subject. Comments concerning funding deficits, resource impacts, recreational use versus resource compatibility, compliance with Service directives, and unanticipated issues led the planning team to re-assess the projects described in the Plan Implementation Section and listed in Table 8. The bulk of the comments urged the refuge to make exotic species removal its highest priority and appeared to strongly support resource protection and environmental education. All the projects were re-assessed and re-analyzed. Some projects were re-structured and amended, some were split and all were prioritized. Thus the project order outlined in the Final Comprehensive Conservation Plan has been changed due in large part to public input.

Funding Issues

Funding will be the first limiting factor determining if a specific project or public use expansion will occur. Ideally, the projects will be implemented in the listed priority order. However if funding is given for a particular project, it may be implemented before a higher ranked project. Often funds are contributed to the refuge for specific programs (i.e., environmental education) and cannot be used for other projects (i.e., exotic plant removal). The refuge will not turn away contributions even if the monies cannot be used for the number one funding priority, exotic plant removal.

The refuge does not have exclusive control over what projects or needs are funded. The following is a scaled down rendition of the process by which a national wildlife refuge is funded. A multi-step process includes each of the Service's refuges (more than 520) competing in many cases for limited discretionary/project funding. Refuges send funding requests (prioritized project and associated funding needs) to their respective Regional Offices each year (see Appendix ___ for the refuge's RONS and MMS funding requests). Each Regional Office prioritizes all projects, selects the top projects, and forward those to the Service's National Office. All the regionally selected projects are prioritized and some are chosen to be presented to the Department of the Interior for final review. Those projects that make the final review are forwarded, as part of larger funding initiatives, to the President's Office of Management and Budget for review and then to the U.S. Congress. These funding requests also include funding needs for the divisions of Ecological Services, Fisheries, and Law Enforcement. Congress usually approves some, but rarely all of the funding requests. Unfortunately, refuge funding requests may not be funded at all or may be partially funded. The refuge can spend allocated monies only on the projects for which they were intended, not for another project that may have a higher ranking. Thus, some projects on the refuge may be implemented before others, and some may languish without funding. It is likely not all projects will be implemented, due to funding shortfalls, staff limitations, new information on potential problems with a project, or other issues.

Other funding sources are available primarily from donations or grants. The Loxahatchee Natural History Association is an example of an organization that can raise monies for specific refuge projects. The refuge staff also submit project proposals to applicable grant opportunities.

Reference Table for Comments on A.R.M. Loxahatchee National Wildlife Refuge Draft Comprehensive Conservation Plan. This list provides a cross reference of the name of the commentor and the random number assigned to their comments. Governmental agency comments were not broken into sub-categories, hence were not given an assigned number. Rather the full text of their comment letters is provided along with the refuges' responses.

<i>Assigned Number</i>	<i>Private Citizen</i>	<i>Organization Member</i>
0001	Bludworth, David	
0002	Rosse Stella	Coalition for Wilderness Islands
0003	Unknown	
0004	Woody, Theresa	
0005	Bunze, Rebecca	Audubon Society
0006	Happel, Doris and William	
0007	Zane, Wilma	
0008	Ilnisky, Tanya	
0009	Unknown	
0010	Maddock, Mrs. Paul	
0011	Rossi, Enrico	
0012	Mitchell, Marthanne	Jupiter Environmental Research and Field Study Academy
0013	Mitchell, John	Audubon Soc. of the Everglades
0014	Johnson, Lydia	Fl. Audubon Society
0015	Kennedy, Terry and Betty	
0016	Schwencke, Matt	Boca Raton High School
0017	Rieneckel, BA	Audubon Society
0018	Calderon, Marvin	
0019	Calderon, Sheila	
0020	Specht, Paul and Susan	
0021	Gates, Jolly and Kathleen	
0022	Martin, Kyle	Bonaire (Boca Raton High School)
0023	Burt, Travis	Team Bonaire (Boca Raton High School)
0024	Fein, Henry	
0025	Fein, Doreen	Everglades Audubon Society
0026	Wilson, Edward	
0027	Wilson, Babara	
0028	Brook, Marilyn	Audubon Society
0029	Koegler, Jeanne	
0030	Heinlien, Joy	
0031	Aden, Frank	Audubon Society of the Everglades
0032	Slifkin, Eve	
0033	Padgett, Norman	
0034	Resen, Warren	Florida Trail Assoc.

Appendix R - Service Response to Comments

<i>Assigned Number</i>	<i>Private Citizen</i>	<i>Organization Member</i>
0035	Schaer, J.	
0036	Freedman, Stuart	Photographers
0037	Cogswell, Ruth	Loxahatchee Natural Wildlife Assn.
0038	Poleshuck, Jean	
0039	Taylor, Kent	Ducks Unlimited (chairman)
0040	Abramowitz, Frances	
0041	Lissone, Elena	
0042	Snyder, Robert	Florida Conservation Council
0043	Simpson, Margaret	
0044	Eisen, Harvey	Loxahatchee Natural History Association
0045	Bunting, David	
0046	Unknown	Audubon Society of the Everglades
0047	Stone, Mike	Audubon Society of the Everglades, VP
0048	Hill, Judy	
0049	Unknown	
0050	Unknown	
0051	Gunther, Vienneth Mr. and Mrs.	Loxahatchee Natural History Assn.
0052	Stark, Victor	
0053	Vollbracht, Nan and Ken	
0054	Friedman, Mrs. Toby	
0055	Moreton, D	
0056	Miller, Family	
0057	Traylor, M.	
0058	Kilmer, Mrs. Cecil	
0059	Parmalee, Alan	
0060	Jordan, Cindy	
0061	Martin, Vac	
0062	Steadman, Mr. and Mrs. Charles	
0063	Stambaugh, Kathy	Audubon Society of the Everglades
0064	Hutchis, William B.	
0065	Schardl, Alison	
0066	Iverson, Grace	
0067	Iverson, Roy	
0068	Siani, Tracy	
0093	Creasman, John R.	Palm Beach County Airboat and Halftrack Conservation Club
0096	Siskind, Michael	
0097	Greico, Andrea	

Appendix R - Service Response to Comments

<i>Assigned Number</i>	<i>Private Citizen</i>	<i>Organization Member</i>
100	Mulhall, Lisa N.	
0102	Arrington, Bruce	
0104	Worley, Amy Lynn	
0105	Kaplan, Neil	
0106	Kern, David D.	
0107	Louda, Dr. William J.	
0108	Louda, Dr. William J.	
0113	Matzkow, Steve and Grabo, Randy	
0120	Hemn, David L.	
0121	Rodriguez, Clemente	
0122	Warnke, Jim	
0123	Leserra, Jeff	
0124	Siani, Alfredo F.	
0126	Brennan, Kathleen	
0130	Middleman, Mort Mrs.	
0132	Harlman, Elizabeth	Florida Trails Assoc.
0069	Greico, Andrea	
0070	Albertson, Hal	Loxahatchee Natural History Association
0071	Eisen, Harvey	Loxahatchee Natural History Association
0072	Durando, Rosa	
0073	Guttridge, Laura	
0074	Butterfield, Mary	
0075	Rossi, Stella	
0076	Dr. Lovda, J. William	
0077	Middleman, April	
0078	Fleck, Donna	
0079	Moreton, Diana	
0080	Guttlieb, Sheldon	
0081	Thomas, Lyle	
0082	Behar, Mark	
0083	Dombrowski, Mark	
0084	Maharrey, Byron	Florida Hunters Coalition
0085	Schoen, Jed	
0086	Gabel, Todd	
0087	Brockway, Robert	Florida Sport and Conservation Association
0088	Keyes, Hillary	
0089	Parsons, Justin	Florida Sportsman Conservation Association

Appendix R - Service Response to Comments

<i>Assigned Number</i>	<i>Private Citizen</i>	<i>Organization Member</i>
0090	Tyson, Pete	Airboat Association of Florida
0091	Crenshaw, Ken	
0092	Ward, Gerald	
0139	Adcock, Jane	Loxahatchee Natural History Association and Friends Group

<i>Assigned Number</i>	<i>Formal Organization Letter</i>	<i>Signature Name</i>
0094	Defenders of Wildlife	Matson
0095	Quail Ridge Property Owners Association	Bloom
0099	The Ornithological Council	Paul
0109	Animal Rights Foundation of Florida, Inc.	Taksel
0110	Florida Hunting Coalition	Clavet
0111	Animal Protection Institute	Papouchis and Fox
0114	Everglades Coordinating Council	Powell
0115	Airboat & Halfback Conservation Club of Palm Beach County, Inc.	McDonald
0116	Palm Beach County Equestrian Trails Committee	Miller, Baker + 15 petition signatures
0117	Friends of the Everglades	Chenoweth
0118	Sierra Club, FL. Chapter	Lange
0119	Sierra Club, Broward County Group	Stone
0127	Audubon of Florida	Harrell
0129	Arthur R. Marshall Foundation	Marshall

* some comments were inadvertently assigned two numbers. Numbers were removed and duplicate comments were deleted when a thorough cross-check was performed.

Agencies that commented on the A.R.M. Loxahatchee National Wildlife Refuge Draft Comprehensive Conservation Plan. A copy of the full comment letter and the refuge response follows.

<i>Governmental Agency</i>	<i>Signature Name</i>
Congress of the United States, House of Representatives	Hastings
South Florida Water Management District	Finch
Florida Fish and Wildlife Conservation Commission	Egbert
Department of the Army; Jacksonville Corps of Engineers	Duck
Florida Department of Environmental Protection	Hall
Florida Department of Environmental Protection	Meeker
Florida Fish and Wildlife Conservation Commission	Hartman
Treasure Coast Regional Planning Council	Hatton

Service Responses to Public and Non-governmental Organization Comments on the Draft A.R.M. Loxahatchee Comprehensive Conservation Plan

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A. Alternatives

1. *Combining Alternatives*

- What I'd like was a combination of 2 and 3. (0072)
- I support elements of Alternatives 2 and 4 in some type of eco-friendly compromise. (0108)
- I feel that a combination of Alternative 2, 3, and 4 would be appropriate for the future planning of Loxahatchee National Wildlife Refuge. (0059)
- We cannot fully support any of the four alternatives, because two that are otherwise closest to our sentiments, numbers 2 and 3, provide for increased killing of wildlife. (0073)
- We cannot fully support one of the four alternatives, because the two that are otherwise closest to our sentiments, numbers 2 and 3, provide for increased killing of wildlife. (0109; Animal Rights Foundation of Florida, Inc.)

Response: Comments Noted

0073, 0109; The wishes to reduce or eliminate hunting and fishing are noted and addressed in more specific issue categories.

2. *Alternative 1- Maintain Current Management*

- Keep Loxahatchee as it is – I support Alternative 1. (0040)
- We would opt by default for Alternative 1. (0073)
- We support more aggressive efforts on behalf of the Service to increase water quality and provide opportunities for increased non-consumptive and non-intrusive activities on the land, we would opt by default for Alternative 1. (0109)
- Keep the same restrictions as are in effect. (0058)
- Keep the refuge as an environmental refuge. (0018)
- Keep the refuge as it is. (0009)
- Leave everything as it is. (0044)
- Continue to manage for environmental purposes. (0006)
- Continue the excellent management. (0022)
- Keep as pristine as it now is. (0005)
- Keep refuge the way it is (0024)
- I fully support keeping the Loxahatchee National Wildlife Refuge as it is now. (0103)

Response: Comments Noted

Unfortunately, a portion of Alternative 2 was placed in with Alternative 1 when the Draft Comprehensive Conservation Plan was printed. This gave the confusing impression that Alternative 1 advocated increased exotic management, aggressive water quality monitoring, and a balanced biological monitoring coupled with increased non-consumptive, non-intrusive activities. The refuge apologizes for this error and the confusion it caused for commentors. Alternative 2 actually has more aggressive exotic control, water, and biological monitoring issues along with greater wildlife-compatible, appropriate public use opportunities. This error was noted and taken into account by the planning team when interpreting the comments.

0073, 0109; Alternative 3 would have given less opportunity for hunting than Alternative 1. The wishes to reduce or eliminate hunting and fishing are noted and addressed in more specific issue categories.

3. *Alternative 2 - Ecosystem Emphasis*

- Like to go on record as supportive of Alternative 2, Ecosystem Emphasis in the Draft Comprehensive Conservation Plan for A.R.M. Loxahatchee National Wildlife Refuge. We fully support the Ecosystem Emphasis Alternative to restore seasonal water regimes, control invasive exotics, expand funding and staffing for inventory and mapping of wildlife habitats, and enhance wildlife habitat for resident and migratory avian species. (0118; Sierra Club, Florida Chapter)
- We embrace the refuge's position, for example, wildlife first. I like the idea of creating in memory where we're endorsing the ...all of the...ecosystems emphasis alternative two. (0070)
- I support the Ecosystem Emphasis Plan. (0123)
- We ask that you amend Alternative 2. Ecosystem Emphasis (Preferred Alternative) to read; 'This plan will increase hunting accessibility and the number of huntable species to include feral hog, deer, turkey and alligator by limited permit (if periodic survey done in conjunction with the Florida Fish and Wildlife Conservation Commission is favorable for hunts). (0110; Florida Hunting Coalition)
- We support the Ecosystem Emphasis Alternative. We are supportive of the efforts to restore natural water regimes, control exotic plants, expand staffing to complete inventory and mapping of wildlife habitats, as well as enhance wildlife habitat for resident and migratory birds. (0119; Sierra Club, Broward County Group)
- I strongly support Alternative 2. (0124)
- Strongly favor Alternative 2. Those plants and animals need a true refuge, and that doesn't include people. (0068)
- I have read the CCP and want to endorse the plan - Alternative 2. (0035)
- Agree mainly with Alternative 2, but with less emphasis on additional public use. (0051)
- Prefer Alternative 2, give protection and flexibility to refuge. (0001)
- Alternative 2. (0067)
- ...concurs with the opinion expressed by the Florida Sierra Club supporting Alternative 2, Ecosystem Emphasis in the Draft Comprehensive Conservation Plan for A.R.M. Loxahatchee NWR. (0117; Friends of the Everglades)
- I have seen the alternatives proposed for the future of the NWR. I would like to see an ecosystem emphasis; to improve water quality, timing and delivery within the refuge. This would benefit the wildlife. (0132)
- Alternative 2. Biological basis of the refuge, given restoration attempts for the Everglades (0067)
- I think the preferred alternative is well-balanced between ecosystem preservation and public outdoor recreational use. I especially like the increased emphasis on environmental education. (0132)

Response: Comments Noted

These comments suggest resource management should be a priority. More detailed responses can be found further into this comment and response document.

4. Alternative 3 - Biological Emphasis

- We support option 3, but also parts of 2 and some of 4. (0062)
- Option 3 includes the acquisition buffer areas and that is a good idea. (0068)
- We find alternative 3 (Biological emphasis) to be the most compelling because of its emphasis on reduced waterfowl hunting, restoration of native ecosystems, and overall emphasis on biology rather than public use. However, we cannot support it in its present form because it includes hunting for recreational and wildlife management purposes. If the FWS withdraws these provisions we would be in full support of Alternative 3. (0111; Animal Protection Institute)
- Please give priority to Alternative 3, with Alternative 2 as they should go along together. With sound biological base and continuing studies on which sound planning can be based. (0066)
- More emphasis on biology (0002)

Response: Comments Noted

0068; Alternative 2 also includes acquisition buffer areas, see Goal 2, Objective 3. Perhaps the designation was not made clear enough in Alternative 2.

0066, 0002; expressed the desire to see more biological basis in the plan.

0111; wishes to reduce or eliminate hunting and fishing are noted, and addressed in more specific issue categories.

5. Alternative 4 - Public Use Emphasis

- However, in Alternative 4, I would not like to see any hunting. (0059)
- However, in Alternative 4, I would not like to see any recreational motorboat use. (0059)

Response: Comments Noted

0059; The wishes to eliminate hunting and fishing or recreational motorboat use are addressed in more specific issue categories.

B. Importance of the Refuge

- I like Loxahatchee because the animal(s) are free. (0049)
- I love the reserve. (0022)
- Refuge is important to us all. (0007)
- We have a few preserves and must protect what we have. (0021)
- The refuge is a national treasure and should be preserved and expanded at all costs. The Everglades are stressed by those of short sight. (0037)
- We are grateful for the solitude and wildlife viewing opportunities this unique NWR offers. Please issue a Final Comprehensive Plan that will ensure these attributes are maintained in perpetuity. Thank you. (0118; Sierra Club, Florida Chapter)

Response: Comments Noted

C. License Agreement and Plan Adequacy

- “Big Sugar” (is) writing legislation to use the refuge for their dumping grounds. (0063)
- Do not support the bill--keep refuge in FWS hands. (0016)
- Do not pass any bill--keep refuge in FWS hands. (0014)
- Attempt to free this issue of political influence...certainly preserve the refuge. (0031)
- Don't let refuge go back to State, keep FWS managing. (0002)
- ...Number two; the Department of the Interior, Fish and Wildlife Service is nothing but the tenant here. Moving to the NEPA issue; that's the most important part of this document...we attended a scoping meeting...there was obviously by Appendix G half of the management characteristics described that needed to be looked at. One of which was not to re-new your lease. That decision has come forward by the thirtieth of September of this year by the owner, the SFWMD, and that should have been fully laid out as an alternative. One of the things of NEPA is economics. What can be saved by making this an effective water quality and water quantity facility? It was designed that way 50 years ago, and you have progressively over the last decade and a half, attempted to convert it to things that are not in your agreement with the Water Management District. You are violating the agreement. The government is here. And you being the lowest level government we have to supply the infrastructure to serve the people first, and in that, the water quality and water quantity aspects of the design. The water conservation area number one, not refuge one, needs to be brought to the people. And that's why this statement is not adequate and it needs to be elevated to the environmental impact statement level. (0092)
- Overall, Nancy and I think this is a great document....noting that you have proposed a rather robust increase in budget to fund the preferred alternative, hope we can help you out here, in the near future. (0129; Arthur R. Marshall Foundation)
- The general public and conservationist and sportsmen like myself, weren't notified of the upcoming plans and didn't get a chance to remark or comment. So at the 11th hour, please hear my comments.... You already know that you cannot penetrate but a very small part of the Area One around the perimeter, except by airboat. You need us to explore this vast 147,392 acres and to map out trails and markers for other users. You, as managers, will have to use an airboat to fully get the 'lay of the land' and explore all the potential uses that are best for all concerned--especially the wildlife....I wish you well in your coming dilemmas and endeavors and only ask that you give us fair consideration.(0115; Airboat & Halftrack Conservation Club of Palm Beach County, Inc.)
- In summation;
 - 1) The Draft Plan does not include sufficient information to give the public the assurance it needs that the USFWS will improve its stewardship of the land the State of Florida has entrusted to it. A new license agreement should not be entered into without a complete analysis of prior management shortcomings and concrete, adequately funded solutions.
 - 2) The Draft Plan does not provide balanced emphasis on rerecreational components, and in fact demonstrates bias against rerecreational hunting and backcountry access.
 - 3) The refuge is not in “pristine” condition” as claimed. Rather it contains a shameful and irresponsible level of exotic vegetation that continues to expand. Top priority must be given to waging an

aggressive mechanical and chemical war on melaleuca and climbing fern. Further delay while waiting on biological control (insects) that may not prove fruitful is unwise and harmful to the resource.

4) The public must have written assurances refuge activities or facilities will not adversely impact existing public uses of adjacent state lands. After the long Draft Plan development process, we were very disappointed to discover that, overall, it is more of a plan-to-do-a-plan, rather than a plan itself. Almost all of the details our members consider vital to know before we can support an extension of the License Agreement have been deferred to future planning efforts. Examples of the specifics we had hoped to see include law enforcement, exotic plant and animal management, fire management, and public use plans. Missing is an option that provides the appropriate level of emphasis on rescuing the natural system from near-collapse due to exotic infestation, together with environmental education and multi-use recreational opportunities. (0114; Everglades Coordinating Council)

- Unique land lease agreement with South Florida Water Management District presents different set of circumstances from other refuges and working with them on these issues is of the utmost importance. The plan is well done, represents a great deal of work. (0051)
- We applaud the plan you have, we applaud the vision and scope. We want to compliment you on all your efforts. (0080)
- Good document. (0001)

Response: Comments Noted

Background information: Just days before the Loxahatchee Draft Comprehensive Conservation Plan public meeting on April 26, 2000, legislation was introduced to the State House and Senate calling for the termination of the license agreement between the refuge and South Florida Water Management District. This proposed legislative bill would have resulted in state management control in what is now the refuge. According to newspaper articles, the legislation was backed by sugar industries and a group of sportsman. The legislation was removed from the agenda just after it was introduced, due in part to public pressure and public support for the refuge. Governor Jeb Bush said the Florida Department of Environmental Protection would join South Florida Water Management District in drafting a new license agreement with the refuge and that there would be a public review process.

As reflected in our Comprehensive Conservation Plan, we feel that the refuge currently has tremendous natural resources and staff resources to be proud of: resources that have been managed well. However these resources can always be improved upon to provide even better wildlife habitat and opportunities of enjoyment by the public. Our 15-year vision, our plan, thanks to tremendous input by the public through open meetings and written comments, lays a clear path before us to implement those improvements. We feel that the refuge is managed well as both a national wildlife refuge and as part of a larger regional system—a water conservation area. We also feel we have demonstrated appropriate flexibility consistent (in the spirit and intent of the license agreement) with changing times in concert with the larger system issues.

A comprehensive conservation plan is required for each refuge as part of the National Wildlife Refuge System Improvement Act of 1997, which was passed by Congress and signed by President Clinton. The Congressional mandate states that the plan shall be written to guide refuge management, not whether or not these lands should be managed as part of the National Wildlife Refuge System. The entire plan process, nationally, is adaptive in nature. Lessons have been learned about the process as plans are

written. This refuge's plan is only the second to be drafted in Florida. The refuge concurs that ideally, it would have been best to have written the many step-down plans prior to completion of the plan. In light of negotiations over license agreement renewal, it was agreed upon with water management district staff that the plan would be an important document to identify the Service's vision for the refuge and involve public participation. Preparing the step-down plans would have required much greater detail and more time than the license agreement time frames allowed. The refuge staff view this document as the most comprehensive review of what is presently known about the refuge and what needs to be accomplished.

A formal part of developing a comprehensive conservation plan is to compile a mailing list. During the 2-year writing process, many addresses were collected, many people requested to be kept apprized of the plan's progress when they sent in preliminary comments. Approximately 700 addresses were used to notify the public of the availability of the draft plan. Included in this list were the most recent addresses the refuge had of non-profit organizations including conservation associations. News releases were sent to major newspapers in the area about the availability of the draft plan and of the upcoming public meeting regarding the draft. Finally, color posters were created and placed in area business windows in an attempt to further notify the public. Finally the Federal Register carried the announcement of the availability of the draft plan.

Partnering and keeping open lines of communication are paramount for this plan to succeed, and are noted under IV. Management Direction (Summary Statement and in the Discussion of Goals 1, 2 and 4).

D. General Refuge Management

1. Emphasize Environmental Protection

- Manage as a preserve. (0008)
- Keep reserve geared toward preservation. (0022)
- Protect and keep refuge pure. (0019)
- Keep refuge pure. (0018)
- ...get rid of anything that is spoiling the refuge. (0010)
- Don't destroy the natural beauty. (0029)
- Keep natural, our future depends upon it. (0025)
- Nature needs a chance and helping hand to survive. (0024)
- Please use the refuge for environmental uses. (0048)
- Manage for environmental purposes. (0009)
- Keep the park's purpose at environmental usage only. (0028)
- I think we need to keep the bulk of mankind out of the interior and leave it for its intended purpose. (0078)
- There is so little time left in a wild state, please do not encourage any more public use than already exists. (0068)
-but with less emphasis on additional public use. (0051)
- Keep the habitat free from the public. The encroachment of the Everglades is a serious mistake. No more public. (0057)
- I strongly support all efforts to discourage development of touristy and commercial attractions in Loxahatchee. At present, it is a unique natural wilderness area in Palm Beach County where caring visitors, naturalists, photographers, and birders can share this preserve. Over development is threatening our wildlife or ecology and our serenity. (0040)
- Imagine the serene silence which must have prevailed in the refuge prior to 1900. Please outlaw ALL man-made sources of noise inside the refuge boundaries. (0061)
- The draft CCP takes bold steps to improve stewardship of an important part of the American landscape, steps that cost millions of dollars. The preferred alternative represents a 450% increase in annual spending on the refuge over the status quo. While we hope the refuge receives the funding it needs to accomplish the vision outlined in the plan, we also hope that when there are funding shortfalls, the biological program retains its integrity above others. The protection of the resources is the first priority of the refuge. (0094; Defenders of Wildlife Organization)

Response: Comments Noted

These comments show the value of the refuge to the public, the wish to protect it, and to limit or at least not expand public use. See other responses for more details.

2. *Emphasize Wildlife*

- I'd just like to leave with this...protect the wildlife. Man has always found a way to destroy. Destroying for necessity is one thing, for pleasure is something else. (0070)
- Preserve wildlife. (0020)
- Manage it for wildlife....protect wildlife who live there (0004)
- Yes to birdwatching. (0012)
- Enjoy wildlife observation and habitat watching. (0015)
- We come to watch birds and wildlife. (0006)
- Leave the wildlife alone. (0049)
- Maintain refuge for wildlife (0021)
- Should be kept true to the meaning of refuge, which is protection of wildlife, not exploitation. (0058)
- I thoroughly support the refuge and the CCP draft, I hope that we will continue to keep it for wildlife and keep people second. Thank you. (0074)
- We too favor the keeping of the refuge for wildlife. (0080)
- The refuge is a refuge. (0063)
- There is a great need for the Loxahatchee NWR to continue to set its priority to preserve the wildlife of our most northern remnant of the Everglades. It is a national treasure of our state and country. (0038)
- I, of course, agree with you that Loxahatchee should be for wildlife and considerations for the enjoyment of people a distant second. After all there's no place on this planet like the Everglades. (0130)
- And the refuge should also be what it is, a refuge for people to enjoy and to have a peaceful experience there. (0086)

Response: Comments Noted

These comments suggest the citizens value observing nature, knowing wildlife reside on the refuge habitats and keeping the refuge for wildlife is important, even at the expense of curtailing human activities. See other Responses for more details.

3. Protect Buffer Lands

- Land acquisition priorities should be expanded to include state identified Strategic Habitat Conservation Areas that abut the refuge. The proposed boundary expansion will further protect the cypress swamp and other refuge resources. We suggest also including lands identified by the Florida Game and Fresh Water Fish Commission in their “Closing the Gaps in Florida’s Wildlife Habitat Conservation System” report. This type of large scale planning is exactly what the FWS should be involved in to prioritize land acquisitions and to understand how refuges and other conservation efforts fit into the larger landscape. The FWS should work closely with the State to see if there are opportunities to acquire lands identified by the State as SHCAs that are close to the refuge. There are indeed a number of small parcels of SHCAs that might make sense for the FWS to include in their boundary expansion. (0094)
- I’m not sure how well integrated you will be with the supposed water preserve areas and buffers, and I hope you will work with the county. (0072)
- We support expansion or buffers. (0062)
- The other thing is.... I was concerned about buffer areas. Everyone is talking about the buffer areas west of 441 or highway seven. And as I look at the map of the refuge, I could understand that when you get to the northern section. But I was wondering about the buffer areas to the south of Boynton Beach Boulevard. And everyone is talking about west of for 441, and I realize that it costs money, but I was more concerned about developing buffer areas east of 441. I was wondering if there were any plans along those lines? (0080)
- The AG reserve is a joke. The proposed density was an outrage, the solution wasn’t much better in that taxpayers have to foot the bill and the density is still huge. Only the rich can afford. (0041)

Response: Comments Noted

The refuge is currently working with many local, county, and state agencies to develop options to protect the lands west of U.S. 441/State Road 7. Protecting these lands would also assist and buffer the refuge. Many ideas are still being formulated by a multitude of interested parties (especially natural resource management and water management agencies) to acquire lands as part of “water preserve areas,” a project component of the Comprehensive Everglades Restoration Plan. Refuge management is keeping abreast of these ideas and will continue to pursue management partnerships to prevent development along its eastern boundaries. Maps of the Strategic Habitat Conservation Areas and range maps of rare and imperiled wildlife identified by the Florida Fish and Wildlife Conservation Commission were consulted. The County’s Ag Reserve program includes some of these lands on the refuge’s eastern boundary to keep in an undeveloped state. Some of the Strategic Habitat Conservation Area lands have been acquired by various natural resource agencies, and some lands could be managed in partnership with the refuge. In light of these efforts, the refuge identified only those lands for acquisition consideration most critical to protecting intensively managed refuge lands outside the District’s levee.

E. Wildlife Habitat Management

1. *Habitat Restoration*

- Clearly, restoration of ‘pond (cypress) swamp’ communities is a priority of the South Florida Multi-Species Recovery Plan. Restoring a cypress swamp community in compartment A and in the land adjacent to the Headquarters Area that is proposed for acquisition, is essential to conserving this community which has been dramatically reduced, particularly in southeast Florida. ... the proposed extension of the interpretive boardwalk through the existing cypress swamp and construction of an observation tower would reduce the quality of the interior forest habitat and is counter to this objective. These two proposed projects seem to conflict...we urge FWS to take a precautionary approach... until the ramifications of the proposed extensions are known. In addition, for pond swamps to recover, they need to have functioning ecological processes to sustain themselves - processes that are more likely to occur with larger, contiguous, intact systems, than in small remnant fragments. To strengthen the CCP, the restoration project should appear in the “goals” section of the CCP and not just as a project idea for implementation. (0094)
- The purpose of this letter is to extend our cooperation to you and your program to develop a partnership for future habitat restoration projects. I would most welcome your comments and to discuss the Audubon Cooperative Sanctuary Program and how we could enhance these programs for the mutual benefit of our community. (0095; Quail Ridge Property Owners Association)
- ...we agree with prescribed burning that will allow for the opening of new habitat areas for fowl and wildlife. (0110)
- I support the used of prescribed burning (0126)

Response: Comments Noted

0094; The map and/or description of the proposed observation platform is misleading in the draft plan. The intent is not to construct another long boardwalk. Rather, a short branch would be made off the existing boardwalk leading to an observation tower enabling the public to experience the cypress forest at the canopy level.

0095;The refuge supports partnerships with many entities, including private landowners. Please contact the refuge, as the Service employs a “private lands biologist” for south Florida. The role of this individual is to assist the refuge in developing land management partnerships with willing landowners to enhance fish and wildlife habitat.

2. *Research and Monitoring*

- Because research is by definition part of the NWRS mission, it should take priority over public uses, even priority public uses... In fact the CCP even lists as two of its objectives (p.58) the development of partnerships for research, control, and monitoring of exotic and invasive species and the development of new and existing partnerships for research and monitoring of biological resources with universities and conservation organizations... We are concerned that the CCP does not provide for biological research by outside scientists on the refuge. The Public Use section of the Management Plan addresses only wildlife-dependent recreational opportunities. We suggest that the Management Plan should include a provision for allowing and encouraging independent biological research. (0099; The Ornithological Council)
- The Animal Protection Institute believes these (see below) recommendations provide an excellent framework for complying with the letter and intent of the Act. We strongly suggest that the U.S. Fish and Wildlife Service follow these steps when finalizing the CCP for the ARM Loxahatchee NWR and that it withhold final compatibility determinations until population information is presented and analyzed. To do otherwise may be in violation of the Act.

1. Given the infeasibility of conducting an inventory for all organisms on a refuge, conduct refuge inventories to obtain, at minimum, information on the abundance and distribution of vascular plants, vertebrates, and all federally threatened and endangered species.
 2. In collaboration with the U.S. Geological Survey's Biological Resources Division biologists and other scientists, chose "focal" species suitable for monitoring on each refuge or refuge complex. Carefully chosen focal species will convey information about the status of the larger ecological system to which they belong and the integrity of specific habitats or ecosystem processes.
 3. Conduct research designed to test whether each focal species does indeed provide information on larger communities and processes. This is essential to the focal species approach.
 4. Select focal species and design the monitoring program for each refuge or refuge complex to produce information about internal and external threats to achieving refuge management goals. Management goals should be consistent with maintaining the biological integrity, diversity, and environmental health of each refuge and should be clearly described in the refuge's comprehensive conservation plan.
 5. Conduct rigorous, quantitative monitoring that is oriented toward management decisions to ensure that refuge management is scientifically based and as effective as it can be. (0111)
- A full blown archaeological survey is a must for all of the area north and west of the high line. It certainly makes common sense and stands to reason that there must be many more mounds, both midden and burial, in the area. It would take a team of machete wielding workers, of course, accompanied by a trained archaeologist ...Aerial infrared photos both day and night, satellite photos, GPS precision, US Geodetic survey cooperation and much more... If this area is not preserved we will have lost a very important and large page of our early history in south Florida! (0122)

Response: Comments Noted

0099; The Fish and Wildlife Service, via its National Wildlife Refuge System, developed a document in March 1999, entitled "Fulfilling the Promise" which outlines how important biological research is for the management of refuges. Formal research, as well as inventory and monitoring, are important to the refuge and the Everglades ecosystem, especially as Everglades restoration progresses. The refuge staff are aware they cannot accomplish all the projects and ideas that have been laid out in this plan with the current or even the proposed increased staffing and funding levels. The following references to research partnerships can be found in the plan under Management Direction, Partnership Opportunities Section, "Collaboration with colleges, universities...will enable the refuge to carry out its extensive plans for research...."; In the Environmental Assessment, Research and Monitoring Section "...greater numbers of research projects will be allowed...."; and in the Compatibility Determination, Research and Special Use Permits Section, "The refuge receives many requests to conduct scientific research" Application for a Special Use Permit is the starting point for qualified, independent researchers to submit their project proposals to the refuge management and biological staff. The Final Plan will be amended to contain a list of monitoring/inventory/research projects and biological special use permit research currently taking place or permitted within the past 2 years. In the Inventory and Monitoring Step-Down-Plan Management Plan, potential research direction important to the refuge will be further discussed. This will aid "independent researchers" in determining how to structure potential special use permit applications.

0111; As noted above, the Final CCP will contain a list of current inventory, monitoring, mapping projects as well as a 2-year year list of outside research projects that have contributed scientific and biological information for resource management. These lists give an indication of the scope of current projects and their tie to the Everglades environment.

The primary direction the inventory and monitoring plan will follow is governed by the Fish and Wildlife Service Refuge Manual, the “Promises” document, and a “Biological Needs Assessment document” that was developed. Issues such as the Everglades restoration and regional protection of listed, trust and focal species are addressed in the South Florida Ecosystem Team’s Ecosystem Plan, South Florida Multi-Species Recovery Plan and the Comprehensive Ecosystem Restoration Monitoring Plan. Each document assists refuge management and the refuge biological program to focus inventory and monitoring plans and limited resources on priority activities.

The following hierarchal lists are guidelines and steps Service refuges use to determine which habitats and species are inventoried and monitored. Note: inventory and monitoring projects are sometimes specific for the refuge, whereas others support regional, national and international emphasis.

- those habitats or species listed in the Refuge Purpose (wildlife habitat and migratory birds)
- the habitats and species of critical management importance. Usually this means the primary trust species (federally listed threatened and endangered species, migratory birds, anadromous fish and certain marine mammals) which reside on or are dependent upon the habitats found on the refuge (e.g., snail kite, wood stork)
- secondary trust species (federally listed threatened and endangered species, migratory birds, anadromous fish and certain marine mammals) which occasionally may use the refuge (e.g., bald eagle, crested caracara)
- state listed species (e.g., Florida sandhill crane, strap fern), Service Species of Management Concern (e.g., yellow rail, American bittern) and CITES species (e.g., river otter, delicate ionopsis)
- those habitats or species of concern in South Florida Ecosystem Team’s Ecosystem Plan, South Florida Multi-Species Recovery Plan and the Comprehensive Ecosystem Restoration Monitoring Plan (e.g., tree islands, wading birds, alligators). These focal habitats and focal species were selected because they can provide information and indicate changes on larger communities and ecological processes.

The refuge agrees that it is cost prohibitive and unproductive to attempt inventorying or monitoring all habitats and species (even listed species). However, biological groups which are thought to be “umbrella,” indicator, or focal species are and will continue to be inventoried and monitored. Adjustments will be made to phase out less productive efforts and include methods providing sensitive indications of population dynamics. Although the refuge is quite large for a refuge, it is not isolated. Rather it is an important portion of the greater Everglades ecosystem and surveys will be closely tied to monitoring the restoration efforts.

0122; The refuge staff and the Service’s Regional Archaeologist fully intend to follow through with Goal 2, Objective 6. Partnerships and Memorandums of Understanding will be forged with a wide variety of organizations, agencies and Indian Nations to further protect our state and nations’ cultural resources as is described in Goal 2, Objective 8.

3. Exotic Plant Control

- Remove exotics. (0045)
- Clear exotics. (0047)
- Get rid of exotics, remove exotics. (0010)
- Get rid of exotic plants and trees. (0048)