

Information Sheet on Ramsar Wetlands (RIS)

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Designation date

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Site Reference Number

2. Date this sheet was updated: May, 2005

3. Country: USA

4. Name of the Ramsar site: Everglades National Park

5. Map of site included:

a) **hard copy** (required for inclusion of site in the Ramsar List): **yes** -or- *no*

b) **digital (electronic) format** (optional): **yes X** -or- *no* (See map at www.nps.gov/ever)

6. Geographical coordinates (latitude/longitude):

Geographical coordinate: **80°20"W**

Geographical coordinate: **81°30"W**

Geographical coordinate: **24°50"N**

Geographical coordinate: **25°55"N**

7. General location:

South Florida, in Miami-Dade, Monroe, and Collier Counties. Metropolitan Miami is nearest large town

8. Elevation: 8 ft (2.4 m) above sea level**9. Area:** 1,508,571 acres (610,497 ha)

10. Overview:

Everglades National Park:

- Comprises the largest designated subtropical wilderness reserve on the North American continent. The park contains vast subtropical upland and marine ecosystems, including freshwater marshes, tropical hardwoods, rock pinelands, extensive mangroves and seagrass ecosystems that support world-class fisheries.
- Relatively unaltered mangrove forest belt stretches from northeastern Florida Bay west to Flamingo and inland in a northwesterly direction to the park's extreme northwest boundary point at Everglades City. This belt represents one of the longest mangrove forest belts remaining in the western hemisphere.
- At least four distinctively different aquatic community types within the park support a variety of seagrasses and fresh water benthic plants and associated aquatic organisms. These include: inland fresh water areas, consisting of broad, shallow grassy rivers, small scattered ponds, and alligator holes; brackish water or estuarine areas where fresh and salt water merge; shallow shore line and off shore embayments, and the deeper Gulf coastal waters.
- Serves as a sanctuary for the protection of more than 20 federal- and 70 state-listed rare, threatened and endangered species.

- Provides important foraging and breeding habitat for more than 400 species of birds (including homeland to world-renowned wading bird populations), and functions as a major corridor for migratory bird populations.
- Is the only place in the United States designated a World Heritage Site, a Biosphere Reserve, and a Wetland of International Importance

11. Ramsar Criteria:

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8

12. Justification for the application of each Criterion listed in 11. above:

Criteria 1: Comprises the largest designated subtropical Wilderness reserve on the North American continent. The park contains vast subtropical upland and marine ecosystems, including freshwater marshes, tropical hardwoods, rock pinelands, extensive mangroves and seagrass ecosystems that support world-class fisheries.

Criteria 2: Serves as a sanctuary for the protection of more than 20 federal- and 70 state-listed rare, threatened and endangered species. Endangered species include:

- Green turtle (*Chelonia mydas*)
- Atlantic Ridley turtle (*Lepidochelys kempi*)
- Atlantic hawksbill turtle (*Eretmochelys imbricata*)
- Atlantic leatherback turtle (*Dermochelys coriacea*)
- Cape Sable seaside sparrow (*Ammodramus maritima mirabilis*)
- Snail (Everglades) kite (*Rostrhamus sociabilis plumbeus*)
- Wood stork (*Mycteria americana*)
- West Indian manatee (*Trichechus manatus*)
- Florida panther (*Felis concolor coryi*)
- Key Largo wood rat (*Neotoma floridana smalli*)
- Key Largo cotton mouse (*Peromyscus gossypinus allapaticola*)
- Red-cockaded woodpecker (*Picoides borealis*)
- Schaus swallowtail butterfly (*Heraclides aristodemus ponceanus*)
- Garber's Spurge (*Chamaesyce garberi*)
- American Crocodile (*Crocodylus acutus*)
- Bald eagle (*Haliaeetus leucocephalus*)

Source: <http://www.nps.gov/ever/eco/danger.htm>

Source: <http://www.fws.gov/endangered/wildlife.html>

Criteria 3 and 4: Provides important foraging and breeding habitat for more than 400 species of birds (including homeland to world-renowned wading bird populations), and functions as a major corridor for migratory bird populations. A bird checklist can be seen in the National Park's website: <http://www.nps.gov/ever/eco/birds.htm>

13. Biogeography:

a) **biogeographic region:** North American sub-tropics

b) **biogeographic regionalisation scheme:** Interface between Nearctic and Neotropical zones

14. Physical features of the site:

The park is located in the far southern tip of the Florida peninsula, underlain by extensive deposits of Pleistocene-aged limestone. The Miami limestone consists of a oolitic and bryozoan facies with the latter predominant in the basement rock of the park. Interestingly, these two components of the geologic foundations of the park are of inorganic and organic origin respectively. *Schizoporella floridiana*, a multi-laminate bryozoan, is largely responsible for the production of that portion of the Miami limestone underlying the park. While peninsular Florida is geologically young, it is among the more stable portions of the continent, having undergone no significant structural change for many years. The subsurface is overlaid with varying depths of marl soils that control water drainage into the underlying aquifer and support biological communities. Although the whole region is an extremely flat plain lying at or near sea level, the land along both coasts of south Florida is slightly higher. These higher elevated areas partially enclose an interior basin that is now occupied by the Everglades.

15. Physical features of the catchment area:

Everglades National Park is a shallow basin, tilted to the southwest. The drainage area consists of more than 16,000 square miles (4.14 million ha) from Orlando south to Florida Bay, and include areas of mixed agriculture, urban development and water conservation areas, as well as a variety of protected areas. Climate is subtropical with hot and wet summer season and cooler and dry winters. Rainfall, averaging 50 inches (1270 mm) a year, originally drained large areas in the interior of central Florida and flowed into Lake Okeechobee. In flood seasons, this water flowed slowly over the south side of the Lake and fed a broad, shallow, and slow moving sheet flow of water going south and southeast to the sea. The original seasonal flooding and drying of this vast wetland created the elements of the biological abundance and diversity that once characterized the Everglades.

16. Hydrological values:

The site is critical for water storage and recharge of the underlying Biscayne aquifer. It is the principal source of freshwater for the growing human population. In addition, remaining natural wetlands serve as storage for water during flood events and filter nutrients and pollutants from drainage waters prior to their release into coastal areas.

17. Wetland Types

a) presence:

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:

I, Ts, A, H, J, G, F, Q, R, U, O, P, Xf.

18. General ecological features:

The main habitats found in the Park are fresh water slough and seasonally flooded marl prairie, dwarf cypress forest, tropical hammock hardwood forest, slash pine forest and marine estuary/mangrove forest coastal area.

Geographically, the Everglades are temperate, but biologically they are strikingly similar to the subtropical West Indies, having attracted hundreds of colonial forms. Many of the plant and animal species found in the park are at the limits of their ranges. The biota has great variety and an ironic mixture of rare and abundant life forms. Complexity, diversity, high numbers of species, and low entropy, generally indicators of environmental stability, further characterize the Everglades.

19. Noteworthy flora:

Tropical hardwood vegetation and pinelands, epiphytes, marsh grasses.

Everglades National Park has a flora comprised of tropical, temperate, and endemic taxa. Native tropical species are primarily from the Antillean-Caribbean region of the Neotropics. Endemic taxa consist of species and subspecies, which have evolved in unique habitats of southern Florida and are found nowhere else in the world. About 850 plant species have been recorded within Everglades National Park. Of these, around 70 are considered endemic.

Within Everglades National Park, fire management has identified eight different vegetative management systems based upon their fire ecology. They are:

- Pinelands
- Hardwood Hammocks and Tree Islands
- Coastal Prairies and Scrub
- Sloughs
- Long-Term Hydroperiod Prairies (Wet Prairies)
- Short-Term Hydroperiod Prairies (Marl Prairies)
- Mangrove Forests
- Cypress Forests

Each of these systems has specific ecological issues and fire management considerations associated with them.

Pine Rockland Savannahs. The pine rockland savannahs of Everglades National Park are the largest remaining example of an ecosystem that formerly extended along the Atlantic Coastal Ridge from Ft. Lauderdale to Long Pine Key. According to Robertson (1959) fire has and does play a dominant role in the maintenance of the pine rocklands.

Dade County slash pine (*Pinus elliottii* var. *densa*) is a fire-adapted species where crown fires have never been documented and surface fires are common. Surface fires, as frequent as every few years, would have maintained the natural ecosystem. Under natural conditions, grasses and forbs (broad-leaved herbaceous plants) are the major carriers of fire in the understory of pine savannahs. The open canopy of pine savannahs allows for the rapid drying of fuels, so that fires are possible within hours after rain. Regeneration of grasses and forbs in the understory is so intense that within one year enough fuels are present to be capable of carrying fire.

Currently, the forest floor of pine rocklands in Everglades National Park is covered with a combination of low palms and trees, shrubs, grasses, and forbs. The pineland grasses and forbs respond to fire with rapid regrowth and increased flowering. Many species flower very infrequently except in recently burned areas. Hardwood shrubs and trees are a normal component of pinelands. Without fire, they would rapidly increase in number and stature, resulting in a reduction of the amount of light reaching the forest floor. Conditions would become less favorable for pine regeneration, and species composition would soon be predominantly hardwood, with pine found only in the overstorey. As the hardwoods develop into a closed canopy, a more humid microclimate is created, a thick organic detritus layer accumulates, and the characteristic herbaceous flora of the pinelands is suppressed. As this succession continues, conditions become more unfavorable to fire. Fire is the natural disturbance that prevents the succession of pineland to hardwood hammock.

Hardwood Hammocks and Tree Islands. Hardwood hammocks and tree islands occur in a variety of habitats. Hardwood hammocks are found imbedded in pine rocklands, throughout the grass prairies, and near the coast. The hammocks are comprised mainly of tropical hardwood trees and shrubs. Tree islands are areas of slightly higher elevation than the surrounding prairie that support tropical and or temperate

hardwood trees and shrubs. Many rare, state listed plant species are found in hammocks and tree islands. Many of these species are susceptible to adverse effects from fire.

Hardwood hammocks and tree islands have historically been susceptible to fire. Under natural conditions, they burned rarely on a long fire return interval. Due to loss of hammocks in developed areas outside the park, these remaining hammocks in the park are of special importance. Consequently, hammocks in the park may require fire protection even from natural fire events. During dry periods, hammocks and tree islands are susceptible to fire. The plants in hammocks are highly susceptible to fire damage. Dry-season ground fires may burn the organic soil down to bedrock, killing all vegetation. During wet periods, higher levels of soil moisture preclude fires from penetrating into hammocks and tree islands.

Coastal Prairies and Adjacent Scrub. Coastal Prairies found exclusively in Fire Management Unit 1 but in Everglades National Park they are almost always surrounded by a border of mangrove, or, on the inland edge, by freshwater marsh. During much of the year, most coastal prairie areas have standing water. At the height of the annual dry period, water levels usually drop below the surface. Coastal prairies readily burn, regardless of the height of the water table, when adequate fuel protrudes above the water surface and weather conditions are conducive. These fires kill any encroaching mangrove, ensuring continued graminoid dominance. In Everglades National Park, coastal prairie fires have not been suppressed since the 1970s due to recognition of the importance of this natural disturbance in maintaining this ecosystem. Starting in the 1980s, prescribed fire has been used as part of a strategy to control invasive exotic species.

Sloughs. Sloughs are elongated, often sinuous natural drainage channels that contain water most of the year. Slough communities include aquatic, floating leaved, and emergent plants and are found in the lowest, wettest sites in Everglades National Park. Because sloughs are wet much of the year and vegetation is sparse, they have historically acted as nature's firebreaks in south Florida. Under severe dry conditions, the peat soils underlying sloughs may dry out, resulting in ground fires. These fires tend to consume all organic material creating depressions, which later become ponds.

Long-Term Hydroperiod Prairies (Wet Prairies). In Everglades National Park Long-term hydroperiod prairies (wet prairies) are areas of prairie dominated by sawgrass (*Cladium jamaicense*) or other emergent plants. Wet prairies tend to occupy sites where the maximum surface water depth is less than 4 feet (125 cm) and there is, at most, only a short annual dry period (<2 months). In general, wet prairies dominated by sawgrass have sufficient fuel to carry a fire when flooded, but wet prairies dominated by other species will not carry fire under standing water conditions. A well-developed algal mat (periphyton) is frequently present, which if dry under severe conditions, will burn, smoldering imperceptibly capable of carrying fire through the night and over considerable distances.

Short-Term Hydroperiod Prairies (Marl Prairies). Short-term hydroperiod prairies (marl prairies) occur in Everglades National Park on the east and west margins of Shark River Slough and Taylor Slough, where bedrock elevations are slightly higher and hydroperiods shorter. This vegetative type is characterized by bunch grasses and sawgrass growing in shallow soils. The soil surface is often covered with a moderate to well-developed periphyton mat. In many places the limestone bedrock is exposed at the surface. Fires sustain marl prairies by pruning back invading native and exotic brush and tree species. The irregular vegetative cover, areas of open bedrock and occasional pockets of standing water generally result in patchy burns, even under some severe burning conditions. Under dry conditions, periphyton will burn and carry a smoldering fire across poorly vegetated areas to unburned patches of fuel.

Mangrove Forests. Mangroves are tropical trees that are adapted to salt water and the rigors of tides. Mangrove forests are found along tropical and subtropical coasts with weak wave action. Although mangroves occasionally become established in other Gulf Coast States, nowhere else in the United States do they form extensive forests, as they do along the southwestern coast of Florida. Mangrove forests are found exclusively in Fire Management Unit 1. Fire and frost are important determinants of how far inland mangroves extend. Mangroves in Florida usually merge into marsh vegetation along the gradient from

saltwater to freshwater, and the marshes with which they are contiguous often burn. Although fire may occasionally burn through a mangrove forest that has been frost or hurricane killed, these mangrove forests themselves rarely burn.

Cypress Forests. Cypress forests exist in the form of strands, domes, and dwarf cypress woodlands and all impacted by fire in some way. All are dominated by a species of *Taxodium* and all occur on sites that are, or were, flooded for at least part of the year. Cypress ecosystems require fire for their establishment and maintenance. Dwarf cypress woodlands, with a grassy understory, have all experienced fire, so the impact of total fire suppression in this vegetation type is unknown. Cypress domes have enough soil to support a variety of hardwoods. Without fire they probably become increasingly dominated by hardwoods, and thus change toward various types of bayheads and mixed swamps. Cypress strands are uncommon in Everglades National Park. They normally have standing water, but occasionally would burn during extreme drought cycles.

20. Noteworthy fauna:

American Alligator (*Alligator mississippiensis*): listed as endangered in the Endangered Species Act in 1967, and through strict conservation and habitat protection measures it was downgraded to threatened in 1977. It was removed from the endangered species list in 1987.

American Crocodile (*Crocodylus acutus*): numbers have been estimated to be increasing. In fact, due to vigilance in protecting nesting habitat (areas of the park were closed to visitors entry in 1980 for this purpose; prior to complete closure, the areas had been closed to the public during nesting season) estimated numbers of breeding females have nearly doubled in the last ten years. There are discussions to possibly downgrade the “endangered” status of the crocodile to “threatened”.

The red cockaded woodpecker (*Picoides borealis*) is listed as endangered. A recent park project has overseen the re-introduction of this species, along with brown-headed nuthatch, eastern bluebirds, and wild turkeys into the parks’ pinelands forest. Initial results of the project have been promising.

Within the U.S., more bald eagles (*Haliaeetus leucocephalus*) nest in Florida (1,043 pairs in 1998-99) than any other State except Alaska. In 1995, after 22 years on the Federal endangered species list, the eagle was upgraded to “threatened” status.

Florida Panther (*Felis concolor coryi*): numbers have increased moderately in the park and in the south Florida region. In 1979, there were estimated to be 5-6 remnant numbers of Panther in the eastern pinelands area of the park. They were in isolated territory and numbers and suffered from genetic inbreeding. In 1986, monitoring efforts identified 7-9 animals. In the mid-1990’s, the park cooperated in the introduction of Texas female Cougars to increase numbers and improve genetic stock. Today, after successful breeding, the original Texas females have been removed and 10 Panther are followed in the park. They include 5 adults, 2 sub-adults, and 3 kittens. Shrinking habitat will continue to affect Panther numbers inside and outside the park.

Cape Sable seaside sparrow (*Ammodramus maritimus mirabilis*): in a comprehensive yearly survey beginning in 1981, estimated sparrow numbers have declined by almost two thirds in counts through 2001. Of particular concern, the previously largest sub-population has declined by 96%. Scientists worry that disappearance of any one of the three large remaining sub-populations could lead to extinction if a natural or man made disaster affected the remaining birds.

Wading birds, for which the Everglades have been legendary, once were described as “covering the skies”. There has been a more than 90% decline in their numbers. The general trend for populations within the park has been a continued decline since 1979. In 1997, 1,367 nests were counted and in 2002, 3,083 nests. The stable numbers are tempered by still low overall population and the chances for unforeseen natural or man made events to affect their numbers. For example, 75% per cent of endangered wood storks abandoned their nests in the 2002-03 winter because of rising water from heavy rains.

The park does not conduct a regular monitoring program for other water bird populations.

21. Social and cultural values:

More than 1,000 documented archaeological sites connected with the pre-historic Calusa and Tequesta communities. Early park architecture, portions of the Old Ingraham Highway, and a 1960's era Nike missile base are managed to protect their cultural significance under the National Historic Preservation Act. Tourism and outdoor recreation, including sport fishing, drive the economic importance of the site.

22. Land tenure/ownership:

(a) within the Ramsar site:

All property is owned and managed by the US Government through the National Park Service. In 1989, Congress authorized the expansion of the park to take in 109,600 acres necessary for restoration of hydrology in the northeast Shark Slough. To date, all but approximately 320 acres are in Federal ownership and under the management of the park administration.

(b) in the surrounding area:

A variety of other public and private lands.

23. Current land (including water) use:

(a) within the Ramsar site:

Tourism and outdoor (passive) recreation.

Administration and management is provided under authority and direction of the Superintendent, who reports to a Regional Director, who in turn reports to the Director of the National Park Service.

The Superintendent directs a staff of about 230 permanent employees. Thirty-five additional science and technology staff have been hired to support Everglades restoration projects. Temporary or seasonal staff are hired during the busy winter months to provide increased visitor services.

1,508,571 acres (610,497 ha) are authorized within the park. This includes 109,600 acres (44,354 ha) in the East Everglades expansion area, of which all but approximately 300 acres (121 ha) have been acquired by the Federal Government. Authorized and acquired park lands are managed by the National Park Service through the Superintendent, Everglades National Park.

Developed areas remain basically unchanged from the 1960's, occupying fewer than 1,200 acres or less than 0.1% of the 1.4 million acres contained within the park boundary during its major development phase.

The park includes:

- 82 miles of surfaced roads
- 156 miles of trails (including canoe trails)
- 5 miles of surfaced trails
- 1 mile of elevated boardwalk trails: Anhinga Trail, Pa-hay-okee Overlook, Eco Pond, West Lake, and Shark Valley
- 2 campgrounds: a. Long Pine Key, 108 sites, and b. Flamingo, 235 drive-in and 60 walk-in tent sites
- 48 designated backcountry campsites (accessible by boat)
- 301 buildings, including:
 - 5 Visitor centers
 - Headquarters
 - Maintenance and utility buildings
 - Research facilities
 - 2 Environmental Education camps

- 2 fee collection stations: Main Entrance, and Shark Valley
- 3 concessionaires:
 - Flamingo Lodge, Marina, and Outpost Resort (at Flamingo--the southern tip of the park at the end of the main park road): motel and housekeeping cottages; restaurant; gift shop; marina; store; rental boats, houseboats, and canoes; sightseeing boat and tram tours.
 - Shark Valley Tram Tours (northern portion of park off Highway 41): sightseeing tram tours, rental bicycles, and snacks.
 - Everglades National Park Boat Tours (Everglades City): sightseeing boat tours, rental canoes, gift shop, and snacks.

Recreational fishing is allowed in the park subject to seasons, species and catch limits. Recreational fishing and monitoring of sport fish harvest have been almost continuously monitored since 1958 to assure the activity is consistent with park preservation mandates.

(b) in the surroundings/catchment:

Agriculture, business development and service oriented industries, retirement and vacation communities.

24. 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:

Exotic plants are the single most serious long-term resource management challenge to Everglades National Park. Over 250,000 acres (101,171 ha) of the park and 500,000 acres (202,343 ha) of adjacent lands are infested. Without control and management, these plants can and will continue to replace native plant communities in the park. Exotic animals are present and monitored.

The "Hole in the Donut" area of the park consists of more than 6,000 acres (2,428 ha) of former wet prairie and pine forest. It continued to be privately owned and actively farmed until it was acquired by the park in 1975. The suspended farming operations have allowed disturbed top soil to be overtaken by Brazilian Pepper (*Scinus terebinthifolius*), an invasive non-native species. Intense experimentation showed the only effective control method to be the scraping of the disturbed soil to bedrock and its removal from the site. This work was begun in 1994 and has since treated and restored 987 acres (400 ha). Work continues each dry season.

Other invasive exotic plants of concern are Australian Pine (*Casuarina equisetifolia*), Melaleuca (*Melaleuca quinquenervia*), Old World Climbing Fern (*Lygodium microphyllum*) and Latherleaf (*Colubrina asiatica*). Since 1999, approximately 15,900 acres (6,434 ha) have been treated for exotic plant removal and control, excluding the "Hole in the Donut".

Exotic animal species were present in the park at the time of the 1979 nomination and remain so. These include a variety of fish species and European wild boar (*Sus scrofa*). Various exotic pets have been released and, for the most part, do poorly. These examples have not represented the invasive threat of the non-native plant species to date. New exotics that are being closely watched and monitored include the Asian Swamp Eel (*Monopterus albus*) and Burmese Pythons (*Python molurus*) (the latter appearing to be successfully reproducing in the wild).

Illegal poaching continues to be an occasional problem in the park; commercial fishing has been banned.

The near completion of park land acquisition in the East Everglades expansion area, where hunting had previously been allowed, has facilitated enforcement of laws and regulations now prohibiting hunting parkwide.

In 1985, all commercial fishing within the park was banned. Although the park's enabling legislation had envisioned a continuation of this activity, concerns about harvest impacts on species abundance, composition and diversity prompted the ban, which remains in force.

In ratio of size to visitation, and in view of the remote and difficult visitor access presented in the majority of the park, there is only limited concern about the negative impacts of visitors and visitor use. The major exception to this statement is presented in Florida Bay. The current process to prepare a new General Management Plan is giving considerable attention to the visible impacts of boating through groundings and propeller scars on Florida Bay. These impacts cause seagrass die offs which, in turn, affect fish, lobster and shrimp nursery habitat and ultimately wildlife higher up the food chain. Proposals are under consideration to limit numbers of boaters through a permit system that could also require completion of a training session on the intricacies of the Bay bottom and the needs for caution while boating in the area.

Hurricanes are natural and recurring phenomena in south Florida and have been for millenia. They serve to regenerate forest and vegetation succession through seed dispersal. They also serve to flush marine and coastal areas and maintain natural conditions in isolated basins. Wildlife is minimally impacted by these events. The most recent hurricane events with significant resource impacts on the park were "Andrew" in 1992 and more significantly "Donna" in 1960. More recent storms have been thought to increase the spread of invasive non-native plants.

As mentioned in previous sections, there is also a constant risk of uncontrolled fires in the site.

(b) in the surrounding area:

The park needs not only a legally guaranteed minimum amount of available water delivery, but also it needs the appropriate quantity, quality, timing and distribution of water. Please refer to Sections 25 and 26 for more details.

25. Conservation measures taken:

Indicator species: manatee populations have been estimated to be remaining stable in surveys since 1998. The park cooperates in re-introductions of rehabilitated manatees following injury or orphans, and tracks their movements and numbers; roseate spoonbill *Ajaja ajaja* populations in Florida Bay were estimated at 1,200 – 1,300 pairs in the 1970's, and at 500 pairs in 2001-02; loggerhead sea turtle populations have been counted as stable, while green turtle numbers are unknown.

The park's current general management planning process is addressing concerns about numbers of boaters in Florida Bay and their impacts on bottom land wilderness, including especially propeller scars from groundings.

The current "Master Plan" for the park was prepared in 1979. It reaffirmed the park's then current configurations of development areas for visitor services and continued the commitment to limit development to those areas. The Master Plan was the first to firmly place the park in the context of its regional ecosystem setting, and addressed adjacent land and water use issues that affect the park's integrity. It called for a proactive park participation in local and regional planning issues to enhance protection of park resources.

A new General Management Plan for the park was begun in 2002 as required by law. This 4-5 year process will address a new range of internal park issues and regional ecosystem challenges facing the park. A round of public involvement and "scoping" meetings was held in January, 2003. The results have been incorporated into more detailed management prescriptions and park zoning ideas.

Major areas of concern include: boating; access; facilities; partnering; ecosystem restoration; and education/interpretation. A second round of public meetings will be scheduled during 2004 to further the process.

Everglades National Park was the first to use prescribed fire to maintain biological diversity. The Organic Act of 1916 not only established the National Park Service, but also described the basic objectives of the

Service in managing park units. The preservation objectives were interpreted to mean that humans should not interfere with these land areas, and should protect them from processes such as fire, which would damage the natural resources. The preservation objectives led to the policy of fire exclusion, where all fires were actively suppressed.

Everglades National Park was dedicated in 1947, and early fire management actions were aimed at total suppression of wildland fires. A series of dry years in the 1950s resulted in great efforts in controlling the prevalent fires. Although fire was seen as a major force in shaping the Everglades, too much fire was destroying it. In 1958, a study was initiated to determine the role of fire in Everglades National Park. The study concluded that in order to preserve certain ecosystems, active fire management was needed. As a result of the 1958 study, the first prescribed fire ever in a national park unit was conducted in Everglades National Park. The objectives were to reintroduce fire in a controlled manner to minimize damaging effects and perpetuate the fire-adapted pine forest community of the park. To maintain its biological diversity, fire is a necessary part of Everglades National Park.

Water Quantity, Timing and Distribution

The Experimental Program of Water Deliveries to the park was authorized in 1983. It consisted of a series of “tests” relating to water levels in the eastern canals adjacent to the park, and the effects of those levels on park hydrology (through seepage loss of ground water) and nearby agriculture. When the project was authorized, canal levels averaged 6 feet (1.8 m). In 1985, levels were dropped to 5.1 feet (1.55 m). In 1994, levels were held at 4.8 feet (1.46). They now average 4.1 feet (1.25 m). The Experimental Program has been suspended. Beneficial effects on park water quantity have yet to be realized.

Water Quality

Significant efforts have gone forward to address the issue of water quality as it relates to introduced phosphorous from agricultural fields into run off to Loxahatchee National Wildlife Refuge and Everglades National Park.

A combination of Best Management Practices (farming operations) and the construction of Stormwater Treatment Areas to filter water run off before its introduction back into the Everglades has produced results in the larger Everglades system. The rate of cat tail expansion in Water Conservation Area 2-A (an indicator of phosphorous concentrations) was estimated at 2,375 acres (961 ha)/year in 1995 and 785 acres (318 ha)/year in 2003. Since 1994, an estimated 1,400 metric tons of phosphorous have been reduced from flows into the Everglades.

In 2003, the State of Florida revised its Everglades Forever Act; the legislation governing water quality issues in the Everglades. The revision extended the legal deadline for conformance with numerical water quality standards from 2006 to 2116. The State’s Environmental Regulatory Commission adopted the enforceable standard at 10 parts per billion of phosphorous (PPB).

No measurements for this standard at park flow ways are consistently available from 1979 to present. In 2003, the measurements were: for the 12 month period ending March, 2003, average levels of 10.1 PPB in Shark River Slough; for the 12 month period ending March, 2003, average levels of 5.9 PPB in Taylor Slough.

Water quality will remain a constant focus for park and general Everglades restoration as elements of the C-111 and Modified Water Deliveries projects and the Comprehensive Restoration Plan move forward.

26. Conservation measures proposed but not yet implemented:

A new General Management Plan for the park was begun in 2002 as required by law. This 4-5 year process will address a new range of internal park issues and regional ecosystem challenges facing the park. A round of public involvement and “scoping” meetings was held in January, 2003. The results have been incorporated into more detailed management prescriptions and park zoning ideas.

Major areas of concern include: boating; access; facilities; partnering; ecosystem restoration; and education/interpretation. A second round of public meetings will be scheduled during 2004 to further the process.

Several major projects have been conceived, legislatively authorized, and implementation begun to address this central and critical need for restoration of the park and preservation of its resources. Restoration objectives for water quantity, quality, timing and distribution have yet to be realized.

In particular, three major projects are underway to address different aspects of the quantity, timing and distribution of water deliveries to the park. They differ in scale, project purposes, and geographic focus. But they are related and are being designed to mutually reinforce south Florida ecosystem needs.

1. The C-111 project aims to reduce ground water loss from the park through seepage along its eastern boundary and to restore more natural water deliveries through the Taylor Slough into NE Florida Bay. Construction work on new pumps is proceeding, along with work on several detention areas to hold and filter water before release into the park. The project has not been made operational and effects on park water quantity have yet to be realized.

2. The Modified Water Deliveries project is intended to expand the park's northeastern boundary and restore more natural flows to NE Shark River Slough. Construction work is proceeding and almost all lands for the park expansion have been acquired. The project has not been made operational and effects on park water quantity have yet to be realized.

3. The Comprehensive Everglades Restoration Plan (CERP) was submitted to Congress by the Corps of Engineers in July 1999, and approved in the Water Resources Development Act (WRDA) of 2000. CERP lays out an ambitious plan for the south Florida ecosystem, as well as the south Florida built-environments. The plan has identified 68 individual projects that will take more than 30 years to complete, at an estimated cost of \$7.8 billion. CERP is a concept model made up of 68 individual projects, at various locations throughout the Greater Everglades ecosystem. A major objective is to increase capacity to store water in south Florida, thereby making greater supplies of water available for natural system and human needs and providing additional options to meet flood control needs.

The CERP is authorized to study the feasibility and desirability of delivering an additional 245,000 acre feet (0.30 cubic Km) of water, over current deliveries, to Everglades and Biscayne National Parks. This increase would approach 90% of target restoration flows. Together with decompartmentalization in the central and northern Everglades, and a variety of steps to assure water quality, the impacts on the integrity of park resources can be substantial.

Proposals of the Comprehensive Plan for water deliveries to the park have not been made operational and are now scheduled for implementation in the latter part of the Plan (2030's). As noted above, projects to restore more natural hydrologic conditions are at various stages of implementation. Park science and resources management staff are fully engaged in modeling to further refine restoration goals and concepts and in field monitoring to assess status of key indicator species and water quality (see below) and to remove and control invasive exotic species.

With generally wetter weather conditions in south Florida since 1994, relatively more fresh water, as localized rainfall and through drainage from more northern areas of the park, has reached Florida Bay. A result has been a general lowering of water salinity and reductions in the sizes of algae blooms. This suggests that attempts to restore water flows through the extent of the park, once they are made operational, will be effective in helping to restore the ecological balance of Florida Bay.

27. Current scientific research and facilities:

Since 1994, an integrated science program has been reviewing and coordinating research activities in Florida Bay; 85% of which is within the park's boundaries. This program has established priorities, based on management needs and information gaps, for research permits issued by the park. More than US \$6 million annually has gone to support this program from federal/State interagency and private/academic sources. Priority interest areas include sediment core sampling to determine historical patterns of sea grass mortality, modeling to assess circulation patterns in Bay waters, and extensive water quality monitoring.

The park reviews and evaluates research proposals and issues permits for approximately 100-125 research projects each year. Permits are judged on the basis of the relevance of research objectives to park management needs, the degree of intrusiveness of the project and potential for resource damage, whether similar projects have been done or are ongoing, duration, and size of research team and amounts of equipment. In addition, there is an active program of inventory and monitoring throughout the park; the results of which are frequently fed into regional information sharing networks with other partners, including government, private and academic institutions.

Permitted research activities share information and results for the benefit of park management and policy level decision makers. Information has been useful in deciding issues of public access for park visitors (for example, closures of areas for crocodile nesting), designing engineering projects for waste water treatment (for example, at sensitive resource areas like the Flamingo complex), and adopting fishing and boating regulations in Florida Bay and in the 10,000 Islands area.

Additional information on park science programs and research in the park can be addressed to EVER_Information@nps.gov

Research projects are also addressed on the park web-site at www.nps.gov/ever, at <http://everglades.fiu.edu>, and at www.evergladesplan.org

28. Current conservation education:

A standard park brochure, available in several languages is provided free of charge to park visitors. It features reference to Ramsar and the other international designations in the text. Two park newspapers are published each year and refer to the international designations. Interpretive themes vary at each visitor center and facility. The Coe Visitor Center addresses resources, visitor activities, and management issues park-wide. These same topics are addressed in a more localized way at Flamingo, Royal Palm, Shark Valley and Gulf Coast visitor centers and at trail heads and observation points throughout the park.

As noted above, the international designations theme is intimately woven through most of the park's educational and information programs and materials. The park is prohibited from "marketing" itself. However, concessionaires in the park, licensed commercial use providers, local community tourism interests and chambers of commerce actively promote themselves in connection with the park as a visitor destination. International significance themes figure significantly in these promotional efforts. In 2002, an estimated 14% of all park visitors were international. The figure has been estimated as high as 38% in prior years.

Each year, the park sponsors curriculum based programs and visits, in cooperation with local public schools, that reach about 12,000 students (10-12 years old). Programs involve direct interaction with Rangers and teachers for 1 day to 3 day overnight visits. The park maintains two environmental education camps to support this program. Since its inception in 1971, more than 320,000 students have completed this program.

29. Current recreation and tourism:

Passive recreation that is based on resource appreciation and enjoyment and is not destructive of or detrimental to resource conservation. Visitation in 2003 was 1,060,602.

30. Jurisdiction:

Everglades National Park is owned by the United States Government on behalf of the American public. It is managed by the National Park Service, a federal agency. As a National Park, it receives the highest level of conservation protection afforded by federal law in the United States.

31. Management authority:

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First Name:	Richard
Last Name:	Cook
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Postal Code:	33034
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