

Information Sheet on Ramsar Wetlands (RIS) – 2009-2012 version



Available for download from http://www.ramsar.org/doc/ris/key_ris_e.doc and
http://www.ramsar.org/pdf/ris/key_ris_e.pdf

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX.22 of the 9th Conference of the Contracting Parties (2005).

1. Name and address of the compiler of this form:

Kristen Kneifl- Refuge Biologist
Pelican Island National Wildlife Refuge
1339 20th Street
Vero Beach, Florida 32907

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

2-15-11

3. Country:

United States

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Pelican Island National Wildlife Refuge

5. Designation of new Ramsar site or update of existing site:

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site ; or
b) Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:**a) Site boundary and area**

The Ramsar site boundary and site area are unchanged:

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ; or
ii) the boundary has been extended ; or
iii) the boundary has been restricted**

and/or

If the site area has changed:

- i) the area has been measured more accurately ; or
ii) the area has been extended ; or

- iii) the area has been reduced**

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

The refuge currently manages 5,444 acres within the 6,184 acre approved acquisition boundary. From 2001-2004, two hundred and fifty acres of citrus groves were removed and restoration efforts have been on-going since this time. Since 1993, hurricanes have damaged and altered the landscape on the refuge. After the hurricanes of 2004, sixty acres of grassland fields are being maintained as early successional habitat after the discovery of federally threatened Southeastern beach mice using the fallow fields. Maintenance buildings for storing equipment were erected in 2007 and 2010. A new administrative is also in place as of 2011, allowing staff to be on the property increasing visitor contact and creating workload efficiency.

Furthermore rapid erosion of island was observed and restoration efforts were undertaken to stop the erosion of the historic Pelican Island rookery. These are outlined in section 27.

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

i) a hard copy (required for inclusion of site in the Ramsar List): ;

ii) an electronic format (e.g. a JPEG or ArcView image) ;

iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The Pelican Island National Wildlife Refuge is bordered on the west by the intercoastal waterway in the Indian River Lagoon with the refuge extending from the east side of the channel to the eastern shore. The northern boundary of the lagoonal habitat is Sebastian Inlet State Park and the southern boundary is located just north of the Wabasso Causeway.

The barrier island portion of the refuge is bordered by residential-resort development and highway A1A on the east, north, and south side. The Indian River Lagoon is located to the west.

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

27°46'N; 80°25'-80°26'W

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

Located in Indian River County along the Atlantic Coast in east-central Florida. Sebastian, Florida is approximately 1.6km (1 mile) west of the refuge.

10. Elevation: (in metres: average and/or maximum & minimum)

The average elevation is 6 feet (1.8m) above sea level. The maximum is 12ft (3.6m) above and 25ft below (7.62m).

11. Area: (in hectares)

2203 ha

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Pelican Island National Wildlife Refuge lies in the Indian River Lagoon which is a narrow brackish water estuarine area that extends 156 miles along Florida's east-central coast. The Indian River Lagoon and its associated wetlands are part of a major ecological system that supports hundreds of species of plants, fish and wildlife. The site and its associated wetlands lie in a climatic zone of overlap between temperate and tropical, thus supporting plants and animals many of them threatened or endangered from both zones. The refuge and adjacent waters support thousands of migratory birds in winter as well as numerous nesting species and shorebirds. Management goals include maintenance of quality habitat for endangered species, protection of nesting and feeding habitat for migratory birds, and promoting public awareness. Three major habitat types are recognized within the refuge. Collectively, these communities contribute to the overall health and productivity of the lagoon system. They are: (1) aquatic habitat, characterized by either intertidal mudflat, estuarine sub-tidal bottom, drift algae communities, or seagrass meadow, (2) transitional wetland habitat, characterized by intertidal and high salt marsh, or mangrove swamp, or (3) upland habitat, characterized by transitional island or coastal hammock.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criteria 2: The refuge and surrounding Indian River Lagoon directly or indirectly support 12 federally listed threatened or endangered species. Examples are the endangered wood stork, sea turtles, sea grass, southeastern beach mice, and manatees.

Criteria 3: Pelican Island Refuge serves as a critical repository of gene pools, species, and communities that is very important to the overall contribution and health of the Indian River Lagoon and the South Florida Ecosystem. Due to the mix of salt and fresh water, and the productivity of the

lagoon system, a high degree of biological diversity is present at both species and community levels. Overall, the Ramsar site supports more than 140 avian species that use the refuge as a nesting, roosting, feeding or loafing area. It also supports 18 species of mammals, 27 of reptiles and amphibians and over 300 plant species.

Criteria 4: Pelican Island is of particular importance for juveniles of many bird, fish and sea turtle species. Pelican Island has been used by colonial nesting birds since the 1800s. The brown pelican is the most abundant nester. Other nesting species include the double-crested cormorant, great and little blue heron, tri-colored heron, black-crowned night heron, great, snowy and cattle egrets, and the endangered wood stork. Federally endangered wood storks began nesting on Pelican Island in the 1970s. The wood stork is found in only three southeastern states, Florida, Georgia, and South Carolina and is an important resident in this area. As a juvenile sea turtle nursery, the lagoonal waters of the refuge serve critical needs for threatened and endangered sea turtles such as the Kemp's ridley, hawksbill, and both green and loggerhead turtles. After hatching, marine turtles use these protected, shallow, benthic waters as feeding grounds. With seven species found in this area, seagrasses are a key habitat of the Lagoon system, playing a prominent role as a nursery (key species supported in this habitat include manatees, red drum, spotted sea trout, sea horses, blue crabs, clams, shrimp, sea urchins, and wading and diving birds).

Besides nesting, Pelican Island National Wildlife Refuge, including the adjacent waters, also supports thousands of migratory birds during the winter season. The fresh and tidal wetlands provide valuable habitat for a broad assemblage of waterbird groups including aerial and surface divers, shorebirds, wading birds, and rails. Wading birds are the most diverse group, foraging in shallow water areas associated with the mangrove vegetated shorelines. Two adjacent impoundments are also subject to intensive foraging by wading birds when the availability of prey organism (principally small fish and invertebrates) is concentrated during draw downs. Shorebirds, particularly sandpipers, plovers, dunlins, and yellowlegs forage along the moist, shallowly flooded elevation gradients.

Criteria 7: The climatic characteristics of fresh and salt water support vegetative communities and aquatic habitat for a diversity of species. The waters also support an abundant and diverse assemblage of fish, with over 600 species identified. Some common species are the spotted seatrout, red drum, snook, tarpon, ladyfish and pinfish. The refuge is well documented for being an important spawning and nursery site for many valuable fish species. In 2010, researchers from the University of Central Florida captured a 15 foot endangered smalltooth sawfish while conducting their regular netting activities for sea turtles on the refuge. The last documented sighting on the refuge was in 1935.

Criteria 8: In seagrass meadows, 214 fish species have been identified, with 87 percent of the species in a juvenile stage. Seagrasses are ecologically and economically important. They are a vital component of this diverse estuary providing nursery and foraging habitat, and protection. The mangrove swamps are also used as nursery habitats by numerous species of fish and shellfish.

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Floridian

b) biogeographic regionalisation scheme (include reference citation):

Spalding et al. 2007

Spalding MD, Fox HE, Allen GR, Davidson N, Ferdaña ZA, Finlayson M, Halpern BS, Jorge MA, Lombana A, Lourie SA, Martin KD, McManus E, Molnar J, Recchia CA, Robertson J (2007) *Marine*

Ecoregions of the World: a bioregionalization of coast and shelf areas. BioScience 57: 573-583

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

The Refuge's climate is characterized as a mix of subtropical and temperate. The average temperature is 67 degrees Fahrenheit with long, warm, humid summers and mild winters. Tropical storms impact the area, especially from August through mid-November. Generally, the area averages between 55 to 60 inches of rain annually, mostly during the summer and early fall. Hurricane season officially begins on June 1 and ends November 30, with the peak of activity in mid-September. Hurricane frequency, timing, intensity, and distribution may change dramatically over the next century as a result of global climate change.

Wetland ecosystems may also experience long-term alterations if local weather patterns are reflective of global climate change. Any increase in the number and intensity of these storms could have profound effects on the flora and fauna.

The general soils of the Refuge include Canaveral-Captiva-Palm Beach, which is characterized by gently sloping, somewhat poorly drained to moderately well drained sandy soils with shell fragments, and McKee-Quartz-St. Augustine, which is characterized by level, somewhat poorly drained soils mixed with sand and shell fragments. Specific soils found on the Refuge include: Canaveral Fine Sand, 0-5 percent Slopes; Quartzipsamments, 0-5 percent Slopes; Captiva Fine Sand; McKee Mucky Clay Loam; and Kesson Muck.

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

The physical features of the catchment area are the same as the physical features of the site.

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The Refuge is located within the Indian River Lagoon, just south of Sebastian Inlet and the confluence of the St. Sebastian River and the Lagoon. The estuarine Indian River Lagoon stretches 156 miles from Ponce Inlet south of Daytona Beach to Jupiter Inlet near West Palm Beach and is fed by numerous rivers, creeks, and canals. In 1991, the Indian River Lagoon became a part of the National Estuary Program (NEP), which is administered by the U.S. Environmental Protection Agency. The program manager for the Indian River Lagoon NEP is the St. Johns River Water Management District. Efforts under the Indian River Lagoon NEP focus on improving water and sediment quality to restore or enhance seagrass, islands, and on rehabilitating impacted wetlands to recover as many their main hydrological values.

The Intracoastal Waterway is the deepest part of the Lagoon, providing for navigation. To the north of the refuge lies St. Sebastian River and Turkey Creek which contribute fresh water to the brackish Lagoon, while Sebastian Inlet contributes saltwater to the system. The Fellsmere Farms and Sebastian River water control districts feed fresh water through the St. Sebastian River to the Lagoon. The St. Johns River Water Management District (SJRWMD) also releases fresh water into the Lagoon after contaminants are naturally filtered through a series of storm water ponds and levies. Salinity in this area typically averages 30ppt. Given the mix of fresh water, brackish water, and saltwater in this area, salinity levels can be a concern, especially during periods of high freshwater flows. Tidal fluctuations

do occur within the lagoon and function in sync daily with ocean high and low tide timing. Water levels also vary depending on the time of the year and rainfall amounts.

The Lagoon contributes to maintaining water quality and several water quality parameters of concern have been identified: cadmium, lead, mercury, nutrients, selenium, thallium, and dissolved oxygen. Water circulation within the Lagoon is affected by the Intracoastal Waterway (e.g., navigation channel maintenance and boat usage), wind, inlets, and causeways. As water quality declines in the Lagoon due to sediment and nutrient runoff, seagrasses die and algae blooms increase, resulting in decreased fish and mollusk production, as well as food for manatees and sea turtles. Generally, the water quality within the Refuge is generally better quality than nearby portions of the Lagoon which tend to experience high levels of nutrient run-off and are located further from inlets that allow constant mixing and flushing of waters. Since the installation of the Sebastian Inlet in 1943, seagrass beds within the refuge have increased due to the constant flushing of waters as confirmed through aerial and ground truth mapping. Currently, the SJRWMD Indian River Lagoon program monitors water quality and seagrass density and species composition at seventy five fixed transects within the lagoon, including three sites located within the refuge.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

F A B G I K E J Q R Ss Tp 2

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Pelican Island NWR supports important bird rookeries, key fish spawning sites, and a globally important juvenile sea turtle nursery. Primarily comprised of lagoon waters, the Refuge includes marine, terrestrial, and wetland habitats supporting a diversity of species, including 12 federally listed threatened and endangered species. This complex ecological system also supports hundreds of species of birds, fish, plants, and mammals. When the refuge was established, as many as 10,000 brown pelicans occupied the tiny 5.5-acre Pelican Island as a last stronghold for this species along the east coast of Florida in the early 1900s. Today, the number of brown pelicans using the island has dwindled in magnitude to less than 50 nesting pairs. The major decline occurred in 2004 after a series of four major hurricanes struck the east coast and disrupted the birds' life cycle. However, current indications are that habitat has recovered and pelicans are returning with hundreds found roosting on the Island. Today at least 16 different bird species nest on Pelican Island proper, including brown pelicans, wood storks, egrets, herons, ibises, anhinga, oystercatchers, and cormorants. Over 130 species of birds use the remainder of the Refuge as a rookery and as a roosting, foraging, and loafing area. Further, federally protected West Indian manatees and sea turtles inhabit the lagoon waters of

the Refuge, alongside some 30,000 annual boaters. Habitats in and around the Refuge serve a variety of species and are highly important in this developed landscape.

Primary Refuge Habitat Types

The primary habitats of the refuge fall into three categories: marine, wetland, and terrestrial. The Marine habitat which includes open estuarine waters, seagrasses, drift algae, and exposed mud and sand bottoms cover over 75 percent of the refuge. The wetland habitats of the refuge include salt marsh, mangroves, and impoundments. The terrestrial habitats of the Refuge include islands, coastal hardwood hammock, and grassland. Dredge spoil areas, abandoned agriculture (former citrus groves), and administrative lands can also be found on the refuge.

Marine Habitat

The marine habitat of the Refuge is a mix of estuarine habitats, including oyster reefs, exposed mud and sand bottoms, drift algae, seagrasses, and open estuarine and impoundment waters. Exposed bottoms and oyster reefs provide substrate and cover for invertebrates and small fish. This habitat supports species such as segmented worms, brittle stars, clams, oysters, stingrays, and flounders. Drift algae collects in response to wind, water currents, and bottom topography and contributes to the primary productivity and overall complexity of the Lagoon ecosystem. Drift algae also composes a large component of the green sea turtle diet within the Lagoon as discovered by UCF researchers. Seven species of seagrass provide an important component of the Lagoon system. Seagrass acts as a nursery for several key species, including juvenile sea turtles, manatees, red drum, spotted sea trout, sea horses, blue crabs, clams, shrimp, sea urchins, and wading and diving birds. The open estuarine water of the Lagoon provides the basis for the diversity of wildlife found on the Refuge. This habitat supports key species such as manatees, bald eagles, sea turtles, ospreys, dolphins, pelicans, cormorants, waterfowl, black skimmers, terns, and a variety of fish.

Wetland Habitat

Wetland habitats on the refuge include salt marsh; mangroves; impoundments; and temporary, seasonal, semi-permanent, and permanent freshwater wetlands. Salt marshes are areas of salt tolerant wetland vegetation, often containing ponds, natural depressions, and creeks that are utilized by fish, crabs, and shrimp. Other key species found in salt marshes include diamondback terrapins, fiddler crabs, marsh rabbits, Atlantic salt marsh snakes, clapper rails, and wood storks. Mangroves trap and collect sediment which helps stabilize shorelines and reduce flood damage. Over 100 fish species and shellfish are dependent on mangroves. Key animal species found in this habitat include mangrove water snakes, river otters, raccoons, mangrove crabs, snook, pelicans, wood storks, herons, egrets, shorebirds, periwinkle snails, and juvenile and predatory fish. Permanent and semipermanent freshwater wetlands provide foraging areas for wading birds and waterfowl. Temporary and seasonal wetlands benefit frogs, salamanders, crayfish, land crabs, *Rivulets* spp., red-bellied sliders, mud turtles, and snapping turtles. The refuge also manages impounded wetlands. Bird's and Pete's impoundments are cooperatively managed with the Indian River Mosquito Control District (Mosquito Control) for mosquito control and wildlife benefits. In doing so, Mosquito Control regulates the water levels in Pete's and Bird's impoundments on an alternating drawdown rotation schedule to provide exposed mudflat and shallow water for wading bird feeding. The other historic impoundments, North and South Deerfield impoundments are breached and therefore fluctuate with water levels of the Indian River Lagoon. Key species supported by these impoundments include herons, egrets, shorebirds, waterfowl, reptiles, river otters, wood storks, ibises, peregrine falcons, and bald eagles.

Terrestrial Habitat

Terrestrial habitats found on Pelican Island NWR consist of islands, coastal hardwood hammocks, grassland, and abandoned citrus groves. Natural islands are typically low in elevation and are colonized by mangroves. Spoil islands are higher and include more upland plants, including exotics such as the Australian pine and Brazilian pepper. Coastal hammocks occur on the barrier islands where the air temperatures are moderated by the surrounding waters. Hammocks are dominated by live oaks and cabbage palms, and include an understory with a diverse assemblage of tropical and temperate plants. Transitional communities give way to upland communities on the Refuge, which include lagoon islands, spoil islands, coastal hammock, citrus groves, grasslands, and developed and interpretative lands. The Refuge manages three spoil islands and 23 natural islands and islets. While both the natural and spoil islands have natural and exotic vegetation, the spoil islands tend to be dominated by exotic plants. Many of the spoil islands off the Refuge are used for recreational activities, such as for day use and overnight camping. The spoil islands are managed under the lease agreement with the State of Florida and are open to the traditional public uses specified in the lease agreement.

To provide a buffer to the historic Pelican Island rookery, the refuge acquired lands within the acquisition boundary on the barrier island, including an old citrus grove that currently is being restored to mimic natural and historic conditions. Coastal hammocks represent much of the native habitats that previously existed on the barrier island. Coastal hammocks are dominated by live oaks and cabbage palms, and include an understory with a diverse assemblage of tropical and temperate plants. Key wildlife species in coastal hammocks of the Refuge are neo-tropical migratory birds, woodrats, eastern indigo snakes, land crabs, and bobcats. In general, and especially within the Indian River Lagoon system, tropical hardwood hammocks have been greatly reduced by conversion to other land uses and fragmentation.

As a remnant of former agricultural operations, an old field habitat exists on the refuge, which is currently maintained as grassland. Although not a native habitat, this old field habitat is managed and maintained by the refuge as early successional for the federally listed southeastern beach mouse. This old field habitat is also valuable for grassland bird species such as bobolinks and loggerhead shrikes. By increasing management, this old field habitat will better support southeastern beach mice, ground doves, and gopher tortoises. The Refuge contributes to recovery efforts for the southeastern beach mouse by protecting this grassland habitat and coordinating with researchers to conduct baseline surveys on the refuge.

In 2004, a native butterfly garden was created along Centennial Trail. The garden was created as a public demonstration garden on native butterfly gardening. Maintenance of the garden is dependent on ongoing volunteer workdays. The Florida native butterfly garden was designed to provide both nectar and host plants specifically for the species of butterflies that have been found on the Refuge. As such, the garden was not created to provide habitat for butterflies in-and-of-itself, but as a tool for educating the public on native butterfly gardening. Approximately 15-20 species of butterfly inhabit the Refuge year-round, though the species change seasonally. Ongoing restoration efforts within the transitional habitats of the Refuge from citrus grove to hardwood hammocks may result in a greater variety of butterfly species using the Refuge in the future. The garden attracts other wildlife, including bees, wasps, dragonflies, reptiles, birds and rabbits. Some of the native nectar and host plants established in the garden include: eastern gamma grass, pink muhly grass, necklace pod, wild lime, Chapman's wild sensitive plant, climbing aster, blazing star, coral honeysuckle, yellowtop, wild red sage, firebush, dune sunflower, silver leaf aster, goldenrod, dotted horsemint, black eyed Susan, swamp milkweed, wild petunia, and blanket flower. The only plant that appears to be germinating by windblown seed from the garden is blanket flower, which is rapidly spreading in other areas around the Centennial Trail.

Butterfly species found year-round on the Refuge include: great southern white, cloudless sulfur, barred sulfur, ceraunus blue, gulf fritillary, common buckeye, mangrove buckeye, monarch, queen,

phaon crescent, white peacock, Dorantes skipper, tropical checkered skipper, southern skipperling, mangrove skipper, and others.

Non-native habitats, visitor facilities, and public trails do occur on the Refuge within the terrestrial habitats. Public facilities in this area include maintained mosquito impoundment dike trails, an observation tower and deck, a paved foot trail and boardwalk, information kiosks and rest shelter, parking areas, restroom facility, and the Jungle Trail roadway.

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Rare, Threatened, Endangered, and Declining Plants Found on the Refuge There are 300 plant species listed on the refuge, including 18 listed by the federal government, State of Florida, and/or Florida Natural Areas Inventory. Declining species include: the giant leather fern, Curtiss' milkweed, hand fern, Christmas berry, butterfly orchid, beach creeper, Johnson's seagrass, crested coralroot, pineland lantana, Simpson stopper, shell mound prickly pear cactus, cinnamon fern, pepper, inkberry, inflated wild pine, giant wild pine, coastal vervain, and Tampa vervain.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The refuge serves as an important site for the recovery of federal and state listed threatened and endangered species. The South Florida Ecosystem supports 70 federally threatened or endangered species. The refuge's location and habitat features are important Information Sheet on Ramsar Wetlands (RIS), page 10 for the future of 12 federally listed threatened and endangered species, as well as for 45 species listed by the State of Florida.

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

Human habitation of the Indian River Lagoon region extends back at least 12,000 years. Indian shell middens throughout the area date from 1,000 BC to 1,000 AD. The Refuge is home to several archaeological sites. Since these sites are accessible to disruption, vandalism, and theft, archaeological surveys have been conducted on the refuge. The Refuge and Indian River County are currently working together to list midden sites in the Florida Master Site File. Some of these sites are eligible for listing in the National Register. In the event that a previously undetected archaeological site is uncovered during routine refuge management activity, the activity must stop and contact the Service's Regional Archaeologist and Florida's State Historic Preservation Office.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

International and National Importance: Pelican Island was the first national wildlife refuge established in the United States. On 14 March 1903, conservationist President Theodore Roosevelt issued an executive order that set aside Pelican Island as a "preserve and breeding grounds for native birds". The executive order also made Pelican Island the first national wildlife refuge and established the land

management responsibilities for the agency that would later become the US Fish and Wildlife Service of the Department of the Interior. Pelican Island was designated a National Historic Landmark in 1963, and was assigned Wilderness Area protection through congressional legislation in 1970. In 2010, the refuge became recognized as a National Marine Monument.

If Yes, tick the box and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

The Indian River Lagoon (IRL) stretches 156 miles from Ponce Inlet south of Daytona Beach to Jupiter Inlet near West Palm Beach and is fed by numerous rivers, creeks, and canals. In 1991, the Indian River Lagoon became a part of the National Estuary Program (NEP), which is administered by the U.S. Environmental Protection Agency. The program manager for the Indian River Lagoon NEP is the St. Johns River Water Management District. Efforts under the Indian River Lagoon NEP focus on improving water and sediment quality to restore or enhance seagrass, islands, and on rehabilitating impacted wetlands to recover as many of their natural functions as possible. The IRL is the most diverse estuary in North America . Many partners work together to conduct research, restoration, debris removal, management activities, and fund projects to protect and conserve the IRL resources.

- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:

Pelican Island has historically significant for being the first refuge and the birthplace of the National Wildlife Refuge System. The Kroegel homestead is locally and historically significant for being the first Refuge Manager's home. The Kroegel homestead was settled in 1881 and is just across the lagoon from Pelican Island. The refuge and the Kroegel home site continue to be an integral part of the local community. There is also a time capsule from the Centennial celebration located on the refuge and contains items such a Paul Kroegel's pipe and other items.

- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:

The Indian River Lagoon is one of the most popular fish destinations in Florida, with more than one million anglers annually. The IRL is also has an estimated economic benefit of 3.7 million dollars to the area since 2007. The refuge and the Kroegel homesite continue to be an integral part of the local community. The yearly Pelican Island Wildlife Festival, held on the anniversary of the refuge, is a very popular event and well known in the local community. The refuge also continues to offer outreach activities and volunteer opportunities to engage the local community.

- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

- a) within the Ramsar site:

Entity	Method	Acreage
USFWS	ownership	363.493
Bureau of Land Management	withdrawal	37.500

Orchid Island Golf and Country Club	easement	127.280
Windsor (27.19 acres total)	easement	19.161
Indian River County	Management agreement	122.480
State of Florida (Pelican Island NWR lease)	Lease	4,737.540
State of Florida (Archie Carr NWR leases)	Leases	37.210
Total Acreage under Pelican Island NWR Management (as of October 31, 2003)		5,444.664

b) in the surrounding area:

public, private and government owned.

25. Current land (including water) use:

a) within the Ramsar site:

Conservation, recreational, educational and research uses as well as low intensity residential and agricultural uses.

b) in the surroundings/catchment:

Residential, commercial, industrial, agricultural and recreational uses.

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) within the Ramsar site:

The refuge faces ongoing threats from contaminated air, soil, and water. Rapid population growth and development have resulted in long-term negative impacts to the refuge. Storm water runoff, pollution, habitat destruction, and development are constant threats to fish and wildlife. Poaching, boat collisions and increased human presence are examples of other threats within the site. Moreover the area is exposed to hurricanes and other natural events that together with other anthropogenic factors threaten the site resulting in erosion, nutrient loading and contamination of habitats.

b) in the surrounding area:

The Service is working to prepare, mitigate, and minimize the potential effects of climate change. Even the slightest alteration in sea levels and climate will have a huge impact on this refuge with its coastal setting and sub-tropical location. Negative scenarios such as rising sea levels and eroding islands, stronger and more violent storms, more pest species invasions, elevated lagoon temperatures and increased algae blooms, and phenological changes in the species currently inhabiting the refuge are all possible consequences. The refuge is currently working with the South Florida Eco-team to develop models and solutions on how to prepare for this potential global event. The refuge is also working with Sea Level Affecting Managed Marshes modelers. In addition, the refuge complex is working on acquiring additional conservation land in-land, conducting shoreline restoration on Pelican Island proper and the other islands within the Indian River Lagoon, pest species management, along with continued monitoring and research on the refuge to detect changes and adapt accordingly.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The Pelican Island National Wildlife Refuge is being managed under guidelines of the National Wildlife Refuge System. Specific management goals for Pelican Island National Wildlife Refuge include: (1) the maintenance of quality habitat to support wildlife threatened with extinction, (2) provide for long-term security and future values of existing special resource areas, (3) provide quality nesting and feeding habitat for production of migratory birds (4) expand public understanding of the role Pelican Island played in the development of the National Wildlife Refuge System, and (5) provide an opportunity for the public to view and appreciate wildlife.

Restoration efforts include invasive exotic species eradication and installation of native vegetation to convert 60 acres of former citrus groves to coastal hammock. In 2002, visitor use facilities were constructed, including restroom facilities and interpretative kiosks. This also included construction of the historic Centennial Trail boardwalk which allows visitors to view the historic rookery from the barrier island, as well as the creation of six man-made freshwater ponds for wildlife.

In 2006, major restoration efforts were undertaken to stop the erosion of the historic Pelican Island rookery. The island had eroded from 5.5 acres to 2.2 acres. Restoration efforts included installation of native spartina and mangrove species and the creation of an artificial oyster reef to serve as a barrier from wave action. The island has increased in size and is currently at 3.2 acres due to these efforts. In addition, work is underway on 30 acres of land to restore hydrology and sheet flow by creating wetland habitat just south of Centennial Trail. This wetland habitat will increase the biodiversity and availability of quality feeding and wading areas, as well as assist in mosquito and exotic pest control. The USFWS staff and partners work very hard to maintain and preserve the conservation lands within the area by conducting important research and monitoring, restoration efforts, and developing management plans. In 2006, a fifteen year management plan was completed. A copy/link to the Comprehensive Conservation Plan (CCP) for Pelican Island NWR has been provided. For additional information to any of the questions below, please refer to the CCP. Additionally, refuge staff is providing final edits to the Habitat Management Plan for Pelican Island, a five year plan focusing on habitat and wildlife management and details specific goals and objectives for each. A copy will be provided once available.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

There is a 15 year Comprehensive Conservation Plan~ USFWS 2006 currently being applied.
Habitat Management Plan~ USFWS 2012

d) Describe any other current management practices:

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The publication and use of the Habitat Management Plan (HMP) - USFWS 2012, which is currently in the last review process.

29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.
See HMP in 2012.

Sea turtle research and netting, smalltooth sawfish monitoring, odonata sampling, butterfly surveys, bird surveys, exotic plant monitoring, plant surveys, seagrass and water quality monitoring, fish sampling, pest management, predator control, woodrat and beachmice trapping and genetics, and other habitat and wildlife monitoring.

No permanent research facilities exist on the refuge. Research, monitoring, and surveys are carried out via Special Use Permits issued by the refuge and the work is conducted by partners, universities, volunteers, and staff.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Currently, the refuge does not have a visitor center on site. However, there are nearby educational conservation facilities that educate the public on the resources in the area and highlight the Pelican Island NWR.

There are three nature hiking trails including two overlooks, interpretive panels and kiosks, brochures and handouts, van tours, kayak tours, travelling informational booths, as well as a yearly wildlife festival and other special events.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The refuge was created for the protection and conservation of wildlife and habitats. Public use such as hiking, photography, and bird watching are compatible activities with the refuge's mission. The refuge is open to the public from sunrise to sunset and hosts about 1,000 visitors per month.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

U.S. Department of Interior- U.S. Fish and Wildlife Service

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

U.S. Fish and Wildlife Service
Pelican Island NWR Complex
Charlie Pelizza- Refuge Manager

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

U.S. Fish and Wildlife Service. 2006. Comprehensive Conservation Plan for Pelican Island National Wildlife Refuge.

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