
Draft Sport Hunting

Decision Document

For

**LACASSINE
NATIONAL WILDLIFE
REFUGE
Draft 2009**

Contents

2. Draft Environmental
Assessment

Draft Environmental Assessment

2009 Sport Hunt Plan

for

LNWR
Cameron Parish, Louisiana

For Further Information, Contact:

Project Leader

U. S. Fish and Wildlife Service

Southwest Louisiana National Wildlife Refuge Complex

Cameron Prairie

National Wildlife Refuge

1428 Hwy 27

Bell City, LA 70630

Prepared by:

U. S. Department of Interior

Bell City, Louisiana

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Chapter 1 Purpose and Need for Action

Lacassine National Wildlife Refuge (LNWR) was established on December 30, 1937, as Lacassine Migratory Waterfowl Refuge by the following: 1) Executive Order 7780, "...as a Refuge and breeding ground for migratory birds and other wildlife...;" 2) the Migratory Bird Conservation Act, "... for use as an inviolate sanctuary, or any other management purpose, for migratory birds," (U.S.C. 715d). Additional lands were added to the refuge under 3) Fish and Wildlife Act of 1956 "...for the development, advancement, management, conservation, and protection of fish and wildlife resources..." [16 U.S.C. 742f(a)(4)] and 4) "...for the benefit of the United States Fish and Wildlife Service , in performing its activities and services" [16 U.S.C. 742f(b)(1)].

The National Wildlife Refuge System Administration Act of 1966 as amended by the National Wildlife Refuge System Improvement Act of 1997 (16 U.S.C. 668dd et seq.) provides authority for the United States Fish and Wildlife Service (Service) to manage the Refuge and its wildlife populations. In addition it declares that compatible wildlife-dependent public uses are legitimate and appropriate uses of the Refuge System that are to receive priority consideration in planning and management. There are six wildlife-dependent public uses: hunting, fishing, wildlife observation, wildlife photography, environmental education and interpretation. It directs managers to increase recreational opportunities including hunting on National Wildlife Refuges when compatible with the purposes for which the Refuge was established and the mission of the National Wildlife Refuge System.

The purpose of this Environmental Assessment is to evaluate the feasibility of modestly expanding hunting opportunities on land currently open to hunting on LNWR. Hunting is a priority public use on National Wildlife Refuges and is an important wildlife management tool that the U S Fish and Wildlife Service (Service) recognizes as a healthy, traditional outdoor pastime, deeply rooted in the American Heritage as stated in Service Policy, 605 FW 2. Hunting changes would include adding a limited duration experimental modern firearms/muzzleloader deer hunt within the existing area currently open to archery deer hunting; and providing additional opportunities for seniors and youth waterfowl hunters during the early portions of the waterfowl hunting season. These actions would support current Service Policy by providing additional opportunities for quality recreational and educational experiences and encourage participation in this tradition which is deeply rooted in America's natural heritage and conservation history. In addition these specific actions have been proposed because they will offer more opportunity to participate in this priority public use in a manner that minimizes conflicts with visitors participating in other compatible wildlife-dependent recreational activities and are within the management capabilities of the current staff.

Hunting regulations would be the same as those currently imposed on hunters currently using the refuge. This hunting plan and environmental assessment also implements the recommendations found in the Lacassine NWR Comprehensive Conservation Plan and Environmental Assessment completed during 2007 and updates the former Lacassine NWR Hunt Plan into conformance with recent policy changes and step-down management plan formatting. This plan and environmental assessment will become an appendix to the Southwest Louisiana National Wildlife Refuge Complex Visitor Services Plan.

Chapter 2 Alternatives Including the Proposed Action

This chapter discusses the alternatives considered for hunting on the 34,724 acre LNWR. These alternatives are the 1) no action which continues with current management of the hunt program and 2) proposed action which implements the Refuge's 2009 Sport Hunting Management Plan

2.1 No Action Alternative: Current Management

Under this alternative waterfowl hunting would occur on 10,434 acres and deer hunting would be allowed on the entire refuge except the refuge headquarters and along Lacassine Pool Wildlife Drive. Species currently allowed to be hunted, include deer, ducks, geese, gallinules and coots. There would be no change to current wildlife management programs. Lottery waterfowl hunting opportunities for youths and seniors would continue to occur during the second split of the Louisiana State Western Zone waterfowl hunting season. Deer hunting would continue as currently managed.

2.2 Proposed Action: 2009 Sport Hunting Plan for Lacassine NWR

The proposed action would not increase any new land open to hunting, but would add a limited duration experimental modern firearms/muzzleloader deer hunt within the existing area currently open to archery deer hunting; and provide additional opportunities for seniors and youth waterfowl hunters during the early portions of the waterfowl hunting season as opposed to only the second split of the Louisiana State Western Zone waterfowl hunting season. The proposed action also supports the goals and objectives of the LNWR Comprehensive Conservation Plan and updates the 1984 Lacassine NWR Hunting Plan bringing it in line with current U S Fish and Wildlife Service planning policy.

Refer to 2009 Sport Hunting Plan for Lacassine NWR for specific regulations.

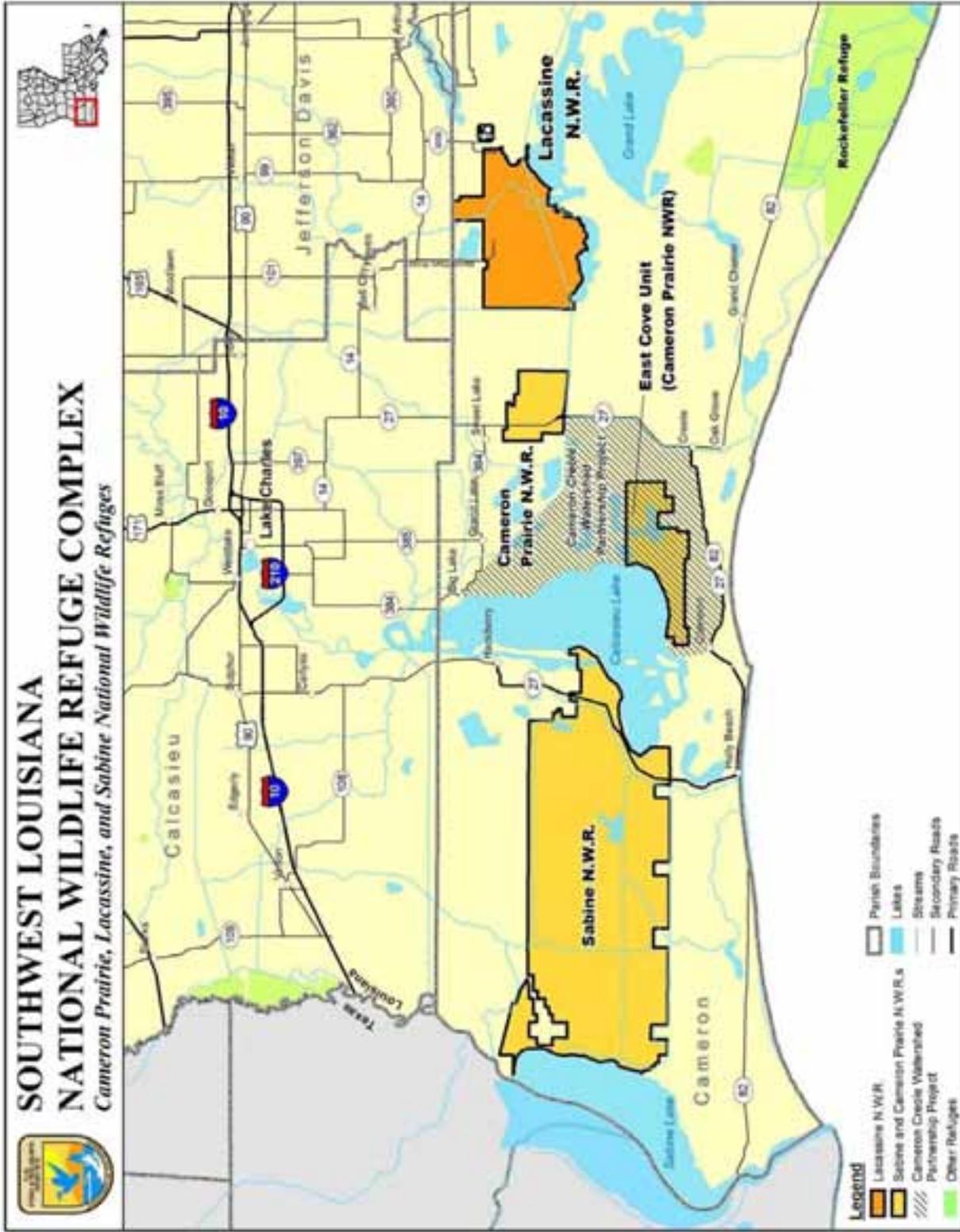
Chapter 3 Affected Environment

3.1 Physical Environment

The Cameron Prairie NWR was administratively combined with nearby Sabine National Wildlife Refuge in 2000. LNWR joined the Complex in April of 2004 and Shell Keys NWR in 2006. The four Refuges now comprise the Southwest Louisiana National Wildlife Refuge Complex with Cameron Prairie serving as Complex Headquarters and also being responsible for management of the 64,000 acre Cameron Creole Joint Venture Watershed Project. The Complex also has a unique administrative oversight role with the Louisiana Department of Wildlife and Fisheries Rockefeller Refuge.

Created in 1937, LNWR was the 123rd refuge established within the National Wildlife Refuge System. It is located at the edge of Grand Lake and 15 miles from the Gulf of Mexico in Cameron and Evangeline Parishes in Louisiana. The refuge is strategically located on the boundary of coastal marsh and agricultural habitats, as well as at the southern terminus of the Mississippi and Central Flyways, making the refuge critically important to migratory birds, especially wintering waterfowl.

Lacassine NWR Location



3.2 Habitat

LNWR is located on the boundary of the costal marsh and agricultural habitats. The dominant feature of the refuge is the Lacassine Pool, which was created by enclosing a 16,000-acre marsh with a low levee during the 1940s. The refuge consists predominately of freshwater marsh, wetlands, and croplands (Figure 6).

Table 3 shows a breakdown of land cover/habitat types on the refuge.

Much of the refuge is impounded and is divided into management units (Figure 7) that are both impounded (Units A, B, C, D, E1, F3, and G) and unimpounded (Units E2, F1, F2, H, I, and J). About 3,300 acres south of the Gulf Intracoastal Waterway is designated as wilderness.

Table 1. Land cover/habitat types on LNWR

Habitat/Cover	Approximate Acres
Impounded Fresh Marsh (Lacassine Pool)	16,000
Natural (Unimpounded) Fresh Marsh	14,700
Forested wetlands	352
Shrub wetlands	348
Open Water	1,048
Managed Fresh Marsh (moist soil plant impoundment)	307
Coastal Prairie	334
Croplands (rice and fallow)	1,109
Roads, levees, miscellaneous	526
Total Acres	34,724

Source: USFWS 2003

Lacassine Pool

The most prominent feature on the refuge is the 16,000-acre impounded fresh marsh known as the Lacassine Pool (Unit G), which provides sanctuary and food for thousands of ducks, geese, shorebirds, and wading birds in peak years. Lacassine Pool is also a popular fishing area and is heavily utilized during the fishing season.

Pool levees were constructed to maintain a maximum water elevation of 4.0 feet mean sea level (MSL) and staff gauges were installed in Lacassine Pool to monitor water elevations. This elevation information was established by interpreting historic data found in refuge files. Lacassine Pool elevation water level of 4.0 feet MSL that was established during the 1940s, and carried throughout the years in numerous surveys and documents, has always been assumed to be the correct water level

Figure 7. Management Units on LNWR



In 2005, John Chance Land Surveys, Inc., performed a new survey to gain better insight into management of water levels in the Lacassine Pool area. This survey was conducted using the best available science for data acquisition and adjusted to the latest accepted horizontal and vertical data. The final adjusted results of this Global Positioning System (GPS) survey revealed that there is a 3.1-foot difference between the historic accepted LNWR vertical datum (assumed to be MSL) and the survey contractor's GPS-derived elevations using North American Vertical Datum of 1988 (NAVD88). This means when converting the 4-foot MSL to NAVD88, the elevation of the full pool is 0.8-NAVD88. This will be the new baseline for future management. The latest vertical adjustment at LNWR was determined from a fully constrained adjustment fixed to three of the National Geodetic Surveys Continuously Operating Reference Stations and using the latest validated geoid model (Geoid03 - 2004.65) for elevation determination in the Louisiana Coastal Zone.

New staff gauges have been installed at the three water control structures (within Lacassine Pool) and are calibrated to the latest NAD83 horizontal datum and NAVD88 vertical datum. Managers of Lacassine Pool will now be using the NAD83 and NAVD88 reference data and will report the accepted datum for water levels accordingly. Water levels will still be managed at a level that will not negatively affect the dikes and is still conducive to migratory birds and sport fisheries in Lacassine Pool.

Lacassine Pool has never been managed as a seasonally flooded moist-soil management area. There are no capabilities to flood the area other than through natural precipitation. Gravity flow dewatering is possible through three stop-log water control structures located on the north, southeast, and southwest portions of the Lacassine Pool levee system. Early literature and documents discussing Lacassine Pool, since its construction in the early 1940s, have never clearly indicated how it should be managed to provide sanctuary for wintering waterfowl.

Not being able to take advantage of dry weather conditions and applying prescribed fire to Lacassine Pool at the appropriate time of the year has been the downfall of past and current pool management actions. In addition, the complexity of managing for waterfowl and fish is a very dynamic public process. In the past, if an annual drawdown was artificially induced by refuge management, it had to be applied to the entire pool, which significantly affected access to the recreational fisheries resource. Trying to manage for waterfowl and recreational fisheries access over the decades has now resulted in the accumulation of more than 60 years of dead plant material, which is surfacing as a significant management issue.

In an effort to manage Lacassine Pool for wintering waterfowl and fully aquatic species (e.g., fish for recreational fishing), water levels are maintained at full pool, or as close to it as possible, during the spring and summer months. In the winter, water levels are lowered so the waterfowl foods that are produced can be made more available to waterfowl. This water level regime is highly dependent upon weather conditions in any given year. A hurricane or tropical depression can completely flood the area for an entire year. A heavy spring rain can do the same. A severe drought can do the complete

opposite so refuge managers must be flexible and have the ability to work with the dynamic weather conditions of the area.

Though Lacassine Pool is recognized as a feeding area for some species of waterfowl, one of its most important contributions to wintering waterfowl is serving as a sanctuary and resting area for pintails. Recent research has documented the value of Lacassine Pool as a key diurnal roost site for harboring pintails in southwest Louisiana, with pintails making frequent long, round-trip journeys to foraging habitat at night (Cox and Afton 1996). Based on an experimental site within Lacassine Pool (Unit D), the current water management regime along with 10-year, cyclic water drawdowns followed by prescribed burning and then flooding appears to stimulate the growth of the aquatic plant *Brasenia* (e.g., water shield), which is characterized as an excellent food for ringed-necked ducks, but of only fair value for other waterfowl. It also allows for oxidation of dead plant material. This management treatment, if continued, should allow for the growth of *Brasenia* and other beneficial waterfowl food plants, create loafing areas for waterfowl, maintain sanctuary for wintering waterfowl, and maintain fisheries habitat and customary and traditional access to recreational fishing. This is one of many management strategies that may be applied to Lacassine Pool as the refuge develops an adaptive water management plan.

Fire management has played a very important role in maintaining Lacassine Pool in the past. Former managers prescribed burned units on a three-year rotation, such that the entire pool was burned every three years. However, the majority of these burns were conducted during the winter months and it is questionable as to how well the burns did in controlling nuisance vegetation, such as maidencane. The burns did aid in controlling hazardous fuels and controlling some woody vegetation in Lacassine Pool.

Forest

A limited bottomland hardwood forest (e.g., approximately 400 acres) is present on the refuge, primarily in the riparian areas along the Mermentau River and Lacassine Bayou. There may be opportunities for forest restoration on the existing refuge, and for acquisition of additional bottomland hardwood forests within LNWR's acquisition boundary (Figure 8). Additional woody vegetation is present on canal and stream banks, and on a series of ring levees in Lacassine Pool that are associated with former oil and gas exploration sites. Chinese tallow, an invasive exotic plant species, is a dominant woody species on the ring levees. Refuge staff have worked to eliminate tallow from some levees, and to replant native species, such as bald cypress, tupelo gum (*Nyssa aquatica*), black gum (*Nyssa sylvatica*), red maple (*Acer rubrum*), common persimmon (*Diospyros virginiana*), sugarberry (*Celtis laevigata*), live oak (*Quercus virginiana*), Nuttall oak (*Quercus nuttalli*), swamp dogwood (*Cornus foemina*), red mulberry (*Morus rubra*), wax myrtle (*Myrica cerifera*), and buttonbush. The staff is monitoring the use of treated ring levees as compared to control sites on other untreated levees, which remain dominated by Chinese tallow trees.

Prairie

The coastal prairie plant community, located along the Gulf Coast of the United States, once encompassed an estimated 8.6 million acres. Today, only a tiny fraction survives: less than 100 acres of upland prairie in small, narrow patches paralleling railroad tracks, and another 100 to 300 acres of wet prairie in disjunctive remnants on private land.

Like Midwestern prairies, coastal prairie is dominated by grasses, such as little bluestem (*Schizachyrium scoparium*), gamma grass (*Tripsacum dactyloides*), switchgrass (*Panicum virgatum*), Indiangrass (*Sorghastrum nutans*), and big bluestem (*Andropogon gerardii*). Coastal prairies are diverse with over 500 species of grasses, sedges, and wildflowers. However, coastal prairie is distinct in several ways, including the presence of species that are not found in the Midwestern prairies, such as slender bluestem (*Schizachyrium tenerum*), brownseed paspalum (*Paspalum plivatulum*), and sweet goldenrod (*Solidago odora*). Prairie nymph (*Herbertia lahue*), Oklahoma grass pink orchid (*Calopogon oklahomensis*), and prairie parsley (*Polytaenia nuttalli*) are a few of the rare species found in coastal prairie habitat.

The need for restoring and conserving coastal prairie is clear, but the scale of restoration adequate for conserving prairie biodiversity has not been determined. A useful approach is to manage for sensitive animal species considered indicators of environmental stress. From an ecological point of view, recruitment of grassland birds to restored prairie may be an indicator of the restoration of ecosystem function (USFWS 2003).

Croplands

Management of the 307-acre Unit A began with farming in 1950 and continued with either cooperative farming or refuge farming until 1981. The refuge continued farming Unit A in a rotation with moist soil, rice, millet, milo, and green browse through 2000. In 2001, the refuge reworked levees and water control structures in Unit A to improve water management capability in the eight fields that range in size from 12 to 48 acres. Water can usually be gravity-flowed into Unit A from Lacassine Pool. A two-way pump is used to drawdown these fields and to provide a reliable method for flooding the unit.

Unit B is a 724-acre area, which includes 579 acres of rice impoundments that have been managed since 1990 by a cooperative farmer. Rice is planted in a field every other year, alternating with wheat, rye grass, or fallow. The farmer harvests the first crop of rice and leaves the second crop for waterfowl, which works out to be about 20-25 percent of the total rice crop. Wheat or rye is planted as green browse for wintering geese.

The refuge acquired the 530-acre Unit F (Coto Unit) in 1996, and, since then, it has been cooperatively farmed similar to Unit B. On average, 327 acres of rice are planted in a field every other year, alternating with wheat, ryegrass, or fallow.

Early Successional Wetland Management

One unit of about 300 acres is available in Unit A and managed as early successional wetlands (e.g., moist-soil habitat). Historically, this unit has been managed on a three-year rotation. Grain crops have been grown in the unit one year out of three to produce high-value waterfowl food, while setting back plant succession. Early successional wetland management is time consuming and often requires swift management action to address plant responses during the growing season.

In Unit C, farming was discontinued in 1981. In 1993, the refuge planted rice in the western portion of the unit and began managing it as an early successional wetland. The refuge plans to convert the western section of Unit C into early successional wetland habitat.

3.3 Wildlife Resources

Although established to provide wintering habitat for waterfowl, LNWR supports many communities of terrestrial and aquatic wildlife. The refuge actually lies at the interface of higher agricultural land and the coastal marshes and includes considerable acreage of marsh and agriculture within its boundaries. It has a high plant and animal species diversity due to its different elevations and water depths, although in this flat part of the country, these elevation differences are measured in inches and feet rather than hundreds or thousands of feet. Wildlife species on the refuge are those indigenous to the marshes of coastal Louisiana. Several nesting colonies of wading and water birds, such as ibises, roseate spoonbills (*Ajaia ajaja*), and egrets are found here. A large population of alligators and furbearers, such as nutria (*Myocastor coypus*) and raccoon, are on the refuge. Several hundred thousand ducks and geese historically utilize the refuge as wintering habitat, while wood ducks (*Aix sponsa*), mottled ducks (*Anas fulvigula*), and fulvous (*Dendrocygna bicolor*) and black-bellied (*Dendrocygna autumnalis*) whistling ducks nest here during the breeding season.

Species of Fish and Wildlife Service Management Concern

Habitat on the refuge may support transient Louisiana black bears, a federally-listed species. No known Louisiana black bears are on the refuge on a regular basis nor have there been any recent sightings.

The paddlefish (*Polyodon spathula*) is a Fish and Wildlife Service, Region 4, species of management concern. Louisiana Department of Wildlife and Fisheries personnel have identified Lacassine Bayou and the Mermentau River as extremely important areas for paddlefish. Paddlefish populations have declined throughout much of their historic range in North America due to habitat changes and over-fishing, mostly to supply the caviar market. Due to their scarcity, and to threats posed from over-harvest, no harvest of paddlefish is currently allowed in Louisiana. Despite prohibitions on harvest, some incidental take of paddlefish in nets and with other tackle sometimes occurs. The refuge prohibits commercial fishing in the portions of the streams that are within its boundaries and jurisdiction.

A 1988 amendment (Public Law 100-653, Title VIII) to the Fish and Wildlife Conservation Act of 1980 mandated the Service to “identify species, subspecies, and populations of all migratory non-game birds that without additional conservation actions are likely to become candidates for listing under the Endangered Species Act of 1973.” *Birds of Conservation Concern 2002* is the most recent effort to carry out this mandate (USFWS 2002a). The report strives to accurately identify migratory and non-migratory bird species, beyond those already designated as federally threatened or endangered, that represent the Service’s highest conservation priorities in order to draw attention to species in need of conservation action. *Birds of Conservation Concern 2002* lists birds of conservation concern at three geographic scales – North American Bird Conservation Initiative Bird Conservation Regions, Fish and Wildlife Service Regions, and National – to maximize the utility of the lists for partners, agencies, and organizations.

Three national plans were used to place birds on the lists: Partners in Flight, U.S. Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. Current conservation assessment scores for each species were taken from the three plans, which were based on several factors, including population trends, threats, distribution and abundance, and area importance.

While all the bird species included in *Birds of Conservation Concern 2002* are priorities for conservation action, the lists make no findings with regard to whether they warrant consideration for Endangered Species Act listing. The Service’s goal is to prevent or remove the need for additional listings by implementing proactive management and conservation actions.

There have been 236 bird species recorded at LNWR (USFWS 2002b, 1989a). The refuge’s bird checklist is presented in Appendix D.

Table 1 lists birds known or expected to occur on LNWR that are of management concern. Refer to Appendix D for scientific names.

Species of Refuge Management Concern

The northern pintail has become a species of special concern to the refuge as populations have steadily decreased over the years. The refuge hosted numbers well over 100,000 until the mid-1980s, then saw peaks reduced by half in the 1990s. The northern pintail, however, is one of the few ducks that continues to lag far behind its North American Waterfowl Management Plan population objective. Southwest Louisiana is one of the key wintering areas for pintails, and the open, shallow water habitats of flooded and managed rice fields are ideal for the species. Specifically targeting pintails as a species of refuge management concern is therefore appropriate.

Alligator snapping turtles (*Macrolemmys temminckii*), one of the world largest freshwater turtles, are becoming increasingly rare throughout their range. Commercial harvest is allowed in Louisiana, despite being outlawed in all other states. These turtles, known to occur in Lacassine Bayou, are occasionally taken on trotlines. Although there

is currently no Federal or State protection, such protection may be needed, since these long-lived creatures do not reach sexual maturity for many years. They are vulnerable to over-harvest from which populations may take a long time to recover.

Waterfowl

Historically supporting over 500,000 ducks and 150,000 geese at peak population, the refuge serves as one of the major wintering grounds for waterfowl in the Mississippi Flyway, and serves as host to large concentrations of northern pintails and greater white-fronted geese, two species of particular concern in the Mississippi Flyway. Other common wintering species include blue-winged and green-winged teal, gadwall, American widgeon, northern shoveler, mallard, ring-necked duck (*Aythya collaris*), and snow geese. Table 2 shows peak waterfowl numbers at LNWR for three recent years. Figures 4 and 5 show peak duck and goose population numbers from 1939 - 2002.

LNWR is in the heart of rice farming country, which supports large numbers of geese. The refuge's largest concentration of white-fronted, snow, Ross, and Canada geese are found on its farm units. Small numbers of white-fronted and Canada geese use the Lacassine Pool. The refuge provides nesting habitat for wood and mottled ducks, black-bellied and fulvous whistling-ducks, and blue-winged teal.

Table 1. Birds of Management Concern to LNWR

Common Name	Bird Conservation Region 37 List	USFWS Region 4 List	National List
American Bittern	X		
Little Blue Heron		X	X
Reddish Egret	X	X	X
White Ibis	X		
Northern Harrier	X		X
Peregrine Falcon	X	X	X
Yellow Rail	X	X	X
American Golden-Plover	X		X
Upland Sandpiper			X
Whimbrel	X	X	X
Long-billed Curlew	X	X	X
Marbled Godwit	X	X	X
Red Knot	X	X	X
Stilt Sandpiper	X		X
Short-billed Dowitcher	X		X
Gull-billed Tern	X	X	X
Common Tern			X
Least Tern	X	X	X
Black Tern	X		
Black Skimmer	X	X	X
Black-billed Cuckoo			X
Burrowing Owl		X	X
Short-eared Owl	X	X	X
Chuck-will's Widow		X	X
Whip-poor-will			X
Red-headed Woodpecker	X	X	X
Scissor-tailed Flycatcher			X
Sedge Wren	X		X
Wood Thrush			X
Golden-winged Warbler		X	X
Prairie Warbler		X	X
Cerulean Warbler		X	X
Prothonotary Warbler	X	X	
Worm-eating Warbler		X	X
Louisiana Waterthrush			X
Kentucky Warbler	X		X
Canada Warbler			X
LeConte's Sparrow	X	X	X
Saltmarsh Sharp-tailed Sparrow			X

Wading Birds (Water and Marsh Birds)

LNWR provides nesting and feeding areas for large numbers of wading and marsh birds. Historically, Black Grove and Blue Grove, located in the southern portion of Lacassine Pool, and Unit C have been the main rookery sites and some are still used. Smaller rookeries in cypress (*Taxodium distichum*), buttonbush (*Cephalanthus occidentalis*), giant bulrush (*Scirpus californicus*), and willow trees (*Salix nigra*) and shrubs have also been located around Lacassine Pool. White-faced (*Plegadis chihi*) and white ibis (*Eudocimus albus*); great (*Ardea alba*), cattle (*Bubulcus ibis*), and snowy (*Egretta thula*) egrets; great blue (*Ardea herodias*), Louisiana (*Egretta tricolor*), and little blue herons (*Egretta caerulea*); anhingas (*Anhinga anhinga*); roseate spoonbills; and neotropical cormorants (*Phalacrocorax brasilianus*) are a few of the more common species found on the refuge.

Table 2. Recent peak numbers of waterfowl on LNWR (FWS-2006)

Species	January 13, 2004	January 5, 2005	January 4, 2006
Mallard	26,141	2,600	13,773
Mottled	995	1,021	1,935
Blue-winged Teal	211	300	18,563
Shoveler	5,749	2,431	2,725
Gadwall	4,904	1,344	2,710
Wigeon	593	901	1,047
Green-winged Teal	28,150	46,770	47,221
Pintail	17,155	582	14,362
Wood Duck	0	0	0
Ring-necked	14,984	3,394	3,650
Black-Bellied Whistling Duck	369	0	0
Lesser Scaup	42	0	0
Redhead	0	0	0
Canvasback	0	0	0
Bufflehead	0	0	300
Ruddy Duck	0	0	0
Fulvous Whistling Duck	0	0	0
White-fronted Geese	2,104	669	3,425
Snow Geese	0	1,500	0
Canada Geese	0	0	0
Coots	2,392	7,480	3,454
Ducks/Geese Total	101,397	61,512	109,711
Puddle Ducks	83,898	55,949	102,336
Diving Ducks	15,395	3,394	3,950

Figure 4. Peak duck populations for 1938-39 through 2001-2002

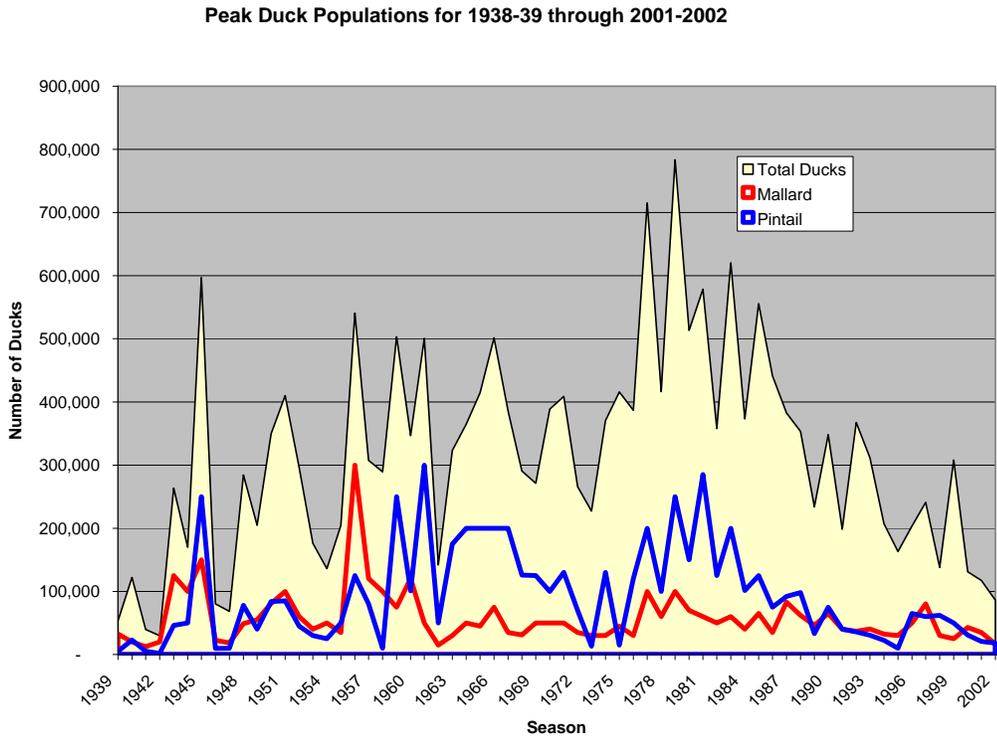
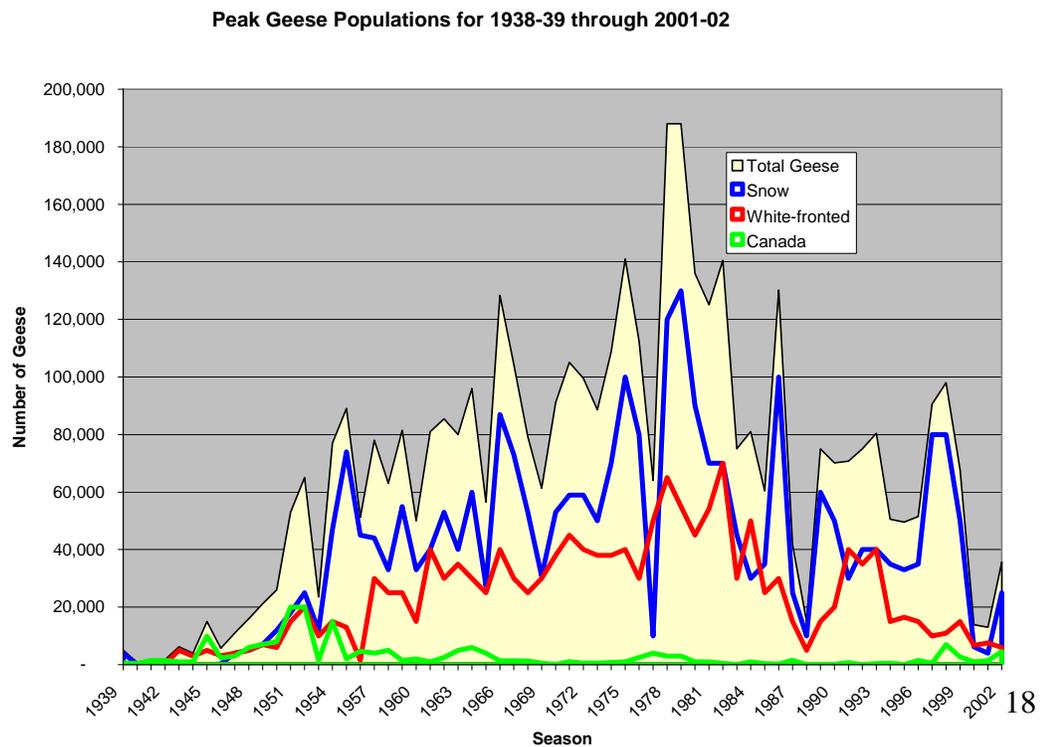


Figure 5. Peak goose populations for 1938-39 through 2001-2002



The refuge has a sizable breeding population of purple gallinules (*Porphyryla martinica*), common moorhens (*Gallinula chloropus*), bitterns, and rails. Dense marsh vegetation makes surveying difficult. Surveys for gallinules and moorhens are conducted in Lacassine Pool each August using an airboat and consisting of six transects totaling 14.2 miles. All gallinules and moorhens within 150 feet of transects are recorded.

LNWR was designated a Globally Important Birding Area in 1998. The refuge provides habitat for globally significant numbers of white-faced ibis and waterfowl, as well as nationally significant numbers of roseate spoonbills.

Shorebirds, Gulls, Terns, and Allied Species

The region's strategic location is enhanced by a diversity of habitat types favored by shorebirds, including beaches, marsh, estuarine tidal flats, rice fields, and crawfish ponds. The refuge provides resting and feeding habitat mainly for spring migrating shorebirds. However, tremendous numbers of shorebirds are attracted each fall to rice fields and crawfish ponds. Surveys are conducted during fall and spring migration. Commonly present shorebirds include killdeer (*Charadrius vociferus*), long (*Limnodromus scolopaceus*) and short-billed (*Limnodromus griseus*) dowitchers, greater (*Tringa melanoleuca*) and lesser (*Tringa flavipes*) yellowlegs, black-bellied plovers (*Pluvialis squatarola*), black-necked stilts (*Himantopus mexicanus*), snipe (*Gallinago gallinago*), and sandpipers. If conditions are favorable, Forster's terns (*Sterna forsteri*), killdeers, and black-necked stilts nest on the refuge.

Raptors

Raptors of LNWR include many species of hawks, owls, and vultures. Year-round residents include the black (*Coragyps atratus*) and turkey (*Cathartes aura*) vulture; osprey (*Pandion haliaetus*); sharp-shinned (*Accipiter striatus*), red-shouldered (*Buteo lineatus*), and Cooper's (*Accipiter cooperii*) hawks; American kestrel (*Falco sparverius*); and barn (*Tyto alba*), great horned (*Bubo virginianus*) and barred (*Strix varia*) owls (USFWS 2002a 1989). Additionally, the golden eagle (*Aquila chrysaetos*), a state-listed rare species, has been routinely recorded from LNWR and vicinity.

Other Migratory Birds

LNWR is not as heavily used by migrating neotropical birds as the coast proper of Louisiana. The refuge is not the first landfall the birds reach following their migration across the Gulf of Mexico. The encroaching, non-native Chinese tallow (*Sapium sebiferum*) has decreased the value of the habitat to neotropical birds. The refuge has limited acreage that can support the preferred species of trees and other vegetation important to neotropical migratory birds. Currently, some levees are being cleared of tallows and are being replanted with native tree species. Mourning doves (*Zenaida macroura*) are commonly seen along fencerows, levees, roads, and fields of the refuge. Yellow-headed (*Xanthocephalus xanthocephalus*) and rusty (*Euphagus carolensis*) blackbirds are rare species of the refuge. The red-winged blackbird (*Agelaius*

phoeniceus) and boat-tailed grackle (*Quiscalus major*) are found on the refuge in abundance.

Mammals

LNWR provides suitable habitat for armadillos, rabbits, squirrels, nutria, mink (*Mustela vison*), muskrats (*Ondatra zibethicus*), skunks, opossums (*Didelphis virginiana*), otters (*Lutra canadensis*), raccoons, coyotes, and whitetail deer (*Odocoileus virginianus*). It is estimated that the deer population on the refuge is approximately 300 individuals. Approximately 50 percent of the refuge, or 16,000 acres, is suitable deer habitat. The Louisiana Department of Wildlife and Fisheries estimates that excellent freshwater marsh habitat can support a potential density of one deer per 30 acres. On LNWR, this species is concentrated on the spoil banks and agricultural fields found throughout the refuge. Deer utilize marsh areas primarily for feeding and escape cover. Cottontail (*Sylvilagus floridanus*) and swamp rabbits (*Sylvilagus aquaticus*) are found on the refuge in abundance. A recent study shows that rabbits breed throughout the entire year at this latitude and the number of rabbits produced annually in this type of habitat is greater than that of rabbits in more upland habitats. Even though many predators prey on these rabbits, their population numbers are considered high. A proposed annual harvesting of rabbits from the refuge would have no negative impact on the population and would allow additional opportunities for recreational hunting.

Amphibians and Reptiles

As a freshwater marsh, LNWR is a haven for reptiles and amphibians. Despite the dominance of these creatures in the landscape, little is known about their populations on the refuge. The American alligator (*Alligator mississippiensis*) is the only member of this group that is managed. In 2001, the refuge began participating in a statewide monitoring program for frogs, known as the Louisiana Amphibian Monitoring Program. Three permanent sites were established and are monitored during specific periods of the year.

In addition to the amphibian monitoring program surveys, drift fences have been in place on the refuge since 2001 to monitor terrestrial reptiles and amphibians. The refuge has plans for expanding its reptile and amphibian monitoring effort to determine the effects of oil and gas development on these sensitive species. Drift fences and other survey techniques are planned to monitor reptile and amphibian populations on sites disturbed by oil and gas development, as well as controlled sites in the marshes east of Lacassine Pool.

Little is known about reptile and amphibian populations in Lacassine Bayou. This habitat should support a different assemblage of species than is found in Lacassine Pool. The bayou also harbors alligator snapping turtles, which have been identified as a species of concern (USFWS 2003).

LNWR provides suitable habitat for a large population of alligators. Alligators are opportunistic carnivores and a top predator on the refuge. Alligator populations are controlled in most areas of the State by a harvest program that is closely regulated by the

Louisiana Department of Wildlife and Fisheries, a program in which LNWR has been a participant. The refuge's harvest program has followed the State's recommendations; in some years, the harvest has been below the allotted quota. Nest densities are much higher in Lacassine Pool in comparison to the fresh marshes located outside of it. The 5-year average (1997-2001) nest density for Lacassine Pool is one nest per 43 acres, while the 5-year average nest density outside of it is one nest per 106 acres.

Aquatic Species

Fish species present include catfish, bowfin, bass, bream, crappie, and gar. Fish populations of LNWR have periodically suffered from the negative effects of drought. In the early 1990s, levees were upgraded so that the level of the Lacassine Pool could be raised from 4 to 5 feet mean sea level. The deeper water areas provide a more stable water quality (e.g., temperature and dissolved oxygen) that supports better fish habitat. As a result, fishing grew increasingly popular with the public; fishing tournaments became a common, almost weekly, event on the refuge. The severe droughts of the late 1990s and early 2000s essentially dewatered Lacassine Pool. Creel surveys are conducted at Lacassine Pool during the months the area is open for public fishing. The refuge does not closely monitor aquatic species outside of Lacassine Pool.

Non-native Plant Species

Also known as exotic species, they pose problems at LNWR because they displace native vegetation. There are several invasive species present on the refuge, with the Chinese tallow tree being the most prevalent. In Louisiana, old fields and pastures that once provided grassland bird habitat are replaced with forests of the exotic, invasive Chinese tallow.

Tallow trees typically grow on elevated and undisturbed ground along fencerows and levees. Refuge staff have worked to eliminate Chinese tallow from some levees and to replant with native species. Chinese tallow control is a major management concern for the refuge, with prescribed burning and herbicides used to control it. However, this exotic is a very resilient species, and tends to re-sprout after the herbicide is applied. Its coppicing ability also restricts the usefulness of fire as a control measure, although studies have found that in areas with sufficient fuel, such as in prairies with good grass cover, summer burns kill or top-kill trees as tall as three meters (TNC 2003). Other non-native, including non-invasive, species are water hyacinth (*Eichhornia crassipes*), water lettuce (*Pistia stratiotes*), common salvinia (*Salvinia minima*), hydrilla (*Hydrilla verticillata*), alligator weed (*Alternanthera philoxeroides*), bamboo (species unknown), Chinaberry (*Melia azedarach*), St. Augustine grass, Bermuda grass, and lantana (*Lantana camera*).

Non-native Animal Species

The most invasive animal on the refuge is the nutria. The nutria is an exotic herbivore that can cause significant damage to marsh habitats when populations become elevated, an event referred to as eat-outs. Currently, nutria populations throughout the refuge and

in the general area are relatively low, causing minimal damage to habitats requiring a minimum of population control. Change in vegetative communities outside of Lacassine Pool may occur again in future years. With favorable habitat conditions and the nutria's high reproductive potential, the population can expand rapidly. Although nutria can be destructive to levees and vegetation, the species is beneficial in that it is available as a food source for alligators, coyotes, and bobcats (USFWS 2003).

No exotic reptiles and amphibians are known to occur on LNWR, but a few are established in nearby parishes and others are expanding their range out of Florida. Of special concern is the brown anole (*Anolis sagrei*) that displaces native green anoles (*Anolis carolinensis*). Efforts are made to monitor reptile and amphibian populations; however, little may be done to stop species, such as the brown anole, once established (USFWS 2003). The domestic cat (*Felix catus*) has established wild, free-roaming populations throughout most of the United States. Feral cats can be devastating to native birds, but they also prey very heavily on other native wildlife, such as snakes, lizards, and rabbits. What effect feral cats have on the refuge's wildlife population is unknown. The Eurasian collared dove (*Streptopelia decaocto*) occurs on the refuge, but apparently is harmless to other species.

3.4 Threatened and Endangered Species

Habitat on the refuge may support transient Louisiana black bears, a federally-listed species. No known Louisiana black bears are on the refuge on a regular basis nor have there been any recent sightings.

The Louisiana black bear was first listed on January 7, 1992. It is currently designated as threatened in its entire range of Louisiana, Mississippi, and Texas. LNWR is outside of known occupied habitat (i.e., defined as an area with resident reproducing female Louisiana black bears); however, it may receive rare use by transient animals. Male Louisiana black bears can travel far from occupied habitats and have been documented in every parish in Louisiana at least once. LNWR does not provide habitat typically used by bears, but such long-ranging individuals may pass through and use the area.

3.5 Fishery Resources

Fish species present include gar, catfish, bowfin (*Amia calva*), bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), paddlefish (*Polyodon spathula*) and crappie (USFWS CCP 2007).

3.6 Cultural Resources

In addition to the natural habitat and wildlife that LNWR encompasses, it also holds resources of archaeological and cultural value. The Refuge is located in a region with a rich human history and pre-history. While cultural resources or properties have yet to be discovered at Lacassine NWR, it should be emphasized that they may well be present. There are seven known shell middens that were used by local native Americans.

The body of federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent Executive Orders. They include: 1) each agency is to systematically inventory the historic properties on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; 2) federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The U.S. Fish and Wildlife Service, like other federal agencies, are legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in 614 FW 1-5 and 126 FW 1-3. In the FWS's Southeast Region, the cultural resource review and compliance process is initiated by contacting the Regional Historic Preservation Officer/Regional Archaeologist (RHPO/RA). The RHPO/RA will determine whether the proposed undertaking has the potential to impact cultural resources, identify the "area of potential effect," determine the appropriate level of scientific investigation necessary to ensure legal compliance, and initiates consultation with the pertinent State Historic Preservation Office (SHPO) and federally recognized Tribes.

Prior to the arrival of Euro-Americans (pre-contact), it was inhabited by the Atakapa tribe. The Atakapa occupied the coastal and bayou areas of southwestern Louisiana and southeastern Texas until the early 1800s. Archaeological evidence suggests that settlements have been present in this area since before American Indians learned to make pottery, approximately two thousand years ago. While "Atakapa" means "eaters of men" in the language of the neighboring Choctaw, it is unknown whether the Atakapas' supposed cannibalism was for subsistence or ritual. Pre-contact Atakapas were hunters, gatherers, and fishers. Their society consisted of loose bands that moved on a regular basis from place to place within a given territory, gathering, hunting, and fishing. The alligator was very important to them, because it provided meat, oil, hides, and even insect repellent (oil). The Atakapan language has fascinated linguists and is among the better-recorded Native American languages. At one time it was believed to be associated with other languages of the Lower Mississippi River, but later this theory was abandoned and it is now classified as an isolated language.

Most of what is known about the appearance and culture of the Atakapa comes from eighteenth and nineteenth century European descriptions and drawings. The Atakapan people were said to have been short, dark, and stout. Their clothing included breechclouts and buffalo hides. They did not practice polygamy or incest. Their customs included the use of wet bark for baby carriers and Spanish moss for diapers. According to another custom, a father would rename himself at the birth of his first son or if the son became famous. In the creation myth of the Atakapa, humans were said to have been cast up from the sea in an oyster shell. The Atakapas also believed that men who died from snakebite

and those who had been eaten by other men were denied life after death, a belief that may have lent support to the notion that they practiced ritual cannibalism.

The various bands of the Atakapas were reported to have traded not only with other Indians but with early French and Spanish explorers and traders as well. After the appearance of these Europeans, the Atakapa dwindled rapidly. An estimated 3,500 still survived in 1698; by 1805, only 175 remained in Louisiana. Just nine known descendants were recorded in 1909. Their downfall was brought about primarily by the invasion of and devastation of European diseases rather than through any direct confrontation with European settlers.

The next major phase of the area's human habitation occurred after the Treaty of Paris in 1763 concluded the French and Indian Wars (Feldman 1998). The British had already expelled French-speaking settlers—the Acadians—from Nova Scotia (in what is now one of the Maritime Provinces of Canada), in 1755. Their exile occurred as a result of the widespread turmoil and upheaval sweeping through French and British colonies in North America as England gained the upper hand in its struggle with France for the control of North America. The Acadians first arrived in “New Acadia,” now Louisiana, then a colony of Spain, in 1764, and this migration continued for the next two decades (Hebert 2003). Even after all their wanderings following their expulsion from Acadia, the adjustment from Maritime Canada, with its sub-arctic climate and rocky, hilly terrain, to the Mississippi Delta, with its nearly subtropical climate and bayous, must have been difficult for the Acadians. Yet over time, the Acadians, later referred to as Cajuns, flourished and developed their own subsistence culture based on hunting, fishing, trapping, and some agriculture, that produced a unique cuisine and music, among other things.

Southern Louisiana is also known for its Creole culture and cuisine, although these are more noted in urban areas like New Orleans. While the Cajuns were specifically French in origin, the Creoles trace their heritage to Spanish, African, Italian, as well as French influences, indeed, to any other peoples who chose to live in New Orleans (Royal Café no date). The roots of Creole culture date to the early 1700s, with the French settlement of La Nouvelle Orleans under its founder Jean Baptiste Le Moyne, Sieur de Bienville, governor of the Louisiana Territory. In 1763 the Louisiana Territory was traded to Spain, and Spanish influence increased. German and Italian immigrants and African slaves also contributed heavily to Creole culture, cuisine and music.

3.7 Socio Economic

LNWR is located in Cameron Parish, one of the largest parishes in the State (1,313-square-miles). Cameron Parish is situated in the extreme southwestern corner of Louisiana, abutting the Gulf of Mexico to the south and Texas to the west. In 2003, the population of the parish was estimated at 9,708, a slight decline (3 percent) from the 2000 Census (USCB 2004). The median household income of the parish in 1999 was \$34,232, compared to \$32,566 for Louisiana as a whole. The same relative prosperity is reflected in a poverty rate below the State average. Approximately 12 percent of Cameron Parish

residents lived below the poverty line in 1999, compared to almost 20 percent for all of Louisiana. Educational attainment is below the State average, however, with only 8 percent of the population aged 25 or higher having a Bachelor’s degree or higher, as opposed to the statewide average of 19 percent.

In 2003, transportation and warehousing was the largest of 20 major economic and employment sectors in the parish (STATS Indiana 2004). The Census Bureau classified occupations in Cameron Parish as shown in Table 3.

Table 3. Occupations of employed civilian population 16 years and older in Cameron Parish (2000)

Occupation	Number	Percent
Management, professional, and related occupations	772	18.5
Service occupations	718	17.2
Sales and office occupations	954	22.8
Farming, fishing, and forestry occupations	199	4.8
Construction, extraction, and maintenance occupations	594	14.2
Production, transportation, and material moving	947	22.6

Source: U.S. Census Bureau, Census 2000, Summary File 3, Profile of Selected Economic Characteristics

In terms of employment by industrial sector, the primary industries lumped as “agriculture, forestry, fishing and hunting, and mining” predominate in Cameron Parish, as shown in Table 4.

In terms of its racial and ethnic breakdown, as reported in the 2000 Census, Cameron Parish is 92.5 percent white, non-Hispanic, 3.9 percent black or African American, 0.4 percent American Indian, 0.4 percent Asian, and 2.2 percent Hispanic or Latino origin (USCB 2004). (The percentages do not add up precisely to 100 percent because of the difference between designated races — white, black, Native American, and Asian — and ethnicities, which are Latino and non-Latino.) In addition, 1.6 percent in the Census reported some other race or two or more races. Overall, the population of Cameron Parish has a greater percentage of non-Hispanic whites (92.5 percent) than the State as a whole (62.5 percent). That is, it is less diverse and has fewer minorities.

Table 4. Employment of civilian population 16 years and older by industry in Cameron Parish (2000)

Industry	Number	Percent
Agriculture, forestry, fishing and hunting, and mining	696	16.6
Construction	470	11.2
Manufacturing	295	7.1
Wholesale trade	143	3.4
Retail trade	426	10.2
Transportation and warehousing, and utilities	396	9.5
Information	52	1.2
Finance, insurance, real estate, and rental and leasing	155	3.7
Professional, scientific, management, administrative, and waste management services	206	4.9
Educational, health, and social services	677	16.2
Arts, entertainment, recreation, accommodation, and food services	269	6.4
Other services (except public administration)	213	5.1
Public administration	186	4.4

Source: U.S. Census Bureau, Census 2000, Summary File 3, Profile of Selected Economic Characteristics

Chapter 4 Environmental Consequences

This chapter describes the foreseeable environmental consequences of implementing the two management alternatives in Chapter 2. When detailed information is available, a scientific and analytic comparison between alternatives and their anticipated consequences is presented, which is described as “impacts” or “effects.” When detailed information is not available, those comparisons are based on the professional judgment and experience of refuge staff and Service and State biologists

4.1 Effects Common to all Alternatives

4.1.1 Environmental Justice

Executive Order 12898 “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” was signed by President Bill Clinton on February 11, 1994, to focus federal attention on the environmental and human health conditions of minority and low-income populations with the goal of achieving environmental protection for all communities. The Order directed federal agencies to develop environmental justice strategies to aid in identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The Order is also intended to promote nondiscrimination in federal programs substantially affecting human health and the environment, and to provide minority and low-income communities’ access to public information and participation in matters relating to human health or the environment. This assessment has not identified any adverse or beneficial effects for either alternative unique to minority or low-income populations in the affected area. Neither alternative will disproportionately place any adverse environmental, economic, social, nor health impacts on minority or low-income populations.

4.1.2 Public Health and Safety

Each alternative would have similar effects or minimal to negligible effects on human health and safety.

4.1.3 Refuge Physical Environment

Impacts of each alternative on the refuge physical environment would have similar minimal to negligible effects. Some disturbance to surface soils, topography, and vegetation would occur in areas selected for hunting; however effects would be minimal. Hunting would benefit vegetation as it is used to keep deer populations in balance with the habitat’s carrying capacity. The refuge would also control access to minimize habitat degradation.

Impacts to the natural hydrology would have negligible effects. The refuge expects impacts to air and water quality to be minimal and only due to refuge visitors’ automobile and off-road vehicle emissions and run-off from road and trail sides. The effect of these refuge-related activities on overall air and water quality in the region are anticipated to be relatively negligible. Existing State water quality criteria and use classifications are adequate to achieve desired on-refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given time and space zone management techniques, such as seasonal access and area closures, used to avoid conflicts among user groups.

4.1.4. Cultural Resources

Under each alternative, hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge.

4.1.5. Facilities

Maintenance or improvement of existing facilities (i.e. parking areas, roads, trails, and boat ramps) will cause minimal short term impacts to localized soils and waters and may cause some wildlife disturbances and damage to vegetation. The Service defines facilities as: “Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc.”

4.2 Summary of Effects

4.2.1 Direct and Indirect Impacts to Habitat

No Action Alternative

Under this alternative, no additional acreage would be opened to deer, or waterfowl hunting. However additional hunting opportunities would be made available in the areas that exist. Non consumptive users would still have access to the pool wildlife drive and birding areas.

Proposed Action Alternative

The biological integrity of the refuge would be protected under this alternative, and the refuge purpose of conserving wetlands for wildlife would be achieved. The hunting of deer would positively impact wildlife habitat by promoting plant health and diversity.

The additional hunt, an experimental modern firearms or muzzleloader deer hunt would be utilized more by hunters than previously, which might cause increased trampling of vegetation. However, impacts to vegetation should be minor. Hunter density is estimated to be an average of 1 hunter/1,000 acres throughout the hunting season during deer hunts.

During the managed waterfowl lottery hunts for youth and seniors the maximum expected usage in a given week will be 12-15 hunters. There are four- five waterfowl hunting blinds available annually (eight blinds total) for the youth and senior lottery hunt and 3 people would be allowed to hunt through a lottery system per blind two days per week. Refuge-regulations would not permit the use of ATVs off of designated trails. Public waterfowl hunting usually does not exceed one hunter per 250 acres. Vehicles would be confined to existing roads and parking lots.

4.2.2 Direct and Indirect Impacts to Hunted Wildlife

No Action Alternative

Migratory bird hunting would occur on 10,434 acres of the refuge and the majority of the refuge would continue to be open to deer hunting. Additional disturbance by hunters to hunted wildlife would not occur; however, other public uses that cause disturbance, such as wildlife observation and photography, would still be permitted.

Deer could increase above the habitat's carrying capacity with archery hunting only. The likelihood of starvation and diseases, such as bluetongue and EHD in deer, could increase as would deer-vehicle collisions.

Proposed Action Alternative

Migratory bird hunting would continue to occur on 10,434 acres of the refuge and the majority of the refuge would continue to be open to deer hunting. Administrative sites and the Wildlife drive area would be closed during deer hunts. Mortality of individual hunted animals would occur under this alternative, estimated by the refuge to be a maximum of 41 deer, 5,481 ducks, 52 snow geese, and 75 white-fronted geese annually. Estimates for other hunted species (gallinules) would be less than 30 individuals per species. Hunting causes some disturbance to not only the species being hunted but other game species as well. However, time and space zoning established by refuge regulations would minimize incidental disturbance.

In the event of disease or starvation, limited duration special firearms might be offered. This would help to maintain deer populations at or below carrying capacity. The likelihood of starvation and diseases, such as bluetongue and EHD in deer would be decreased as would deer-vehicle collisions.

4.2.3 Direct and Indirect Impacts to Non-hunted Wildlife

No Action Alternative

Increased disturbance to non-hunted wildlife would not occur. The areas hunted are the same areas that have been hunted in the past. Non-consumptive users would still be permitted to access the 700 acre wildlife drive and Pool birding areas.

Proposed Action Alternative

Disturbance to non-hunted wildlife could increase slightly if the special firearms hunts were offered. However, significant disturbance would be unlikely for the following reasons. Small mammals are less active during winter when hunting season occurs. These species are also nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters

would rarely encounter reptiles and amphibians during most of the hunting season. Invertebrates are also not active during cold weather and would have few interactions with hunters during the hunting season. During the vast majority of the hunting season the refuge is not open to deer hunting. Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted. Disturbance to the daily wintering activities, such as feeding and resting, of birds might occur, but would be transitory as hunters traverse habitat. Disturbance to birds by hunters would probably be commensurate with that caused by non-consumptive users.

4.2.4 Direct and Indirect Impacts to Endangered and Threatened Species

No Action Alternative

There are no endangered species to be impacted

Proposed Action Alternative

There are no endangered species to be impacted

4.2.5 Direct and Indirect Impacts to Refuge Facilities (roads, trails, parking lots, levees)

No Action Alternative

Additional damage to roads due to hunter use during wet weather periods would not occur; however, other users would still be using roads, thereby necessitating periodic maintenance. Additionally, costs associated with an expanded hunting program in the form of road and levee maintenance, instructional sign needs, and law enforcement would not be applicable.

Proposed Action Alternative

The current refuge hunt program has shown damage to roads trails due to hunter use during wet weather periods to be minimal. There would be some costs associated with a hunting program in the form of road maintenance, instructional sign needs, and law enforcement. These costs should be minimal relative to total refuge operations and maintenance costs and would not diminish resources dedicated to other refuge management programs.

4.2.6 Direct and Indirect Impacts to Wildlife Dependant Recreation

No Action Alternative

The public would have the opportunity to harvest a renewable resource, participate in wildlife-oriented recreation that is compatible with the purposes for which the refuge was

established and have an increased awareness of Lacassine NWR and the National Wildlife Refuge System. However, public relations would not be enhanced with the local community.

Proposed Action Alternative

As public use levels expand across time, unanticipated conflicts between user groups may occur. Experience has proven that time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts between user groups. Conflicts between hunters and non-consumptive users might occur but would be mitigated by time (non-hunting season) and space zoning.

The public would be allowed to harvest a renewable resource, and the refuge would be promoting a wildlife-oriented recreational opportunity that is compatible with the purpose for which the refuge was established. The public would have an increased awareness of LNWR and the National Wildlife Refuge System and public demand for more hunting would be met. The public would also have the opportunity to harvest a renewable resource in a traditional manner, which is culturally important to the local community. This alternative would also allow the public to enjoy hunting at no or little cost in a region where private land is leased for hunting, often costing a person \$300-\$2000/year for membership. This alternative would allow youths the opportunity to experience a wildlife-dependant recreation, instill an appreciation for and understanding of wildlife, the natural world and the environment and promote a land ethic and environmental awareness. Seniors would also be offered a unique opportunity to continue their traditional hunting in a user friendly area and that is conducive to their place in society.

4.3 Cumulative Impacts Analysis

4.3.1.1 Migratory Birds

The U.S. Fish and Wildlife Service annually prescribe frameworks, or outer limits, for dates and times when hunting may occur and the number of birds that may be taken and possessed. These frameworks are necessary to: allow State selections of season and limits for recreation and sustenance; aid Federal, State, and tribal governments in the management of migratory game birds; and permit harvests at levels compatible with population status and habitat conditions. Because the Migratory Bird Treaty Act stipulates that all hunting seasons for migratory game birds are closed unless specifically opened by the Secretary of the Interior, the Service annually promulgates regulations (50 CFR Part 20) establishing the frameworks from which States may select season dates, bag limits, shooting hours, and other options for the each migratory bird hunting season. The frameworks are essentially permissive in that hunting of migratory birds would not be permitted without them. Thus, in effect, Federal annual regulations both allow and limit the hunting of migratory birds.

Migratory game birds are those bird species so designated in conventions between the United States and several foreign nations for the protection and management of these birds. Under the Migratory Bird Treaty Act (16 U.S.C. 703-712), the Secretary of the Interior is authorized to determine when "hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any ... bird, or any part, nest, or egg" of migratory game birds can take place, and to adopt regulations for this purpose. These regulations are written after giving due regard to "the zones of temperature and to the distribution, abundance, economic value, breeding habits, and times and lines of migratory flight of such birds, and are updated annually (16 U.S.C. 704(a)). This responsibility has been delegated to the U.S. Fish and Wildlife Service as the lead federal agency for managing and conserving migratory birds in the United States. Acknowledging regional differences in hunting conditions, the Service has administratively divided the nation into four Flyways for the primary purpose of managing migratory game birds. Each Flyway (Atlantic, Mississippi, Central, and Pacific Flyways) has a Flyway Council, a formal organization generally composed of one member from each State and Province in that Flyway. Lacassine NWR is within the Mississippi Flyway.

The process for adopting migratory game bird hunting regulations, located in 50 CFR parts 20, is constrained by three primary factors. Legal and administrative considerations dictate how long the rule making process will last. Most importantly, however, the biological cycle of migratory game birds controls the timing of data-gathering activities and thus the dates on which these results are available for consideration and deliberation. The process of adopting migratory game bird hunting regulations includes two separate regulations-development schedules, based on "early" and "late" hunting season regulations. Early hunting seasons pertain to all migratory game bird species in Alaska, Hawaii, Puerto Rico, and the Virgin Islands; migratory game birds other than waterfowl (e.g. dove, woodcock, etc.); and special early waterfowl seasons, such as teal or resident Canada geese. Early hunting seasons generally begin prior to October 1. Late hunting seasons generally start on or after October 1 and include most waterfowl seasons not already established. There are basically no differences in the processes for establishing either early or late hunting seasons. For each cycle, Service biologists and others gather, analyze, and interpret biological survey data and provide this information to all those involved in the process through a series of published status reports and presentations to Flyway Councils and other interested parties (USFWS 2006).

Because the Service is required to take abundance of migratory birds and other factors into consideration, the Service undertakes a number of surveys throughout the year in conjunction with the Canadian Wildlife Service, State and Provincial wildlife-management agencies, and others. To determine the appropriate frameworks for each species, the Service considers factors such as population size and trend, geographical distribution, annual breeding effort, the condition of breeding and wintering habitat, the number of hunters, and the anticipated harvest.

After frameworks are established for season lengths, bag limits, and areas for migratory game bird hunting, migratory game bird management becomes a cooperative effort of State and Federal Governments. After Service establishment of final frameworks for hunting seasons, the States may select season dates, bag limits, and other regulatory options for the hunting seasons. States may always be more conservative in their selections than the Federal frameworks but never more liberal. Season dates and bag limits for National Wildlife Refuges open to hunting are never longer or larger than the State regulations. In fact, based upon the findings of an environmental assessment developed when a National Wildlife Refuge opens a new hunting activity, season dates and bag limits may be more restrictive than the State allows. At LNWR, season length is more restrictive for waterfowl and deer than the State allows.

NEPA considerations by the Service for hunted migratory game bird species are addressed by the programmatic document, “Final Supplemental Environmental Impact Statement: Issuance of Annual Regulations Permitting the Sport Hunting of Migratory Birds (FSES 88– 14),” filed with the Environmental Protection Agency on June 9, 1988. We published Notice of Availability in the Federal Register on June 16, 1988 (53 FR 22582), and our Record of Decision on August 18, 1988 (53 FR 31341). Annual NEPA considerations for waterfowl hunting frameworks are covered under a separate Environmental Assessment, “Duck Hunting Regulations for 2006-07,” and an August 24, 2006, Finding of No Significant Impact. Further, in a notice published in the September 8, 2005, Federal Register (70 FR 53376), the Service announced its intent to develop a new Supplemental Environmental Impact Statement for the migratory bird hunting program. Public scoping meetings were held in the spring of 2006, as announced in a March 9, 2006, Federal Register notice (71 FR 12216). More information may be obtained from: Chief, Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Department of the Interior, MS MBSP-4107-ARLSQ, 1849 C Street, NWR, Washington, DC 20240.

4.3.1.2 Resident Big Game

4.3.1.2.1 Deer

When deer are overpopulated, they over browse their habitat, which can completely change the plant composition of an area. Overpopulation can also lead to outbreaks of devastating diseases such as epizootic hemorrhagic disease (EHD) and bluetongue (BTV) which have been found locally in overpopulated herds. Overpopulation also leads to starvation, increased car-deer collisions and poor overall herd health.

Abomasal parasite counts (APC) are periodically conducted on deer populations throughout the state to assist in determining herd health. Blood samples and serum samples are taken from deer collected for APC or other research to monitor the occurrence of bluetongue virus (BTV) and epizootic hemorrhagic disease (EHD). These samples are sent to the Southeast Cooperative Wildlife Disease Study (SCWDS) in

Georgia for laboratory analyses. SCWDS also assists with other disease and parasite problems concerning species other than white-tailed deer. Samples from sick or dead wildlife also are sent to SCWDS for analysis. SCWDS provides reports to the Louisiana Department of Wildlife and Fisheries (LDWF) indicating the cause of death or illness along with information concerning implications to other wild animals, domestic livestock, and human health (LDWF 2007).

Chronic Wasting Disease (CWD) is a neurodegenerative disease that has been identified in deer and elk. It is a poorly understood disease that is related to other spongiform encephalopathy's such as scrapie in sheep, bovine spongiform encephalopathy (mad cow disease) in cattle, and Creutzfeld-Jakob disease in humans. This disease has recently become a major wildlife issue in several states. At this time, CWD is not known to occur in Louisiana (LDWF 2007).

Deer are very active during the peak of the breeding season. The LDWF attempts to set hunting seasons during these times to increase hunter success. Breeding season dates are established from fetal measurements and backdating from the harvest date. A 1966 investigation indicated three-distinct breeding seasons for deer in Louisiana. Additional studies affirmed these three distinct times; however, isolated deer herds with different breeding seasons within the same hunting season area also were documented. Data collected from these two activities allow biologists to determine peak breeding activity times for the herd and recommend hunting seasons that coincide with these times. Season dates are especially important for those clubs and landowners involved with quality and trophy deer management (LDWF 2007)

The LDWF recorded deer harvest rates from 1996-2006 from various hunting clubs within Cameron Parish. An average of 95 deer per year was harvested during the 10-year period. (*Personal comm.*).

Harvest and survey data confirm that decades of deer hunting on surrounding private lands (using bait and a longer season) have not had a local cumulative adverse effect on the deer population. LDWF estimate 209,200 deer were harvested throughout the state in 2005/06. The average annual statewide harvest since 1995 is 234,000 deer. The refuge estimates an additional maximum 41 deer would be harvested under the proposed action, representing only 0.02% of the long-term average state harvest. Expansion of hunting on refuge lands for a very limited deer gun hunt should not have negative cumulative impacts on the deer herd.

4.3.1.3 Non-hunted Wildlife

Non-hunted wildlife would include non-hunted migratory birds such as songbirds, wading birds, raptors, and woodpeckers; small mammals such as voles, moles, mice, shrews, and bats; reptiles and amphibians such as snakes, skinks, turtles, lizards, salamanders, frogs and toads; and invertebrates such as butterflies, moths, other insects and spiders. Except for migratory birds and some species of migratory bats, butterflies

and moths, these species have very limited home ranges and hunting could not affect their populations regionally; thus, only local effects will be discussed.

The cumulative effects of disturbance to non-hunted migratory birds under the proposed action are expected to be negligible for the following reasons. Hunting season would not coincide with the nesting season. Long-term future impacts that could occur if reproduction was reduced by hunting are not relevant for this reason. Disturbance to the daily wintering activities, such as feeding and resting, of birds might occur. Disturbance to birds by hunters would probably be commensurate with that caused by non-consumptive users.

The cumulative effects of disturbance to small animals under the proposed action are expected to be negligible for the following reasons. Small mammals are generally inactive during winter when hunting season occurs. These species are also nocturnal. Both of these qualities make hunter interactions with small mammals very rare. Hibernation or torpor by cold-blood reptiles and amphibians also limits their activity during the hunting season when temperatures are low. Hunters would rarely encounter reptiles and amphibians during most of the hunting season. Encounters with reptiles and amphibians in the early fall are few and should not have cumulative negative effects on reptile and amphibian populations. Invertebrates are also not active during cold weather and would have few interactions with hunters during the hunting season. The refuge has estimated current hunter density on peak days to be no more than 1 hunter per 250 acres. During the vast majority of the hunting season, estimated hunter density is much lower (1 hunter/1,000 acres). Refuge regulations further mitigate possible disturbance by hunters to non-hunted wildlife. Vehicles are restricted to roads and the harassment or taking of any wildlife other than the game species legal for the season is not permitted.

Although ingestion of lead-shot by non-hunted wildlife could be a cumulative impact, it is not relevant to Lacassine NWR because the use of lead shot would not be permitted on the refuge for any type of hunting except deer hunting.

Some species of bats, butterflies and moths are migratory. Cumulative effects to these species at the “flyway” level should be negligible. These species are in torpor or have completely passed through South Louisiana by peak hunting season in Nov-Jan. Some hunting occurs during October when these species are migrating; however, hunter interaction would be commensurate with that of non-consumptive users.

4.3.1.5 Endangered Species

Habitat on the refuge may support transient Louisiana black bears, a federally-listed species. No known black bears are on the refuge on a regular basis nor have there been any recent sightings. A Section 7 Consultation published in the Final Lacassine Comprehensive Conservation states that the implementation of the plan “will not affect” the Louisiana black bear. Big game and migratory birding hunting were taken into consideration during this analysis.

4.3.2.1 Wildlife-Dependant Recreation

As public use levels expand across time, unanticipated conflicts between user groups may occur. The Refuge's visitor use programs would be adjusted as needed to eliminate or minimize each problem and provide quality wildlife-dependent recreational opportunities. Experience has proven that time and space zoning (e.g., establishment of separate use areas, use periods, and restrictions on the number of users) is an effective tool in eliminating conflicts between user groups.

The level of recreation use and ground-based disturbance from visitors would be largely concentrated at trails and the Refuge's office and maintenance areas. This, combined with the addition of increased hunting opportunity, could have a negative effect on nesting bird populations. However, the hunting is during the winter and not during most birds' nesting period.

The refuge would control access under this alternative to minimize wildlife disturbance and habitat degradation, while allowing current and proposed compatible wildlife-dependent recreation. Some areas, such as waterfowl sanctuaries, would be closed seasonally to hunting to minimize disturbance to wintering waterfowl.

4.3.2.2 Refuge Facilities

The Service defines facilities as: "Real property that serves a particular function(s) such as buildings, roads, utilities, water control structures, raceways, etc." Under the proposed action those facilities most utilized by hunters are: roads, parking lots and trails. Maintenance or improvement of existing facilities (i.e. parking areas, roads, and trails) will cause minimal short term impacts to localized soils and waters and may cause some wildlife disturbances and damage to vegetation. The facility maintenance and improvement activities described are periodically conducted to accommodate daily refuge management operations and general public uses such as wildlife observation and photography. These activities will be conducted at times (seasonal and/or daily) to cause the least amount of disturbance to wildlife. Disturbed sites will be restored to as natural a condition as possible. During times when roads are impassible due to flood events or other natural causes those roads, parking lots, trails and boat ramps impacted by the event will be closed to vehicular use.

4.3.2.3 Cultural Resources

Hunting, regardless of method or species targeted, is a consumptive activity that does not pose any threat to historic properties on and/or near the Refuge. In fact, hunting meets only one of the two criteria used to identify an "undertaking" that triggers a federal agency's need to comply with Section 106 of the National Historic Preservation Act. These criteria, which are delineated in 36 CFR Part 800, state:

1- An undertaking is any project, activity, or program that can alter the character or use of an archaeological or historic site located within the “area of potential effect;” and

2- The project, activity, or program must also be either funded, sponsored, performed, licenses, or have received assistance from the agency.

Consultation with the pertinent State Historic Preservation Office and federally recognized Tribes are, therefore, not required.

4.3.2.4 Anticipated Impacts of Proposed Hunt on Refuge Environment and Community.

The refuge expects no sizeable adverse impacts of the proposed action on the refuge environment which consists of soils, vegetation, air quality, water quality and solitude. Some disturbance to surface soils and vegetation would occur in areas selected for hunting; however impacts would be minimal. Hunting would benefit vegetation as it is used to keep resident deer populations in balance with the habitat’s carrying capacity. The refuge would also control access to minimize habitat degradation.

The refuge expects no impacts to air and water quality. Existing State water quality criteria and use classifications are adequate to achieve desired on-refuge conditions; thus, implementation of the proposed action would not impact adjacent landowners or users beyond the constraints already implemented under existing State standards and laws.

Impacts associated with solitude are expected to be minimal given time and space zone management techniques, such as seasonal access and area closures, used to avoid conflicts among user groups.

The refuge would work closely with State, Federal, and private partners to minimize impacts to adjacent lands and its associated natural resources; however, no indirect or direct impacts are anticipated. The newly opened hunts would result in a net gain of public hunting opportunities positively impacting the general public, nearby residents, and refuge visitors. The refuge expects increased visitation and tourism to bring additional revenues to local communities but not a significant increase in overall revenue in any area.

4.3.2.5 Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, viewed as a whole, become substantial over time. The proposed hunt plan has been designed so as to be sustainable through time given relatively stable conditions. Changes in refuge conditions, such as sizeable increases in refuge acreage or public use, are likely

to change the anticipated impacts of the current plan and would trigger a new hunt planning and assessment process.

The implementation of any of the proposed actions described in this assessment includes actions relating to the refuge hunt program (see 2009 Sport Hunting Plan for Lacassine NWR). These actions would have both direct and indirect effects (e.g., additional hunting opportunity would result in increased public use, thus increasing vehicular traffic, disturbance, etc); however, the cumulative effects of these actions are not expected to be substantial.

The past refuge hunting program has been very similar to the proposed action in season lengths, species hunted, and bag limits. Changes to the hunt program in the past decade have been made to provide more specialized hunts within the existing open area. The refuge does not foresee any changes to the proposed action in the way of increasing the intensity of hunting in the future.

4.3.2.6 Anticipated Impacts if Individual Hunts are Allowed to Accumulate

National Wildlife Refuges, including Lacassine NWR, conduct hunting programs within the framework of State and Federal regulations. Lacassine NWR is more restrictive than the State of Louisiana for deer archery and waterfowl hunting. By maintaining hunting regulations that are as, or more, restrictive than the State, individual refuges ensure that they are maintaining seasons which are supportive of management on a more regional basis. The proposed hunt plan has been reviewed and is supported by the Louisiana Dept. of Wildlife and Fisheries. Additionally, refuges coordinate with LDWF annually to maintain regulations and programs that are consistent with the State management program.

Chapter 5 Consultation and Coordination with Others

A 30 day public review and comment process has been announced via a U S Fish and Wildlife Service News Release. The draft environmental assessment can be found on the internet at <http://www.fws.gov.swlrefugecomplex> or by contacting the Southwest Louisiana National Wildlife Refuge Complex at 337-598-2216.

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