

U.S. Fish & Wildlife Service

Arthur R. Marshall Loxahatchee

National Wildlife Refuge



*Arthur R. Marshall
Loxahatchee is one of
more than 538 refuges
in the National Wildlife
Refuge System which
is the world's most
outstanding network
of lands dedicated to
wildlife. The mission
of the National Wildlife
Refuge System is "to
administer a national
network of lands and
waters for the conservation,
management, and where
appropriate, restoration
of the fish, wildlife and
plant resources and
their habitats within
the United States for
the benefit of present
and future generations
of Americans."*

*Loxahatchee
National
Wildlife
Refuge*



*This blue goose,
designed by J. N.
“Ding” Darling,
has become a
symbol of the
National
Wildlife
Refuge
System.*

**Welcome to your
National Wildlife Refuge**

Arthur R. Marshall Loxahatchee National Wildlife Refuge, all that remains of the once vast northern Everglades, is located seven miles west of the city of Boynton Beach in Palm Beach County, Florida. Palm Beach County is the largest county east of the Mississippi River in terms of land area and is the largest agriculture producing county in the east in terms of dollar value. The refuge is situated west of U.S. Highway 441, south of U.S. Highway 98, and 15 miles west of the Atlantic Ocean. The Everglades Agricultural Area, which includes large sugar cane plantations, winter vegetables, sod farms, and cattle ranches, is located to the north and west. Rapidly expanding urban communities and fast disappearing small farms are found to the east where nearly six million people live within two hours of the refuge from Ft. Pierce south to Miami. The remainder of the central and southern Everglades (Water Conservation Areas 2 and 3 and Everglades National Park) is located to the south.

**Part of a Network of Lands—
Born of Necessity, Managed with Care**

A.R.M. Loxahatchee NWR is one of over 538 refuges in the National Wildlife Refuge System which is the world’s most outstanding network of lands dedicated to wildlife. Refuges provide habitat for more than 200 endangered and threatened species as well as hundreds of other birds, mammals, reptiles, amphibians, fish, insects, and plants.



The National Wildlife Refuge System, first started in 1903 by President “Teddy” Roosevelt, is managed by the U.S. Fish and Wildlife Service and encompasses over 94 million acres across the nation. Found in every state, refuges include arctic tundra in Alaska, coral reefs in the Caribbean, bogs in the north woods of Maine, and tropical forests at the base of volcanoes in Hawaii.

History

Archaeologists suspect that prehistoric occupation did not occur on the refuge because of little dry land on which to live. Even tree islands, which are thought to have formed recently, would have been unsuitable for prehistoric occupation. However, archaeologists have hypothesized that the refuge may have been used by the Belle Glade People, early Indian settlers, to travel east toward the Atlantic Ocean.



Beginning with the Swampland Act of 1845, and later the 1907 Everglades Drainage Act, excessive drainage activities occurred in the Everglades to pave the way for agriculture and population expansion. Three water storage areas called Water Conservation Areas 1, 2, and 3 were constructed by the U.S. Army Corps of Engineers in the 1940s. The Everglades “River of Grass” no longer flowed freely then, losing its connectivity. Bounded by levees and connected only by a series of canals, these areas were placed under the jurisdiction of what is now the South Florida Water Management District (SFWMD), an agency of the State of Florida.

In 1951, a license agreement between the State of Florida and the U.S. Fish and Wildlife Service, under the authority of the Migratory Bird

Conservation Act, enabled the establishment of the 143,238-acre Loxahatchee National Wildlife Refuge in Water Conservation Area 1. “WCA-1” or “refuge interior” land, as it is now called, is owned by the State of Florida and SFWMD, but managed by the U.S. Fish and Wildlife Service as a unit of the National Wildlife Refuge System. The license agreement was later amended to include the 1,604-acre Strazulla Marsh, which lies adjacent to WCA-1 on the northeast side.

In addition to the licensed lands, the U.S. Fish and Wildlife Service owns 2,550 acres to the east and west of the refuge interior. This acreage is sub-divided into four management compartments (A, B, C, D) and the 400 acre Cypress Swamp. In total, the refuge currently includes 147,392 acres of northern Everglades habitat.



In 1986, the refuge’s name was changed from Loxahatchee National Wildlife Refuge to the Arthur R. Marshall Loxahatchee National Wildlife Refuge to honor former U.S. Fish and Wildlife Service employee and noted South Florida conservationist, Arthur Raymond Marshall.

The refuge is managed within the framework of the Comprehensive Conservation Plan (CCP), a document developed from 1998 - 2000 with extensive public input. The vision to guide the refuge’s future management in the CCP is . . . “To serve as an outstanding showcase for ecosystem management that restores, protects, and enhances a portion of the unique northern Everglades biological community. This public asset provides for the enjoyment and enhanced quality of life for present and future generations.”

Wildlife Habitats

The Everglades habitats of the refuge consist of sloughs, wet prairies, sawgrass, and tree islands. Cypress forest is a fifth major plant community that lies along the eastern edge of the Everglades within the refuge.



Sloughs have deeper water and hold water longer than other Everglades plant communities. They vary in depth from a few inches in the dry season to two feet or more in the wet season. The slough is characterized by a scarcity of visible surface plants. Among the surface plants that do grow there are white water-lily and spatterdock. There is an abundance of submergent plants such as fanwort or chara.



The Wet Prairie community is characterized by short emergent plants and relatively shallower water levels than sloughs. It is the most prevalent vegetative community in much of the central and eastern portions of the refuge. Plants include duck potato, pickerelweed, spikerushes, and redroot.

The Sawgrass community gets its name from the characteristic saw-edged sedge that dominates this type

of habitat. Sawgrass may grow in solid strands or in the presence of other species. In some areas, a mixture of sawgrass, wax myrtle, and dahoon holly grows abundantly. A ring of sawgrass often encircles tree islands, separating them from the wet prairie.



Tree Islands are formed on slightly higher elevation areas within the marsh, including where peat has “popped up” to the surface. Small water tolerant plants are the first to germinate, followed by shrubs and trees. The canopy of well developed tree islands is usually a dense growth of redbay intermixed with dahoon holly. A narrow border of wax myrtle, buttonbush, and coco-plum surrounds the typical island. Occasionally, other trees such as red maple and willow are found on tree islands in the refuge.



The cypress community is composed of pond cypress trees, pond apple, myrsine, lichens, and ferns such as giant leather, sword, strap, cinnamon, royal, resurrection, and swamp ferns. The moist microclimate of the cypress swamp also provides for a profusion of epiphytes (air plants), such as cardinal, leatherleaf, needleleaf, and southern needleleaf, as well as ball



moss and Spanish moss. This 400 acre cypress swamp is part of the largest cypress forest left on the east side of the Everglades that once ranged from Lake Okeechobee south to Fort Lauderdale.

The managed compartments are composed of Compartments A, B, C, and D. The compartments are subdivided into impoundments which are actively managed in a mosaic of habitats to benefit wildlife.

Birds



Wildlife on the Refuge

In any given year, as many as 257 species of birds may use the refuge. Of these birds, approximately 93 species are considered to be common or abundant during certain seasons. For the snail kite, limpkin, smooth-billed ani, white ibis, glossy ibis, roseate spoonbill, wood stork, American swallow-tailed kite, short-tailed hawk, Florida sandhill crane, purple gallinule, black-necked stilt, and a variety of herons and egrets, the refuge can provide important habitat for both nesting and migration. Many neotropical migratory birds (which may include songbirds, raptors, and shorebirds), also depend on the refuge for habitat.





Waterfowl

A variety of duck species such as the ring-necked, mottled, fulvous-whistling, wood, and ruddy duck, as well as blue-winged teal, green-winged teal, lesser scaup, northern pintail, American widgeon, northern shoveler, hooded merganser, and gadwall may be found on the refuge when water levels are appropriate and adequate cover is available. The mottled and wood duck nest on the refuge.

Resident Wildlife



There are 23 species of mammals known to occur on the refuge, including the Mexican free-tailed bat, cotton mouse, grey squirrel, raccoon, bobcat, gray fox, round-tailed muskrat, river otter, and the nine-banded armadillo. There are at least 17 species (exotic and native) of frogs, toads, and amphibians on the refuge. A few of the most common are the greater and lesser siren, amphiuma, Florida cricket frog, green treefrog, pig frog, and southern toad. Approximately 18 species of turtles and lizards use the refuge, including the stinkpot, Florida redbelly, peninsula cooter, and Florida softshell turtles, green anole, and ground skink. Up to 24 different snake species have been found on the refuge, including garter snake, racers, Florida cottonmouth, dusky pygmy rattlesnake, and a



variety of watersnake species. Alligators, an important “keystone” species in the Everglades, occur on the refuge in large numbers. The refuge supports the densest, and arguably healthiest, alligator population south of Lake Okeechobee.

Threatened and Endangered Species



There are at least 63 plant or animal species listed by the state or federal government as endangered, threatened, or of special concern known to occur or that could occur on the refuge. These species include wading birds such as the wood stork and Florida sandhill crane, raptors such as the snail kite and bald eagle, and other species including the eastern indigo snake and the tropical curley-grass fern.

Providing for a Diversity of Plants and Animals

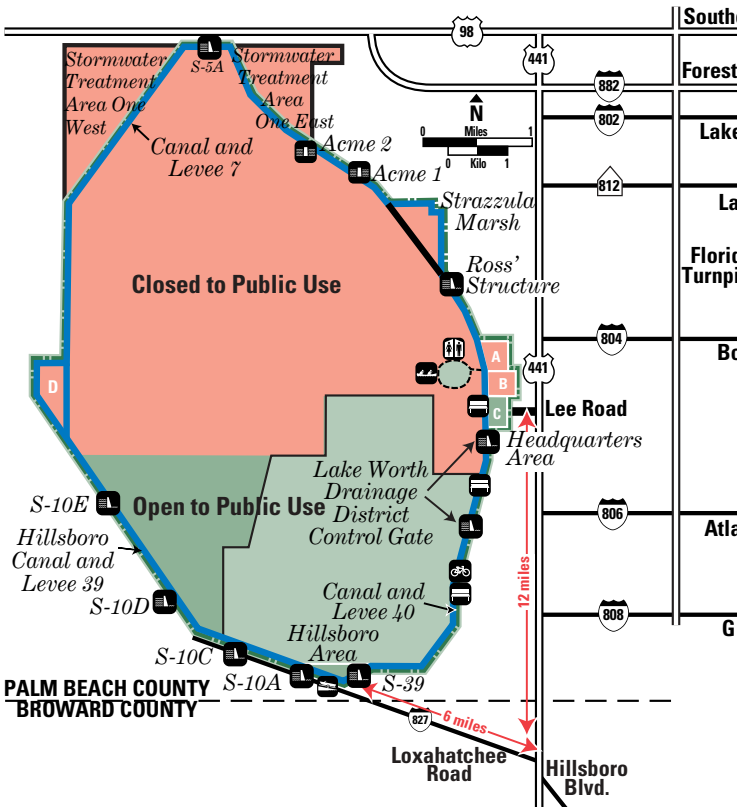
Habitat Management

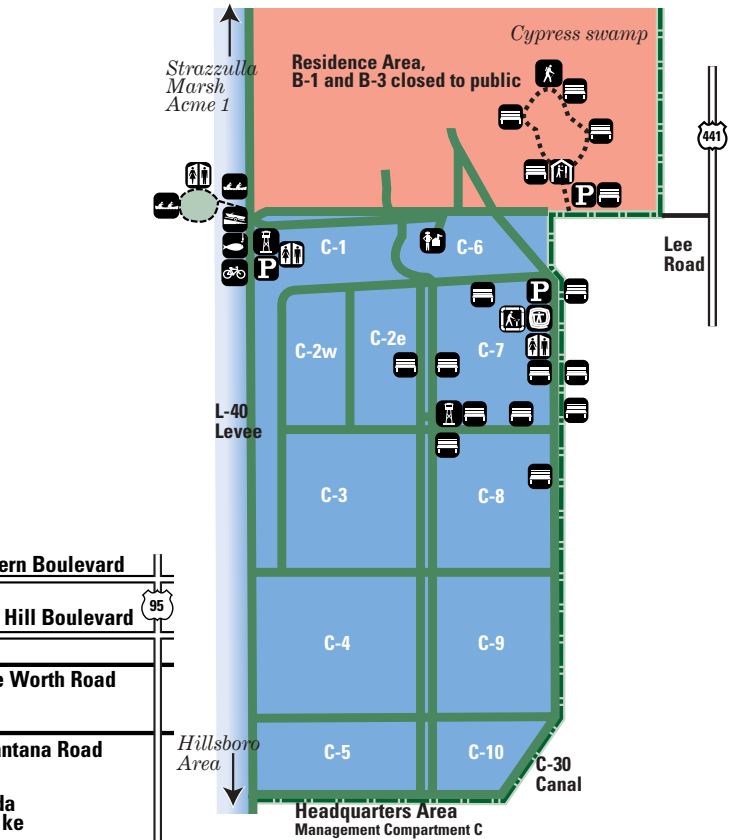
A variety of management programs enhance the array of habitats available to wildlife on the refuge.

A major portion of refuge management effort is spent controlling exotic and invasive plants and pursuing funding to eliminate these threats. Invasive exotic plants, such as melaleuca, Old World climbing fern, and Brazilian pepper pose a serious threat to the whole

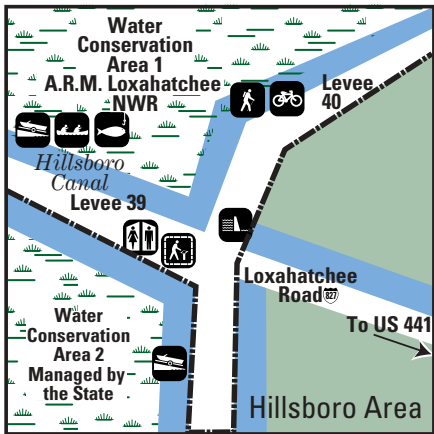


- Open to public use
- Closed to public use
- Waterfowl hunting by permit only
- Canal and boatable water
- Refuge boundary
- Canoe trail
- ABCD** Management compartments
- Portable restrooms
- Viewing platform
- Administration office
- Visitor center
- Marsh trail (#7)
- Bike trail
- Cypress swamp boardwalk
- Observation tower
- Parking
- Boat ramp
- Fishing
- Pump structure
- Water control structure
- Bench
- Chickee





ern Boulevard
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South Florida ecosystem, especially to native plant communities and wildlife habitats. These alien plants, lacking natural predators and insects to keep them in check, rapidly expand, forming dense forests or thickets which are undesirable to humans and wildlife. This degraded habitat has been proven to support much less species diversity than native plant habitats. Management of invasive exotic pest plants is the top priority of the refuge. Refuge staff work with other scientists from key federal, state, and local agencies and private organizations that deal directly with invasive exotic pest plants.



Appropriate water quantity, timing, delivery, and high quality water are critical to achieve refuge objectives and those of Everglades ecosystem restoration. To achieve effective water management the refuge relies upon developing progressive partnerships with the South Florida Water Management District, U.S. Army Corps of Engineers, and other entities.

Prescribed fire is used as an important tool for managing wildlife habitat. The refuge staff and partners conduct prescribed burns to enhance a variety of habitats and to control invasive and exotic plants. Wildfires are closely monitored. The refuge has a variety of vegetation types which are either dependent upon fire, susceptible to fire, or spread fire. Sawgrass marsh is

extremely combustible but well adapted to fire. Beakrush and spikerush wet prairies have insufficient fuel to carry a fire under high water levels. Sloughs act as natural firebreaks, since the vegetation is sparse and wet most of the year. However, if the surface sediments dry out, “muck” fires may develop in the peat. Tree islands, found interspersed among the sloughs and wet prairies, will rarely carry fire during the wet season. However, when the water table drops below ground level, tree island communities are susceptible to destructive fires.

All the compartments (2,550 acres) are actively managed to enhance wildlife habitat. Portions of the compartments are being restored to cypress swamp, beginning with cypress planting, relevant levee removal, invasive exotic removal, restoration of hydrology (water movement), and public outreach. The remaining compartments and their impoundments are managed in a mosaic of habitats to benefit a variety of wildlife.



Wildlife Calendar

This calendar is a general guide to seasonal wildlife events. Weather may cause slight variations. The best times to observe wildlife are generally early morning and just before sunset.

January



Many bird groups spend the winter season at the refuge. Many raptor species can be seen foraging over the wetlands or in the trees, including resident and migratory red-shouldered hawks. Hundreds of American robins, cedar-waxwings, and tree swallows are sometimes foraging in trees. Winter warblers such as prairie, orange-crowned, yellow-rumped and common yellowthroat warblers, northern waterthrush, and ovenbirds also are found.

February



Wintering shorebirds can be seen in addition to the wintering raptors, waders, and passerines. Wintering secretive marsh birds can sometimes be heard. Florida and migrant red-shouldered hawks continue to be abundant this month. Eagles should be sitting on eggs, and snail kites are engaged in courtship behavior.

March



Some northern waterfowl species remain, but most have started migrating north to breed. Thousands of tree swallows begin gathering for their northern migration in late spring. Usually, water levels are slowly dropping in the interior portions of the refuge, and most of the smaller wading birds and great egrets are starting courtship behavior and are in full breeding plumage. The first black-necked stilts of their nesting season start to arrive. Most of the shorebirds wintering on the refuge have migrated to the northern parts of their ranges, and spring shorebird migrants will be arriving in April. Kingfishers and common snipe begin to migrate north this month.

April

Alligators may be heard bellowing this month. Snail kite nests should have chicks near fledging age. As the water levels continue to lower during this 'dry down season' wading birds such as little blue herons, tricolored herons, snowy and great egrets, and glossy and white ibis should be into full phase nesting; sitting on eggs or having chicks. A few American bitterns still remain, but most have migrated north. Least bitterns are in full breeding color. Late month reveals an increase in migrating shorebirds on exposed mud flats. Resident red-shouldered hawks are courting and beginning nesting activities.



May

Black-necked stilts are nesting on mud flats. American bitterns and belted kingfishers have probably migrated north by now. Alligators continue to bellow this month. If water levels are quite low, alligators may be concentrated in the canals or in small pools of open water (alligator holes) in the interior of the refuge. Numerous turtle nests (soft-shelled, red-bellied, snapping, and peninsula cooters) are being dug. Migrant shorebirds move northward. Some species that could be observed include lesser and greater yellowlegs, and solitary, stilt, spotted, least, semipalmated, pectoral, and white-rumped sandpipers. White-tailed deer buck's antlers are covered in velvet.



June



Continued hot and dry conditions keep most species out of the sun during the day. During this time of year, wildlife hunkers down for survival, and few animals are easily observed. Unless the 'wet season' rains come, the water levels are usually quite low. Extended periods of hot temperatures and no rain can contribute to decreased oxygen availability, resulting in the fish kills along the L-40 canal. Alligators are building nests. Daytime raccoon activity seems to increase. By the end of the month, rain usually brings water levels up. Wading birds disperse after nesting and can be difficult to find. Red-shouldered hawks may have chicks in their nests.

July

Rainy season is usually in full swing. Juvenile otters can be occasionally seen along the roads or levees near the water. Some white-tailed deer buck are still in velvet. Female alligators are attending their nests.

August



Butterflies are becoming more numerous as summer rains encourage grass and other plant blossoming. Alligator nests hatch at the end of the month and hatchlings may be visible. An early migrant, blue-gray gnatcatchers can be sometimes heard this month.

September

Early passerine migrants can be seen. Six to nine species of warblers and occasionally Baltimore orioles, scarlet and summer tanagers, and hermit thrushes can be found during this fall migration.

October

Raptors start arriving for the winter, including vultures, American kestrels, Cooper's and sharp-shinned hawks, and northern harriers. The first merlins and peregrine falcons of the fall season are usually seen this month. Florida red-shouldered



hawks are abundant, and fall migrants are arriving. Bobolinks and eastern kingbirds can be heard and seen migrating southward. Generally speaking, teal and pied-billed grebes show up but ducks do not appear until later in the year. Belted kingfishers arrive and are commonly seen on the impoundments. Secretive marsh birds such as king, sora, black, and Virginia rails can often be heard, but not seen.

November

Sometimes hurricanes approaching from the west side of the state in the fall will enhance the sightings of passerines such as blackburnians, Brewster's, blue-winged, ceruleans, and chestnut-sided warblers. Pied-billed grebes have migrated in for the winter and are easily observed in the impoundments. When they first arrive they tend to stay in tight feeding groups but soon disperse and forage individually. Northern wintering migrants continue to arrive to increase our year-round resident bird numbers. Some of these are palm warblers, grey catbirds, blue-grey gnatcatchers, great-crested flycatcher, blue jays, northern cardinals, and white-eyed vireos.



Bobcat kittens can be seen with their mother occasionally. River otters are observed regularly. Hundreds of tree swallows can occasionally be seen over the impoundments. Wintering waders are foraging in many locations and can be observed easily.

December

With cooler weather, small mammals are seen more frequently. Early morning visitors may see grey foxes, otters, and marsh rabbits along the impoundment edges in the tall grasses. The numbers of wading and marsh birds have increased with the cooler and drier weather.

Public Use Opportunities

Listed below are recreational activities available on the refuge. In all cases, public access, public use, or recreational activities not specifically permitted are prohibited. Please inquire at the Visitor Center or consult an information kiosk as to whether a specific activity is permitted.

Refuge Hours:

The refuge is open daily from sunrise until sunset. Night use is prohibited. Exact times are posted at each entrance and change seasonally.

Access:

Public entry into the refuge is available at both the Headquarters Area (off US 441/SR 7 between Boynton Beach Blvd. and Atlantic Avenue) and the Hillsboro Area (at the west end of Loxahatchee Road). Entry at any other point is illegal. An entrance fee of \$5.00 per vehicle or \$1.00 per pedestrian is charged daily. Golden Age, Golden Access, Golden Eagle, and Duck Stamp annual passes are available upon request. A \$12 Refuge Specific Annual Pass and a \$15 Golden Eagle Hologram for National Park Service pass upgrades are also available. Entrance fees apply at both refuge entrances.



Visitor Center:

The Center is open daily from November to the end of April, except Christmas Day. Hours are 9:00 am - 4:00 pm Monday through Friday and 9:00 am - 4:30 pm Saturday and Sunday. From May to early November the Center is open Wednesday through Friday from 9:00 am - 4:00 pm and Saturday and Sunday 9:00 am - 4:30 pm. Exhibits, information, and restrooms are available at the Center.

Interpretive Programs:

A variety of activities, including guided tours and audiovisual

programs, are offered throughout the year. Inquire at the Visitor Center.

Everglades Day - 2nd Saturday in February

International Migratory Bird Day
2nd Saturday in May

Kid's Fishing Day - National Fishing Week - 2nd Saturday in June

National Wildlife Refuge Week - 2nd week in October

Calendar of Events activities - November through April

Waterfowl hunting - November through January on specified days (must obtain permit)

Summer Activity Schedule - June through August



Environmental Education:

The environmental education and outreach program showcases the northern Everglades ecology and human influence on the southeast Florida ecosystem. The refuge offers area educators the challenge to wisely use this unique and fragile resource as their outdoor classroom. By calling 561/732 3684 at least two weeks prior to your requested day, staff can assist educators in booking field trips, preparing the curriculum, and ensuring an educational fee waiver.



Wildlife Observation:

Nature observation, photography, and hiking are encouraged. Observation is best along the Cypress Swamp Boardwalk, the Marsh Trail, the Everglades Canoe Trail, the L-40 Levee, and Management Compartment C. Hiking is allowed only in areas open to public use and on designated trails. Hiking is permitted from the

Headquarters Area north to Acme 1 pump station, south to the Hillsboro Area, and west approximately 12 miles. There is no entry or exit at the Acme pump stations at this time. Entry to the refuge from any point other than Headquarters Area or Hillsboro Area is illegal.



Fishing:

Sport fishing is permitted in the L-40 perimeter canal and public use areas of the interior except for the Management Compartment C and other areas posted as closed to the public. Only the use of rods and reels or poles and lines is permitted and these must be attended at all times. State and refuge regulations apply, and a state license is required.



Boating:

Boating, canoeing, and kayaking are permitted in canals and in the public use area, except for Management Compartment C and other areas marked as being closed to the public. Airboats, go-devils, swamp buggies, water skiing, jet skiing, and other personal water craft are prohibited. U.S. Coast Guard, state, and refuge regulations apply. All Coast Guard regulations apply pertaining to boat speeds. There is a minimum wake



slow speed zone at each boat launch area. The 5.5 mile Everglades Canoe Trail is well marked and provides a unique opportunity to explore the Everglades. No motors are allowed on the canoe trail. All canoes must conform to boating regulations. The trail may be closed during some parts of the year due to low water levels. Canoes and kayaks for rent are available through local outfitters. A listing may be obtained from the Visitor Center.



Biking:

Biking is permitted along the L-40 levee from the Headquarters Area to the Hillsboro Area. The 12-mile trail is recommended for mountain or hybrid bikes. It is also recommended that you bring water, helmet, sunscreen, and light snacks. There is no shelter along the levee, but two benches have been installed at roughly the one-third and two-thirds points.



Hunting:

Waterfowl hunting is permitted by permit only in designated area. Special refuge dates, times, and regulations apply. Waterfowl hunting is available mid-November through mid-January on Wednesday through Sundays during the state season, and only during the morning hours. There is no hunting on Christmas Day.

A weekend youth hunt occurs the last weekend of the hunt season in January. All hunters must possess a valid Florida State Hunting License and Florida State Duck Stamp. In addition, all hunters age 16 and older must possess a signed valid Federal Migratory Bird Hunting Conservation Stamp. A free annual refuge hunt permit, required of all hunters, may be obtained by writing or calling the Refuge Administration office at 561/732 3684 after November 1.



Volunteering on the Refuge

A growing number of volunteers assist the refuge with a variety of public use, maintenance, and biological projects, including leading tours, staffing the Visitor Center, building boardwalks and benches, assisting with wildlife surveys, and checking nest boxes. For volunteer information contact the refuge Volunteer Coordinator at 561/732 3684 extension 112 or call 561/734 8303.



In addition, a non-profit friends group, the Loxahatchee Natural History Association - Friends of the Refuge, has formed to help staff the Visitor Center, operate a book and gift store, and help the refuge to fulfill its mission. For more information write to the Loxahatchee Natural History Association - Friends of the Refuge at P. O. Box 2737, Delray Beach, Florida 33447-2737. Their website is www.lnha.net

Enjoying the Refuge

The public is welcome to visit the refuge any time of the year from sunrise to sunset. There are several motels and numerous restaurants and gas stations within a 15 minute drive of the refuge. For more information, contact the Greater Boynton Beach Chamber of



Commerce at 639 East Ocean Avenue, Suite 108, Boynton Beach, FL 33435 or telephone 561/732 9501. Be prepared to observe refuge regulations concerning: posted hours, closed areas, fishing and hunting license requirements, boat registrations, life jackets, and other required safety equipment.

Please do not leave valuables in your vehicle, and allow time to return to your vehicle and leave the refuge before posted closing time. Tell a relative or friend where you are going and when you should return. Please contact refuge personnel for emergency assistance. The emergency number for the refuge is **561/936 4100 or dial 911**

All government property including natural, historic, and archaeological features are protected by Federal Law. Searching for or removal of objects of antiquity or other objects is strictly prohibited. Do not pick flowers or other vegetation, or harass, capture, or remove wildlife.





Firearms

Firearms or weapons of any type are prohibited, except approved firearms used in conjunction with the refuge waterfowl hunt. These weapons must be unloaded and encased when not hunting.



Pets

Pets of any kind are prohibited.



Littering

Littering is prohibited. Please use trash receptacles provided or take your litter with you.



Speeding

The refuge-wide speed limit is 25 m.p.h. Wildlife and people may be on or near roads. Refuge law enforcement staff and sheriff's deputies strictly enforce the speed limit.



Vehicle Access

The use of motor vehicles is permitted only on designated roads. All-terrain vehicles are prohibited.



Administrative Office

Located 1/4 mile west of the visitor center on Lee Road, the administrative office is open Monday through Friday from 8:00 am to 4:30 pm The telephone number is 561/732 3684.

**Arthur R. Marshall Loxahatchee
National Wildlife Refuge
10216 Lee Road
Boynton Beach, Florida 33437-4796
561/732 3684**

**U.S. Fish & Wildlife Service
1 800/344 WILD
<http://southeast.fws.gov>
<http://Loxahatchee.fws.gov>**

**Emergency Call:
936 4100 or dial 911.**

May 2002



**CELEBRATING A
CENTURY
of CONSERVATION**

