JEFFERSON PARISH

ENDANGERED & THREATENED FLOODPLAIN SPECIES PLAN

AUGUST 2021

Prepared by the Department of Floodplain Management and Hazard Mitigation

Floodplain Species Plan
Jefferson Parish, Louisiana

An assessment of floodplain species and a plan of action based on that assessment are credited under the Community Rating System (CRS) of the National Flood Insurance Program (NFIP) to encourage and recognize community actions to protect species listed pursuant to the Endangered Species Act, protect their critical habitat and habitat in general, and help those species recover. The "floodplain species assessment" is the first step. It starts the process of learning which species that are listed or proposed for listing by the Services and which associated critical habitats may be present within the community. The second step is the "floodplain species plan." For the plan, further research is conducted on selected species identified in the floodplain species assessment and a more detailed plan is developed with input and assistance from subject-matter experts. The plan identifies actions the community will pursue to support conservation and recovery of those species. - NFIP/CRS

After completing the Floodplain Species Assessment and receiving input from the reviewing agencies and organizations, it was concluded that the Parish should proceed to the next step and prepare a Floodplain Species Plan. For a copy of the Floodplain Species Assessment and/or Plan, please visit our website at www.JeffParish.net/Flood or call the Jefferson Parish Floodplain Management and Hazard Mitigation Department to arrange delivery via email.

The eastern black rail, officially listed as a threatened species on November 9, 2020, and the Atlantic green sea turtle are included in the Plan (Table 1.). As noted on page 2 of the Assessment, the actions discussed here are limited to those that can be implemented by the following participating jurisdictions: unincorporated Jefferson Parish, the City of Gretna, and the Town of Jean Lafitte. They do not include actions beyond local jurisdictions, such as restricting fishing practices, conducting scientific research, addressing international trade issues, and regulating actions in public waters like the Mississippi River and the Gulf of Mexico.

Henceforth, unincorporated Jefferson Parish, the City of Gretna, and the Town of Jean Lafitte will be referred to as either "Jefferson Parish" or "the Parish."

Because of the commonalities and the comments received, the Plan addresses similar species rather than individual species. These are organized under four groups:

- → Birds: Eastern Black Rail, Piping Plover, and Red Knot
- → Sea turtles: Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, Loggerhead Sea Turtle, Green Sea Turtle
- → Sturgeon: Atlantic (Gulf) Sturgeon and Pallid Sturgeon
- → Florida Manatee

This Plan focuses on the common recovery actions shared by the threatened and endangered species in each group. The next section summarizes basic information about these groups, the threats they face, and the recommendations for conservation and recovery in the various species' recovery plans.

Table 1. Threatened and Endangered Species in Jefferson Parish			
Species	**Scientific Name**	**Status**	**Agency**
Atlantic Green Sea Turtle	Chelonia mydas	Threatened	Joint
Atlantic (Gulf) Sturgeon	Acipenser oxyrinchus desotoi	Threatened	NMFS
Eastern Black Rail	Laterallus jamaicensis ssp. jamaicensis	Threatened	FWS
Hawksbill Sea Turtle	Eretmochelys imbricata	Endangered	Joint
Kemp's Ridley Sea Turtle	Lepidochelys kempii	Endangered	Joint
Leatherback Sea Turtle	Dermochelys coriacea	Endangered	Joint
Loggerhead Sea Turtle	Caretta caretta	Threatened	Joint
Pallid Sturgeon	Scaphirhynchus albus	Endangered	FWS
Piping Plover	Charadrius melodus	Threatened	FWS
Red Knot	Calidris canutus rufa	Threatened	FWS
West Indian Manatee	Trichechus manatus	Threatened	FWS

Birds

The piping plover is a small North American shorebird[1] that typically spends the non-breeding season on the Gulf Coast. During their stay in Louisiana, they are found at accreting ends of barrier islands, along sandy peninsulas, and near coastal inlets. Plovers appear to prefer sandflats adjacent to inlets or passes, mud flats along prograding spits, and overwash areas as foraging habitats.

The red knot is a sandpiper[2], which has one of the longest migrations of any bird. It breeds in the Canadian Arctic and migrates to the southern end of South America. Red knots come through with some overwintering in Louisiana. They predate on hard-shelled organisms on sandy beaches, sand flats, and mud flats.

The eastern black rail is "a small, secretive marsh bird" (FWS). [3] It can be found in salt, brackish, and freshwater marshes. It requires dense herbaceous vegetation to provide shelter and cover for protected nest sites. It feeds on small aquatic and terrestrial invertebrates andseeds.

[1] References: FWS ECOS, *Piping Plover, Atlantic Coast Population, Revised Recovery Plan*, FWS, 1996, Piping Plover 5-Year Review, FWS, 2020. Information used for the Coastal Migration and Wintering Range.

[2] References: FWS ECOS, *Recovery Outline for the Rufa Red Knot*, FWS, 2019 (there is no recovery plan)

[3] References: FWS ECOS, *Species Status Assessment Report for the Eastern Black Rail*, FWS, June 2018, and Eastern black rail websites managed by the FWS' Southeast Region, NatureServe Explorer, and the Audubon Society.

Piping Plover

Red Knot

Eastern Black Rail

Threats: The wide, flat, sparsely vegetated barrier beaches preferred by the piping plover and red knot are an unstable habitat, dependent on natural forces for renewal and susceptible to degradation by development and shoreline stabilization efforts. Destruction of beach habitat by residential, resort, and seawall development constitutes irrevocable habitat loss for piping plovers and red knots. Other threats include beach activities, especially vehicle traffic, mechanized beach cleaning, and oil spills.

The primary threat to the eastern black rail is the loss and degradation of wetland habitat due to drainage, dredging, filling, impounding, mining, pollution, loss of vegetation due to livestock grazing, and invasion by non-native plant species. Other threats include sea level rise and tidal flooding; predation by cats, rats, and native predators, and human disturbance.

Recovery plans' recommendations: The piping plover's recovery plan has two overall objectives within the jurisdiction of a local government. These are listed below. The *Recovery Outline* for the red knot has similar recommendations. As a newly listed species, the recovery plan for the eastern black rail has not yet been developed but, given the similar threats to habitat from human activities, the actions listed below are appropriate for all three species.

1. Manage habitat to maximize survival and productivity:
    a. Maintain natural coastal formation processes that perpetuate high quality breeding habitat
    b. Reduce disturbance from humans and pets
    c. Monitor and manage invasive vegetation in nonbreeding habitats, including replanting native vegetation
    d. Preserve wetlands as managed open space
2. Develop and implement public information and education programs.

Managing habitat actions would be most important in the critical habitat on the Parish's coastal barrier islands.

Sea Turtles

Five of the world's seven species of sea turtles can be found in Jefferson Parish. They live similar lives and face similar threats.

Their feeding grounds vary, but are in the ocean, such as pastures of sea grass and coral reefs. They come ashore to lay their eggs on beaches in Mexico, Texas, Florida, or the Caribbean. In recent history, they have not been nesting in Louisiana. For example, over the last ten years, only twogreen sea turtle nests were verified in the state.

Threats: The threats that the Parish can address are primarily threats on nesting beaches:

→ Beach cleaning, human presence, and vehicles on the beach

→ Beach erosion, beach nourishment, beach armoring, energy development, dredging, and sand mining

→ Artificial lighting on nesting beaches

→ Exotic dune and beach vegetation

Hawksbill[4]

Leatherback[5]

Loggerhead[6]

Kemp's Ridley[7]

Green[8]

[4] References: FWS ECOS, Recovery Plan for the Hawksbill Turtle in the U.S. Caribbean, Atlantic and Gulf of Mexico, NMFS & FWS, 1993

[5] References: FWS ECOS, Recovery Plan for Leatherback Turtles in the U.S. Caribbean, Atlantic, and Gulf of Mexico, NMFS & FWS, 1992

[6] References: FWS ECOS, Recovery Plan for the Northwest Atlantic Population of the Loggerhead Sea Turtle (Caretta caretta); Second Revision, NMFS & FWS, 1991

[7] References: FWS ECOS, Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle, NMFS & FWS, 2011

[8] References: FWS ECOS, Recovery Plan for the Atlantic Green Turtle, FWS & NMFS, 1991

Marine environment threats include:

→ Pollution, oil spills, toxins, diseases, and sedimentation on coral reefs

→ Entanglement at sea, ingestion of marine debris, collisions with boats, trawling and other commercial fishing practices using nets

Recovery plans' recommendations: The recovery plans for the five-turtle species have similar recommendations. These are the ones appropriate for Jefferson Parish in areas where nesting beaches are close to populated areas.

1. Educate the public
   a. Develop and implement a communication campaign in various media
   b. Include messages on boating and fishing practices at public access points
   c. Maintain websites with comprehensive information
   d. Develop an education curriculum for students and the general public
2. Regulate adverse development practices, such as beach nourishment and shoreline armoring

Sturgeon

Jefferson Parish is in the range of two types of listed sturgeon. The Atlantic (Gulf) sturgeon[9] is a *subspecies* of the Atlantic sturgeon. It is anadromous (i.e., a fish born in fresh water that spends part of its life in the sea and returns to fresh water to spawn). They spend eight to nine months each year in rivers and three to four of the coolest months in estuaries or Gulf waters. Atlantic (Gulf) sturgeon less than two years old remain in riverine habitats and estuarine areas throughout the year.

Lake Pontchartrain east of the Causeway Bridge has been designated as critical habitat for the Atlantic (Gulf) sturgeon (see Map 4, page 3). All of this habitat is in the lake and does not include any land areas within Jefferson Parish's jurisdiction. However, the Parish can help protect this area by managing the quality of water that it discharges into Lake Pontchartrain.

Atlantic (Gulf) Sturgeon

Pallid Sturgeon

[9] References: FWS ECOS, *Gulf Sturgeon Recovery/Management Plan*, FWS and NMFS, 1995, Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Gulf Sturgeon; Final Rule, March 2003, Gulf Sturgeon Fact Sheet, LDWF (undated)

Pallid sturgeon[10] are not anadromous. They live in the Mississippi – Missouri River system as far upstream as the Yellowstone River. They prefer flowing water and spend the majority of their time at or near the channel bottom. While the lower Mississippi has been leveed and channelized for flood protection and navigation purposes, it "retains significant amounts of in-channel complexity and floodplain connectivity thought to be important to pallid sturgeon." (*Revised Recovery Plan*, page 13)

Threats:

→ Habitat reduction, especially due to dredging, bank stabilization, sedimentation, and impoundment

→ Dams and other barriers to historical spawning habitats

→ Poor water quality, especially from farm chemicals

→ Incidental catch by commercial and recreation fishermen

→ Illegal harvest of the Atlantic (Gulf) sturgeon for its eggs which are sold as caviar

Recovery plans' recommendations: Because of the Parish's limited jurisdiction over marine waters, the listed recommendations focus on freshwater concerns and stormwater runoff that flows to fresh, brackish, and salt waters.

1. Identify and eliminate known or potentially harmful chemical contaminants, and water quantity and water quality problems.

2. Develop a regulatory and/or incentive framework to ensure that essential habitats, streamflow, and groundwater in-flows are protected.

    a. Provide and protect instream flows

    b. Regulate restrictions to migration

    c. Increase woody debris in these systems (without creating navigation hazards)

3. Restore, enhance, and provide access to essential habitats

[10] References: FWS ECOS, *Final Revised Recovery Plan for the Pallid Sturgeon*, FWS, 2014

West Indian Manatee

The Florida manatee subspecies of the West Indian manatee[11] can be found in Louisiana's coastal waters, mainly in the summer. They have large, seal-shaped bodies with paired flippers and a round, paddle-shaped tail. They are typically grey in color. They are found in marine, estuarine, and freshwater environments.

[11] References: FWS ECOS, *Florida Manatee Recovery Plan Third Edition*, FWS, 2001

Manatees are herbivores that feed opportunistically on a wide variety of marine, estuarine, andfreshwater plants, including submerged, floating, and emergent vegetation.

Florida Manatee

Threats: The most significant problem presently faced by manatees is death or serious injury from boat strikes. The second largest source of human-related manatee death is due to entrapment in water control structures and navigational locks. The availability of warm-water refuges for manatees is uncertain if minimum flows and levels are not established for the natural springs on which many manatees depend, and as deregulation of the power industry occurs. Consequences of an increasing human population and intensive coastal development are long-term threats to the Florida manatee.

Recovery plan's recommendations: The *Florida Manatee Recovery Plan* identifies four overall objectives and a series of actions under each objective. Some of the actions are not in the Parish's jurisdiction. Those that the Parish can implement are checked.

1. Minimize causes of manatee disturbance, harassment, injury, and mortality

    a. ✓ Regulate coastal construction actions to minimize harm

    b. Monitor and police watercraft in protection zones

    c. ✓ Post and maintain signs

    d. Install and maintain protection technology at water control structures, locks, etc., where manatees are at risk and monitor success

    e. Enforce regulations prohibiting harassment

2. Determine and monitor the status of manatee populations

3. Protect, identify, evaluate, and monitor manatee habitats

    a. Establish, acquire, manage, and monitor regional protected area networks and manatee habitat

    b. ✓ Protect existing, and promote re-establishment of, seagrass and freshwater submerged plant communities with regulatory standards for construction projects in water

4. Facilitate manatee recovery through public awareness and education

    a. ✓ Identify target audiences and key locations for outreach

    b. ✓ Develop, evaluate, and update public education and outreach programs and materials

Wildlife Action Plan

The Louisiana Wildlife Action Plan (WAP) was prepared in 2005, revised in 2015, and revised with an addendum in 2019. Prepared with input from a broad array of public and private stakeholders, the 2015 WAP guides "the conservation efforts of LDWF over the next 10 years." (2015 WAP, page iv).

There are four themes in the WAP that dovetail with this Plan.

1. The WAP identifies 345 "Species of Greatest Conservation Need" (SGCN), listed under three "tiers" with Tier 1 having those species most in need of immediate action. All eleven of the Jefferson Parish species listed in Table 1 are SGCN. All three bird species are Tier 1.

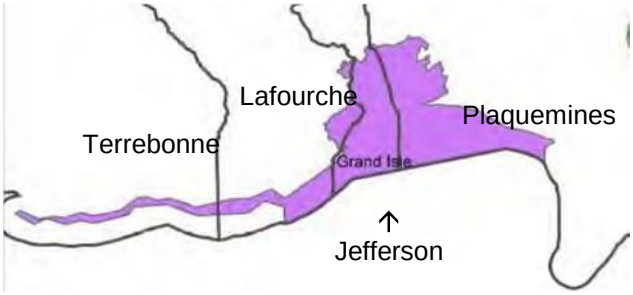
2. As with this Plan, "a significant portion of the 2015 WAP is dedicated to detailed descriptions of the habitats upon which SGCN depend, as well as the assessment of threats to those habitats and conservation actions needed to address said threats." (page iii)

3. Public information and involvement are important:

    > "One theme that will emerge to readers of the Louisiana WAP is the importance of private lands in the conservation of our fish and wildlife resources. This is due to the fact that over 90% of the state is privately owned. Clearly, successful conservation will not be achievable solely by focusing on public lands. Indeed, the cooperation of conservation minded private citizens will be critical to effective conservation of Louisiana's natural resources." (page iii).

4. The WAP identifies 30 Conservation Opportunity Areas (COA) to help the stakeholders focus conservation actions. One of these areas is in Jefferson Parish, the Barataria-Terrebonne COA, which is shown in Map 1. This area has 38 "focal SGCN," including three on the Parish's list, the Kemp's Ridley sea turtle, piping plover, and red knot.

Map 1. Barataria-Terrebonne COA



The general status of habitat in the State is reviewed by river basin. The WAP has identified 11 threats to SGCN habitat. Their scope, severity, and impact in the Barataria Basin are summarized in the table to the right. “Primary threats to this basin include changes to the natural hydro- logy of the system, negative impacts of invasive plants, and subsidence.” (page 353)

Barataria Basin Threats Assessment:

1st Level Threat	Scope	Severity	Impact
Residential/Commercial Development	Restricted	Moderate	Low
Agriculture/Aquaculture	Restricted	Moderate	Low
Energy Production & Mining	Restricted	Serious	Medium
Transportation & Service Corridors	Restricted	Moderate	Low
Biological Resource Use	N/A	N/A	N/A
Human Intrusion/Disturbance	Small	Moderate	Low
Natural System Modification	Large	Serious	High
Invasive & other Problematic Species	Pervasive	Serious	High
Pollution	Pervasive	Moderate	Medium
Geological Events	Large	Serious	High
Climate Change & Severe Weather	Large	Moderate	Medium
Overall Calculated Threat Impact: Medium			

This information was the same in the 2019 update.

The WAP then lists Basin Research Needs/Conservation Actions:

1. Maintain existing freshwater diversion canals from the Mississippi River into the Barataria Basin.
2. Inform other agencies and the public about the uniqueness of freshwater floating marsh; protect such marshes from disturbance resulting from canal development, and from excess input of nutrients and sediment.
3. Work with other partners to abate threats to this basin.
4. Promote coastal restoration and protection initiatives to maintain or enhance coastal marsh and barrier island habitat critical to SGCN.

Items 2, 3, and 4 are within the realm of the Parish’s authorities and interests.

Parish Recovery Strategies and Actions

Our review of the recovery plans’ recommendations concluded that there are four strategies that the Parish can take to support the recommendations:

1. Educate the public so people will take conservation and recovery actions seriously
2. Support the conservation and recovery of terrestrial habitat
3. Support the conservation and recovery of aquatic habitat
4. Stormwater runoff – increase quality, decrease quantity

All four strategies will work to protect and improve the habitat and breeding areas of the four groups of species. Each strategy has specific action items, most of which can be linked to credits in the Community Rating System. Each strategy identifies who will be responsible for it, other agencies or organizations that can help or should be coordinated with, and needed funding (if other than staff time).

1. Educate the public so people will take conservation and recovery actions seriously

Benefiting species: all four groups

Responsible offices: Jefferson Parish's Floodplain Management & Hazard Mitigation, the City of Gretna Planning and Zoning Department and Administration, and the Town of Jean Lafitte Clerk of Court Office and Administration

Cooperating/supporting agencies or organizations: Ecosystem and Coastal Management, Parish Information Office, Environmental Affairs, Parks and Recreation, Parkways, Louisiana Department of Wildlife and Fisheries (LDWF), Pontchartrain Conservancy, and the Barataria Terrebonne National Estuary Program (BTNEP)

Funding: Staff time and current public information budgets. No increase in funding is expected. Rather, current projects would be revised to convey new messages.

1.1. Develop and implement a communication campaign in various media. Jefferson Parish will add a new section to their multijurisdictional Program for Public Information (PPI) that focuses on threatened and endangered species.

CRS elements: Activity 330 (Outreach Projects), Program for Public Information (PPI) and Stakeholder Delivery (STK)

Jefferson's multijurisdictional Program for Public Information (PPI) is reviewed and updated every year following a review of the effectiveness of past initiatives and the need for new messages and projects. This process is an existing system that would be augmented to support this strategy. The result will be outreach projects as described in action items 1.2, 1.3, and 1.4.

While the Parish is receiving the maximum credit for its Program for Public Information (PPI), as noted on page 4 of the Assessment, it would not be hard to adjust the projects to better address threatened and endangered species. One way would be to add an outreach project aimed at preventing beach disturbance.

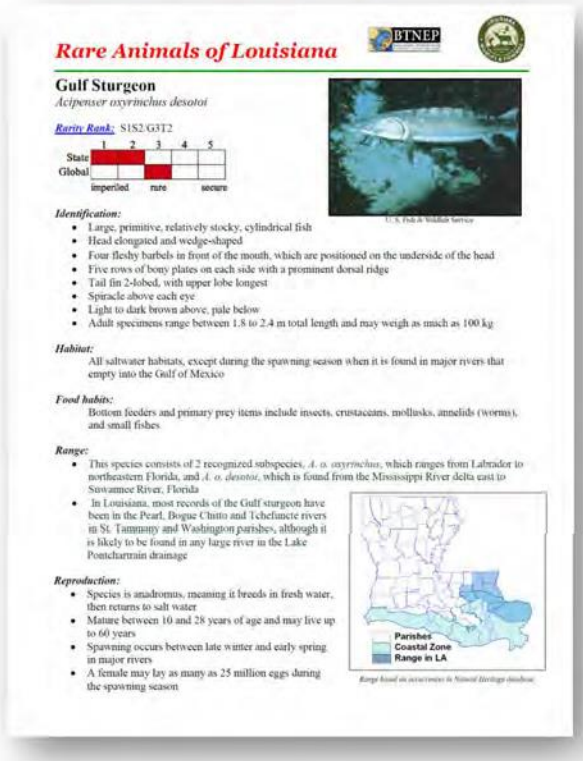
The annual review could also identify priority audiences. Owners of wetlands or natural shorelines are not on the current list. They could be added along with a message on the benefits of keeping their property in a natural state. Similarly, permit applicants could be a target audience for messages on ways to preserve natural features on a property that will be developed.

The Parish is not receiving the maximum credit for Stakeholder Delivery (STK). The stakeholder projects are also identified in the multijurisdictional Program for Public Information (PPI). The next review could add more projects like the handouts from the Barataria-Terrebonne National Estuary Program and LDWF (next page), and other organizations with similar missions.

One tool that can help this work is FWS' 2017 *Atlantic Coast Piping Plover Strategic Communications Plan: Reducing Human Disturbance*. As with the Program for Public Information (PPI), this guide identifies outcomes, priority audiences, and creditable messages.

The Parish's Program for Public Information (PPI) makes recommendations for other public information activities, such as Activities 320 (Map Information Service) and 350 (Flood Protection Information), in addition to outreach projects. Currently, the Parish is not receiving the maximum credit for these activities, so adding these resources will result in more points as well as more support for the recommended recovery projects. These are noted in action items 1.5 and 1.6.

1.2. Distribute educational brochures and factsheets at various locations and outreach events. These could include existing documents, such as those shown below, or new ones developed explicitly for the revised Program for Public Information (PPI) messages. These would be provided to locations appropriate for their audiences, such as messages on boating and fishing practices posted at public access points. They would also be distributed to organizations that host activities like fairs, open houses, and "clean-up days."



Rare Animals of Louisiana

BTNEP

Gulf Sturgeon

Acipenser oxyrinchus desotoi

Rarity Rank: S1S2,G3T2

	1	2	3	4	5
State					
Global					
	imperiled		rare		secure

Identification:

- Large, primitive, relatively stocky, cylindrical fish
- Head elongated and wedge-shaped
- Four fleshy barbels in front of the mouth, which are positioned on the underside of the head
- Five rows of bony plates on each side with a prominent dorsal ridge
- Tail fin 2-lobed, with upper lobe longest
- Spiracle above each eye
- Light to dark brown above, pale below
- Adult specimens range between 1.8 to 2.4 m total length and may weigh as much as 100 kg

Habitat:

All saltwater habitats, except during the spawning season when it is found in major rivers that empty into the Gulf of Mexico

Food habits:

Bottom feeders and primary prey items include insects, crustaceans, mollusks, annelids (worms), and small fishes

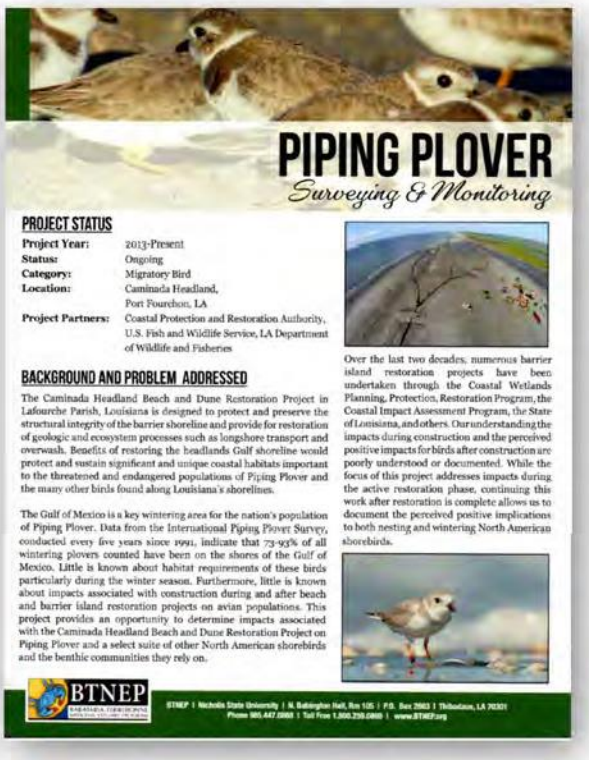
Range:

- This species consists of 2 recognized subspecies, *A. o. oxyrinchus*, which ranges from Labrador to northeastern Florida, and *A. o. desotoi*, which is found from the Mississippi River delta east to Suwannee River, Florida
- In Louisiana, most records of the Gulf sturgeon have been in the Pearl, Bogue Chitto and Tchefuncte rivers in St. Tammany and Washington parishes, although it is likely to be found in any large river in the Lake Pontchartrain drainage

Parishes
Coastal Zone
Range in LA

Reproduction:

- Species is anadromus, meaning it breeds in fresh water, then returns to salt water
- Mature between 10 and 28 years of age and may live up to 60 years
- Spawning occurs between late winter and early spring in major rivers
- A female may lay as many as 25 million eggs during the spawning season



PIPING PLOVER

Surveying & Monitoring

PROJECT STATUS

Project Year:	2013-Present
Status:	Ongoing
Category:	Migratory Bird
Location:	Caminada Headland, Port Fourchon, LA
Project Partners:	Coastal Protection and Restoration Authority, U.S. Fish and Wildlife Service, LA Department of Wildlife and Fisheries

BACKGROUND AND PROBLEM ADDRESSED

The Caminada Headland Beach and Dune Restoration Project in Lafourche Parish, Louisiana is designed to protect and preserve the structural integrity of the barrier shoreline and provide for restoration of geologic and ecosystem processes such as longshore transport and overwash. Benefits of restoring the headlands Gulf shoreline would protect and sustain significant and unique coastal habitats important to the threatened and endangered populations of Piping Plover and the many other birds found along Louisiana's shorelines.

The Gulf of Mexico is a key wintering area for the nation's population of Piping Plover. Data from the International Piping Plover Survey, conducted every five years since 1991, indicate that 73-93% of all wintering plovers counted have been on the shores of the Gulf of Mexico. Little is known about habitat requirements of these birds particularly during the winter season. Furthermore, little is known about impacts associated with construction during and after beach and barrier island restoration projects on avian populations. This project provides an opportunity to determine impacts associated with the Caminada Headland Beach and Dune Restoration Project on Piping Plover and a select suite of other North American shorebirds and the benthic communities they rely on.

Over the last two decades, numerous barrier island restoration projects have been undertaken through the Coastal Wetlands Planning, Protection, Restoration Program, the Coastal Impact Assessment Program, the State of Louisiana, and others. Our understanding the impacts during construction and the perceived positive impacts for birds after construction are poorly understood or documented. While the focus of this project addresses impacts during the active restoration phase, continuing this work after restoration is complete allows us to document the perceived positive implications to both nesting and wintering North American shorebirds.

BTNEP

CRS element: Activity 330 (Outreach Projects), Outreach Projects (OP)

1.3. Post messages on signs at various locations. These would be especially useful at boat launching sites (for messages on the sturgeons) and the Lakefront (for messages on the manatees). These messages will pertain to 1) the location of critical habitat and the diversity of listed and proposed species in the surrounding area; 2) the importance of wise-use and continuous protection of our natural resources in order to maintain critical ecosystem services; and 3) statements pertaining to the connectivity among habitats, and how positive and negative changes in land use and water quality result in local and collateral impacts. Signage locations will be determined in early 2022.

CRS element: Activity 330 (Outreach Projects), Outreach Projects (OP)

1.4. Issue news and status information updates on Facebook and in newsletters and other publications. These would include the key Program for Public Information (PPI) messages and additional information, such as adoption of new regulations or a reminder of the precautions people should take at the beginning of turtle nesting or fishing seasons.

CRS element: Activity 330 (Outreach Projects), Outreach Projects (OP)

1.5. Provide map information on sensitive areas. The Floodplain Management and Hazard

Mitigation Department publicizes its Map Information Service. The service could be augmented with information on whether a parcel should be protected because of its natural floodplain functions. The service could incorporate a link to the Natural Resources Conservation Service's National Wetland Inventory, for example.

CRS element: Activity 320 (Map Information Service), Natural Floodplain Functions (MI7)

1.6. Provide more detailed references. The revised Program for Public Information (PPI) could recommend that recovery plans, similar technical references, and this Plan, be added to the Jefferson Parish Public Library System.

These references can also be posted on the Ecosystem and Coastal Management or Floodplain Management and Hazard Mitigation Department's website as a separate page titled "Threatened and Endangered Wildlife."

CRS elements: Activity 350 (Flood Protection Information), Locally Pertinent Documents (LPD) and Flood Protection Website (WEB1)

1.7. Develop an educational curriculum for students and the public. This action item is to investigate the possibility of developing a coastal processes/science curriculum module that could be incorporated into the Jefferson Parish Public School System's curriculum for middle schoolstudents.

CRS elements: Activity 330 (Outreach Projects), Program for Public Information (PPI) and Outreach Projects (OP)

2. Support the conservation and recovery of terrestrial habitat

Benefiting species: Birds and sea turtles

Responsible office: Ecosystem & Coastal Management, the City of Gretna Planning and Zoning Department and Administration, and the Town of Jean Lafitte Administration.

Cooperating/supporting agencies or organizations: Floodplain Management and Hazard Mitigation, GIS, Land Use Review Technical Committee, Parks & Recreation, Parkways, Planning, Inspection & Code Enforcement, The Town of Grand Isle, Louisiana Department of Wildlife and Fisheries (LDWF), and the Barataria Terrebonne National Estuary Program (BTNEP)

Funding: Staff time

2.1. Regulate adverse development practices, such as beach nourishment and shoreline armoring. The Jefferson Parish Coastal Zone Management (CZM) Program was developed in 1984 and approved by the state in 1985. Currently there are twelve coastal parishes with approved programs, all of which are state reviewed every two years to ensure consistency with state guidelines, which requires compensatory mitigation for wetland impacts outside levee protection and fastland exempted areas. Fastland exempted areas are defined by the Louisiana Department of Wildlife and Fisheries as lands surrounded by publicly owned, maintained or otherwise validly existing levees or natural formations that normally prevent activities, not to include the pumping of water for drainage purposes, within the surrounded area from having a direct and significant impact on coastal waters. Under this program, the

Ecosystem and Coastal Management Department regulates certain coastal shoreline and wetland impacts from development projects.

This action item calls for continuing the current regulation, but also conduct an in-depth review of them to see if there are ways they could better support conservation and recovery actions by property owners and developers. The Parish will look deeper into the possibility of collaborating with the Louisiana Department of Wildlife and Fisheries (LDWF) to identify specific actions that can be taken to preserve the natural coastal formation processes and perpetuate high quality breeding habitat.

CRS elements: The review would also cover CRS credits under Activity 420 (Open Space Preservation) and Activity 430 (Higher Regulatory Standards), which would determine if full credit is being received for the current standards and if there are opportunities for new credits. Here are two specific examples that should be included in this review:

The element Natural Shoreline Protection (NSP), in Activity 420, credits allowing coastal shorelines and stream channels to erode or meander naturally. It credits regulations that prohibit construction of seawalls, armoring, or "hard" channel bank protection measures. Such regulations are very important for habitat protection but are also not popular with people wanting to protect their properties from erosion. The review will need to take all of these concerns into account.

Second, the work should include a review of the Parish's permit processing and inspection procedures to see if they could qualify for Regulation Administration (RA3) credit. This review will include procedures for coordinating permit reviews with Parish offices, the Corps of Engineers, and other agencies with authority related to protecting threatened and endangered species.

2.2. Inventory open areas to prioritize them for preservation. While more than 70% of the Parish's floodplain is preserved as open space by the Urban Growth Limit rules, there are still many areas that are not preserved. Areas not subject to the Parish's Urban Growth Limit rules may be owned by individuals or organizations who would support acquisition or easements that would restrict development. Further, some preserved areas, such as beaches, play a greater role as habitat for threatened and endangered species when compared to other areas.

This action item is to conduct an inventory of the open areas in the Parish's floodplain, including those not currently credited as preserved open space. Beaches and high marsh will be identified to determine if there are remaining areas of prime habitat that should be preserved. Priority would be to start this work in the Barataria-Terrebonne Conservation Opportunity Area (see page 7).

The inventory would also determine if more preserved open space areas would also qualify for Natural Functions Open Space (NFOS). For example, a publicly owned parcel could have land management procedures to maintain their properties in a way that would attract threatened and endangered species (e.g., removing invasive species, reducing human traffic in an area, etc.).

CRS elements: Activity 420 (Open Space Preservation), Open Space Preservation (OSP), Natural Functions Open Space (NFOS), Coastal Erosion Open Space (CEOS).

2.3. Reduce disturbance from humans and pets. Well preserved beach and marsh habitat is still inadequate if it's constantly invaded by people, and the wildlife is predated upon by cats and dogs.

(1) Work with LDWF and local public safety offices to discuss their authorities and examine potential methodologies that would reduce disturbance from humans and pets.

CRS elements: There is no specific credit for law enforcement actions, but there would be credit under Activity 330 (Outreach Projects) Outreach Projects (OP) for public information materials and activities that advise the public about the rules.

2.4. Manage vegetation. Action item 2.2 will investigate land management practices on public and private open space properties. Effective programs and lessons learned will be shared with the other property owners. The Ecosystem and Coastal Management Department maintains a cypress tree growing/planting program that plants a minimum of 1,000 cypress trees annually. The Parish will contact local non-profits and environmentally focused agencies to determine who is conducting invasive species removal and if that entity is willing to collaborate with Jefferson Parish.

CRS elements: Effective vegetation management programs could help Open Space Preservation (OSP) areas receive the additional credit for Natural Functions Open Space (NFOS). The Program for Public Information (PPI) could also include the program documents with creditable message(s) for a priority audience of open space land owners.

3. Support the conservation and recovery of aquatic habitat

Benefiting species: Sea turtles, sturgeon, and manatee

Responsible office: Jefferson Parish Ecosystem and Coastal Management Department and the Town of Jean Lafitte Clerk of Court Office

Cooperating/supporting agencies or organizations: Floodplain Management and Hazard Mitigation, GIS, Parks & Recreation, and the Louisiana Department of Wildlife and Fisheries (LDWF)

Funding: Staff time

3.1. Develop a regulatory and/or incentive framework to ensure that essential habitats, streamflow, and groundwater in-flows are protected. In coordination with the regulatory review in action item 2.1, staff will review the Parish's Code of Ordinances to determine if any department has regulations pertaining to stream flow and other potential restrictions to migration. The review will also look at relevant state and federal regulations, such as Corps of Engineers permits, to determine the effectiveness of existing regulations and incentives. The result will be a report that displays the current framework to protect aquatic habitat and recommendations for improvements.

CRS elements: This action would include a review of CRS credits under Activities 420 (Open Space Preservation) and 430 (Higher Regulatory Standards). The review would assure that full CRS credit is being received for the current standards, and if there are opportunities for new credits.

3.2. Restore and enhance essential habitats. The Parish will work with interested owners of waterfront lands to advise and help them, where possible, incorporate habitat improvement measures on their properties. For example, in order to promote re-establishment of seagrass and freshwater submerged aquatic vegetation, Jefferson Parish could reach out to local organizations to determine if they are planting native aquatic vegetation and if collaborating with Jefferson Parish would be of interest to them.

Another example already underway is the design and engineering of a mile-long living shoreline/marsh creation project located to the east of the Causeway Bridge between the Bucktown Marina and Bonnabel Boat Launch. This project will create heterogeneous marsh and tidal creek habitat shoreward of the breakwaters to serve as a nursery and refuge for commercially and recreationally important fish, crab, and shrimp species as well as other wetland associated species.

CRS elements: These restoration and enhancement projects would help Open Space Preservation (OSP) areas receive the additional credit for Natural Functions Open Space (NFOS). The Program for Public Information (PPI) could also include the program documents with creditable message(s) for a priority audience of open space land owners.

3.3. Protect, identify, evaluate, and monitor manatee habitat. Not much is known about manatees in Lake Pontchartrain and other waters of the Parish. Jefferson will investigate a collaborative approach with state and local entities tasked with protecting, identifying, evaluating, and monitoring manatee habitat. The goal will be to produce a map, information for the public, and procedures for monitoring activities in those areas.

CRS elements: Because there is no CRS credit for preservation and other land use management activities in "large bodies of water," the CRS credit would be limited to public information products. The credit(s) would be in Activity 330 (Outreach Projects).

3.4. Minimize causes of manatee disturbance, harassment, injury, and mortality. This action item would be coordinated with action item 2.3. The Parish will work with LDWF, the Coast Guard, and local public safety offices to discuss their authorities and examine potential methodologies that would reduce disturbance from boating and similar activities.

CRS elements: There is no specific credit for such law enforcement actions, but there would be credit under Activity 330 (Outreach Projects) Outreach Projects (OP) for public information materials and activities that advise the public about the rules.

4. Improve stormwater runoff

Benefiting species: Sea turtles, sturgeon, and manatees

Responsible offices: Ecosystem and Coastal Management, Environmental Affairs – Stormwater Management, the City of Gretna Planning and Zoning and Public Utilities Departments, and the Town of Jean Lafitte Administration

Cooperating/supporting agencies or organizations: Floodplain Management & Hazard Mitigation, Planning, Inspection & Code Enforcement, Land Use Review Technical Committee, Pontchartrain Conservancy, and the Barataria Terrebonne National Estuary Program (BTNEP)

Funding: Staff time

4.1. Incorporate water quantity and low impact development techniques into stormwater facility design. The Parish has recently started some initiatives that will improve its stormwater management program (see page 5 of the Assessment). These include updates to the Parish's Comprehensive Plan (adopted 2019) and Hazard Mitigation Plan (adopted in 2020), and an evaluation of incentives in the Parish's development regulations to include more attention to low-impact development (starting in 2021). This action item (starting in late 2021) is to review these processes and determine their impact.

CRS elements: Activity 450 (Stormwater Management), Stormwater Management Regulations (SMR), including Low Impact Development (LID)

4.2. Develop a Watershed Master Plan. Currently, all areas must meet the same regulatory standards for stormwater facilities, regardless of their location in relation to aquatic habitat, high marsh, or other special local conditions. A Watershed Master Plan will identify how the Parish's stormwater management regulations can be better tailored to local conditions.

As noted on page 6 of the Assessment, Jefferson Parish was awarded funding to develop a Watershed Master Plan. The funds were awarded in early 2021 with the goal of finalizing the plan by the end of 2021. The Parish plans to review measures that protect natural floodplain functions, like preserving wetlands for storage.

CRS element: Activity 450 (Stormwater Management), Watershed Master Plan (WMP)

4.3. Identify and eliminate harmful contaminants. It goes without saying that aquatic species must have clean water. Some pollutants have a greater adverse effect on species than others. This action item proposes two ways to identify and eliminate known or potentially harmful chemical contaminants.

The first approach will be through the Parish's Industrial Pretreatment Program, which regulates discharges to the sanitary sewer system. The program is implemented through the use of discharge permits issued to individual businesses. Influent and effluent water treatment plant sampling ensures water discharged into the Mississippi River meets State standards and would provide data on the types and sources of hazardous chemicals.

The second approach would be to establish a small-scale citizen science-based water sampling program where participants would periodically report their results to the Parish. Ideally, the sample sites would be predetermined and based on recommendations from the Parish's advisory partnerships. The results would be used to identify potential point and non-point source pollution issues and as a proxy of the overall health of the surrounding aquatic environment. In addition, the Parish could incorporate digital wildlife observational applications (e.g., iNaturalist, eBirds, Seek, Smart Bird ID, etc.) to gauge the variety and variability of wildlife in the area, which could provide meaningful insight into the overall health and carrying capacity of the surrounding habitat.

CRS elements: There is no specific credit for such water quality efforts, but the presence of hazardous chemicals should provide input to the Watershed Master Plan (action item 4.2) and resulting public information materials could be credited under Activity 330 (Outreach Projects) Outreach Projects (OP).

Coordinating the Strategies

The Parish should also seek credit for the Floodplain Species Assessment and Plan under CRS Activity 510 (Floodplain Management Planning), Natural Floodplain Functions Plan (NFP – FSA). Obtaining and keeping the credit (beginning in 2021) will be an incentive to implement the projects that can receive Community Rating System credit.

Natural Floodplain Functions Plan (NFP) credit is dependent on adoption of this Plan by the Parish Council. For continued credit, an annual evaluation report must be prepared and provided to the Parish Council. "The [Plan] must be updated at least once every 10 years. The update must include a review of any changes to conditions as well as progress made since the original plan was prepared. Any changes to the adopted plan must be approved by the [Parish Council]." (*CRS Coordinator's Manual*, page 510-35). Having such high-level attention following this work will facilitate coordination among the various offices and encourage implementation of these action items.

Action Item Timetable

The matrix below shows when new projects are planned for development ("D") and implementation ("I"). Existing projects are to be evaluated and revised ("E/R").

Strategy/Action Item	2021	2022	2023	2024	2025	2026	2027
1. Educate the public so people will take conservation and recovery actions							
1.1. Develop and implement a communication campaign		D	I	I	E/R	I	I
1.2. Distribute educational brochures and fact sheets		D	I	I	I	I	I
1.3. Post messages on signs at various locations		D	I	I	I	I	I
1.4. Issue news and status information updates		D	I	I	I	I	I
1.5. Provide map information on sensitive areas	D	I	I	I	I	I	I
1.6. Provide more detailed references	D	I	I	I	I	I	I
1.7. Develop an educational curriculum for students and the public		D	I	I	E/R	I	I
2. Support the conservation and recovery of terrestrial habitat							
2.1. Regulate adverse development practices		D	I	E/R	I	I	I
2.2. Inventory open areas to prioritize them for preservation		D	I	I	I	E/R	I
2.3. Reduce disturbance from humans and pets		D	I	I	I	I	I
2.4. Manage vegetation		D	I	I	I	E/R	I
3. Support the conservation and recovery of aquatic habitat							
3.1. Develop a regulatory and/or incentive framework			D	I	I	I	I
3.2. Restore and enhance essential habitats		D	I	I	E/R	I	I
3.3. Protect, identify, evaluate, and monitor manatee habitat		D	I	I	I	I	I
3.4. Minimize causes of manatee disturbance, harassment, injury, and mortality		D	I	I	E/R	I	I
4. Improve stormwater runoff							
4.1. Incorporate water quantity and low impact development techniques into stormwater facility design			E/R	I	I	I	I
4.2. Develop a watershed master plan	D	I	I	I	I	I	I
4.3. Identify and eliminate harmful contaminants		D	I	I	I	I	I
Seek CRS credit for this Floodplain Species Plan	I	I	I	I	I	I	I

D: Develop the action item I: Implement the action item E/R: Evaluate and Revise

Comments on the Plan:

There are a number of federal and state agencies and private organizations that have goals and programs to protect and rehabilitate threatened and endangered species. The draft Plan was sent to the organizations listed below in June and July of 2021, to solicit comments and recommendations as was done with the Assessment. Comments were received from the Louisiana Department of Wildlife and Fisheries (LDWF – Julia Lightner and Michael Seymour), and The Nature Conservancy (TNC – Seth Blitch). Their comments and recommendations were included in this final version.

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