

*FY 2005-2006
Progress
Report*

on activities of the

Florida Fish & Wildlife Conservation
Commission

**Endangered/Threatened
Species Management &
Conservation Plan**



**FLORIDA'S ENDANGERED AND THREATENED SPECIES
MANAGEMENT AND CONSERVATION PLAN -
FY 2005-2006 PROGRESS REPORT**

by the

Florida Fish and Wildlife Conservation Commission

**Prepared by Staff of the
Florida Fish and Wildlife Conservation Commission**

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EXECUTIVE SUMMARY

This document constitutes the 28th progress report and update of the Florida Endangered and Threatened Species Management and Conservation Plan as required under Section 5 of the Florida Endangered and Threatened Species Act of 1977 [s. 372.072, Florida Statutes (F.S.)]. That section of the Act required the preparation of an initial plan for submission to the 1978 Florida State Legislature, and that a revised and updated plan for management and conservation of endangered and threatened species shall be submitted annually.

The initial plan submitted in March 1978 remains the basic reference document for the annual updates. Subsequent annual reports may be consulted regarding a chronological history of the listed species activities of the former Florida Game and Fresh Water Fish Commission (GFC) and the Florida Department of Environmental Protection (DEP). These activities have since become the responsibility of the Florida Fish and Wildlife Conservation Commission (FWC) upon the merger of the GFC with the Marine Fish Commission and certain organizational functions of DEP on July 1, 1999. Copies are available from the Division of Habitat & Species Conservation, Species Conservation Planning Section of the FWC, Tallahassee.

This document consists of two main sections. The “Statutory Requirements” section covers five of the six elements listed in Statute, including a description of FWC’s criteria for research and management priorities, a description of FWC’s citizen awareness program, policies pertaining to listed species, required legislation, and a funding request. The sixth element required by Statute is a progress report. The “Progress Report” section provides a description of agency actions for listed species, and provides contact information for individuals who desire more knowledge about a specific species or action. This Progress Report includes eight reports of staff activities covering listed mammals, 36 reports covering listed birds, four reports covering listed amphibians, 12 reports covering listed reptiles, three reports covering listed fish, five reports covering listed invertebrates, four reports covering listing evaluations, and one report on habitat modeling efforts. Additionally, this section covers agency actions to provide technical assistance and coordination, Critical Wildlife Areas, the Landowner Incentive Program, law enforcement actions for listed species, and a summary of listed species permitting.

I would like to express my appreciation to the many people who contributed to this report. Judy Gillan, Dan Sullivan, and Sandy Wilson provided information regarding statutory requirements. Shane Belson, Joan Berish, Ashleigh Blackford, Mike Blondin, Robin Boughton, David Cook, Stuart Cumberbatch, Michael Delany, Terry Doonan, Nancy Douglass, Harry Dutton, Nancy Dwyer, Mark Endries, Norberto Fernandez, Marty Folk, Derek Fussell, Kelly Gamble, Brooke George, Jim Garrison, Jeff Gore, Katherin Haley, Cathy Handrick, Allan Hallman, John Himes, Don Holway, Costas Katecho, John R. Knight, Carol Knox, Darrel Land, Adriene Landrum, Phil Manor, Ed Matheson, Walt McGown, Mike McMillan, Anne Meylan, Karl Miller, Eric Nagid, Steven A. Nesbitt, Annemarie Prince, Gregg Poulakis, Fred Robinette, James A. Rodgers, Jr., Katie Roscoe, Nuria Sancho, Barbara Schmeling, Steve Shattler, Stephanie Simek, Valerie Sparling, Rick Spratt, Dan Sullivan, Robbin Trindell, Christopher Tucker, David Turner, Marsha Ward, Leslie Ward-Geiger, Adam Warwick, John West, Angela T. Williams, and Ricardo Zambrano contributed to the progress report. Special appreciation is

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SUMMARY OF IMPERILED WILDLIFE LISTS

The first Florida endangered species list consisted of 23 species and was promulgated in 1972. The listing concept was expanded in 1973 to include threatened species, and again in 1979 to include species of special concern. The State lists are revised as needed and constitute Rules 68A-27.003 (endangered), 68A-27.004 (threatened) and 68A-27.005 (species of special concern) of the Florida Administrative Code (Title 68A, F.A.C.). Currently, the Florida Fish and Wildlife Conservation Commission (FWC) lists 118 species as endangered (41), threatened (26), and species of special concern (51; Table 1). A complete listing of Florida's imperiled wildlife species may be accessed at <http://myfwc.com/imperiledspecies/pdf/Threatened-and-Endangered-Species-2006.pdf>, or at the F.A.C. website, located under Chapter 68 - FWC, section 27.003 - .005 <http://fac.dos.state.fl.us/>. The federal agencies that share the authority to list species as Endangered and Threatened are the National Oceanic and Atmospheric Administration-National Marine Fisheries Service (NOAA-NMFS) and U. S. Fish and Wildlife Service (USFWS). The NOAA-NMFS is responsible for listing most marine species. The federal list of animals and plants is administered by the USFWS, and this list is published in 50 CFR 17 (animals) and 50 CFR 23 (plants). Additional information regarding federal listings can be located at the following websites; NOAA-NMFS - <http://www.nmfs.noaa.gov/pr/> and USFWS - <http://endangered.fws.gov/wildlife.html#Species>. A listing of plants that are protected under the jurisdiction of the Florida Department of Agriculture and Consumer Services (DOACS) may be accessed at http://www.fl-dof.com/forest_management/plant_conservation_index.html.

Table 1. Summary of Official Lists of Florida's Endangered Species, Threatened Species and Species of Special Concern.

STATUS DESIGNATION	FISH	AMPHIBIANS	REPTILES	BIRDS	MAMMALS	INVERTEBRATES	TOTAL
E	3	0	6	8	20	4	41
T	2	0	10	10	4	0	26
SSC	10	5	8	18	6	4	51
TOTAL	15	5	24	36	30	8	118

STATUTORY REQUIREMENTS

CRITERIA FOR RESEARCH AND MANAGEMENT PRIORITIES

To ensure the State's resources are properly spent on conserving Florida's imperiled species, the FWC (FWC) uses a variety of tools to prioritize research and management decisions for State-listed species. The primary tool used is the state listing process described in 68A-27.0012 Florida Administrative Code (F.A.C.). This process uses a quantitative system to identify Florida's most imperiled species and directs the development of a management plan for each species undergoing listing action. In addition to the listing process, the FWC uses a species ranking process that was developed by FWC staff and published in Wildlife Monographs (Millsap et al. 1990). This ranking process provides a biological score which is intended to rank species based on their biological vulnerability; an action score that ranks species based on the amount of available information and ongoing management actions for a species; and a supplemental score that looks at variables not included in biological or action scores. These scores help identify species most in need and the amount of effort previously expended on them, which then is used to help in prioritizing agency resources. In addition to these tools, the FWC must address activities mandated by legislation, court rulings, grant agreements, and approved management plans when setting priorities. The FWC uses a combination of the listing process, the ranking process, and other mandated activities to allocate resources for the protection of Florida's state-listed species.

CITIZEN AWARENESS PROGRAM

Summary (Judy Gillan).--Citizen awareness programs are conducted by FWC staff throughout the agency. The following is an attempt to combine the efforts that occur throughout the agency into one cohesive report.

Media Relations and Information Requests.--Staff prepared 29 statewide news releases including one on bald eagles (*Haliaeetus leucocephalus*), one on burrowing owls (*Athene cunicularia*[*Athene cunicularia floridana*]), one on Florida panthers (*Puma concolor coryi*), one on red-cockaded woodpeckers (*Picoides borealis*), 10 on Florida manatees (*Trichechus manatus latirostris*), two on Florida black bears (*Ursus americanus floridanus*), five on gopher tortoises (*Gopherus polyphemus*), one on American crocodiles (*Crocodylus acutus*), two on American alligators (*Alligator mississippiensis*), one on North Atlantic right whales (*Eubalaena glacialis*{*Balaena glacialis* [*incl.australis*]}) and four on the reclassification of four species: Panama City crayfish (*Procambarus econfinae*), bald eagle, gopher tortoise and Florida manatee).

An additional 30 regional news releases included six on American alligators; two on bald eagles; one on nesting shorebirds including piping plovers (*Charadrius melodus*), black skimmers (*Rynchops niger*), oyster catchers (*Haematopus palliatus*) and least terns (*Sterna antillarum*); two on Florida black bears; three on Florida manatees; two on North Atlantic right whales; two on Florida panthers; two on American crocodiles; one on gopher tortoises; three on sea turtles, including leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*) and

green (*Chelonia mydas*); and one on Atlantic (Gulf) sturgeons (*Acipenser oxyrinchus*(*Acipenser oxyrinchus desotoi*))

Regional Media Contacts.--The Fish and Wildlife Research Institute St. Petersburg-based media relations and research staff members responded to and acted as media spokespersons for 126 media inquiries regarding listed species, including 84 regarding Florida manatees, 31 regarding sea turtles, seven regarding North Atlantic right whales, three regarding bald eagles, and one regarding Florida black bears. Staff also distributed six media advisories, five on manatees and one on right whales.

St. Petersburg-based media relations staff members also worked with three documentary film crews. In April, WUSF filmed a feature on the Marine Mammal Pathobiology Lab (MMPL). Featuring five staff members, the program gave an overview on the FWRI MMPL program, and touched briefly on science behind reclassification. In March and April, Wild Florida filmed a feature on the FWRI Florida panther (*Puma concolor coryi*) staff. The crew went into the field with staff members in search of panthers. In December and January, PBS filmed a feature on manatee captures.

The North-Central Regional public information coordinator responded to approximately 57 media inquiries regarding listed species, including approximately 23 about the Atlantic (Gulf) sturgeons, 12 about Florida manatees, seven about gopher tortoises, five about loggerhead sea turtles, five about Florida black bears, three about bald eagles and two about North Atlantic right whales.

The Southwest Regional public information coordinator responded to 350 media requests regarding listed species, not including alligators. These media contacts included 32 inquiries about Florida manatee protection; 10 about Florida panthers; 17 about gopher tortoises; 35 total for nesting shorebirds including piping plover, black skimmer, oyster catcher and least tern; 11 for Florida sandhill cranes (*Grus canadensis pratensis*); 12 for bald eagles; 27 about Florida black bears; and three inquiries about sea turtles. Alligators accounted for an additional 203 media inquiries and interviews. In addition there were two press conferences - one each for gopher tortoise and manatee protection.

The Northeast Regional public information coordinator responded to 191 media requests regarding listed species, not including alligators. These media contacts included 130 inquiries about Florida black bear; 77 about gopher tortoise; 18 about Florida manatee; 15 about Florida panther; 20 total for least tern, red-cockaded woodpecker, crested caracara (*Caracara cheriway* [*Polyborus plancus audubonii*]), sandhill crane, whooping crane (*Grus americana*), bald eagle, wood stork (*Mycteria Americana*), North Atlantic right whale, red wolf and sand skink (*Neoseps reynoldsi*). Alligators accounted for hundreds of media inquiries and interviews, many resulting from the three fatal attacks the fiscal year. In addition, the Northeast Regional public information coordinator held one news conference about beach nesting least terns and wrote one magazine article about Florida black bears. One Northeast Regional biologist gave approximately 40 television interviews and another 12 newspaper interviews regarding Florida black bears.

The Northwest Regional public information coordinator responded to more than 38 media inquiries including 12 about Florida black bears, two about Panama City Crayfish, 15 about American alligators, one about black skimmers, two about Gulf sturgeon and six about bald eagles.

Video and Photography.--In addition to print news releases, the Media Relations Section and Media Services Section produced three video news releases concerning alligators, red-cockaded woodpeckers, black bears, manatees and the Wildlife Legacy Initiative (which included footage of black bear, Panama City crayfish, and Florida sandhill cranes). The section conducted field photography (still images and video) and editing in support of other communication methods (public service announcements [PSA], news releases, news media requests) for the red-cockaded wood pecker, Panama City crayfish, Florida panther, Florida manatee and the Florida black bear.

Ask FWC.--A new agency question/answer (Knowledge Base) service is available now to handle most of the routine manatee, as well as other, questions that come into the agency. This service provides the individual with an automatic response and a link to the FWC manatee pages for more information. Outreach staff is responsible for updating or adding new questions to the system for all of the FWC imperiled species. The overall request for manatee information has dropped off considerably since the web site and other avenues of information dissemination have evolved.

School Based Presentations and Programs.--Several research staff members participated in the Pinellas County Great American Teach-In on November 17. This program introduces students to, among other things, career options they might never have considered. One participant spoke to students about North Atlantic right whales and marine mammals, another participant spoke about duties as a sea turtle stranding coordinator, and a third participant spoke to students about manatees.

Staff presented Flying WILD activities to girl scouts in Leon County and volunteers participated in two Flying WILD school festivals in Leon and Polk Counties reaching 400 students. Flying WILD is a bird-based education program educating students through festival-based activities about bird biology, migration and natural history. Species covered include osprey (*Pandion haliaetus*), burrowing owls, scrub jays (*Aphelocoma coerulescens*), piping plover (*Charadrius melodus*), snowy plover (*Charadrius alexandrinus*), brown pelican (*Pelecanus occidentalis*), reddish egret (*Egretta rufescens*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), peregrine falcon (*Falco peregrinus*), wood stork and roseate spoonbill (*Platalea ajaja*).

Each year preceding the Florida Black Bear Festival, two special education days are held at Trout Lake Nature Center in Lake County focusing on the Florida black bear. Two hundred forty (240) fourth and fifth graders, teachers and parents participated in black bear activities from the Florida Black Curriculum Guide and learned how to avoid attracting bears at home and what to do if they encounter a black bear.

Marine mammal and sea turtle research staff members gave over 40 presentations to school groups throughout the state. Most of the students were elementary-level, but presentations were also given to middle and high school students, as well as teachers and science camp attendees.

Educator Learning Kits/ "Suitcase" Curriculum Kits for Educators.--The Outreach Coordination office at the Fish and Wildlife Research Institute compiled "suitcase" curriculums

to be provided to classroom teachers to help them educate students about manatees and sea turtles. These kits have been designed for teachers of middle and high school students to provide students a complete lesson on these species. They are meant to be adequate resources for the educator to replace or supplement the visit of a biologist. The suitcases are all inclusive in that they provide lesson plans and activities that are correlated to Sunshine State Standards, bones and biofacts to provide an up-close feel of the animal that could not be brought into the classroom, and different types of media to supplement the learning, including books, videos, slideshows, and computer activities. The suitcase curriculums are loaned out to surrounding counties for up to three months at no cost to the borrower.

The manatee suitcase was checked out five times by groups varying from a college class, local middle and high schools, a reformatory, and staff members utilizing it for various presentations. The sea turtle suitcase was checked out twice.

Advertisement and promotion of the suitcase curriculums is done through the FWRI Web site, teacher workshops (of which five were performed, with a total of 63 teachers from around the state trained), professional workshops (such as the conferences of the National Marine Educators Association and the Florida Marine Science Educators Association), and flyers distributed to educators at various outreach events.

Way of the Manatee Treasure Box Program.--Staff participated in a variety of special events or teacher workshops to promote the Manatee Treasure Box program. The main focus was distribution of boxes to other groups around the state who wanted to use the Way of the Manatee Treasure Box program. A list of supplies and some resources were provided for this service. The boxes are loaned out to area teachers or are used by the host sites for their programs. Outreach staff included additional learning tools, including bone drawings for the Anatomy Center and Center signs for the activity centers and also solicited publishers and authors for books to use with the program. As a result, FWC received hundreds of books to distribute in support of the treasure boxes. Five boxes are in development for distribution to nature and environmental education centers.

Workshops and Classes.--Staff and volunteer facilitators provided approximately 65 one-day workshops to approximately 1,600 educators, including workshops involving Project WILD, Aquatic WILD, Schoolyard Activities and Ecosystems and the Florida Black Bear Curriculum Guide (FBBCG). K-12 program volunteers throughout the state continue to donate thousands of hours of their time and expertise annually, to provide one-day workshops to educators and promote our programs through their workplaces and networks. Species covered in Project WILD include the Florida panther, Florida black bear, Florida manatee, American alligator, American crocodile, gopher tortoise, loggerhead sea turtle, green sea turtle, leatherback sea turtle, hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), osprey and burrowing owl.

The Hunter Safety section spent approximately 406 hours teaching Florida's endangered/imperiled species to just over 12,000 students.

Web-based Outreach: E-field Trips.--An internet company specializing in educational field trips available on-line for classrooms worked with staff to update our e-field trip about manatees. This engaging self-guided tour into the natural history and ecology of the manatee

gives elementary to high school students, nationally and internationally, a tool to learn about the manatee without traveling to or within Florida. A student journal and a question/answer session go along with the on-line field trip. A total of 301 schools from almost all of the 50 states and three US territories participated. Florida students continue to be the highest number of students who visit this site with 118 schools participating and almost 4,000 students participating in the on-line field trip.

Efforts are underway by FWC staff to develop an e-field trip on right whales. Staff coordinated graphic designs and text selection with other biologists, education and graphic art staff. The project was started in the spring of 2006 and should be available to students by October 2006.

Community Outreach.--Chinsegut staff hosted three public programs reaching 102 people: two on gopher tortoises, one on alligators and one on wood storks. An annual festival, Reptile and Amphibian Expo, was held in October at Chinsegut Nature Center with an attendance of 483 people. This festival included two talks on alligators and guided hikes on a gopher tortoise trail.

In addition, Chinsegut staff responded to 14 telephone calls for information; four gopher tortoise, two alligator, one manatee, one red-cockaded woodpecker, one wood stork, three panther and two sandhill crane.

Research staff members attended the Tampa Electric Company Manatee Viewing Center tenth anniversary celebration. FWC manatee research was discussed with members of the public, and related publications and materials were handed out.

Regional and Tallahassee staff began to work with an interagency group to address panther awareness, especially in Collier County. Major concerns included keeping family, pets and livestock safe. A draft awareness and education plan was developed and text for a Living in Panther Country brochure drafted.

FWC law enforcement officers based in Collier County are actively engaged in panther education and outreach. They have an outreach exhibit booth that they take to many speaking events including school career days, the county fair, a local parade and FWC classes such as Hunter Safety. These FWC officers have talked to thousands of Collier County residents about Florida panthers throughout the year.

The Florida Black Bear Festival was held for the seventh year in a row on October 1, 2005 in Umatilla just south of the Ocala National Forest. Attendance peaked at 8,000 participants mostly from Lake, Marion, Seminole and Osceola counties. The festival seeks to provide local residents with tips on how to live compatibly and safely in bear habitat in a fun and festive atmosphere. Presentations, exhibits and field trips focus on how to live safely in bear habitat and reduce bear attractants and hence encounters with bears.

Black bear response agents distribute Living in Bear Country brochures when they respond to bear complaint calls. In the Northeast Region, bear response agents were sent out on 69 site visits and distributed the brochures and any additional material the homeowner needed such as plans for building bear resistant garbage can caddies or electric fencing.

One Northeast Regional field biologist delivered five presentations to approximately 225 residents and provided outreach with an exhibit trailer to three events reaching approximately 2,550 local people living in bear country. A special targeted effort was made with the Seminole County Sheriff's Office District 7 providing bear information and response training to 30 officers

and about 20 volunteers called Seminole County Sheriff's Office Citizens on Patrol. A training CD was produced for internal use. In addition, the northeast regional public information coordinator utilized the traveling exhibit trailer 24 times to educate and inform school children, festival-goers, civic groups, etc., about listed species.

Northwest Regional staff initiated the Franklin County Initiative (FCI), which identified issues at the root of human-bear conflicts. As a result, the City of Carrabelle included mandatory trash pick up in its 2007 Comprehensive Plan, which will reduce unauthorized dumping, thereby reducing human attractants available to bears. Carrabelle also will require Waste Management Inc. to provide access to residential bear-proof containers. FCI submitted a proposal for a \$100,000 grant through the Wildlife Legacy Initiative, which, if approved, would broaden the scope of the FCI and provide the front-end cost of animal resistant containers for citizens. In addition, FCI presented the Bear Curriculum Guide to the Franklin County school board, and September 21-23, 2006 was been designated as dates for teacher training to be conducted by FWC and Defenders of Wildlife staff.

The FWC exhibit at the 2006 Florida State Fair featured live displays and information on the following listed species: Florida panther, gopher tortoise, American alligator, American crocodile, Florida black bear, red rat snake (*Elaphe guttata*) and Eastern indigo snake (*Drymarchon corais couperi*). Approximately 400,000 fair patrons visited the FWC state fair exhibit.

MarineQuest is the annual open house of the FWC Fish and Wildlife Research Institute and is held in St. Petersburg. Since the first event was held in 1995, MarineQuest has evolved into a three-day event that welcomes thousands. The first two days accommodate students in grades 4-12 who are invited to participate in "School Daze," a special version of MarineQuest available to schools by registration only. Students tour lab stations managed by FWRI scientists. Vibrant exhibits with hands-on displays and activities draw students into the world of marine science and the fascinating things that FWRI scientists discover. The third day, a Saturday, is open to the general public. MarineQuest 2006 was held April 20-22. The event hosted 1,900 students and teachers during the School Daze program and 2,400 visitors during the general open house. Two displays discussing listed species were set up at the event. Inside, the manatees and turtles arts and crafts room gave kids of all ages the chance to make a manatee sock puppet and find coloring sheets, activity packets, and crafts. Visitors could also see turtle shells and skulls, touch a full-sized manatee skeleton, and talk with FWRI biologists about endangered and threatened marine species in Florida. Outside, a manatee rescue boat was on display and allowed visitors the opportunity to look inside a specially designed boat used to rescue manatees, as well as a chance to speak with manatee biologists about the techniques used to rescue manatees.

The contract for participating with the State of Florida Nature and Heritage Tourism Center continued this year. FWC provides free manatee related materials to the center in exchange for free distribution of the materials to tourists. The center is located in White Springs, a short distance away from I-75 near the Georgia-Florida border. Other visitor centers request materials for distribution without the formal contract process that is used at this facility.

Manatee Outreach staff visited several sites during 2005-2006: Citrus County (festival), Homosassa Springs State Wildlife Park, Tampa Electric Company Manatee Viewing Center (site visit), and toured the necropsy facilities and the FWRI facilities. In addition to providing information at these events/sites, staff maintained the collection of monofilament fishing line from a recycling bin in St. Marks, Florida.

In June, a press event was held to present the framed decal to the middle school 2006-2007 Manatee Decal Art Contest winner, Berry Donovan Foster, who was a 7th grade student at Citrus Springs Middle School. Each year tax collectors participate by selling decals at the tax collection sites around the state. Over 75 students participated in the art contest for the manatee decal. The 2005-2006 decal, with art designed by Vivian Chu, was available for sale from July 1 to June 30. Over 10,000 decals were sold with Chu's design.

A contract was signed with Responsive Management to perform a manatee education assessment survey among the state's manatee education providers. Information is still being gathered for the survey.

Marine mammal and sea turtle research staff members participated in numerous other outreach activities, including information booths at beach clean-ups, Waterfest in Okeechobee, Nature Scape at John D. McArthur State Park, and participation in science fairs and several summer camps. Both manatee and sea turtle staff members gave presentations to regional FWC law enforcement officers and sea turtle staff members trained Miami dispatchers and supervisors.

Manatee Captures and Tagging.--Members of the FWRI outreach office were on hand at manatee captures and tagging during the months of December and January to help explain the research goals of the activities to members of the public.

Volunteer Opportunities.--During the last fiscal year, 51 volunteers worked with the marine mammal research program. Approximately 40 volunteers assisted with set-up, take-down and implementation of the Florida Black Bear Festival at Umatilla.

FWC's Chinsegut Nature Center in Hernando County partnered with The Wildwood Girl scout camp in Sumter County to receive a \$2,500 grant to develop a gopher tortoise monitoring program. The goals of the grant are to involve girl scouts in the development of a scientific gopher tortoise monitoring program. Chinsegut Volunteers will assist on a supervisory board and assist in monitoring. New GPS units purchased through the grant will be used to map Gopher tortoise burrows, and a baseline database will be set up at the nature center. Initial planning took place in the spring of 2006, and the project is expected to take place from late fall of 2006 and spring of 2007.

The Ridge Rangers volunteer program, coordinated by the Lake Wales Ridge Wildlife and Environmental Area, collaborates with 12 land managing agencies along the Lake Wales Ridge to engage volunteers in conservation efforts. Volunteers work on a wide variety of projects including Florida scrub-jay surveys, gopher tortoise monitoring, rare plant inventories, planting of listed species for restoration projects, maintenance of listed plants in the wild and the removal of harmful exotics from native areas.

Manatee Mortality Database.--The Manatee Mortality Database, housed on the FWRI Web site (<http://research.myfwc.com/manatees/>), provides internet users a way to search for data on manatee mortalities in the state of Florida. The summary report allows users to search manatee mortality data by Florida county, probable cause of death, month and year, while the individual report allows users to search manatee mortality data by Florida county, probable cause of death, and date range, and also provides more detailed information including sex, size, and region in which the death occurred. A preliminary mortality report is also provided.

The reports are updated monthly or more often if the need occurs. Web visitors can subscribe to receive a notification e-mail when the database has been updated or new or updated tables have been posted. Over the last fiscal year, the number of subscribers to this service grew from 360 to 624.

Publications.--FWC's bimonthly magazine, *Florida Wildlife*, included seven articles within the "News and Notes" section – one on the listing process, two on Atlantic (Gulf) sturgeons, two on Florida panthers, one on Florida manatees and one on humpback whales (*Megaptera novaeangliae*). An additional six articles addressed the following species in greater length; Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*), burrowing owls, myths about panthers and manatees, Miami blue butterflies (*Cyclargus [=Hermiargus] thomasi bethunebakeri*), manatees, ivory billed woodpeckers in Arkansas, one story on dunes which features the Perdido Key beach mouse (*Peromyscus polionotus trissyllepsis*), Chocktawhatchee beach mouse (*Peromyscus polionotus allophrys*) and the St. Andrews beach mouse (*Peromyscus polionotus peninsularis*). Lastly, *Florida Wildlife* included a special full color insert on Florida's Wildlife Legacy Initiative featuring scrub jay, gopher tortoise, Miami blue butterfly and Sherman's fox squirrel (*Sciurus niger shermani*). Florida Wildlife magazine has a paid subscription base of 3,500 subscribers and is circulated to an additional 14,500 reaching a total of 28,000 readers.

Since 1998, FWC has published a two-page feature in *Florida Monthly* magazine called, "Watching Wildlife with the Florida Fish and Wildlife Conservation Commission." *Florida Monthly* has a paid circulation of 215,229 people per month. During this reporting period "Watching Wildlife" highlighted the Florida mouse (*Podomys floridanus*) and the flatwoods salamander (*Ambystoma cingulatum*).

A total of 220 phone or mailed requests for information were received for a response. Of these, 141 were requests for bulk orders of materials to be distributed through the requestor's organization.

Coloring Activity booklets, manatee brochures and the Commonly Asked Questions booklet continue to be popular reprinting/distribution items. The brochure, "The Florida Manatee— A Florida Treasure" was reprinted. Bookmarks with the resource protection number and a manatee support message are print by-products of the multilingual card that the Boating and Safety office continues to reprint.

Based on writing a previous white paper, outreach staff pursued the reasons behind why Columbus called manatees mermaids and if they were indeed manatees or the Caribbean monk seal. The developing historical publication is geared toward middle and high school students and should be available on-line during the 2006-2007 or 2007-2008 fiscal year.

The Sea Stats series of brochures provides information on some of FWC's areas of marine research including fish, manatees, and right whales. Approximately four pages in length, these brochures provide information on age and growth, distribution, migration, feeding habits, and more. Printing and distribution of the *Manatees* Sea Stats is on hold while the brochure is under review. Printing of the *Right Whales* Sea Stats is also on hold while the brochure is reviewed, but 800 copies of the brochure were distributed. No copies of the *Sea Turtles* Sea Stats were printed this fiscal year, and over 4,500 copies were distributed. Printing of all three titles is scheduled for the upcoming fiscal year.

Signs--The FWC was awarded a grant in 2004 from the National Fish and Wildlife Foundation aimed at increasing mariner awareness of right whale conservation and recovery through the development and strategic placement of right whale protection signs. The 3-foot by 4-foot metal signs provide information such as physical characteristics that help to identify right whales, and includes a map showing seasonal distribution of right whales off of the coastal southeastern United States. The signs also highlight how the boating public can help protect this endangered species, including abiding by the federal 500-yard no approach regulation and immediately contacting the U.S. Coast Guard if an injured, entangled, or dead right whale is sighted. Partners with this project include the Georgia Department of Natural Resources, the South Carolina Department of Natural Resources, the University of North Carolina Wilmington, and the National Oceanic and Atmospheric Administration.

The FWC, along with these partners, are strategically placing approximately 140 signs at participating facilities throughout the coastal areas of the southeastern United States. The signs are generally placed within close proximity to oceanic inlets near the right whales' migratory route or calving areas. Right whale signs can also be found at major boat ramp facilities servicing boaters who frequent these coastal waters.

STATEWIDE POLICIES PERTAINING TO LISTED SPECIES

Listing Process (*Dan Sullivan*)--Prior to creating policy to protect imperiled species, one must first have a tool to determine which species are the most imperiled. The tool used to determine which species deserve FWC listing is the listing process described in Rule 68A-27.0012, F.A.C. This process was modified with stakeholder input in 2005. During the current fiscal year, staff of the FWC worked on four active petitions; the bald eagle, the Florida manatee, the gopher tortoise and the Panama City crayfish. Following the guidance of our listing process rule, Biological Review Panels (BRP) for these four species were recommended, discussed and approved at the June 2005 Commission meeting. Public input on the status of these four species was sought from July 15, 2005 through August 31, 2005. The BRP for each species met, evaluated the best available information against the FWC listing criteria (68A-1.004 F.A.C.), and developed a Biological Status Report (BSR) for their species. The BSRs were reviewed by independent scientists, then presented to the Commission at the June 2006 Commission meeting. The final Status Report for the bald eagle is available at <http://myfwc.com/imperiledspecies/reports/Bald-Eagle-BSR.pdf> and recommends removing the eagle from the State Imperiled Species list. The final Status Report for the gopher tortoise is available at <http://myfwc.com/imperiledspecies/reports/Gopher-Tortoise-BSR.pdf> and recommends the species be reclassified to the threatened category. The final Status Report for the Florida manatee is available at <http://myfwc.com/imperiledspecies/reports/Manatee-BSR.pdf> and recommends reclassification to the threatened category. The final Status Report for the Panama City crayfish is available at <http://myfwc.com/imperiledspecies/reports/PCC-BSR.pdf> and recommends reclassification to the threatened category. Staff of the FWC is currently working on management plans for these species and the recommended classification changes will not occur until these plans are completed. It is believed the reclassification of these four species will occur during 2007.

REQUIRED LEGISLATION

Currently, the FWC has no requests for legislative changes affecting wildlife species that are listed as threatened or endangered. The staff of the FWC will work with lawmakers should any legislation involving listed wildlife species be proposed.

FUNDING REQUEST

Recommended Funding Level (Sandy Wilson).-- The recommended level of funding for the FWC endangered species programs in FY 2007-2008 is approximately \$18,096,818 (Table 2). This includes funding to maintain current programs, in addition to anticipated awards from federal grants designed to assist in development of new recovery programs. These include assistance to local governments and private individuals for development of conservation plans, acquisitions and private conservation efforts to benefit listed species.

Table 2. FWC Endangered/Threatened Species Budget Request for FY 2007-2008.

Funding Source	Amount
Nongame Wildlife Trust Fund (NWTF)	\$1,767,959
Florida Panther Research and Management Trust Fund (FPRMTF)	\$2,016,167
Save the Manatee Trust Fund (STMTF)	\$3,694,671
Marine Resources Conservation Trust Fund (MRCTF)	\$6,971,362
Federal Grants	\$3,456,527
Non-Federal Grants	\$100,132
Total	\$18,096,818

PROGRESS REPORT

PROJECT SPECIFIC REPORTS

Research is a systematic means of generating the scientific information that is necessary to guide conservation of endangered, threatened, and special concern species. Additionally, research is a critical process for addressing the biological and management needs of those resources in a way that affords consistent monitoring and evaluation. Significant research has been conducted on many listed species during the past three decades, and results are leading to a better understanding of the extinction process and how managers may alter this process through management actions. Research results have led to management actions that have aided in species stabilization and recovery, may assist in the recovery of some species, and preclude further population declines of others. This section describes the progress of ongoing listed species research and management by FWC staff. Annual reports of these activities are available upon request.

Black Bear

Black Bear Management and Research (*Stephanie Simek, Walt McCown*).--The FWC is involved in research and management efforts to ensure the long-term perpetuation of the Florida black bear. The Florida black bear is currently listed as a state Threatened species and exists in fragmented habitats throughout the state, which include large segments of public and private tracts of land, as well as rural and urban areas. The range of issues confronting our agency regarding black bears is broad. Proactive conservation and management planning is necessary for maintaining the Florida black bear for the benefit of the species and the public. Recognizing that bears are a highly visible species that draw considerable public attention and interest, the FWC developed and organized an agency Florida Black Bear Standing Team (FBBST). The FBBST is comprised of agency personnel who currently work on topics related to bears. The FBBST developed a Charter that states the goals and objectives of the FBBST as well as provides the opportunity for outside agency experts to be invited to participate in meetings when they can contribute to specific topics. The FBBST met six times during Fiscal Year (FY) 2005-2006 and is in the process of revising the existing FWC Bear Policies. Plans are to present the revised policy document to senior leadership for approval during the upcoming FY 2006-2007.

During FY 2005 – 2006, FWC personnel received 2,715 calls regarding bears (this includes sick and injured bears, bear in yard, complaints, etc.) and the number of reported roadkilled bears totaled 148 individuals for the year. Efforts to reduce negative human/bear encounters continued through implementing the Bear Response Agent Program and developing outreach programs to address garbage handling issues in local communities. These efforts are being addressed through community involvement and partnerships with non-profit organizations such as Defenders of Wildlife.

The Bear Response Agent Program was continued in the Northwest and Northeast Regions. In the Northwest, Agents responded to 51 events, including 24 carcass recoveries, seven site visits, and 20 capture efforts. In the Northeast, Agents responded to 140 events, including 31 carcass recoveries, four hit/alive bears, 64 site visits, and 41 capture efforts. FWC

staff continued responding to public inquiry by distributing information and education packets and through e-mail and telephone correspondence. For further details please refer to the Citizens Awareness Program section of this report.

FWC staff spent a month working with Dr. Dan Decker (Cornell University) to begin the development of human dimensions-related topics as part of a comprehensive and statewide approach to successfully manage the Florida black bear. Dr. Decker, as a subject matter expert, assisted the FBBST with establishing a process to obtain an understanding of both internal and external perceptions regarding black bears and black bear management as well as effective methods to address human-bear interactions.

Proceedings for the 18th Eastern Black Bear Workshop, which was hosted by FWC in 2005, were completed and mailed to participants and sponsors at the end of FY 2005-2006. Additional copies of the proceeding may be acquired for \$10.00 each by contacting the Bear Management Program, Florida Fish and Wildlife Conservation Commission, 620 South Meridian Street, Tallahassee, Florida 32399, or bearmanagement@MyFWC.com.

Staff attempted to monitor a rehabilitated cub that was released in June and fitted with a radio-collar to follow its movements and determine its fate. Shortly after being released, the collar emitted a mortality signal and the collar was found in a day bed not far from the release site. It is speculated the bear slipped the collar due to significant weight loss. Staff also coordinated and conducted a variety of projects in cooperation with researchers and managers from state, federal, university, and non-governmental organizations. The “Non-invasive Assessment of Black Bear Movements and Abundance Relative to U.S. 98 within the Aucilla Wildlife Management Area” project Final Report was completed in December 2005 (<http://myfwc.com/bear/Reports/Aucilla-Final-Report.pdf>). This project assessed the movements (number and locations of black bear crossings) and abundance of black bears relative to U.S. 98 within the Aucilla Wildlife Management Area (WMA) and adjacent lands in southeastern Jefferson County. Population estimate calculations failed to provide a reliable estimator due to small generated sample size, low recapture rates, few new captures, and model closure violation. However, habitat differences, intersecting roads, and seasons have an effect on black bear crossing rates. None of these tested variables had an effect on black bear roadkill. Recommendations were provided to address elevated crossing and roadkill activity concurrently for all seasons. These included specific wildlife crossings, habitat manipulations, signage and visual stimuli, and road improvements for the study interval of U.S. 98 as well as considerations for U.S. 19. Additionally, recommendations were provided for current and projected road projects in collaboration with private and state agencies and organizations.

Work continued on the “Determining the Impact of Relocation on Nuisance Florida Black Bears in Central Florida” study; which is being conducted in partnership with the University of Florida and the U.S. Forest Service. The purpose of this study is to determine the efficacy of relocation as a technique for the management of nuisance bears in Florida by the FWC. Nuisance bears were captured in peninsular Florida and relocated to the Ocala National Forest (ONF) after being fitted with radio-collars. The project began in May 2004 and the last bear was captured, collared, and relocated in December 2005, increasing the sample size to 43 bears (33M, 10F). To date, seven bears have died (6M, 1F). Two (1M, 1F) were killed by vehicles, two males were killed illegally, one male died in a forest fire, and two (1M, 1F) were euthanized by FWC for repeated nuisance behaviors. The fate of two male bears remains unknown, although one is believed to have been killed illegally when his intact collar was

recovered from a creek. Twenty bears engaged in nuisance activities post-relocation, five of which were recaptured and relocated a second time; two males were removed from the study after being relocated to Apalachicola National Forest in NW Florida, and three males were moved back to their first relocation site in ONF (per FWC policy), one of which was originally a non-target capture. Three bears that returned to original capture area continued nuisance behaviors. Thirteen bears (9M, 4F) are currently collared and will continue to be monitored through the end of 2006.

Another project that FWC staff, the University of Florida, and the U.S. Forest Service have partnered on is the "Ecology of the Florida black bear at the urban-wildland interface of Ocala National Forest". The goal of this project is to closely monitor the movements and activities of Florida black bears living in the urban-wildland interface of ONF. This project began in late June 2005. To date, a total of 32 bears (17M, 15F) have been captured. At the urban interface, 25 bears (13M, 12F) were captured in two different study sites and seven (4M, 3F) interior forest bears were captured as controls. Three males have dropped their collars and an adult female and her male yearling died of unknown causes. Diel monitoring is being used to determine bear activity patterns and habitat use. A total of five collared females reproduced in 2006. One female lost her cubs after approximately three weeks (no remains were discovered). Seven cubs from the remaining females (1M, 6F) were equipped with expandable radio-collars to document mortality rates. To date, only dispersing sub adult male bears have exhibited documented nuisance behavior. Additional bears may be trapped during the remainder of 2006 and all bears will continue to be monitored into 2007. Cubs born to females that reproduce in 2007 will also be radio-collared.

FWC staff have been involved in several outreach efforts. Staff participated in events such as the 2005 Umatilla Bear Festival.

Current activities and reports can be viewed on the FWC's black bear web page at <http://myfwc.com/bear/>.

Bear-Human Conflicts (Adam Warwick)--Bear-human conflicts in Florida continue to rise with records set in 2004- 2005. Communities on the fringes of the eastern panhandle's public lands are chronic sources of human-bear conflicts. Managing nuisance bear behavior has suffered from a lack of coordination among governmental agencies, citizens, and waste management authorities. Sponsored by the NW Regional Leadership Team, Billy Sermons, Robbie Edalgo, and Adam Warwick initiated an action team known as the Franklin County Initiative (FCI), which identified issues at the root of human-bear conflicts. As a result, the City of Carrabelle included mandatory trash pick up in its 2007 Comprehensive Plan, which will reduce unauthorized dumping, thereby reducing human attractants available to bears. Carrabelle will also require Waste Management Inc. to provide access to residential bear-proof containers. FCI submitted a proposal for a \$100,000 grant through the Wildlife Legacy Initiative, which, if approved, would broaden the scope of the FCI and provide the front-end cost of animal resistant containers for citizens. In addition, FCI presented the Bear Curriculum Guide to the Franklin County school board, and September 21-23, 2006 has been designated as dates for teacher training to be conducted by FWC and Defenders of Wildlife staff.

Beach Mice

Overview (Jeff Gore).--Several subspecies of the old-field mouse (*Peromyscus polionotus*) inhabit dune habitat along Florida's coast and are collectively known as beach mice. Due to the extensive development of their coastal habitat, several subspecies of beach mice are listed as threatened or endangered by state or federal agencies. Biologists have traditionally monitored beach mouse populations through periodic live-trapping; however trapping is labor intensive and therefore, not affordable as a routine long-term monitoring method. FWC biologists are currently developing a method of monitoring the distribution and abundance of beach mice that relies on detecting mouse tracks rather than capturing mice. The method developed involves attracting mice to bait inside plastic tubes that contain an ink pad and paper. Testing on three subspecies indicates that beach mice will readily use the tracking tubes and leave suitable tracks on the paper. These records of mouse presence will be used to monitor both distribution and abundance of mice.

In addition, FWC staff assisted with the collection of tissue from beach mice (taken from tail tips) to be used for genetic analysis. This work was done in cooperation with scientists from the University of California – San Diego who are doing the genetic analysis. For more information on the FWC's actions for these species, contact Jeff Gore at Jeff.Gore@MyFWC.com.

Choctawhatchee Beach Mouse.--FWC staff selected the eastern population of the Choctawhatchee Beach Mouse (*Peromyscus polionotus allophrys*) for preliminary testing of tracking tubes as a monitoring technique. This test area, West Crooked Island, is owned and managed by Tyndall Air Force Base. Mice were found at a high density throughout the surveyed area during initial study periods. Based on tracking tube data collected over the past year, beach mice occupy an estimated area of 5.68 km² (1.05 square miles) of beach habitat along the southeastern edge of Tyndall from Shell Island to West Crooked Island. Plans are to expand the monitoring to the rest of the range of the Choctawhatchee Beach Mouse.

Perdido Key Beach Mouse.--The Perdido Key Beach Mouse (*Peromyscus polionotus trissyllepsis*) is restricted to Perdido Key, Escambia County, Florida. In September 2004, Hurricane Ivan overwashed most of Perdido Key and destroyed much of the dune habitat occupied by the beach mouse. Post storm assessments showed that some mice survived the storm at Perdido Key State Park and on a small area of Gulf Islands National Seashore. FWC biologists installed a grid of tracking tubes on public lands on Perdido Key and have used the tracking data to monitor changes in the distribution of mice after the hurricane. At Perdido Key State Park, beach mice occupied approximately 0.774 km² (0.3 square miles) last year and at Gulf Islands mice occupied 1.73 km² (0.67 square miles). At both Perdido Key State Park and at Gulf Islands National Seashore biologists conducted live-trapping for mice in 2005-2006 and beach mice were caught at each location. Trapping data from Gulf Islands National Seashore suggest that the beach mouse population is relatively secure and slowly expanding as habitat recovers. Data from Perdido Key State Park indicate that the beach mouse population there remains extremely small. FWC biologists have begun training personnel from Florida State Parks and the National Park Service who will continue to monitor mouse populations as more habitat recovers from storm damage.

St. Andrew Beach Mouse.--Assisted by a grant from the U.S. Fish and Wildlife Service, FWC biologists began a range-wide assessment of suitable habitat for the St. Andrew Beach Mouse (*Peromyscus polionotus peninsularis*). Staff also tested tracking tubes as a monitoring technique of the St. Andrew beach mouse in three areas: East Crooked Island, St. Joseph Peninsula State Park, and Cape San Blas. These three areas are owned and managed by Tyndall Air Force Base, Florida Parks, and Eglin Air Force Base respectively. Beach mice were trapped at both East Crooked Island and at St. Joseph Peninsula State Park. Tracking data indicate beach mice occupy about 4.89 km² (2.36 square miles) at East Crooked Island and 8.70 km² (4.20 square miles) at St. Joseph Peninsula State Park. Tracking tube surveys at Cape San Blas failed to detect beach mice.

Perdido Key Beach Mouse Mitigation Option (*Brad Gruver*)-- An Intergovernmental Agreement between the USFWS, FWC, and Escambia County was signed in December 2005 establishing the Perdido Key Beach Mouse Conservation Management Fund (CMF). Establishment of the CMF enabled the implementation of a mitigation option that will allow some development to proceed on Perdido Key while enhancing the survival potential of the Perdido Key beach mouse, a species listed as Endangered by the USFWS and FWC.

Key Largo Woodrat and Key Largo Cotton Mouse

Conservation efforts (*Jeff Gore*).--The Key Largo woodrat (*Neotoma floridana smalli*) and the Key Largo cotton mouse (*Peromyscus gossypinus allapaticola*) are listed as endangered at both the state and federal levels. Both animals are found only in Key Largo, Monroe County, Florida. Due primarily to loss of the tropical hardwood hammock habitat upon which these animals depend, populations of both woodrats and cotton mice are now restricted to the northern half of the Key and almost exclusively to public lands.

Wildlife managers need to regularly monitor woodrat and cotton mouse populations to ascertain their status over time, especially their response to management activities. Monitoring in the traditional manner requires trapping, but trapping is both labor-intensive and potentially stressful to the captured rodents.

In 2005, FWC biologists refined an alternative method of monitoring populations of woodrats and cotton mice using tracking tubes. The tubes are short sections of plastic (PVC) pipe that contain an inkpad, a clean paper, and bait. The animals enter the tubes and leave distinctive ink footprints on the paper. Biologists can use the tracking data to determine the local presence of Key Largo woodrats and cotton mice and assess their current distribution and abundance. FWC staff provided a final report to the U.S. Fish and Wildlife Service that describes a long term monitoring plan based on tracking tubes. FWC biologists also provided technical advice and assistance on woodrat conservation and participated in the Key Largo Woodrat Working Group. The Working Group has addressed multiple management issues for woodrats including captive breeding, predator control, and habitat restoration.

Florida Panther

Genetic Restoration and Management (Darrell Land).--Florida panthers (*Puma concolor coryi*) are endangered by a combination of population and habitat factors. Loss and fragmentation of habitat and unregulated killing over the past two centuries have reduced and isolated populations in the southeastern United States to the point where only one population, estimated at 87 adults and sub-adults in 2003, exists on approximately two million acres of habitat in south Florida. Small population size and geographic isolation increase the chance for extinction of Florida panthers due to demographic instability inherent in small numbers and erosion of genetic diversity from restricted gene flow and inbreeding. In the spring of 1995, the FWC released eight female puma (*Puma concolor stanleyana*) from Texas into areas occupied by Florida panthers in order to offset the potential deleterious effects of inbreeding and to diversify the panther population's genetic composition. None of these eight female Texas puma remain in the population today, but FWC continues to monitor the effects of this genetic infusion and its impact on the panther population.

Telemetry data were collected on 42 radiocollared Florida panthers in southern Florida during the reporting period by the three entities (FWC, Big Cypress National Preserve, and Everglades National Park). Seven new panthers and one that had a failed collar were added to the radiocollared population monitored by FWC this past capture season. Seven panther dens were documented by the three agencies during the study period producing a minimum of 21 (11M, 10F) kittens. All kittens were handled at their dens, permanently marked with subcutaneous transponder chips, and genetic material acquired. A total of 148 panthers have been radiocollared since 1981 and 210 neonate kittens have been handled at dens since 1992. Four (1M, 3F) radiocollared panthers and 13 (9M, 4F) uncollared panther deaths were documented during the reporting period. Three of the uncollared mortalities were handled as neonates and identified by their transponder chips. Ten (6M, 4F) panthers died from vehicular trauma and three panthers (1M, 2F) died from intraspecific aggression. Two panthers (1M, 1F) died from septicemia; one induced by unknown trauma and the other induced by an unknown predisposed cause. A cause of death could not be determined in two panthers (2M) that consisted of only skeletal remains.

We are continuing our evaluation of Global Positioning System (GPS) radiocollars and deployed nine units on panthers during FY 05-06. We are completing analyses on the first 12 GPS radiocollars that have been recovered from panthers since 2002. Our preliminary evaluations show that GPS radiocollars work reasonably well on panthers but do not perform as well as the manufacturer's expectations. Regardless, GPS radiocollars offer a significant advancement over traditional aerial monitoring of panthers with respect to gathering multiple locations throughout a 24 hour day.

FWC's Wildlife Research Section is initiating several research projects that were deemed a priority via the recommendations received from the Florida Panther Scientific Review Team commissioned by FWC and the USFWS in 2002. Current research initiatives include estimating adult and kitten survival, adult panther habitat selection analyses, and den site selection by female Florida panthers. All research plans are vetted with our partners to ensure our research and monitoring efforts are well designed, coordinated, and meet priority needs.

FWC convened a team comprised of administrators, biologists, and law enforcement officers from the National Park Service, USFWS, and FWC and tasked them with developing a

Florida Panther Response Plan. This plan will provide guidance when dealing with human/panther interactions. A draft plan called Guidelines for Living with Florida Panthers and Interagency Florida Panther Response Plan has been through an Environmental Assessment by the USFWS. Public comments have been received and these need to be addressed before the plan is finalized and adopted. This interagency group has developed panther safety tips for public dissemination and will soon have a more detailed brochure available.

An extensive collection of panther reports and publications can be found at the following websites: <http://www.wildflorida.org/critters/panther/index.asp>, and <http://myfwc.com/panther/>.

Florida Manatee

The FWC is involved in many recovery efforts for the Florida manatee (*Trichechus manatus latirostris*). The manatee is native to Florida's coastal and riverine waters and is listed by both the USFWS and the FWC as an endangered species. The State of Florida's efforts to recover the manatee are funded primarily by the Save the Manatee Trust Fund (STMTF) that derives approximately half of its funds from the sale of automobile license plates with the manatee design. Florida has protected manatees since 1892. Current state efforts to recover the population are guided by the Florida Manatee Sanctuary Act of 1978 and the USFWS Florida Manatee Recovery Plan of 2001. In addition, the manatee is protected under the federal Marine Mammal Protection Act and Endangered Species Act.

FWC staff participate as members of the various working groups of the federal manatee recovery and implementation team. Two staff members are on the steering committee for the team. In addition, the FWC and the USFWS have been working to address the existing controversy surrounding manatee issues.

For more detail about the FWC Marine Mammal Program please see the STMTF annual report provided to the President of the Florida Senate and the Speaker of the Florida House of Representatives each year, available at http://research.myfwc.com/features/category_main.asp?id=1986

Listing Evaluation (*Dan Sullivan*).—In accordance with the listing process (68A-27.0012 F.A.C) the Commission approved a Biological Review Panel (BRP) to review the status of the manatee. This group consisted of one biologist from the FWC, one from the USFWS, one from the U.S. Geological Survey, one from academia, and one private biologist. The BRP evaluated the best available information on the status of manatees and compared this to the listing criteria found in 68A-1.004 F.A.C. The information was compiled in the Biological Status Report (BSR) which is available at <http://myfwc.com/imperiledspecies/reports/Manatee-BSR.pdf>. The BSR was distributed to scientists for a peer review and then presented to the Commission at the June 2006 Commission meeting. The Commission agreed with the conclusion of the BSR that the manatee warranted listing as threatened and directed staff to move forward with management plan development. The manatee will remain an endangered species until the rules proposed in the management plan are voted on by the Commission. It is anticipated a draft plan will be available in November 2006 with the final plan being presented in April or June 2007.

Conservation Management Activities (*Carol Knox*).--FWC staff implements many tasks of the Florida Manatee Recovery Plan. The Conservation management activities are focused in five program areas:

Manatee Protection Plans (MPPs) - This involves the development and implementation of county-based MPPs. Staff reviewed and prepared comments on draft county MPPs for Broward, Clay, Duval, Palm Beach, and Volusia Counties. The FWC approved the final MPP for Volusia and Clay Counties. Review of comprehensive plan amendments concerning adoption of Boat Facility Siting Provisions of manatee protection plans were also provided to the Department of Community Affairs.

Rule Making - Staff members develop boat speed and safe haven regulations to protect manatees statewide. Extensive work is required involving county governments, stakeholder groups, and the general public in order to complete rule making efforts. Rule development activities in Lee County, which began in fiscal year 2003-04, were completed in August 2005. Amendments to the General Provisions rules were adopted in October 2005 to address how the measurable biological goals are used when the FWC considers manatee protection rules. Potential changes to the zones in the southern portion of Lemon Bay in Charlotte County went through the Local Rule Review Committee (LRRC) process in August – October 2005, with amendments approved by the FWC in June 2006 (and filed for adoption in July 2006). The LRRC process began in Duval County in February 2006 to consider possible changes in the downtown Jacksonville area to incorporate the existing federal manatee protection zones into the FWC rule.

Permits - A total of 823 correspondence letters were produced for projects during the year. These biological opinions and recommendations on ways to reduce or eliminate potentially negative effects to manatees were provided to regulatory agencies such as the Florida Department of Environmental Protection (DEP) and the water management districts. Implementation of the Boat Facility portion of the FWC-approved MPPs is accomplished by providing these recommendations during the permit review process.

Manatee Habitat - Staff participated in various working groups and task forces regarding seagrass protection, warm water refuges, comprehensive Everglades restoration, minimum flows at springs, and other habitat related concerns. Staff is currently involved in the many tasks required to address the potential loss of artificial warm water manatee habitat.

Public Outreach and Information - Programs focused on continuing to provide information to various user groups including schools children, boaters, tourists, marina owners, and law enforcement entities. An internet e-field trip about manatees has been viewed by 40,000 students in 47 states (almost half from Florida). It is available at <http://www.eFieldTrips.org>.

Manatee Research Program (Leslie Ward-Geiger).--Manatee Mortality and Rescue- During calendar year 2005, 396 manatee carcasses were recovered. There were 79 watercraft related mortalities. For the fiscal year from July 1, 2005 through June 30, 2006, 389 manatee carcasses were documented in Florida. All but 11 of these carcasses were recovered and necropsied in order to determine causes of death. An interactive searchable web-based database with manatee mortality information is available at FWRI's web page (http://research.myfwc.com/features/category_sub.asp?id=2241).

FWC staff and cooperators rescued 84 sick or injured manatees statewide under the federal rescue program. Three oceanaria participate in the rehabilitation program for critical care treatment and are reimbursed for these costs by the state of Florida through FWRI. Manatee rescues provide specific information on causes and geographic locations of manatee injuries and

illness. The information obtained during manatee rehabilitation, treatment, and necropsy assists in reducing manatee mortality.

Population Assessment - Research and management staff participated as members of the USFWS Florida Manatee Recovery and Implementation Team's Manatee Population Status Working Group which developed a status statement on the Florida manatee. One interagency, statewide "synoptic" aerial and ground survey of manatees was conducted in February 2006 to meet legislative requirements of conducting an annual manatee census. These surveys yield a minimum manatee population count. Good weather conditions contributed to a count of 3,116 this winter. For more information about aerial surveys and the synoptic count please go to http://research.myfwc.com/features/category_sub.asp?id=2190.

In conjunction with United States Geological Survey (USGS), research staff employed the manatee core biological model to evaluate the manatee population as part of a Biological Status Review. The core biological model uses available monitoring data to simulate population dynamics, and the effects of various management and environmental covariates on population persistence.

Behavioral Ecology and Movements - Research on manatee use of Florida's coastal habitats is essential to understanding what resources are required to sustain a healthy population. By tracking the movements of individual manatees in fresh, brackish, and marine habitats, valuable information is obtained about their seasonal and daily movement patterns, migratory behavior, site fidelity, and habitat use. For our fourth and final year of a study on winter foraging movements and attendance patterns of tagged manatees at industrial warm-water sources in Tampa Bay, researchers tagged 15 manatees at Apollo Beach outside the TECO Big Bend power plant discharge canal. The manatees carried Global Positioning System (GPS) tags, time-depth recorders, and temperature dataloggers that provided data about movements, diving behavior, and water temperature throughout the winter. Five of the tagged manatees were recaptured to evaluate body condition after the winter. Researchers also examined the effects of manatee grazing on seagrass beds near the winter aggregation site.

Human-dimension research can lead to approaches that allow agencies and citizens to be more effective and work cooperatively in resource management issues. FWRI human impacts studies include projects to derive methods for assessing risk of manatee-boat collisions, characterizing boating patterns using aerial surveys and compliance, and developing models that simulate boating patterns.

FWRI, in cooperation with the USGS Sirenia Project and Mote Marine Laboratory, maintains an image-based, computerized database called the Manatee Individual Photo-Identification System (MIPS) that is used for photo-identification of individual manatees. These data provide life history information and assist scientists in estimating survival and reproduction rates, critical data required for determining the status of the manatee population. MIPS currently contains the sighting records of 2,219 manatees, each of which have met stringent criteria for cataloging. In a continued effort to transition to a digital platform, FWC completed the scanning and subsequent metadata processing of all slides from the FWRI photo-identification slide catalog (69,000+ slides).

Contracts for Manatee Research - FWRI managed a contract for Mote Marine Laboratory to conduct the following manatee research studies: Photo-Identification Studies and Genetic Sample Acquisition and Processing of Manatees in Southwestern Florida; Fatty Acid Signature

Analysis as a Potential Forensic Tool for Manatees; Calibration Survey Planning; Molecular Biologist Postdoctoral Position; and Florida; and Manatee Rescue and Verification.

In addition, contracts for the Florida Manatee Avoidance Technology Program (FMAT) were managed through FWRI. Two of three ongoing projects that were initiated under an RFP in 2003-2004 were completed. One of these projects, which examined manatees' sound localization capabilities, determined that manatees do in fact have the sensory ability to determine from what direction most sounds in their environments are coming. Another project which proposed to use detection of manatee vocalizations to alert boaters to the presence of manatees had more limited success. Investigators on the project have struggled to improve the signal to noise ratio of manatee vocalizations to background noise to maximize the distance at which manatees can be detected. Work on a project to test a manatee alerting device is still ongoing. None of the technology investigated to date is yet ready to be used in Florida waterways to alert manatees and boaters to each others' presence. At the end of FY 2005-2006, a solicitation for new FMAT projects was initiated through the FWRI internal grants process. Awards are expected to be made in early fall of 2006. For more details about the FMAT program see: http://research.myfwc.com/features/category_sub.asp?id=4468.

North Atlantic Right Whale

North Atlantic Right Whale Research Program (*Leslie Ward-Geiger*).-- The FWC is involved in recovery efforts for the North Atlantic right whale (*Eubalaena glacialis*), one of the most endangered of the world's large whales. This work is supported almost entirely through grant funding provided by National Oceanic and Atmospheric Administration (NOAA) Fisheries. Efforts have been heightened to prevent human-caused mortality in this species. Even one death per year has a significant impact on the population that is estimated to number approximately 300 - 350 individuals. In 1994, NOAA Fisheries designated Florida and Georgia coastal waters as critical habitat for the right whale as it is the only known calving ground of the North Atlantic right whale. FWC is instrumental in assisting a recovery plan implementation team whose aim is to help NOAA Fisheries by providing advice to and support of recovery activities. During FY 2005-06, FWC staff continued to chair this team.

During the 2005-2006 North Atlantic right whale calving season (December 01, 2005 – March 31, 2006) staff coordinated and conducted aerial surveys off the coastal waters of Florida in an effort to alert vessels to the presence of right whales, monitor calf production, identify unique individuals, and describe whale distribution and habitat. FWC staff conducted more than 100 aerial surveys this season. The effort contributed to sightings of a total of over 70 individual right whales and 19 cow/calf pairs. Staff also assisted with the retrieval and necropsy of two dead right whale calves. One of these calves was determined to be killed as a result of ship-strike and the other due to entanglement in fishing gear.

A leading cause of right whale mortality is collisions with ships. Since the loss of as few as one individual is critical to the recovery of the species, information provided by aerial observers is immediately reported to a federally implemented Early Warning System network (EWS). Working with the Fleet Area Control and Surveillance Facility at the Naval Air Station in Jacksonville, FL, the EWS disseminates right whale location information to mariners in the waters of Florida and Georgia via the typical marine communication network and via a right whale pager system coordinated by FWC researchers. Using this approach, mariners are alerted

to the presence of right whales in order to alter course to avoid close calls or collisions with right whales in the calving grounds. Another cause of human-related mortality is entanglements in fishing, and other, gear. FWC staff participated in the partial disentanglement of a right whale fouled in commercial fishing gear during December 2005 off Florida and North Carolina. This whale was seen again in the Northeast U.S. and appeared to have shed the life-threatening portion of the gear. FWC staff also participated in the successful disentanglement of a juvenile humpback whale fouled in commercial fishing gear off Ponce Inlet, Florida.

Bald Eagle

Bald Eagle Population Monitoring (*Stephen A. Nesbitt*).—The bald eagle (*Haliaeetus leucocephalus*) is currently listed as a threatened species by both the FWC and the USFWS. Florida traditionally supported the largest nesting population of bald eagles in North America south of the 40th parallel. Statewide eagle nesting surveys have been conducted annually since 1973 in an effort to monitor Florida's eagle population and identify trends in their population status.

A statewide survey of bald eagles was conducted during the nesting season from December through April. Surveys employed fixed-winged aircraft and ground visits. The U.S. National Park Service (NPS) surveyed Everglades National Park, and the FWC was responsible for the remainder of the state. All previously known bald eagle nests were checked for activity. All reported new nests were checked and any areas inadequately surveyed in the past also were more thoroughly checked for the presence of nests.

The number of active bald eagle nesting territories documented in 2006 (n=1,113) represented a 1.8% decrease over the number of nesting territories reported in 2005 (n=1,133). The estimated number of young produced in 2006 (n=1,325 birds) was similar to the number estimated last year (n=1,292 birds). These numbers represent an estimated population of between 2,961 (includes both breeding adults and non-breeding subadults) and 4,286 (includes breeding adults, non-breeding subadults, and young produced in 2006) eagles in the state. This year was the first time since surveys were initiated in the 1970s that we have documented a decrease in the number of active territories in Florida. However, this decline is consistent with recent trend during the last decade of a flattening in the growth curve for the bald eagle population in the state. This plateau in the eagle population should be expected as available eagle nesting habitat in Florida reaches the point of population saturation.

In contrast to the 2005 nesting season, which followed the active 2004 hurricane season with three major hurricanes (Charley, Frances, and Jeanne) crossing peninsular Florida resulting in some impacts to nests and less breeding activity in some counties of south Florida, the 2006 nesting season appeared to be unaffected by the 2005 hurricane season. However, the slight decrease in the number of nesting territories in 2006 may be a residual effect of the 2004 hurricane season.

Seasonal Movements (*Katherin Haley*).--Current bald eagle (*Haliaeetus leucocephalus*) management primarily focuses on nest sites, but areas used regularly by sub-adult (non-breeding) eagles are also important resources that warrant management consideration. Many of Florida's sub-adult bald eagles migrate north along the east coast to summering areas from North Carolina to Canada, where they spend 4-5 months. They then return to Florida, where they winter in areas that are often far away from their natal areas. To determine areas important for sub-adult bald

eagles, five-year satellite transmitters [platform terminal transmitters (PTTs)] were attached to nestling bald eagles over several years. Since the study was initiated, 70 eagles have been fitted with satellite transmitters transmitting latitude, longitude, and mortality data. The results of this study have expanded the knowledge of area and habitat requirements of Florida's sub-adult bald eagles by providing locations on migration routes and by determining summer and winter home range sizes and location. The important use areas for Florida's sub-adult eagles are being shared with other state, federal and local land managers to help better manage for bald eagles. For more information, please contact Katherin Haley at 850-488-3831.

Surveys on select FWC lands (Phil Manor).--Nesting surveys for bald eagles were conducted in January 2006 on Apalachicola River Wildlife and Environmental Area (WEA). Systematic aerial flights were conducted to locate bald eagle nests. Nest locations were recorded using GPS and the status of nests (active or inactive) was recorded. On Apalachicola River WEA 22 nests were observed, 15 of which were active and one of which had not been observed in previous years. For more information, contact Phil Manor at 850-827-2934.

Listing Evaluation (Dan Sullivan).—Following the guidance of the listing process (68A-27.0012 Florida Administrative Code, [F.A.C]) the Commission approved a Biological Review Panel (BRP) to review the status of the bald eagle (*Haliaeetus leucocephalus*). This group consisted of two biologists from the FWC, one from the USFWS, and two private biologists. The BRP evaluated the best available information on the status of eagles and compared this to the listing criteria found in 68A-1.004 F.A.C. The information was compiled in the Biological Status Report (BSR) which is available at <http://myfwc.com/imperiledspecies/reports/Bald-Eagle-BSR.pdf>. The BSR was distributed to scientists for peer review, was then presented to the Commission at the June 2006 Commission meeting. The Commission agreed with the conclusion of the BSR that the eagle no longer warranted listing and directed staff to move forward with management plan development. The bald eagle will remain a threatened species until the rules proposed in the management plan are voted on by the Commission. It is anticipated a draft plan will be available in spring 2007 with the final plan being presented in September 2007.

Brown Pelican

Population Monitoring (Steve Nesbitt).--The brown pelican (*Pelecanus occidentalis*) population in the United States experienced a major reduction during the 1950s and 1960s. In addition, this charismatic species nests along the coasts of Florida where considerable developmental pressures may have an impact on their colony sites. The objective of this project is to monitor the population status and gross productivity of the species in Florida.

A statewide aerial survey of all known brown pelican nesting sites was conducted April 21 and 25, and May 18, 2006. Ground checks were completed in early July. The estimated number of nesting pelicans this year was 8,552 pairs at 40 sites. While this number is above the average for previous years (8,004 pairs), it represents an increase of only about 0.3 % over the total recorded last year. Nesting success was not measured during 2006.

One new nesting colony was found in 2006 near Wabasso (Indian River County) that contained an estimated 75 pairs of pelicans as well as 100+ pairs of wood storks (*Mycteria americana*). These pelicans were likely the birds that traditionally nested on Pelican Island (usually 50 to 200 pairs), which was not active this year. The above numbers are indicative of an

estimated population of 22,748 adult and subadult brown pelicans, and 7,600 to 13,170 young of the year for 2006. A recent decline in the annual pelican nesting effort that was documented on the Gulf coast (particularly Tampa Bay and Charlotte Harbor) seems to have leveled off to some extent in 2006.

The effects of hurricane Charley, which came ashore in Charlotte Harbor (Lee County) on 13 August 2004, were still apparent in 2006. The nesting populations at several sites in Charlotte Harbor during 2006 are still below average numbers recorded during previous years. We will continue to conduct a statewide survey since it provides a cost effective means of monitoring the population and distribution of brown pelicans in Florida.

Burrowing Owl

Research and Conservation (Katherin Haley)-- FWC and City of Cape Coral staff completed the final year of a five-year study to evaluate the effectiveness of FWC management policies for burrowing owls (*Athene cunicularia*) in urban areas. The burrowing owl is currently listed as a species of special concern. FWC policy regulates take of nests during land clearing and development, with more active protection during the breeding season (Feb. 15 - July 10). On the study area in Cape Coral that was used for earlier studies (1987 - 1991), field work was conducted to determine the number and distribution of nest sites, nest success of pairs, survival of adult and juvenile owls, and dispersal characteristics of adults and juveniles. Preliminary analysis of this year's data: staff found approximately 210 nests, observed 150 individuals banded in previous years, and monitored 80 nests to estimate nest success, which averaged 3.9 young/successful pair (approx. 2/3 of nests were successful). The results of this project will be compared to the previous study in order to assess the need for modifying FWC management policy for burrowing owls in urban areas. Questions about the burrowing owl project can be directed to Katherin Haley at 850-488-3831.

Crested Caracara

Nongame Wildlife Grant - Crested Caracara Habitat (Stuart Cumberbatch)--Dr. Joan Morrison, Trinity College, completed the development of a population viability assessment model (PVA) for the crested caracara (*Caracara plancus audubonii*) in Florida. This project addressed the need for additional information required for the federal recovery plan developed for the crested caracara as a part of the South Florida Ecosystem Multispecies Recovery Program. GIS modeling was used to identify the parameters required for identifying suitable habitat at the landscape scale and predicting habitat for the crested caracara.

Florida Grasshopper Sparrow

Habitat Assessment and Meta-population Analysis (Michael Delany)--The Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) is an endangered subspecies endemic to the dry prairie landscape of south-central Florida. The bird was federally listed as endangered in 1986 because of its low numbers, restricted distribution, and habitat loss. Breeding aggregations are known from only six locations and fewer than 1,000 individuals may exist. The recovery objective is to down-list the sparrow to threatened when > 10 protected

locations contain stable, self-sustaining populations of > 50 breeding pairs. However, only two extant populations, Three Lakes Wildlife Management Area (WMA) and Kissimmee Prairie Preserve State Park, meet recovery criteria. Three other protected populations occur on Avon Park Air Force Range. Florida grasshopper sparrows on protected lands are monitored with annual point count surveys, and grassland habitat is maintained for sparrows with prescribed fire every two to three years. Basic information on population trends and habitat availability is needed to develop and implement conservation strategies for the sparrow. The cooperative effort of public as well as private land managers will be needed to prevent the extinction of this bird.

With funding from the Department of Defense and USFWS, digital land cover information (Landsat Thematic Mapper data) was used to identify potential habitat for Florida grasshopper sparrows range-wide. However, because of concerns of land use restrictions if an endangered species was found, most private landowners denied access to verify habitat and some landowners could not be contacted. For these areas, visual assessments were conducted aurally from a Bell Jet Ranger helicopter during 16.1 hours of flight time at an altitude of < 400 ft. (122 m) from 7 February to 28 March 2006. Flights were first made over areas of Three Lakes WMA and Kissimmee Prairie Preserve State Park currently occupied by Florida grasshopper sparrows to develop a search image for suitable habitat. Habitat evaluations were based on vegetative cover and landscape context. A GPS receiver and topographical maps were used to navigate to the center point of each area identified as potential habitat where access was denied. For large areas, the helicopter circled until a complete view of the area was obtained. FWC personnel also searched for additional potential habitat during flights and visited suitable prairie identified during 1996 aerial assessments to determine its current status. Remote sensing and ground and aerial assessments revealed a fragmented distribution of 110,985 acres (44,933 ha) of potential habitat for the Florida grasshopper sparrow with 74,747 acres (30,262 ha, 67%) of this habitat located on conservation lands. A continued decrease in available habitat since 1996 was indicated.

The USFWS grant also supports an analysis of Florida grasshopper sparrow population trends on public lands. Annual point count data from Three Lakes WMA (1991-2005), Avon Park Air Force Range (1996-2005), and Kissimmee Prairie Preserve State Park (1998-2005) were compiled (a total of 18,120 five-minute observations) and reviewed for errors. These data will be examined for changes in sparrow distribution and abundance. This information will be related to management activities and used to guide recovery efforts for the subspecies.

For additional information on Florida grasshopper sparrows, please contact the principal investigator at 352-955-2230.

Surveys Conducted on Three Lakes Wildlife Management Area (Annemarie Prince).-- Point count surveys for Florida grasshopper sparrows (*Ammodramus savannarum floridanus*) have been conducted at Three Lakes Wildlife Management Area (TLWMA) since 1991. The surveys are conducted each spring (April- June) and consist of a grid of 190 stations, 0.25 mi (.40 km) apart. Each station is surveyed three times and all Florida grasshopper sparrows that are heard or observed are recorded. Beginning in 2002, 60 stations were established north of the main population to determine if a translocation of 18 juvenile sparrows in 2001 and 2002 was successful. In 2006, surveys estimated there were at least 112 different male Florida grasshopper sparrows at the main site and only 1-2 different males at the translocation site. These data indicate only a slight decrease in Florida grasshopper sparrow numbers at the main site from

2005 surveys (114 males) and no change at the translocation site. Monitoring will continue at TLWMA in 2007 and stations will be expanded to monitor changes in population due to habitat improvement. Tree removal on TLWMA's main site will be completed during fiscal year 2006/2007 with funding assistance from the United States Fish and Wildlife Service. For additional information or questions about this report, please contact Steve Glass at 407-436-1818.

Florida Scrub Jay

Demographics in Suburban Charlotte County (Karl Miller)-- FWRI staff continued to study Florida Scrub-jay (*Aphelocoma coerulescens*) population demographics in suburban Charlotte County, focusing on the Deep Creek region which supports the second largest population of scrub-jays in southwest Florida. Limited research has been done on scrub-jay demographics in suburbs even though 30-40% of the statewide scrub-jay population occurs in suburban habitats. The primary goal of this color-banding study is to determine if this population is stable or declining. Second, if it is declining, the study will determine what life history stage is most affected (nest success, productivity, recruitment, or adult survival) and make recommendations about how the causative factors can be addressed in the context of land use planning and metapopulation dynamics. Related, supplemental research questions focus on the effects of Hurricane Charley on scrub-jay populations and scrub-jay habitat.

During FY 2005-2006, FWRI staff conducted summer, fall, and spring population surveys to census the size, location, and composition of all Florida Scrub-jay family groups in the study area. The population size increased from 61 family groups at the onset of the 2005 breeding season to 65 family groups at the peak of the 2005 breeding season and increased further to 67 family groups at the peak of the 2006 breeding season. Of particular interest was the existence of several new family groups during 2006, including four *de novo* territories in areas not previously occupied during the course of this study. Each of these territories was located in a block of habitat that was leveled by Hurricane Charley. Thus, the hurricane has had modest positive effects by removing most of the pine trees and opening up the understory shrub layer in remnant undeveloped scrub lots in Deep Creek. This seems to have occurred primarily north of Sandhill Boulevard.

Research staff captured and color banded 175 scrub-jays in Charlotte County during the 2006 breeding season. These included 10 adults (8 of which were recaptured to replace color bands) and 165 nestling or fledgling jays. Each scrub-jay was fitted with a unique combination and sequence of three plastic color bands and one numbered aluminum USGS band. Family groups were monitored during the breeding season (February – July) to determine the onset and duration of breeding activity. We located and monitored 147 scrub-jay nests, including a couple dozen early nests which were not completed, or if completed, where no eggs were laid. Analyses of reproductive success by nest stage and season are in progress. Nest predation accounted for nearly all of the nest failures. Of particular concern was the large percentage of nests located in exotic vegetation in, or near, suburban yards.

Blood samples also were collected from Charlotte County scrub-jays for collaboration with the statewide genetics study being conducted by Archbold Biological Station and Cornell University. Research staff also distributed educational handouts and pamphlets in both English and Spanish to citizens, homeowners, laborers, and local government staff.

During FY 2006-2007, the focus will be on data analyses. Field data collection will be scaled back to focus on: 1) monitoring group size and composition of family groups; 2) determining recruitment of young into the population as one-yr-old helpers and determining adult survival; and 3) continuing to monitor dispersal on and off the study site. Educational efforts will continue with citizens and landowners. Staff will continue to attend numerous meetings with County staff, U.S. Fish and Wildlife Service staff, and private consultants to discuss habitat conservation planning for scrub-jays in Charlotte and Sarasota counties. For more information contact Karl Miller at (352) 955-2230.

Florida Scrub-Jays on Mitigation Parks (Shane Belson)-- Annual Florida scrub-jay monitoring at Hickey Creek Mitigation Park WEA (HCMP) was completed during FY 2005-06 by FWC staff. The population at HCMP consisted of 10 individuals from four family groups, which is an increase of one family and two birds from the previous year. In addition, scrub-jays were banded at HCMP and on surrounding properties. Florida scrub-jay habitat enhancement is a primary management activity at HCMP. In addition to prescribed fire, mechanical treatments of vegetation are used to create habitat structure upon which the species depends. During FY 2005-06, FWC staff enhanced scrub-jay habitat on 30 ac (12 ha) by felling oaks, pines (*Pinus* spp.), and cabbage palms (*Sabal palmetto*) within or adjacent to strategic habitat areas. Mechanical treatments to small areas each year allows for a progressive approach to habitat enhancement by prioritizing critical areas and allowing for modification and evaluation of treatment methods.

Monitoring of Florida scrub-jays at Platt Branch Mitigation Park (PBMP) has been conducted since 1992. The population has fluctuated over the years, varying from six to 12 groups. It is apparent that the population has occupied most of the available habitat. Some expansion of this habitat has been successfully accomplished through fire and mechanical treatments over time. An annual survey was completed during FY 2005-06 at PBMP by FWC staff. The overall population at PBMP was 17 individuals from six families. Data from the past several years indicate that the population is stable. Management efforts will continue to focus on maintaining and improving scrub-jay habitat. Additional banding of juveniles each year will aid in long-term monitoring. Habitat enhancement is a management priority at PBMP. Mechanical treatments of vegetation are often used in conjunction with prescribed fire to create habitat conditions required by scrub-jays. During FY 2005-06, 20 acres of oaks (*Quercus* spp.) and sand pines (*Pinus clausa*) were felled to enhance scrub-jay habitat. Prescription burning will be used to remove the debris and complete the enhancement of the project area.

A small population of Florida scrub-jays occurs at Moody Branch Mitigation Park WEA (MBMP), which has been in public ownership since 2004. Upon acquisition, the site contained two family groups. During FY 2005-06, FWC staff coordinated with The Nature Conservancy's Jay Watch Program to incorporate MBMP into the state-wide monitoring effort. Jay Watch volunteers surveyed MBMP and documented two family groups consisting of a total of nine individuals. The accompanying habitat monitoring indicates that vegetation characteristics within scrub-jay territories are satisfactory.

Additional information on Florida scrub-jay management activities at these sites is available in the "FY 2005-2006 FWC Mitigation Park Program Annual Report" on file at the Kissimmee Field Office. Contact Shane Belson at 407/846-5300 for information.

Florida Scrub-Jay Population Survey and Habitat Management on Salt Lake Wildlife Management Area (David Turner).--FWC staff continued to monitor the Florida scrub jay (*Aphelocoma coerulescens*) population on the Salt Lake Wildlife Management Area (SLWMA) in east central Florida. SLWMA supports about three family groups with an estimated population of 16 birds. Recruitment consisted of a total of four juveniles among two families. All three family group territories are located in proximity to the SLWMA boundaries and each family group has territories that extend onto adjacent private properties. In 2006-07, staff plans to develop partnerships with adjacent public and private landowners in order to develop a regional strategy for scrub jay recovery and management.

Scrub jay habitat management on SLWMA has focused on mechanical treatments in preparation for prescribed burning of overgrown oak (*Quercus* spp.) scrub and scrubby flatwoods. Roller chopping treatments were applied to 51 ac (20.6 ha). Forty-nine acres (19.8 ha) of oak scrub roller chopping and 100 ac (40.5 ha) of potential scrub jay habitat is scheduled for prescribed burning in 2006-07.

Florida Scrub-Jay Population Survey and Habitat Management on Half Moon Wildlife Management Area (Nancy Dwyer).--FWC staff continued monitoring the Florida scrub jay (*Aphelocoma coerulescens*) population on the 9,500-acre Half Moon Wildlife Management Area in west central Florida. Jays are monitored on a weekly or biweekly basis. To better track the population, three more jays were banded in 2005-06 for a total of 68 birds banded since 2001. Half Moon WMA supports about eight family groups but only five fledglings were observed this year. The present population is still estimated at about 30 birds. Jays continue to occupy a site that was reoccupied in 2004 after an absence of jays for the previous six years. This area had been restored through roller chopping, tree cutting and burning.

Habitat management focused on growing-season prescribed burning and roller chopping saw palmetto (*Serenoa repens*) and overgrown oak trees (*Quercus* spp.). Prescribed burns in the past two growing seasons included about 450 acres of potential or occupied scrub-jay habitat. In 2005-06, 125 acres of this habitat was roller chopped. Contact Nancy Dwyer at (352) 330-1370 for more information.

Monitoring and Management of Florida Scrub Jays on the Cedar Key Scrub WMA (Norberto Fernandez and Karl Miller).--The FWC currently assists the Florida Park Service in the monitoring and management of Florida scrub jays (*Aphelocoma coerulescens*) on the Cedar Key Scrub State Reserve / Wildlife Management Area (WMA) in Levy County, Florida. During fiscal year (FY) 2005-2006, up to 10 family groups of scrub jays were documented in and around the Cedar Key Scrub WMA. Three of the family groups were located within the WMA and seven were located on surrounding lands. At the close of the 2006 breeding season, only 21 resident scrub-jays were extant in six family groups. The monitoring program during FY 2005-2006, included weekly monitoring of family groups (n = 8), the capture and leg banding of four fledglings and one adult, and sex identification of adults through territorial and nesting behavior. Three family groups have established territories and in the northeastern portion of the WMA in an area that had been treated with prescribed fire five years ago and that previously did not contain a family group. Approximately 247 acres (100 ha) were prescribed burned during the growing season and an additional 274 acres (111 ha) were mechanically treated to reduce the vegetative height of the scrub prior to the scheduled burning of that parcel to maintain habitat

necessary for the scrub jay population on Cedar Key Scrub WMA. During FY 2006-2007, FWC staff will continue to assist the Florida Park Service with monitoring and management of the resident scrub jay population on the Cedar Key Scrub WMA. Contact Norberto Fernandez at (352) 493-6740 or Karl Miller at (352)955-2230 for more information.

Florida Scrub Jay Monitoring Activities, Camp Blanding Wildlife Management Area (Jim Garrison).--A small, remnant population of Florida scrub jays has existed within the cantonment area at Camp Blanding Wildlife Management Area (WMA) for several years. It is believed this is the most northern extent of scrub jays in Florida. The population size has varied over the years, with seven or fewer individuals normally counted. The only monitoring activities conducted during 2005-06 concerning scrub jays were bait stations and random surveys with tape recorded calls. During this reporting period, two scrub jays were located in the portion of the cantonment area called the Kingsley Scrub.

It is believed that a significant population of scrub jays occurs in the artillery impact area, about five miles south of the Kingsley Scrub at Camp Blanding WMA. This area is off limits to all personnel because dud artillery shells occur in the area. Therefore, no scrub jay surveys can be completed and the population level is unknown. However, this area is subject to frequent fires from munitions impact and aerial prescribed burning. Habitat in the impact area should be suitable for scrub jays for the foreseeable future, and scrub jays seen on other areas of Camp Blanding WMA are probably dispersing from the impact area population. Contact Jim Garrison at (904) 533-2768 for more information.

Florida Scrub-Jay Population Monitoring on the Lake Wales Ridge (Mike McMillan).--The FWC monitors Florida scrub jay populations on select FWC properties along the Lake Wales Ridge in cooperation with Archbold Biological Station (ABS) and The Nature Conservancy's Jay Watch program. Properties surveyed in 2005 by ABS include Carter Creek, Gould Road, Henscratch, Highlands Ridge, Holmes Avenue, Lake Placid Scrub, and McJunkin. Gould Road and Holmes Avenue were also surveyed in 2005 by Jay Watch, as well as Royce Unit, Silver Lake, and Sun 'n Lake. ABS surveys were conducted between 6 June and 11 July 2005. Jay Watch surveys were conducted between 15 June and 15 July 2005. This time period was used because annual reproduction is complete and surviving young are nearing nutritional independence from their parents, but are still found in close proximity to their natal territory. Additionally, at this time the young retain the brown crown plumage characteristic of juveniles, which allows for estimation of the number of independent young produced per group for each of the survey sites.

Archbold Biological Station Results- Based on the total number of groups, Florida scrub jay populations were highest at Highlands Ridge, Lake Placid Scrub, and McJunkin. The populations were lowest at Henscratch and Carter Creek. Holmes Avenue and Gould Road had median populations. In all populations surveyed by ABS, the number of groups remained stable or declined compared to the surveys done in 2004. At Carter Creek, Holmes Avenue, and Highlands Ridge, populations decreased by 33%, 25%, and 10%, respectively. Carter Creek, a wildland area, and Highlands Ridge, a suburban area, have seen consistent decline since initial surveys in 2003 (Carter Creek) and 2000 (Highlands Ridge) (Table 1).

Jay Watch Results- The number of documented Florida scrub jays increased 62% from 2004 at Gould Road. These results have been compared to ABS research to test the validity of

volunteer monitoring, it was found that Jay Watch and ABS results are comparable. At Holmes Avenue, Jay Watch determined that the number of Florida scrub jays remained stable compared to 2004. At Royce Ranch and Sun 'n Lake, there was an increase from the 2004 surveys of 33% and 21%, respectively. The total number of Florida scrub jays declined 21% at Silver Lake from 2004 (Table 3).

Summary- The results of Florida scrub jay monitoring on the LWRWEA properties are used to determine areas of successful habitat management or restoration and to assess areas still in need of management activities. The Gould Road property has received several prescribed burns since the state purchased it in 1997. While the number of jay territories/families has remained relatively constant (the population may have reached carrying capacity), the mean group size and the number of young per group has increased. Other scrub jay populations showing stable or increasing numbers are located on the Royce Unit, Lake Placid Scrub, Silver Lake, Highland Park Estates, and Holmes Avenue. Numerous prescribed burns have occurred on some properties (Royce, Lake Placid Scrub, and Silver Lake), while several wildfires have swept through others (Highland Park Estates). The subsequent habitat change has resulted in increases in jay territories. However, one factor that may confound the effects of habitat management is development. Several houses have been built in the areas surrounding Holmes Ave. and Highland Park Estates, which may have forced jays to immigrate to this property resulting in an increase of jay territories.

Subdivision properties pose special management problems (i.e. Holmes Ave) and often have suboptimal jay habitat. The ownership of these properties is a checkerboard of private and state property, and the FWC does not have the authority to manage the private lands when they are interspersed with public lands. The result is that scrub jay populations are showing decreases on a number of FWC properties; Leisure Lakes, Henscratch, and Carter Creek. FWC personnel will use a newly acquired vegetation grinder to facilitate prescribed burning in these overgrown scrub communities. Private parcels will be "cut out" of prospective burn units, which should facilitate prescribed burning on FWC-owned parcels.

Table 3. Comparison of population size, mean group size, and the mean number of independent young per breeding group of Florida Scrub Jays at sites surveyed from summers of 2000-2005 by Archbold Biological Station. Information for the Royce Unit is provided by Jay Watch.

Demographic Variables by Year	Natural Areas					Urban Areas			Natural/Agricultural Mix
	Royce Unit (JW)	Lake Placid Scrub (ABS)	Silver Lake (JW)	Holmes Avenue (JW)	Carter Creek (ABS)	Leisure Lakes (ABS)	Highland Park Estates (ABS)	Henscratch Preserves (ABS)	Gould Road (ABS)
# Groups									
2000	NS*	21	NS	9	NS	57	NS	6	8
2001	NS	24	NS	NS	NS	45	NS	NS	12
2002	3	18	9	6	NS	38	13	5	7
2003	5	22	8	6	14	35	12	3	6
2004	6	26	13	15	9	31	17	3	8
2005	8	25	13	12	6	28	NS	3	8
Mean Group Size									
2000	NS	2.67	NS	3.78	NS	3.23	NS	3.00	3.63
2001	NS	2.50	NS	NS	NS	3.22	NS	NS	2.50
2002	3.3	3.10	3.70	3.00	NS	3.00	3.92	3.60	3.14
2003	2.4	2.68	3.80	2.80	3.00	2.86	3.42	2.66	3.50
2004	4	3.08	3.23	2.60	0.63	2.68	3.41	3.33	2.75
2005	4	3.36	2.54	3.00	2.5	3.32	NS	2.00	4.38
Mean Ind. Young/Group									
2000	NS	0.38	NS	1.44	NS	0.58	NS	1.00	1.13
2001	NS	0.50	NS	NS	NS	0.60	NS	NS	0.08
2002	1.00	1.05	1.00	1.60	NS	0.53	1.15	0.53	1.00
2003	0.4	0.27	0.60	0.60	0.43	0.40	1.00	0.00	0.66
2004	1.17	1.08	0.38	0.40	0.33	0.48	0.77	1.33	0.38
2005	NS	0.96	0.15	0.67	0	0.54	NS	0.33	2.13

*NS = property not surveyed

JW = Surveyed by Jay Watch

ABS = Surveyed by Archbold Biological Station

Nongame Wildlife Grant- Jay Watch (Stuart Cumberbatch)--Ms. Tricia Martin, The Nature Conservancy, initiated a project to work with researchers, land managers and citizens to standardize monitoring efforts for Florida scrub-jays on public and private lands. The project aims to utilize trained volunteers to conduct regular surveys on jay populations and their respective habitats throughout the range of the species. Regular more accurate data will allow land managers to be proactive in implementing effective management techniques for jay populations.

Red-cockaded Woodpecker

Conservation Planning (Robin Boughton).--Statewide conservation planning for the Red-cockaded woodpecker (*Picoides borealis*; RCW) continued through fiscal year (FY) 2005-2006. Progress on the priority actions identified in the plan and not previously completed is outlined below.

Develop a Memorandum of Agreement (MOA) with the USFWS - FWC staff discussed development of an MOA with USFWS staff in 2004 and determined that there was no immediate need for an MOA to guide conservation activities. Staff of the FWC and the USFWS have a history of close cooperation on RCW recovery in Florida. Following completion of the Risk Assessment (see below), staff reevaluated the need for an MOA to accomplish management needs and determined that a MOA was not needed to promote RCW conservation efforts.

Develop and maintain a RCW database for Florida - The RCW database previously developed is updated with current information on population size, ownership, habitat, and management activities every two years.

Conduct a risk assessment for each metapopulation and prioritize metapopulations according to their immediate management needs - An RCW database with data relevant to a risk assessment was developed in 2004-05. An analysis of populations and metapopulations most at risk was completed in 2004-05.

Establish and convene a meeting of the Florida RCW working group - Two RCW working groups currently meet; agenda items relevant to the Florida RCW management plan have been incorporated into working group meetings and will continue as needed in the future.

Coordinate the initiation of MOAs, management plans, and conservation activities for metapopulations - Management plans for each Florida RCW population are on file with FWC as a prerequisite to translocation activities. Preparation of MOAs for each metapopulation has not been pursued because interagency cooperation and communication has been and continues to be exceptional. MOAs will be developed on an as-needed basis for the populations most at risk and those where improved cooperation or management is needed.

Coordinate with the USFWS to develop a statewide Safe Harbor program for RCWs in Florida -FWC's application for an RCW Safe Harbor was approved by the USFWS and was signed in September 2006. The program is now functioning. For more information, please visit <http://myfwc.com/safeharbor/default.htm>.

At the close of the 2006 RCW breeding season, Florida RCW populations were on track to achieve and in many cases exceed the year 2020 population and metapopulation goals outlined in the Management Plan. Field visits to RCW populations have confirmed that by and large RCW populations in Florida are well-managed and that fire suppression, reliance on dormant

season prescribed fire, and low availability of old-growth pines remain the greatest threats to RCW recovery in Florida.

At the close of fiscal year 2005-06, implementation of the conservation actions identified in the management plan was complete. Certain management activities will continue until the species is recovered. These activities include meetings of the RCW working groups, updating of the RCW database, and implementation of the statewide RCW Safe Harbor program.

Contact Robin Boughton, the avian taxa coordinator at 352-732-1225 for more information.

Red-cockaded Woodpecker Management at the J. W. Corbett Wildlife Management Area (Katie Roscoe).--J. W. Corbett WMA is land managed by the FWC and all monitoring and management of the RCW population is conducted by FWC staff. The scope of work scheduled for fiscal year (FY) 2005-2006 included monitoring the number of active clusters, monitoring active clusters for nests, color-banding nestlings, determining fledging success, and installation of artificial cavity boxes as well as drilled cavity starts in existing and recruitment clusters. Habitat restoration for RCWs at J. W. Corbett WMA also included chopping 800 acres (324 hectares) to reduce midstory height.

In October, Hurricane Wilma struck J. W. Corbett WMA. Staff surveyed each cluster and determined 25 cavity trees had been destroyed and several additional cavities rendered unsuitable. At least one RCW was missing directly following the storm. Damaged cavities were repaired when possible and new artificial cavities were installed to replace those that were lost. A total of 19 Artificial Cavity boxes were installed and eight cavity starts were drilled.

At J. W. Corbett WMA, there were eight potential breeding groups occupying 12 active clusters during the 2006 nesting season. Six clusters fledged a total of eight young, twice the number fledged during the 2005 nesting season.

During FY 2006-2007, active clusters will continue to be monitored for nests, nestlings will be banded, and fledging success will be determined. Before nesting season, three pair of RCWs will be translocated from Fort Stuart, Georgia to increase the number of potential breeding groups. An additional 600-800 acres (243-324 hectares) will be chopped to reduce midstory height. Corbett will continue extensive management to promote reproductive success and increase population size.

Red-cockaded Woodpecker Reintroduction at the John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area (Valerie Sparling).--The John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area is cooperatively managed by the South Florida Water Management District and the FWC. All monitoring and management of the RCW population is conducted by FWC staff. In 1989, the last active RCW cavity tree on the area was destroyed by fire. A reintroduction plan was developed during FY 2005-2006, establishing 12 cluster locations. Habitat restoration activities included mowing and shredding midstory vegetation on approximately 1000 acres (405 hectares) in and around the cluster locations.

The reintroduction plan will be implemented during FY 2006-2007. Four artificial cavity inserts will be installed in each cluster location, with five of these clusters designated for the initial releases. Three pairs of RCWs from Fort Stewart and two pairs from Camp Blanding will be relocated to the five initial release clusters. During the breeding season, clusters will be monitored for nests, nestlings will be banded, and fledging success will be determined.

Vegetation control will continue, using burning, mowing, and shredding to reduce midstory height and enhance RCW habitat.

Red-cockaded Woodpeckers on Babcock/Webb Wildlife Management Area (Brooke George).--Since 1999, the FWC has been the primary agency actively engaged in managing and monitoring RCW on the Babcock/Webb Wildlife Management Area (WMA). Annual monitoring began in 2001 with roost checks to determine cluster activity, nest monitoring, nestling banding, and fledge checks to determine productivity. These activities continued through the 2005-2006 fiscal year during which 29 active clusters were monitored. Twenty-seven clusters contained potential breeding groups and two clusters contained single “floater” females. Of the 27 potential breeding groups, 24 produced eggs, and 15 of these produced 15 fledges.

As per the recommendations of the USFWS RCW Recovery Plan, the FWC area staff for the Babcock/Webb WMA has maintained at least four suitable cavities within each cluster. This has been achieved with the installation of USFWS approved artificial cavity inserts. Since 2002, inserts have been used to increase cavity numbers to the appropriate levels in new clusters, mitigate loss to natural occurrences, and to establish recruitment clusters available for dispersed RCW's and translocations. Thirty-one artificial cavities were installed to maintain adequate cavity numbers in 12 clusters, and to establish five recruitment clusters.

The first translocation of RCW's to the Babcock/Webb WMA took place in October 2005. Three pairs were translocated from the Apalachicola National Forest to recruitment clusters on the Babcock/Webb WMA. Although the birds moved did not stay in the clusters into which they were released, by the 2006 nesting season 50% (2 males & one female) of the six birds had paired or joined existing RCW groups.

Habitat management consisted of dormant season burns (December 1- February 28) totaling 48,881 acres and growing season burns (March 1- November 30) of 529 acres. Fuel loads around all 515 RCW cavity trees were reduced prior to burning to decrease the risk of damage during prescribed fires. Roller chopping of 1,400 acres was used to diminish the understory of saw palmetto (*Serenoa repens*). This occurred within some of the allotted RCW foraging areas but not within close proximity to any cavity trees. Roller chopping and plantings took place over 250 acres in areas suitable for south Florida slash pine (*Pinus elliottii* var. *densa*) in order to improve foraging habitat under the direction of the South/Central Florida Recovery Unit's Standard for Managed Stability Foraging Guidelines.

Red-cockaded Woodpecker Population Management at Platt Branch Mitigation Park WEA (Steve Shattler).--Monitoring of RCW in the Fisheating Creek population has been conducted by FWC on an intensive level since 2002. A total of 15 active clusters comprise this population within the Platt Branch Mitigation Park WEA (PBMP) and surrounding properties owned by the Lykes Bros. Corporation, portions of which are classified as a conservation easement.

Annual surveys conducted by FWC during FY 2005-06 indicate there were 11 potential breeding pairs within the population prior to nesting season. Successful nesting occurred in nine clusters, resulting in 12 hatchlings. Two additional clusters experienced nest failure and there were no observed re-nesting attempts. All hatchlings were banded with unique color band combinations and seven of the nestlings fledged and became part of the population.

A post-hurricane survey of all cavity trees within the population was conducted. Three RCW cavity trees were destroyed by Hurricane Wilma, but none was considered critical to the population. Subsequently, two existing cavities were repaired and were fitted with excluder devices and three new cavities were drilled within strategic areas. A recruitment cluster was chosen for the placement of new cavities. Also, snake excluders were installed on all new active trees.

Habitat enhancement within the RCW population is priority management concern. FWC contracted the mowing of 30 acres of overgrown habitat within an inactive cluster at PBMP. Additionally, FWC supervised the mowing of 400 acres of RCW habitat within the Lykes Bros. property.

Additional information on red-cockaded woodpecker management activities at this site is available in the "FY 2005-2006 FWC Mitigation Park Program Annual Report" on file at the Kissimmee Field Office. Contact Shane Belson at 407/846-5300 for information.

Red-cockaded Woodpecker Population Management on Blackwater WMA (Barbara Schmeling).--The RCW has been intensively managed on Blackwater WMA by DOF cooperatively with FWC since 1996. The population has been monitored using leg bands, banding of nestlings and unmarked adults, "fledge checks", translocations and installation of artificial cavities where appropriate. Six pairs of birds were translocated from Apalachicola National Forest during three separate events during the winter of 2005. At last check the pairs appeared to be in the same area but some pair bonds appeared to be disintegrating. There were 42 potential nesting pairs on the WMA as of June 2006. Additionally, seven clusters were identified as single bird clusters. Total adults in all clusters consisted of 105 birds. For further information, contact Barbara Schmeling at (850)957-6170.

Red-cockaded Woodpecker Population Management on Apalachicola River WEA (Phil Manor).--In an effort to improve and enhance habitat for RCW, three recruitment clusters were established on Apalachicola River WEA. A total of 14 artificial cavities were monitored during the year. Two sites had RCW activity observed. A single bird was observed at one site while two birds were utilizing another of the artificial cavity sites. Three other natural clusters within the area are also showing signs of activity.

Red-cockaded Woodpecker Population Management on Citrus Wildlife Management Area (Rick Spratt).--FWC staff, in cooperation with the Division of Forestry, continued monitoring the RCW population on the 49,000-acre Citrus tract of the Withlacoochee State Forest in west central Florida. Of 60 active RCW clusters, 48 nested and 41 of these were successful in fledging 59 young. Although the number of fledglings did not increase from last year, four more clusters nested for a 9% increase. The number of active clusters grew 22% from 2005, the first substantial increase since intensive monitoring began in 2002. Color banding continued with 68 nestlings banded during FY 2005-2006. No translocations were attempted. The current adult population stands at 134, up from last year's 106.

Other active management to increase reproductive success, population size, and habitat quality included installation of artificial cavity inserts and hardwood control. In FY 2005-2006, 25 artificial cavities were installed to augment cavity numbers at existing clusters. Encroaching

oak trees (*Quercus* spp.) were cut in clusters where needed while cavity trees in clusters located within prescribed fire units were protected by raking and pre-burning.

Monitoring and Management of Red-cockaded Woodpeckers on the Goethe WMA (*Norberto Fernandez*).--The FWC currently assists the Division of Forestry (DOF) in monitoring and managing the RCW population on Goethe State Forest / Wildlife Management Area (WMA) in Levy County, Florida. During fiscal year (FY) 2005-2006, there were 42 active clusters of RCWs on Goethe WMA. The monitoring program for FY 2005-2006 included roost checks at each of the 42 active clusters, cavity and tree inventories at 42 active and 36 inactive clusters, non-systematic searches for new RCW cavities, removal of cavity competitors (i.e. flying squirrels), and the banding and sexing of chicks of the year ($n = 39$). During the search for new cavities, two previously undetected cavities were documented. Twenty-two artificial cavities were inserted as required for the obtainment of three pairs of RCWs trans-located from the Apalachicola National Forest and Ft. Stewart, Hines City, GA. Prior to conducting approximately 15,000 acres (6073 ha) of prescribed burns designed to improve RCW nesting and foraging habitat on the area, protective measures were taken to protect cavity trees by mowing or burning within a 30-ft (9-m) buffer of the tree(s). During FY 2006-2007, the FWC will continue to assist the DOF in monitoring and managing the RCW population on Goethe WMA.

Population Surveys, Nest Monitoring and Habitat Management at Camp Blanding Wildlife Management Area (*Jim Garrison*).--The FWC's role at Camp Blanding Wildlife Management Area (WMA) is to assist the lead area manager with management, and provide technical assistance for the RCW population on the site. During the reporting period there were 131 active cavity trees in 26 active clusters (22 potential breeding groups, mean group size = 2.83). Two active clusters and one recruitment cluster were brought up to suitable status, resulting in a total of 28 suitable clusters (\geq four cavity trees per cluster). There has been a 100% increase in the number of active clusters between the years of 2000 – 2006. In November of 2005, four birds were relocated to Camp Blanding from Ft. Stewart, Georgia.

Of the 22 family groups, 17 nested and 14 were successful in fledging chicks. 29 nestlings survived to banding age (6 days), and 22 were fledged (76% successful fledging rate). FWC and Camp Blanding personnel were trained and certified on installing artificial drilled cavities by a representative from Ft. Benning, Georgia. Subsequently, five drilled cavities and four artificial cavity boxes were installed. Habitat surrounding two clusters was subject to prescribed fires during the growing season. Hardwoods were mechanically removed from 12 clusters, and herbicide applied to hardwoods in 26 clusters. Contact Jim Garrison at (904) 533-2768 for further information.

Red-cockaded Woodpecker Management on Three Lakes, Triple N and Bull Creek Wildlife Management Areas (WMAs) (*Ashleigh Blackford*).--The RCW located on Three Lakes, Triple N and Bull Creek WMAs are part of the same meta-population as determined by the USFWS Recovery Plan. The scope of work for fiscal year (FY) 2005-2006 on these central Florida WMAs included monitoring the number of active clusters, monitoring active clusters for nests, color-banding nestlings, determining fledging success, and increasing population size and success through translocation and installation of artificial cavities in existing clusters and recruitment clusters.

The number of active clusters on Three Lakes has been stable since 1999 and consisted of 48 in 2005. Within the 48 clusters there were 42 potential breeding groups, and group size ranged from 2-4 individuals. Fifty-four nestlings were banded, and 34 of the 41 nesting attempts made were successful. The average fledgling production was 1.3 fledglings per attempt (1.5 per successful nest). A total of 17 artificial cavity inserts were placed to augment the nesting sites in established clusters.

Bull Creek and Triple N are adjacent to one another, and supported five active clusters and three potential breeding groups combined. Group size ranged from 2-3 individuals. Four nestlings were banded, and two of the three nesting attempts were successful, fledging an average of 1.0 fledgling per attempt (1.5 per successful nest). In 2005, 50 artificial cavities were installed and eight recruitment clusters were established in previously unoccupied habitat. In addition, the first translocation to Bull Creek and Triple N was conducted and eight RCWs were placed in recruitment clusters.

During FY 2006-2007, RCW work will continue to focus on active management to enhance reproductive success and to increase population size through habitat improvement (including artificial cavity inserts and prescribed fire) and translocations. For additional information or questions about this report, please contact Ashleigh Blackford at (407) 436-1818.

Roseate Tern

Management Actions (Ricardo Zambrano).-- The roseate tern (*Sterna dougallii*) is a seabird designated as Threatened by both the FWC and the USFWS. As of 2005, there were only two known nesting sites in Florida: 1) Pelican Shoal, a small island off of Boca Chica Key that is designated a Critical Wildlife Area (CWA) by FWC, and 2) the rooftop of the State building in the Marathon Government Center in Marathon. Each spring, a colony of 150-300 pairs of terns nested on Pelican Shoal, and around 50 pairs used the rooftop in Marathon.

After the hurricane season of 2005, Pelican Shoal was submerged under 1-2 feet of water and thus no longer available as a nesting site for roseate terns. In the spring of 2006, FWC biologists attempted to provide the birds displaced from Pelican Shoal with an alternative nesting area. In cooperation with the National Park Service (NPS), biologists placed plastic tern decoys along with a sound system and speakers broadcasting tern calls on Long Key at Dry Tortugas National Park. These techniques, known as "social attraction", have been used around the world to attract colonially-nesting birds to nesting areas and to restore seabird colonies. In July of 2006, FWC and NPS biologists returned to Long Key and documented 33 roseate tern nests. A few weeks later, 16 chicks of varying ages were documented, indicating that the small colony had been successful in their nesting attempts. FWC and NPS will continue using social attraction methods at Dry Tortugas National Park until it is determined that roseate terns have permanently established themselves there.

During the nesting season, FWC biologists also surveyed the Marathon rooftop colony to conduct nest, egg, juvenile, and adult counts. A sample of chicks was captured, banded, and released onsite.

U. S. Fish and Wildlife Service staff discovered five roseate tern nests on Bruce Key, a small sandbar approximately 6.5 miles west of Key West, Florida. FWC staff posted "No trespassing" signs around the nests, with symbolic fencing to prevent disturbance to nesting

birds. According to reports from USFWS staff some of the nests were lost to overwash during weather events, but two young fledged from this nesting site.

For more information on the roseate tern, please contact the South Region's nongame Biologist at (561) 625-5122.

Snail Kite

Surveys Conducted on the Kissimmee Chain of Lakes during 2005-2006 (*Adriene Landrum*).--Roving surveys of the Everglade Snail Kite (*Rostrhamus sociabilis*) have been performed quarterly by FWC staff on the Kissimmee Chain of Lakes (KCOL) since October 2002. The surveys were conducted to examine kite utilization and nesting activities prior to, during and after the 2004 Lake Tohopekaliga Habitat Enhancement Project. The data collected from the surveys were submitted to the USFWS to comply with the Lake Tohopekaliga Environmental Impact Statement. Monitoring of the kite was conducted on lakes Tohopekaliga, Kissimmee, Cypress, Hatchineha and Tiger.

During FY 2005-2006, the annual mean number of birds on Lake Tohopekaliga nearly tripled from 16 (in 2004-2005) to 45 birds. More snail kites have been utilizing the lake since July 2005. The increase may be due to the abundant amount of forage (primarily exotic apple snails [*Pomacea canaliculata*]) available and the neighboring, nesting habitat on the lake.

Annual mean number of snail kites on Lake Kissimmee declined to nine birds in 2005-2006. Lack of available forage and nesting habitat may have attributed to the decline. Nesting habitat (cattail [*Typha spp.*], Carolina willow [*Salix caroliniana*]) on Lake Kissimmee has been greatly disturbed from the hurricanes which occurred in 2004 and 2005. Additionally, the number of native apple snails (*Pomacea paludosa*) observed on the lake has been scarce for some time.

No snail kites were observed on lakes Cypress and Tiger during the report period. One bird was observed on Lake Hatchineha in the spring 2006. The bird was most likely migrating, as birds are occasionally sighted on the lake.

Data and the Snail Kite Annual Demography Report 2005 (Martin et al. 2006) indicate that snail kite utilization and reproduction statewide remains in jeopardy. Although kite utilization on the KCOL has remained consistent, this does not reflect the overall status of the species. In recent years, the KCOL has become increasingly important in providing supplemental nesting habitat for the kites; especially when foraging and nesting conditions are unfavorable in their primary habitat (Water Conservation Areas and the Everglades). Snail kites are accustomed to migrating in search of "refugia" on the KCOL, St. Johns Marsh, etc. during times of drought and when habitat degradation has occurred in their indigenous habitats. Habitat preservation to protect sovereign lakes and adjacent wetlands will become more crucial as the onset of development encroaches closer to critical habitat for kites and all wetland dependent species.

For additional information concerning Everglade Snail Kite surveys on the KCOL, contact Adriene Landrum, Florida Fish and Wildlife Conservation Commission at (407) 846-5300.

Monitoring Program in Everglades Wildlife Management Area (*Marsha Ward*).--The Everglades and Francis S. Taylor Wildlife Management Areas (EWMA), which consist of Water

Conservation Areas (WCA) 2 and 3, are important habitat for the endangered snail kite (*Rostrhamus sociabilis*). Ongoing monitoring of snail kites has occurred in EWMA since 1986 by FWC staff, more recently typified by yearly mid-winter adult snail kite surveys. In response to a decline in snail kite population numbers and nesting success over the last five years, FWC staff redesigned the monitoring program in EWMA. The Florida Cooperative Fish and Wildlife Research Unit (FCFWRU) has been conducting monitoring since 1992, designed to provide information about population size, survival, movement, and reproductive success of the snail kite throughout its range in Florida. FWC staff coordinated with FCFWRU to design a monitoring protocol that would complement information FCFWRU already collects in EWMA. The recent decline in reproduction was of particular concern (0 successful nests detected in the WCA in 2005), so the focus was on nesting efforts. The protocol was designed to meet two objectives: (1) estimate detection probability of nests, and (2) increase detection probability of nests. The method consisted of FCFWRU and FWC performing two independent nest counts of the same sampling unit at 1-3 day intervals. The five sampling units, located in WCA 2B and 3A, were surveyed from airboats using east-west transects approximately 0.5 miles (0.8 km) apart. Results will be analyzed and reported later this year, and will be key to understanding nest detection probabilities. In addition, the collaborative effort between FWC staff and FCFWRU was important in maintaining positive communication between different agencies working toward recovery of the endangered snail kite. For additional information, please contact Marsha Ward at (954) 746-1789 or email at marsha.ward@myfwc.com.

Snowy Plover

Status and Distribution (*John Himes/Nancy Douglass*).--The snowy plover (*Charadrius alexandrinus*) breeds along the barrier islands and coastal beaches of Florida. Loss of nesting habitat, reduced productivity, and expanding human disturbance have contributed to a low breeding population in the southeastern United States. Consequently, the snowy plover is listed as Threatened by the FWC and is under consideration for federal listing with the USFWS under the Endangered Species Act.

A cooperative agreement with the USFWS provided funds to the FWC to re-assess the status and distribution of breeding snowy plovers along the Gulf Coast of Florida. The census followed the protocol defined during the 2002 survey, which enabled the detection of population trends in the state of Florida. Surveys were conducted from late February to early August 2006. Survey results indicated a breeding population of at least 210 breeding pairs. The majority of the population was found in the Northwest region of Florida, with 165 breeding pairs. An additional 45 pairs were scattered throughout the Southwest region.

The breeding population of snowy plovers in the state of Florida was 1.4% lower in 2006 than it was during the last statewide survey in 2002 (Table 4). While the difference in the number of snowy plovers surveyed between 2002 and 2006 was not significant, an apparent trend in movement from the western to the eastern portion of the panhandle occurred between 1989 and 2006, with 75.2% of the Northwest region's breeding population located in the eastern portion in 2006, compared to 40.0% in 1989. The cause for this dramatic shift is unclear.

The population in the Southwest region was 25% lower than it was in 2002. This decline was caused in part by a loss in breeding pairs at Sanibel Island, possibly due to several factors leading to habitat degradation over time. A majority of sites in the Southwest maintained

isolated breeding pairs. However, it was documented that these isolated pairs utilize adjacent islands based upon the availability of suitable habitat throughout the breeding season and from year to year.

Similar to findings during 2002, nesting began earlier than other breeding shorebirds and seabirds (terns and skimmers) on which most protection efforts are based. Snowy plovers nested the first week of March in the panhandle and mid-March in southwest Florida. Nesting protection efforts should be altered to incorporate the breeding season of the snowy plover.

Productivity was inconclusive without statewide banding. Determining productivity and the factors that potentially influence productivity could ultimately help in the development of management actions to conserve the Florida snowy plover population. Furthermore, information on movement trends in response to human disturbance, as well as an understanding the migratory trends of the snowy plover within the state of Florida, will also be necessary for proper management of the snowy plover. Therefore, a statewide banding effort to address these information gaps is recommended.

For additional information on the results of the 2006 statewide survey, please contact Dr. John G. Himes at (850) 265-3676 or Ms. Nancy J. Douglass at (863) 648-3203.

Table 4. Total number of breeding pairs observed.

Breeding Pairs by Region	Survey Year	
	2002	2006
Northwest Florida	153	165
Southwest Florida	60	45
Statewide Total	213	210

Southeastern American Kestrel

Southeastern American Kestrel Monitoring and Nest Enhancement Activities, Camp Blanding Wildlife Management Area (Jim Garrison).--Activities to enhance the survival of the state threatened Southeastern American kestrel (*Falco sparverius paulus*) on Camp Blanding Wildlife Management Area included providing and maintaining nest boxes and conducting surveys. During February 2006, 38 nest boxes were cleaned and maintained. Contact Jim Garrison at (904) 533-2768 for more information.

Southeastern American Kestrel Monitoring and Nest Enhancement Activities, Jennings Forest Wildlife Management Area (Allan Hallman).--Activities to enhance the survival of the state threatened Southeastern American kestrel (*Falco sparverius paulus*) on Jennings Forest Wildlife Management Area included providing and maintaining nest boxes and conducting surveys. During February of the reporting period, 14 nest boxes were cleaned and maintained. Contact Allan Hallman at (904) 533-2768 for more information.

White-crowned Pigeon

Nongame Wildlife Grant - White-Crowned Pigeons in the Lower Florida Keys (Stuart Cumberbatch).--Dr. Kenneth Meyer, Avian Research and Conservation Institute, continued a radio telemetry study of white-crowned pigeons (*Columba leucocephala*) in two Florida Keys National Wildlife Refuges. The project will compare foraging habitats between the refuges and will also identify critical foraging sites, determine the extent of winter residency and philopatry, and estimate survival of adult birds in the unstudied populations of the lower Florida Keys.

Whooping Crane

Whooping Crane Reintroductions in Florida (Marty Folk).--Non-Migratory Population - The whooping crane (*Grus americana*) is listed by the FWC as a species of special concern. The only self-sustaining flock, which breeds in Wood Buffalo National Park in Canada and winters on the Aransas National Wildlife Refuge in Texas, is federally endangered. The Florida population is listed as experimental non-essential by the USFWS. The minimum criteria for federal relisting from endangered to threatened are to meet the goal of establishing two self-sustaining wild populations in addition to the Wood Buffalo-Aransas population, and these populations must be reproducing at an acceptable rate for 10 years. The goal of the Florida release is to produce a population of ≥ 25 breeding pairs of non-migratory whooping cranes in Florida by 2020. The objective of this project is to release annually 20 to 40 whooping cranes between seven - 10 months of age in central Florida and determine the rate and causes of mortality for released whooping cranes. Monitoring of dispersal and movements, and documenting reproductive efforts (pairing, territoriality, and nesting) and the success of released whooping cranes also will be recorded. Release procedures were based on modifications of the standard soft-release techniques developed during previous segments of this study.

This year no captive-reared whooping cranes were released. We recovered remains of eight whooping cranes that died. Three whooping cranes were captured for replacement of failed or broken transmitters. As of 30 June 2006, the population consisted of 54 birds, which included 16 pairs.

The non-migratory flock raised four chicks to fledging this year, setting a productivity record. The most fledged in single year, prior to this year, was two in 2003. This brings the project total to eight chicks fledged in the wild. Productivity "in the wild", though better this year, still was lower than what ultimately was expected. We continue to explore the reasons *why*. Preliminary results of looking at environmental conditions indicate a correlation of annual productivity and winter rainfall preceding the breeding season.

Because of the unresolved question of why we are seeing an unusually high rate of infertility or early egg death and because we are still seeing what we feel is an unsustainable level of mortality in older birds, we recommended to the Whooping Crane Recovery Team that we release no more captive reared young in Florida until we have resolved these questions or the trend is otherwise resolved.

Table 5. Whooping cranes released in Florida by year.

Year	Number Released
1993	14
1994	19
1995	19
1996	47
1997	28
1998	22
1999	28
2000	30
2001	21
2002	27
2003	13
2004	16
2005	05
2006	0

Eastern Migratory Population– A team known as the Whooping Crane Eastern Partnership (WCEP) is reintroducing migratory whooping cranes that summer in Wisconsin and winter in Florida. The primary technique used for establishing this flock is to train the birds to follow ultra-light aircraft and lead them south on fall migration, after which they are released in the wild. FWC’s involvement with this project has been mainly to issue a permit to cover instate activities and participate in long range project planning. However, this year, FWC staff (from the non-migratory flock) made significant contributions in the field. Pen materials that were previously used for release of non-migratory cranes were loaned to WCEP for a two-acre holding pen for migratory whooping cranes. Non-migratory staff also contributed much of the labor for building that pen.

This was the fifth year of releases of whooping cranes into the migratory population and the population stands at 61 (30 June 2006). A pair of migratory whooping cranes hatched and raised two chicks to fledging (at Necedah National Wildlife Refuge in Wisconsin) in summer 2006-the first reproduction in the wild for that flock. Eighteen young whooping cranes are being raised to be led by ultra-light aircraft to Florida this winter. Another technique, called Direct Autumn Release (DAR), is being tested on a much smaller group of whooping cranes. This technique involves raising birds in captivity and releasing them into wild groups of cranes that are preparing for migration. The release birds learn the migration from other birds, rather than from humans on ultra-light aircraft. If successful, DAR may provide a cost-effective alternative to the ultra-light technique.

For the second winter, whooping cranes from the migratory and non-migratory projects interacted. Three migratory birds spent most of December 2005 in close proximity to non-migratory birds. No negative interactions were observed.

Infectious Bursal Disease.--Project biologist Kristi Candelora is working on a MS degree at the University of Florida on Infectious Bursal Disease (IBD). As part of this study, blood samples were collected from sentinel chickens. Additionally, blood was collected from captured

(32) and harvested (322) wild turkeys (*Meleagris gallopavo*). Other project personnel assisted in capturing and bleeding 11 Florida sandhill cranes (*Grus canadensis pratensis*). Results of all samples are pending. A grant of \$1,000 was received from by the Natural Resources Foundation of Wisconsin. Ultimately, we hope this study will give us a better understanding of the prevalence and possible etiology of IBD in Florida and its effect on whooping cranes.

Awards and Education--Staff provided educational presentations and field trips for Audubon chapters, birding festivals, and the like. Project personnel also presented papers at the 10th North American Crane Workshop, and attended the annual Whooping Crane Recovery Team Meeting. The North American Crane Working Group awarded FWC Biologist Steve Nesbitt the L. H. Walkinshaw Crane Conservation Award-the group's highest honor. Steve, after nearly 35 years with our agency, retired in April 2006.

Wood Stork

Productivity of Wood Storks in North and Central Florida (*James A. Rodgers Jr.*)--The wood stork (*Mycteria americana*) once was a common breeding species throughout the southeast United States, but declines in the species= range and population occurred during the mid-1900s. The U.S. population was listed as endangered in 1984. The primary objective of this study will be to gather productivity data for storks nesting within the St. Johns River Water Management District (SJRWMD) of Florida. These data may be useful for determining if the stork population in the U.S. meets criteria for reclassifying the species.

The average fledging rate of wood storks within the SJRWMD region of north and central Florida during 2006 was 2.25 fledglings/nest (n=9 colonies, 889 nests terminal). For only successful nests (nests that fledged at least one stork), the average fledging rate was 2.59 \pm 0.69 fledglings/nest (n=776 nests). About 87.9% of monitored nests fledged at least one bird and 83.4% of nests fledged 2+ birds. Significant differences in the mean fledging rate existed among colonies (range=0.12 to 2.59 fledglings/nest) during 2006. The greatest fledging rates were at colonies along the southeast coastal region from Brevard County south (Deseret Ranch, North Fork, Kemper US 192S, Bird Island). However, all colonies except Matanzas Marsh possessed rates greater than two fledglings/nest.

Several unusual events occurred during the 2006 nesting season. Three colonies (Pumpkin Hill, Pelican Island, and Horseshoe Island [Martin County]) active in 2005 were not active in 2006. The reason for lack of nesting at Pumpkin Hill probably was due to little or no water present in the cypress domes prior to the nesting season. Reasons for no nesting at the other two sites are unclear but Horseshoe Island has exhibited a continued decrease in nest numbers during recent years. Initially, at least 68 nests were completed at Matanzas Marsh (St. Johns County), an increase of 26 nests compared to 2005. However, drought conditions resulted in the water beneath the nest trees receding. The result was most nests were depredated prior to June 8 probably by raccoons as evidenced by claw marks at the base of nest trees and the feather remains of the large nestlings scattered on the nearly dried forest floor. A similar event occurred in 2005 at Matanzas Marsh. Previous to 2006, there were too few nests (i.e., <25 nests) to monitor at both Lake Disston (Flagler County) and Hontoon Island (Volusia County). However, both Lake Disston (n= 149 nests) and Hontoon Island (n= 67 nests) sites exhibited large increases in nest numbers in 2006 that warranted their inclusion in the study. Initially only 94

nests were started during the normal beginning of the nesting season in early February at Lake Disston. However, during the week of March 30th, another 55 nests were initiated at a second subcolony about 610 meters farther to the west of the previous subcolony. Finally, during the week of April 13th, an estimated 60-70 adult storks were observed about 500 meters farther to the east of the first subcolony. These storks were exhibiting pairing and territorial behaviors but neither birds nor nests were observed during the next visit.

A comparison of the combined fledging rate for colonies within the SJRWMD region of the state indicates the rate of 2.25 fledglings/nest in 2006 was significantly greater than the fledging rates of all previous nesting seasons. While the fledging rate in 2003 was greater than both 2004 and 2005, fewer colonies were monitored in 2003 and these data may not be representative of the entire region. A comparison of the fledging rates among years for colonies monitored for at least three years indicates that four of seven (57.1%) colonies exhibited their greatest fledging rates during the 2006 breeding season compared to one of seven colonies in 2004 and 2005. However, no nesting occurred at three colonies and nearly complete nesting failure occurred at Matanzas Marsh in 2006. Similar nonbreeding (Pelican Island) and near whole-colony failure (Matanzas Marsh) occurred in 2005. The greatest fledging rates exhibited by colonies along the southeast coastal region from Brevard County south reversed the trend of previous years whereby the greatest fledging rates occurred in the northeast region (Duval and St. Johns Counties) of the district.

While most of the 2004 breeding season (March to August) was characterized as dry due to low amounts of rainfall associated with the rainy season during the latter part of 2003, water levels were generally higher during the 2005 nesting season due in part to the rainfall from the 2004 hurricane season. Lack of rainfall resulted in no water beneath the nest trees and no nesting at Pumpkin Hill in 2004; however, flooded nest trees resulted in the return of breeding storks in 2005. The abandonment of nests at both Matanzas Marsh and Pelican Island occurred during above average amounts of rainfall during the latter period of the 2005 nesting season. Whereas lower water levels may contribute to lower fledging rates via the available prey at nearby wetlands used for foraging, higher water levels also may depress productivity by dispersing available prey to breeding adults. The 2006 nesting season was associated with below average rainfall that resulting in no nesting at Pumpkin Hill. However, these same low water levels in wetlands used for foraging may facilitated the higher fledging rates by concentrating prey as wetlands dried up and made for easier capture by adults.

For more information on the status of this study or wood storks, contact James A. Rodgers, at the FWC Gainesville Wildlife Research Field Lab, 4005 South Main Street, Gainesville, FL 32601, (352) 955-2230, email: James.Rodgers@MyFWC.com.

Wading Birds

Wading Bird Surveys(*Kelly Gamble*).--Numerous wetlands and water bodies present on the Carter Tract of Econfina Creek WMA provide excellent nesting habitat for the many species of wading bird found in the Florida panhandle, most of which are listed or imperiled. Protocols for surveying wading birds on their breeding sites vary from aerial surveys to shoreline visual surveys. On Carter Tract, water bodies and creeks were surveyed in spring 2006 by roadside visual surveys. One large rookery was found in Little Deep Edge Pond. This rookery was subsequently surveyed by canoe to identify species and numbers of birds present. Species of

Special Concern present include: Snowy Egret (*Egretta thula*) (n= 14) and Little Blue Heron (*Egretta caerulea*) (n= 45). Wood Storks (*Mycteria americana*) and roseate spoonbills (*Platalea ajaja*) have recently been documented on another pond (Garrett Pond) on the area. Next spring, all waterways on the Carter Tract will be surveyed annually for possible wading bird breeding activity, and the existing rookery will be monitored monthly during the breeding season (March – July) to document species present, number of birds and nesting success. Contact Kelly Gamble at (850) 773-2631 for further information.

Gopher Frog

Nongame Wildlife Grant – Habitat Use by Florida Gopher Frogs (Stuart Cumberbatch).-- Dr. Steve Johnson, University of Florida, initiated a study to employ radio telemetry and Geographic Information System (GIS) in determining the extent of upland use by the Florida gopher frog (*Rana capito*) in Florida longleaf pine-wiregrass uplands. This study dovetails with the long term monitoring effort of isolated ephemeral ponds in this habitat type for evidence of use by several amphibian species including the Florida gopher frog. Initial efforts have focused on the dispersal of post-metamorphic frogs, outfitted with transmitters, from the ponds. Relative survival and predation rates have been reported for the first two (2) reporting periods. During the next breeding season, adult frogs will likewise be outfitted with transmitters as they disperse to collect data on movements and habitat use.

Flatwoods Salamander

Management and Conservation (David Cook).--The flatwoods salamander (*Ambystoma cingulatum*) was listed as threatened by the USFWS in 1999. The FWC listed it as species of special concern in 2001, in conjunction with the preparation of a statewide management plan. The presence of these rare salamanders is difficult to confirm in their fossorial adult stage; they apparently remain hidden in burrows in flatwoods “uplands” most of the year. The most reliable technique to determine flatwoods salamander presence is to conduct dipnet sampling surveys for the distinctively striped aquatic larvae in temporary ponds in January – April following adequate winter rains to fill the ponds.

Surveys to determine presence of flatwoods salamanders continued in 2006, but were limited to several key public lands that were identified in FWC population-specific management plans as needing additional surveys or monitoring. In addition to those areas, surveys for larval flatwoods salamanders were conducted at potential or known ponds on public land at Garcon Point Water Management Area, Yellow River Marsh Preserve State Park, Tate’s Hell State Forest, and Aucilla Wildlife Management Area. A site visit was made to one known pond on private land in Santa Rosa County, but the pond was dry. Presence of flatwoods salamander larvae was confirmed at Garcon Point Water Management Area and Yellow River Marsh Preserve State Park in 2006.

This was the last year that Section 6 funds were requested to support work on flatwoods salamanders. Survey work in subsequent years is expected to be minimal and will be funded from other budgets. The funding from the Safe Harbor grant, which had supported extensive surveys on non-federal lands over previous seasons, ended in 2005. The final report submitted in December 2005 concluded that implementation of a Safe Harbor program for flatwoods

salamanders would be both problematic and largely ineffective at enhancing the conservation of the species in Florida.

Draft population-specific management plans for flatwoods salamanders on federal lands (Apalachicola NF, Osceola NF, St. Marks NWR, Eglin AFB/Hurlburt Field, Holley OLF), state lands (Pine Log SF, Point Washington SF, Tate's Hell SF, Aucilla WMA, and Garcon Point Water Management Area), and two private lands (Flint Rock WMA, International Paper) have been completed and are being reviewed by the respective agencies or landowners. The International Paper site has been purchased by The Nature Conservancy and will probably be part of Blackwater State Forest in the future.

The flatwoods salamander federal recovery plan, a draft of which was submitted for USFWS review in summer 2005, has not been approved. The delay is due to lawsuit requiring the inclusion of designated critical habitat in such recovery plans. Biologists in the FWC and in other states and agencies have been asked to provide input on the designation of flatwoods salamander critical habitat throughout the species' range.

Research – FWC biologists were consulted by staff of the USGS during the planning of a potential research project to be conducted through the Amphibian Research and Monitoring Initiative. The proposed work, to study habitat use of flatwoods salamanders on St. Marks National Wildlife Refuge and possibly adjacent St. Joe land (i.e., Flint Rock WMA), has not yet been pursued due to turnover in USGS personnel.

For more information on the flatwoods salamander, please contact wildlife biologist David Cook at (850) 410-0656 ext. 17315 or e-mail at: david.cook@myfwc.com. The flatwoods salamander statewide management plan (2001) can be viewed in PDF format at <http://myfwc.com/imperiledspecies/pdf/Flatwoods-salamander.pdf>

Survey and Monitoring on Pine Log and Point Washington Wildlife Management Areas (*Fred Robinette*).--Two of the known flatwoods salamander breeding sites occur on WMAs cooperatively managed by FWC personnel based out of the Northwest Regional Office in Panama City. WMA staff activities to determine the status on select WMAs in the Panhandle were coordinated with statewide efforts undertaken by FWC. One breeding site, reconfirmed as recently as April 2005, is located on the Pine Log WMA in Washington County. The second confirmed breeding site is located on the Point Washington WMA in Walton County. On Pine Log and Point Washington WMAs, potential breeding ponds are sampled twice annually from January through May in attempt to reconfirm known breeding sites, as well as document new sites. The drought of March 2006 set an unprecedented record for dryness in the region. Early spring drought indicated an abnormally poor breeding season for flatwoods salamander populations. Subsequently, very few of the 161 ponds (91 classified as potential breeding sites) on Point Washington WMA and the 44 ponds (26 classified as potential breeding sites) normally monitored on Pine Log WMA were wet enough to be sampled in the spring via dip netting or drift fence trapping methodology. Year round, local FWC staff worked with Division of Forestry (DOF) continuing to improve potential breeding pond habitat through prescribed fire, mowing and chopping.

On Point Washington WMA, local staff provided recommendations to DOF for which ponds would be potential candidates for mitigation practices (mowing, burning or combinations of such) to benefit flatwoods salamander habitat. Criteria were designed by which to evaluate the ponds for mitigation suitability. Ponds with much grass in the pond and ecotone but with

thick shrubs (i.e. *Cyrilla racemiflora* or *Cliftonia macrophylla*) on the edge were considered the most ideal candidates for mitigation mowing, because these ponds would be ideal habitat for flatwoods salamanders if they were more open. Similar ponds that were non-grassy are less ideal, but could still be good habitat if the shrubs were mowed and herbaceous growth encouraged. Other ponds were ranked as less in need of mowing because they had less vegetation or because the habitat was unsuitable for flatwoods salamanders for other reasons, such as the water level being too deep. The ponds were surveyed by ATV and each pond was assigned to one of six categories: (1) potential salamander pond high mowing priority-grassy; (2) potential high mowing priority-nongrassy; (3) potential low mowing priority; (4) potential no mowing recommended; (5) unlikely no mowing recommended; and (6) unlikely, still mowing recommended. Ponds not surveyed for the mitigation project were simply classified as “unranked/not surveyed.” All ranked ponds were surveyed for salamander breeding potential via dip-netting and field observations. The mitigation analysis was performed for the eastern section of Point Washington WMA. GIS generated maps were crafted depicting the ranking of each pond surveyed for mitigation and their potential as flatwoods salamander habitat, along with recommendations as to mowing. On the grounds implementation of restoring and/or improving the ecotone along select potential breeding ponds for flatwoods salamanders is in progress.

On Blackwater WMA, the flatwoods salamander has not been identified as occurring presently. Still annual surveys and monitoring of nearly 90 potential breeding ponds continue. A recent purchase by The Nature Conservancy and soon to be part of the Blackwater WMA has within its boundaries a known flatwoods salamander breeding site along the Yellow River. Once the area is established as part of the WMA, proactive management by local FWC staff will begin at this locale. Contact Fred Robinette at (850)265-3677 for more information.

Surveys for Flatwoods Salamanders on the Goethe Wildlife Management Area (Norberto Fernandez).--The FWC currently assists the DOF in attempts to document flatwoods salamander (*Ambystoma cinglatum*) populations on Goethe State Forest / Wildlife Management Area (WMA) in Levy County, Florida. Surveys of potential ephemeral ponds were again conducted during FY 2005-2006 on Goethe WMA. In addition to the ephemeral pond surveys, herpetological arrays were also monitored to detect presence of the flatwoods salamander. As of this time, no occurrence of the flatwoods salamander has been documented on Goethe WMA. Contact Norberto Fernandez at (352) 493-6740 for more information.

American Crocodile

Crocodile Management Efforts (Harry Dutton).--The American crocodile (*Crocodylus acutus*) is listed as an endangered species by the federal government and the State of Florida. In 1975, when the crocodile was federally listed as endangered, habitat loss had reduced nesting in Florida primarily to northeastern Florida Bay and northern Key Largo. Annual production at that time was 20–22 nests. Since then, Florida crocodile populations have rebounded, and the number of nests has increased to approximately 90 annually. Concomitant with the increasing crocodile population (currently estimated to be between 1,200 – 1,500 animals) has been an increased number of crocodile-human conflicts.

Since May 2005, the FWC has been managing crocodile-human conflicts through an approved plan that was developed by an issue team comprised of FWC staff and crocodile

experts from the USFWS, National Park Service, and University of Florida. This team's charge was to develop a comprehensive response plan that would provide guidance for dealing with all crocodile-human interactions. The goal of the plan was to promote public safety while recognizing the needs of recovery and conservation of an endangered species. Over fiscal year 2005-06, upwards of 100 nuisance crocodile complaints were received by FWC staff. Most of these complaints were resolved through telephone calls or site visits. Seven complaints resulted in crocodile captures. Of these, six were males and one was a female. The males averaged 7.9 feet (2.42 m) in length, with the largest one being 10.8 feet (3.28 m) in length. The female was 8.1 feet (2.47 m) in length. One of the males was captured for the third time and, pursuant to the approved inter-agency response plan, was subsequently placed in captivity. The remaining six animals were translocated to canals in close proximity to the Southern Glades Wildlife and Environmental Area. Crocodile occurrences have now been documented as far north as northern Brevard County on the east coast (circumstances of this occurrence are suspicious, however) and Punta Gorda on the west coast. FWC staff were involved in recovering six road killed crocodiles. Of the road kills, four were females and two were males. Females averaged 6.2 feet (1.89 m) in length, with the largest being 8.8 feet (2.68 m). Males averaged 10.4 feet (3.17 m) in length, with the largest being 11 feet (3.35 m) in length. Two of the road kills, one male and one female, were animals previously relocated.

Barbour's Map Turtle

Apalachicola River WEA Surveys (Derek Fussell)--In an effort to document presence/absence of Barbour's Map Turtle on the ARWEA, counts were conducted on the Apalachicola River and its tributaries. A total of 88 Barbour's Map Turtles were observed during the surveys. Contact Derek Fussell at (850)827-2413 for more information.

Gopher Tortoise

Listing Evaluation (Dan Sullivan).—In accordance with the listing process (68A-27.0012 Florida Administrative Code, [F.A.C]) the Commission approved a Biological Review Panel (BRP) to review the status of the gopher tortoise (*Gopherus polyphemus*). This group consisted of two biologists from the FWC, one from the U SFWS, one biologist from academia, and one private biologist. The BRP evaluated the best available information on the status of gopher tortoises and compared this to the listing criteria found in 68A-1.004 F.A.C. The information was compiled in the Biological Status Report (BSR) which is available at <http://myfwc.com/imperiledspecies/reports/Gopher-Tortoise-BSR.pdf>. The BSR was distributed to scientists for peer review, then presented to the Commission at the June 2006 Commission meeting. The Commission agreed with the conclusion of the BSR that the gopher tortoise warranted listing as threatened and directed staff to move forward with management plan development. The gopher tortoise will remain a species of special concern until the rules proposed in the management plan are voted on by the Commission. It is anticipated a draft plan will be available in early 2007 with the final plan being presented in June 2007.

Gopher Tortoise Issue Team (Joan Berish).--The need for a gopher tortoise (*Gopherus polyphemus*) issue team became apparent during 2003, as FWC staff struggled to reconcile the time spent on permitting issues with the minimal benefits that current mitigation efforts

contribute to the conservation of this high-profile, declining species. The gopher tortoise is listed as a Species of Special Concern in Florida, but has been approved for reclassification to Threatened. This reclassification will occur after a species management plan has been drafted, reviewed both internally and externally, and then approved by the Commission in 2007. The species is often on the front lines of wildlife/development conflicts because it inhabits the same high, dry habitats desired by humans, and its conspicuous burrows draw attention to the fate of individuals as development encroaches. Additionally, this keystone species provides refuges for many other species and, thus, increases the biodiversity of Florida's uplands.

In fall 2003, FWC senior leadership established the Gopher Tortoise Issue Team to determine more effective strategies for conserving Florida's gopher tortoise resource. The 21-person Team first convened in January 2004 and met a total of six times between January 2004 and February 2005. In January 2005, the Team's draft recommendations were presented to FWC senior leadership. Preliminary approval to pursue a new tortoise conservation paradigm was given, and several action teams met during the summer of 2005 to address permitting and land management issues. In August 2005, the original issue team was distilled into a smaller, fast-track, issue team of seven members with a facilitator and a leader from FWC senior leadership. The 9-person team currently meets every other week. This team has drafted biological goals for the species and is revising the current mitigation and permitting program. The team has also determined criteria for responsibly restocking tortoises on lands where populations have been depleted. In the new conservation paradigm, it is hoped that restocking tortoises can provide a valid conservation benefit while reducing the numbers of tortoises currently being entombed on development sites through incidental take. Take of tortoises is highly controversial and has generated considerable public outcry during 2005-2006.

In fall 2005, a gopher tortoise stakeholder advisory group was convened, using a facilitator provided by FWC. This advisory group now meets monthly and is working with the FWC issue team on many aspects of the impending management plan. In spring 2006, a new rule protecting the burrow of gopher tortoises was drafted and implemented. Work will continue throughout 2006 and into 2007 on the species management plan.

Mitigation Park Program (Shane Belson).--The FWC Mitigation Park Program began as a pilot initiative in 1988. It was developed with the primary goal of improving the biological effectiveness of listed species habitat protection efforts required for new land developments by state and federal regulations. The program increases the biological value of mitigation by consolidating habitat protection areas into larger tracts, implementing listed species habitat management plans, and providing for permanent management by endowing each facility with a dedicated funding source.

Since 1990, management strategies at Perry Oldenburg Mitigation Park WEA (POMP) have been tailored to provide optimal habitat conditions to benefit the gopher tortoise (*Gopherus polyphemus*). As part of ongoing habitat enhancement activities, FWC oversaw implementation of a 150-ac (61-ha) invasive exotic plant herbicide treatment project funded by the Florida Department of Environmental Protection (FDEP). Herbicide treatments were completed on cogongrass (*Imperata cylindrica*), tropical soda apple (*Solanum viarum*), skunkvine (*Paederia foetida*), and other exotic upland species that have detrimentally impacted sandhill restoration areas. In addition to this treatment, a FDEP-funded maintenance project was secured by FWC for FY 2006-07. Also, FWC staff provided logistic support to the University of Florida (UF) on

a multi-year National Science Foundation investigation of the relationship between upper respiratory tract disease and tortoise population dynamics and health. Primary research activities for this reporting period were studies of disease dynamics, estimates of population demographics, and a habitat assessment.

Split Oak Forest Mitigation Park WEA has been intensively managed to benefit the site's gopher tortoise population. Since 1996, FWC has performed periodic gopher tortoise burrow surveys as part of its long-term monitoring efforts. During the fall of 2005, a standard burrow survey was completed by FWC staff. Survey results indicate a persistently low [≈ 0.3 tortoises/ac (0.75 tortoises/ha)] density that is likely attributable to an upper respiratory tract disease die-off that occurred during recent years. Population surveys will continue at regular intervals in order to detect future population changes and to facilitate adaptable management strategies.

Habitat management activities to benefit the gopher tortoise are a priority at Hickey Creek Mitigation Park WEA. The primary habitat enhancement accomplishment during FY 2005-06 was the mechanical treatment of 35 ac (14 ha) of mesic and scrubby flatwoods. Saw palmetto (*Serenoa repens*) and oak (*Quercus* spp.) mid-story vegetation in target areas were cut with a hydro-ax mower in order to reduce shade and promote herbaceous ground cover vegetation. Prescription burning of mowed areas will be the final phase of the project.

A primary management goal at Moody Branch Mitigation Park, which has been in public ownership since 2004, is to promote habitat conditions that support a viable gopher tortoise population. To that end, habitat restoration and enhancement is a top priority at the site. Beginning in FY 2004-05, FWC staff implemented the Upland Habitat Restoration Plan by beginning work on 150 ac (61 ha) of uplands on former tomato row crops. Restoration activities included site preparation, direct seeding of native ground cover species, and follow up maintenance. The project was completed through contractual services and will remain in a maintenance phase for several years. It is expected that gopher tortoises from adjacent intact upland habitat will increasingly use the restoration area as desirable habitat conditions develop.

Additional information on gopher tortoise management activities at these sites is available in the "FY 2005-2006 FWC Mitigation Park Program Annual Report" on file at the Kissimmee Field Office. Contact Shane Belson at (407) 846-5300 for information.

Burrow Surveys and Monitoring on Select WMAs (Fred Robinette).--Since the spring of 1993, local FWC staff on Point Washington WMA has been surveying, monitoring and assessing the status of the gopher tortoise (*Gopherus polyphemus*), a Florida Species of Special Concern. Comprehensive surveys or burrow counts continue to be used to determine the relative abundance of tortoise populations during May through September, annually. Comprehensive burrow surveys are conducted across "gopher tortoise" habitat on the area. Burrows are identified as active, possibly active, inactive, or abandoned. Given the relationship between gopher tortoise body size and burrow width/age, burrow size class distribution data are obtained during the comprehensive surveys. Boundaries have been drawn around mapped concentrations of tortoises. Each group of burrows was defined as a burrow cluster. Clusters are primarily delineated for devising management options. No attempt to group burrows using stringent behavioral or spatial criteria was made. Quite simply, the clusters are recognized for accounting and management purposes. Presently, gopher tortoise burrows on Point Washington are grouped into 33 clusters. Management recommendations for individual gopher tortoise clusters have been submitted to DOF (lead manager for the tract). Staff recognizes the inherent biases with

burrow counts if trying to correlate with robust gopher tortoise population density estimates. Nonetheless as a tool for monitoring habitat strategies being recommended and implemented on Point Washington WMA, this survey methodology is practical and effective.

For the past two years monitoring and surveying for gopher tortoises on the Pine Log WMA have been conducted. The same monitoring and management protocol established for the aforementioned Point Washington WMA was followed on Pine Log. The data collected in this survey provided practical comparative data on tortoise population trends within Pine Log. Presently, gopher tortoise burrows on Pine Log are grouped into 13 clusters. Habitat improvements are being prescribed and implemented for the delineated clusters. Prescribed fire continues to be the preferred strategy for improving and maintaining the integrity of these gopher tortoise clusters. Herbicide has proven to be an effective tool on some sandhills to control turkey oaks out of the reach or control of prescribed fire.

FWC area staff on Blackwater WMA began a comprehensive survey of the gopher tortoise population, utilizing burrow counts, in June of 2005. Only a small acreage was surveyed prior to July 2005 but long range plans are in place to evaluate the entire 198,000 acres of Blackwater WMA for gopher tortoises. The impetus for obtaining this information is to provide DOF, the lead land manager on the area, with habitat improvement recommendations across the WMA. With this said, habitat manipulation and applications to improve identified gopher tortoise clusters were implemented. Prescribed fire, mowing and chopping are used aggressively at identified clusters to improve integrity of these habitats for tortoise populations.

Gopher tortoise survey and monitoring began this year on the Carter Tract of Econfina Creek WMA. This is our first comprehensive gopher tortoise burrow survey for the area. The data collected in this survey will serve as a baseline. Future work will provide comparative data on tortoise population trends within the Carter Tract following land management and mitigation strategies. Contact Fred Robinette at (850)265-3677 for more information.

Gopher Tortoise Burrow Survey, Spring Creek Unit of the Big Bend Wildlife Management Area (Nuria Sancho).--A gopher tortoise (*Gopherus polyphemus*) burrow survey was conducted at the Spring Creek Unit during and after clear cutting a 102-acre sand pine stand in May 2006. The purpose of this survey was to provide a baseline count of active and inactive gopher tortoise burrows prior to active management of the area. These surveys will be conducted every two years to monitor the effects of sand pine removal and longleaf pine/wiregrass restoration on the local gopher tortoise population. A total of eight gopher tortoise burrows were observed, all of which were active. Burrow density calculations indicated that there were a total of 0.08 burrows per acre. The estimated gopher tortoise population on the 102-acre site is four gopher tortoises, which gives an average density of 0.04 tortoises per acre. (Calculations were based on procedures outlined by Ashton and Ashton in "Monitoring Tortoise Populations and Forage".) Contact Nuria Sancho at (850) 838-9016 for more information.

Gopher Tortoise Technical Assistance, Camp Blanding Wildlife Management Area (Jim Garrison).--Technical assistance was provided to Camp Blanding Joint Training Center regarding the incidence of Gopher Tortoise (*Gopherus polyphemus*) burrows on a proposed construction site. FWC personnel surveyed four burrows on the site with a remote camera device to determine the presence or absence of tortoises in the burrows. Contact Jim Garrison at (904) 533-2768 for more information.

Gopher Tortoise Commensal Surveys, Ft. White Mitigation Park (Cathy Handrick).-- More than 400 gopher tortoise (*Gopherus polyphemus*) commensals utilize gopher tortoise burrows during all or part of their lives, and several of these species are state listed. In November of 2005 a field trial was initiated to determine the effectiveness of using remotely triggered cameras to detect presence/absence of commensal species and help determine the commensal species present at Ft. White Mitigation Park. In this evaluation, five burrows were randomly selected for placement of 'traditional' traps, specifically Sherman traps (2 at each burrow, n=10) and funnel traps (1 inside the burrow, n=5). Five additional burrows were randomly selected for placement of the remotely triggered cameras.

Over five nights of trapping, the traditional trapping methods resulted in the detection of two commensal species. Florida mice were captured at four of the five traditional trapping sites with a total of seven mice captures. All mice were released unmarked, therefore recaptures are possible. The camera technique documented seven commensal species over eight nights of collecting data, with a total of 79 probable Florida mouse captures (photographs) and one mouse. However, because the mice were not marked in any way, the number of individuals could not be determined. The gopher frog occurrence record from this trial was the first specimen recorded in Gilchrist County and was submitted to and accepted by the Florida Museum of Natural History. Contact Cathy Handrick at (386) 758-0531 for more information.

Nongame Wildlife Grant - Gopher Tortoise and Upper Respiratory Tract Disease (Stuart Cumberbatch).--Drs. Earl McCoy and Henry Mushinsky, University of South Florida completed the preparation of their final report for the study "Population Consequences of Upper Respiratory Tract Disease (URTD) on Gopher Tortoises." This study examined serum levels of ten populations of tortoises to determine relationships to chronic stress. The investigators concluded that observed declines of the indicators of demographic-well-being, including burrow status, size, frequency, etc. in the surveyed populations could not conclusively be linked to the presence of the agent responsible for URTD, *Mycoplasma agassizii*. However, evidence does support a connection between the disease and chronic stress from habitat change, immune response and demographic well-being.

Upper Respiratory Tract Disease (URTD) Research funded by the National Science Foundation at Branan Field Mitigation Park (Christopher Tucker).--Research projects on URTD, hatchling recruitment, nest site habitat characteristics, and predator exclusion were conducted during this reporting period. As part of a multiyear grant from National Science Foundation, the University of Florida proceeded with work at both Branan Field Mitigation Park (BFMP) and Perry Oldenburg Mitigation Park (POMP) with primary goals to continue the study of URTD disease dynamics, obtain estimates of population demographics, and perform detailed habitat assessments. Additionally, interventional strategies, such as experimental predator exclusion fences, were investigated at BFMP to promote tortoise hatchling recruitment. This work began in 2003 and will continue through at least 2007. Dr. Mary Brown, of the University of Florida is the principal investigator. Contact Christopher Tucker at (386) 935-4074 for more information.

Marine Turtles

Management Activities (*Robbin Trindell*).--The FWC continues to focus on working with stakeholders throughout Florida to implement the state's responsibilities under the Marine Turtle Protection Act (Florida Statute 370.12 (1)) and the USFWS Recovery Plans for five species of marine turtle: loggerhead, green, leatherback, hawksbill, and Kemp's ridley. During 2005-2006, staff worked closely with the federal government, state regulatory agencies, volunteer conservation groups, and local governments on the protection of threatened and endangered marine turtles and their critical nesting beaches, developmental habitat, and foraging habitat along Florida's coast. FWC staff continues to provide expertise for requests to conduct human activities that could impact marine turtles and their nesting and foraging habitats. Public education concerning marine turtle biology and important conservation issues such as lighting, debris and nesting beach protection continues to be a major focus of educational efforts. FWC's Marine Turtle Management Subsection is fully supported by proceeds from the sale of the marine turtle license plate and voluntary donations.

Environmental Commenting - During Fiscal Year (FY) 2005-2006, two FWC staff reviewed approximately 330 requests for comments from the Florida Department of Environmental Protection's (DEP) District Offices, DEP's Bureau of Beaches and Coastal Systems, and the State Clearing House. Projects reviewed included more than 119 Coastal Construction Control Line applications, 43 Environmental Resource Permit applications, and 36 Joint Coastal Permit applications. Staff participated in over 30 meetings with Tallahassee DEP staff and more than 25 conference calls on general project impacts. Staff traveled to 28 meetings around the state to discuss regulatory projects and conducted more than 20 site inspections as part of our environmental commenting responsibilities.

Storm Recovery Activities - Staff worked closely with the DEP's Bureau of Beaches and Coastal Systems, the Army Corps of Engineers, the U.S. Fish and Wildlife Service, FEMA, local governments, and private citizens to facilitate storm recovery activities while ensuring that state and federal laws for protection of marine turtles were met. Site inspections were conducted in Broward, Palm Beach, Martin, St. Lucie, Indian River, Brevard, Pinellas, Flagler, St. Johns, Gulf, Santa Rosa, Okaloosa, Bay, Escambia, and Walton Counties to assess impacts to marine turtle nesting beaches and to coordinate on storm recovery activities.

Marine Turtle Permit Program - Staff reviewed and approved approximately 181 applications for conservation activities with marine turtles, including nesting beach surveys (98 permits), stranding and salvage work (110 permits), research (41 permits), public turtle walks (27 permits), rehabilitation at captive facilities (17 permits) and educational display (23 permits). Staff also made presentations at INBS/SNBS training workshops statewide.

Captive Facilities - FWC authorizes captive facilities to hold marine turtles for rehabilitation (17) or for educational display (23) in Florida. Staff coordinated transfer and release of marine turtles during rehabilitation, supervised public marine turtle releases, participated in the annual Marine Turtle Rehabilitation Workshop held at Hidden Harbor Sea Turtle Hospital, and conducted two facility inspections.

Outreach and Education – FWC staff hosted the 2006 Marine Turtle Permit Holder Workshop, co-sponsored by The Jacksonville Zoo, for approximately 200 Marine Turtle Permit Holders and volunteers. This two day event included approximately fifteen presentations by

agency management and research staff, conservation organizations, and local governments as well as summaries of Marine Turtle Grant projects.

Staff continued to offer a training workshop, “The Official Marine Turtle Exterior Lighting Course and Exam”, for lighting designers, local government personnel, turtle volunteers, businesses, and landscape architects. The course was developed jointly with the USFWS and hosted by different organizations around the state, including the City of Venice, Cape Canaveral, Cocoa Beach, Marathon, and Holmes Beach as well as staff from the Florida Department of Environmental Protection. A total of seven (7) workshops were held around the state.

Staff were invited to make presentations on marine turtles and conservation issues at the 2006 CLE International (Continuing Legal Education) Endangered Species conference in Tampa, DEP’s SLERP (Submerged Land and Environmental Resources) meeting in Jacksonville, DEP’s Workshop on Innovative Technologies in Tallahassee, and at the Army Corps of Engineers Council Meeting in St. Petersburg.

Interagency Coordination – FWC staff were invited to participate as an expert for the U.S. Fish and Wildlife Service and Army Corps of Engineer’s Team on the Programmatic Biological Opinion for beach restoration. Staff served on the following teams, working groups, and committees: Archie Carr Sea Turtle Refuge Working Group, DEP’s Turtle Friendly Berm Technical Advisory Group, FWC’s Environmental Commenting, Endangered Species and Shorebird Issue Teams, the Marine Turtle Grants Committee, DOT’s Emergency Response Contact List, and the Florida DOT’s Regional Endangered Species Team. Staff coordinated with local officials on lighting inspections in numerous coastal communities.

In Broward County, FWC initiated a multi-agency effort to assist the County in implementing their approved Light Management Plan. In March, FWC staff met with staff from USFWS, FDOT, Florida Power and Light, Pompano Beach, Deerfield Beach, Fort Lauderdale, Hallandale, and City of Hollywood to discuss the upcoming nesting season and options for minimizing lighting impacts on marine turtle nesting beaches in the county. FWC staff continued to coordinate with local governments, property owners, and USFWS on reducing lighting impacts on Broward County beaches through correspondence, training sessions, and nighttime beach inspections.

For more information on the FWC’s Marine Turtle Protection Program, visit the following web site at <http://www.myfwc.com/seaturtle>. Questions about Marine Turtle Permits, regulatory permit review, or education can be directed to the Imperiled Species Management Biological Administrator for the Marine Turtle Protection Program at (850) 922-4330.

Marine Turtle Research (*Anne Meylan*).--Salvage, Rescue and Necropsy – FWC staff coordinated the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program administered by the National Marine Fisheries Service (NMFS). A total of 1,596 dead or debilitated sea turtles were documented in Florida from 1 July 2005–30 June 2006. By species, there were 984 loggerheads (*Caretta caretta*), 358 green turtles (*Chelonia mydas*), 160 Kemp's ridleys (*Lepidochelys kempii*), 33 hawksbills (*Eretmochelys imbricata*), 23 leatherbacks (*Dermochelys coriacea*), and an additional 38 sea turtles not identified to species. Staff reviewed, edited, and entered all submitted STSSN reporting forms, responded to or coordinated the response to approximately 1,100 reports of dead or debilitated sea turtles, and conducted gross necropsies on approximately 110 of the carcasses. Staff conducted three

workshops to train STSSN participants in standardized data collection methodology. Florida stranding updates were provided weekly to NMFS for incorporation into the Sea Turtle-Shrimp Fishery Management Report. Detailed Florida stranding reports were generated weekly. Staff were co-authors of a peer-reviewed article on a neurological disease in Florida loggerheads that was based on work conducted through the STSSN (Jacobson et al. 2006).

Population Monitoring - This long-term monitoring program involves the collection of nesting and habitat information throughout the geographic range of marine turtles in Florida. Approximately 90% of the world's largest loggerhead nesting population occurs in Florida, and the green turtle and leatherback nesting populations are of regional significance. FWC staff assesses nesting abundance and reproductive output by coordinating a network of state, federal and volunteer permit holders who monitor sea turtle reproduction on Florida's beaches. FWC establishes scientifically sound monitoring designs, provides training, resolves data collection problems, assesses data collection error rates, analyzes data trends, and serves as a clearinghouse for information on marine turtle populations and habitats. Two overlapping monitoring programs, the Statewide Nesting Beach Survey Program and the Index Nesting Beach Survey Program, are carried out, each with separate objectives.

The Statewide Nesting Beach Survey Program, initiated in 1979, achieves nearly complete coverage of the state's nesting beaches to provide data on total nest numbers, nest geographic distribution, and nesting seasonality for each species. Managers use results to minimize human impacts to turtles and nesting beach habitats, and to identify important areas for land acquisition or enhanced protection. In 2005, 191 survey areas were monitored, comprising 805 miles (1,295 km) of beaches. Statewide, the program documented 52,469 loggerhead nests, 9,642 green turtle nests, 782 leatherback nests, one hawksbill nest and four Kemp's ridley nests. FWC disseminates results of the Statewide Nesting Beach Survey Program through scientific publications, presentations, reports, the Internet, and the media.

The Index Nesting Beach Survey Program, started in 1989, differs from the Statewide Nesting Beach Survey program in collecting more detailed data from a smaller set of index beaches. Surveyors identify each sea turtle track to species, identify the tracks as a nest or abandoned attempt, and locate nests within an approximate half-mile beach zone. Nests and nesting attempts have been monitored for 18 years at 478 index beach zones surveyed daily during each 109-day season, an effort that currently provides more than five million records in the Index Nesting Beach Database. Annual surveyor training, on-site verification, and consistency of the methods used during the 18 years of the program and among the 246 miles (396 km) of index beaches make the resulting database a representative and unbiased assessment of sea turtle nesting. The program provides a reliable indication of temporal and spatial trends in Florida sea turtle abundance.

FWC staff monitors sea turtle nesting habitat in part by cataloging barriers to nesting. Barriers include coastal armoring, buildings, geotextile tubes, dune-beach walkways, and other man-made structures. Staff has mapped all structures that could be barriers to sea turtle nesting on approximately 450 miles (724 km) of index nesting beaches and additional randomly selected stretches of turtle nesting beach around the State. Randomly selected stretches were split into ten 5-mile (8 km) stretches of beach in each of four regions of the state (i.e., Northeast, Southeast, Southwest and the Panhandle). On these beaches, structures were categorized and mapped with DGPS to sub-meter accuracy. Surveys were conducted in 2002 and 2003. Because beach conditions change, with accretion and erosion covering and uncovering structures, there is a need

for this habitat assessment to be ongoing. In 2005 and 2006, staff resurveyed four 5-mile stretches of beach in each of four regions of the state (80 miles total) to examine changes in barriers to nesting.

Biology, Ecology, Life History, Migrations - Most research on marine turtles has been conducted on the nesting beach although turtles spend only a small fraction of their lives there. Recovery efforts depend on a broad knowledge of population biology, life history, ecology and migrations. Ongoing projects in the Western Florida Current, the eastern Gulf of Mexico, Florida Bay, the Key West National Wildlife Refuge (NWR), Bermuda, and Panama involve capturing live animals at sea. Studies target four species of marine turtles and several life history stages, and address population structure (including natural sex ratios), growth rates, genetic identity, life history, health, diet, habitat preferences, and migrations. FWC research on the early neonate dispersal stage is critical to understanding and managing threats to marine turtles as they leave Florida waters and circulate throughout the North Atlantic.

In June 2006, 58 loggerheads and two green turtles were captured during an eight-day sampling session in Florida Bay. All animals were measured and tagged. Nineteen of the turtles had been previously marked, providing data on growth and residency in Florida Bay. This project has been continuously conducted since 1990. Some individual turtles have now been capture numerous times over periods as long as ten years. A collaborative study conducted during this sampling session in Florida Bay involved taking skin samples for stable isotope analysis to determine trophic level (collaborating with researchers from the Archie Carr Center for Sea Turtle Research, University of Florida).

FWC staff study the abundance, distribution, behavior, and diet of young-of-the-year and small juvenile sea turtles in open-ocean habitat off Florida (western Florida Current and eastern Gulf of Mexico). These turtles live in surface waters and occupy a pelagic stage in sea turtle development that precedes the shallow-water benthic foraging stage occupied by larger immature and adult sea turtles. Study objectives are to measure relationships between open-ocean habitat and pelagic turtle abundance, and to measure threats unique to this habitat such as mortality and morbidity from plastics and tar ingestion. Staff records physical oceanographic measurements, turtle behavior, their relationships to floating objects and other organisms, turtle weights and measures, and evidence of ingested plastics and tar. Thirteen sampling trips were conducted between July and September of 2005. Survey locations included Gulf of Mexico waters offshore from Apalachicola and Sarasota, and Atlantic waters offshore from St Augustine, Cape Canaveral, Sebastian Inlet, and Ft. Pierce. GIS analysis revealed two important oceanographic features that correlated with observations of epi-pelagic sea turtles: convergence at the western boundary of the Gulf Stream Front, and the centers of mesoscale eddies from major currents, namely, the Loop Current and the Gulf Stream. The potential for magnetic resonance imaging (MRI) to detect and measure ingested plastics and other synthetic material in the gastrointestinal tract of neonate sea turtles was investigated through collaboration with researchers at the Advanced Magnetic Resonance Imaging and Spectroscopy (AMRIS) facility at the University of Florida.

As part of a cooperative research project with the government of Bermuda, 174 green turtles were captured in nets, tagged and released during 2005. Over 3,000 green turtles have been tagged as part of this project, which has been ongoing since 1968. DNA sequence data have shown that one-third of the population of immature green turtles that inhabit Bermuda waters were derived from Florida nesting beaches. Captures of flipper-tagged turtles and satellite tracks

from this project have documented migrations to feeding grounds in Nicaragua, Cuba, Colombia, Florida, the Dominican Republic, Panama, Venezuela, St. Lucia, and Grenada, showing the need for international cooperation in research and management of this endangered species. In conjunction with field sampling in Bermuda, FWC staff collaborated with the Bermuda Aquarium and Eckerd College to sponsor a course on the Biology and Conservation of Sea Turtles for nine resource managers and students drawn from Bermuda, Colombia, Guatemala, Mexico, St. Kitts/Nevis, Peru, and the United States

Data on gender, size, maturity, and genetic identity were collected from 20 green turtles, 10 hawksbills and two leatherbacks captured in nets or on the nesting beach at Zapatilla Cays, Bastimentos Island National Marine Park, Panama. Captures of flipper-tagged turtles from this project have documented reproductive and developmental migrations to feeding grounds in Nicaragua, Costa Rica, Colombia, and Cuba. 195 hawksbill nests were documented by beach surveys; productivity assessments on 179 nests showed that over 23,396 hatchlings successfully emerged from beaches on Zapatilla Cays. This work is part of a larger collaborative effort to restore what was once the most important hawksbill nesting population in the Western Hemisphere. Collaborators include USFWS, National Marine Fisheries Service (NMFS), the Caribbean Conservation Corporation (CCC), the Smithsonian Tropical Research Institute, ANAM (National Environmental Authority of Panama) and the indigenous authorities of the Ngöbe-Buglé Comarca. A female hawksbill was satellite-tracked after nesting at Chiriqui Beach. Genetic, tag-return, and satellite tracking data provide the basis for understanding the ecological geography of these wide-ranging migratory species, and guide regionally-based management.

Scientific Consultation with Management and Educational Outreach - Staff conducted five training workshops (383 attendees) around the state for permit holders who conduct surveys of turtle nesting beaches, three workshops (60 attendees) for volunteers assisting with sea turtle stranding and salvage activities, and one regarding stranding response for marine turtles for Miami law enforcement dispatchers and supervisors in Miami. FWC staff served on several scientific advisory committees and governing boards: the Loggerhead Recovery Team, Carr Refuge Working Group, university graduate committees, editorial boards, and the International Union for the Conservation of Nature's Marine Turtle Specialist Group. Staff reviewed research proposals for the Nongame Wildlife program and all research-related proposals submitted for consideration by the small grants program of the Florida Sea Turtle License Plate. Staff gave presentations to school groups at MarineQuest, to permit holders at the 9th Annual Permit Holders Workshop, and to South Regional FWC Law Enforcement Officers; judged the South Florida Science Fair; manned a booth at the Lake Worth USCG station open house; and presented five papers and posters at the 26th Annual Symposium on the Biology and Conservation of Sea Turtles.

For more information on the Marine Turtle Research Program, visit the following website at http://research.myfwc.com/features/category_main.asp?id=1289. Questions about research programs for marine turtles can be directed to Dr. Anne Meylan of the FWC's Florida Wildlife Research Institute at (727) 896-8626.

Smalltooth Sawfish

Smalltooth Sawfish Research (*Ed Matheson/Gregg Poulakis*).--Smalltooth sawfish (*Pristis pectinata*) were once common in the coastal and estuarine waters of the southeastern

United States, but during the 20th century they became rare throughout their North American range. Currently, south and southwest Florida are the only areas where this species is regularly found. This decline is attributed to two main factors: 1) bycatch in commercial and recreational fisheries, and 2) life history parameters that include late maturity and production of small numbers of young.

Conservation efforts directed toward smalltooth sawfish in the United States began with their protection by the State of Florida in 1992 and eventually led to protection under the Endangered Species Act in 2003. These conservation measures were enacted largely on the basis of large scale declines in occurrence and a gross reduction of historical range. Despite the special concern for this fish, there is a dearth of scientific information, making the implementation of conservation and recovery plans for this species difficult.

The FWC has been conducting multi-species fisheries-independent surveys of fishes in many of Florida's estuaries since the late 1980's. This program employs standard methods, which provide high quality fisheries data, some of which are used in developing stock assessments and setting regulations. In November 2004, FWC staff initiated a long-term monitoring program specifically designed to collect data on the life history, biology, and ecology of the smalltooth sawfish. The program is funded by monies obtained from the National Marine Fisheries Service/National Oceanic and Atmospheric Administration's Southeast Region Office of Protected Resources through the Protected Species Conservation and Recovery with the States program. FWC was issued permit number 1475 by the National Marine Fisheries Service Office of Protected Resources to conduct this research.

Monitoring- Between July 2005 and June 2006, two complimentary sampling methods were used to collect smalltooth sawfish in the Charlotte Harbor estuarine system which is located on the southwest Gulf coast. Monthly, randomized sampling was conducted using a large (600 ft; 183 m) seine in the Caloosahatchee River, which is an area that is known to be frequented by smalltooth sawfish. In addition, monthly directed sampling that targeted sawfish hotspots was conducted throughout the estuary using a multi-gear approach (e.g., gill nets, seines, hook and line). Captured sawfish were tagged with a brightly colored rototag and a subdermal passive integrated transponder tag and immediately released at the site of capture. In addition, acoustic tags were fitted to most of the sawfish. The rototags are printed with FWC tagging hotline information on one side and a unique tag number on the other. Anglers who encounter these tags can call the hotline and report their catch and location information. The passive integrated transponder tags are about the size of a grain of rice and contain a uniquely numbered microchip that is detected by an electronic reader that is carried by researchers. The advantage of these tags is that they remain with the sawfish for life. The acoustic tags are used by researchers to track sawfish movements.

During this 12 month period, 24 sawfish were collected (2 during randomized sampling and 22 from directed sampling), including seven recaptures. One additional sawfish was recaptured by an angler. A variety of data were taken on all sawfish (e.g., lengths, rostral tooth counts) and each new animal was tagged and released. Total lengths ranged from 2.2 to 6.9 feet (690–2120 mm); all of these sawfish were immature. Through this monitoring effort, the FWC is identifying habitats that are important during the early life history of this endangered species.

Movements- Successful recovery of the smalltooth sawfish will require a broad understanding of the life history, biology, and ecology of this species, including movement patterns and habitat use. FWC staff is using acoustic technology to determine the movements of

individual sawfish. Between July 2005 and June 2006, 19 smalltooth sawfish were fitted with acoustic tags and were tracked. The data obtained from these and future tracks will help define growth rates, activity space, home range, and the abiotic preferences of this species. This is a collaborative effort between the FWC and the Mote Marine Laboratory.

Communication, Education, and Outreach- One FWC staff is part of the Smalltooth Sawfish Recovery Team. This group includes members with federal, state, academic, and non-profit affiliations and is assembled by the National Marine Fisheries Service to draft a Recovery Plan for this species. Data from the FWC's sampling are provided to the Recovery Team as needed.

Information on the FWC's smalltooth sawfish research and the status of the species was presented at a variety of venues, including the Charlotte Harbor Conference in October, local school classes, and fishing groups. In addition, posters, which contain a request that catches or observations of sawfish be reported to the FWC, have been maintained at boat ramps and tackle shops. Information received is compiled and used to help determine potential research sample sites. During these contacts, staff takes the opportunity to educate responders about the smalltooth sawfish and the FWC's role in its protection.

For more information on the Smalltooth Sawfish Research program, please visit the smalltooth sawfish portion of the Fish and Wildlife Research Institute web site (<http://research/MyFWC.com/sawfish>) or call Gregg Poulakis of the FWC's Fish and Wildlife Research Institute at (941) 255-7403.

Gulf Sturgeon

Conservation and Management (*Eric Nagid*).--FWC staff attended the 7th Annual Gulf Sturgeon Workshop on November 1-2, 2005, held in Panama City, FL. Contributions by FWC staff to the workshop entailed a presentation documenting the presence of adult and juvenile Gulf Sturgeon on the Withlacoochee River (Suwannee River tributary) observed during the fall of 2005. Other contributing presentations by agency personnel from USFWS, USGS, NOAA, USACE and academic institutions focused on current research and monitoring programs in their respective states, and hurricane related impacts to these studies and populations.

FWC staff assisted the Suwannee River Water Management District with Minimum Flows and Levels (MFL) for Gulf sturgeon migrations and habitat needs in the Suwannee River Basin. MFLs for the Lower Suwannee River are complete, and those for the Middle Suwannee and Withlacoochee Rivers are near completion. MFLs that are protective of critical habitat and physical passage to traditional spawning and resting locations are vital to the sustainability and continued recovery of the of Gulf sturgeon in the Suwannee River.

Research- FWC funded Dr. Bill Pine (University of Florida) to assess Gulf sturgeon movement, spawning site selection, and post-spawn holding areas in the Apalachicola River. This assessment was made using active and passive telemetry techniques, extensive egg sampling, and habitat availability surveys. His findings documented an additional spawning site on the Apalachicola River. Dr. Pine indicated that the Apalachicola River system contains a variety of important habitat types used by Gulf sturgeon prior, during, and after spawning. He provided recommendations for developing a more robust monitoring program that could possibly detect Gulf sturgeon population responses to various management actions. The final report is complete and a link to the report is at http://floridarivers.ifas.ufl.edu/sturgeon_summary.htm.

FWC staff collaborated with Dr. Daryl Parkyn (University of Florida) to deploy egg collection mats on the Withlacoochee River in the spring of 2005 and 2006. A single egg was recovered from the collection mats in May 2005, but provided the first documented occurrence of reproductive use by Gulf sturgeon on the Withlacoochee River. Continued monitoring of this tributary to the Suwannee River is planned for coming years.

Monitoring- FWC personnel assisted the USFWS with the monitoring of gulf sturgeon populations. The species was collected from the Blackwater system, north of Milton Florida, at a previously known location. An additional sample from the Perdido River did not observe the species. Gulf sturgeon were also incidentally observed, while conducting research for the Gulf Stream Monitoring Program from the Yellow River (near the confluence of the Yellow and Shoal Rivers) and from the Choctawhatchee River system (south of SR 2).

Other Imperiled Fish

Gulf Coastal Plain Stream Monitoring Program (John R. Knight and Costas Katechis).-- During the previous fiscal year a State Wildlife Grant (T-7) funded project was initiated. The goal of the project is to provide a long-term monitoring strategy for stream fish communities residing in the Gulf Coastal Plain ecosystem. While imperiled fish taxa were not specifically targeted, several collections/observations were encountered during this reporting period. When feasible (e.g. sample locations occurred in the vicinity of known imperiled species locations) efforts were made to collect (or observe) these taxa, in order to monitor the status of these populations.

Blackmouth shiner (*Notropis melanostomus*).--No blackmouth shiners were collected during this period. Samples were conducted within the known range of the species (Blackwater and Yellow Systems), but habitats associated with the species were rarely surveyed. Sample sites focused on lotic habitats, where blackmouth shiners typically do not occur. As mentioned in previous reports (Bass et al. 2004), this species is likely difficult to monitor quantitatively, warranting the need for alternative monitoring strategies to assess the status of the species.

Bluenose shiner (*Pteronotropis welaka*).--Bluenose shiners were collected from two locations during research efforts conducted for this project. One collection (Wilder Branch, an Escambia River tributary) was a previously known location for the species. The species was collected here, but in low numbers. A second location where a single specimen was collected (Limestone Creek, a tributary to the Choctawhatchee River), represents a range extension in Florida. As with the blackmouth shiner, this species may also difficult to quantitatively monitor in tributary systems, warranting the need for an alternative sampling strategy. Based on previous research by Bass et. al (2004), non-wadeable system (e.g. large streams and rivers) populations may be monitored using boat electrofishing gear.

Saltmarsh topminnow (*Fundulus jenkinsi*).--With the collaboration of The Nature Conservancy personnel and Florida Department of Environmental Protection, FWC biologists conducted a series of samples from the Perdido River system in an effort to collect saltmarsh topminnows. No individuals were collected during these surveys. Additional samples are needed to determine whether this species can be quantitatively sampled. Since the scope of the

Gulf Stream Monitoring Program does not include brackish habitats, additional future research is needed to address the status of this species.

Shoal bass (*Micropterus cataractae*).--The distribution of shoal bass is primarily confined in Florida to the Chipola River between Altha and Marianna. While the species is occasionally collected outside this area, population size is likely limited by the scarcity of limestone outcrops, the species' preferred habitat. Samples collected by FWC personnel north of Marianna did yield two specimens, within a surveyed reach of two kilometers. Samples conducted south of Blountstown, Florida did not collect any shoal bass, confirming a restricted distribution for the species.

Crystal darter (*Crystallaria asprella*).--In Florida, crystal darters are only known to occur in the Escambia River system. Samples collected from the Perdido River during the previous year did not observe any crystal darters. Numerous samples conducted from the Escambia River also did not observe the species. Three attempts were made to collect the species from their only known location in Florida (two boat electrofishing and one snorkel survey). Due to drought conditions resulting in extreme low flow conditions, the specific location where crystal darters were previously collected was no longer submerged. Concurring with previous research (Bass et. al 2004 and Walsh et. al 1993), the species' classification may need to be re-evaluated.

Harlequin darter (*Etheostoma histrio*).--The harlequin darter is also only known to occur in the Escambia River system in Florida. While restricted in range, the species was regularly collected from both tributaries and mainstream Escambia River, when suitable habitat was present. Collaborative efforts by the USFWS and FWC personnel to monitor stream fish communities from Big Escambia Creek indicated the population size of harlequin darters is likely increasing, as a result of a stream restoration project on this system. Additional long-term monitoring from this system is still needed to confirm this trend.

Miami Blue Butterfly

Recovery Efforts (*Ricardo Zambrano*).--The Miami blue butterfly (*Cyclargus* [= *Hemiargus*] *thomasi bethunebakeri*) received emergency listing as an endangered species in Florida on December 10, 2002 by FWC to prevent imminent extinction. The butterfly was formerly found from Hillsborough County to the Dry Tortugas on the Gulf Coast and from Merritt Island to the Florida Keys on the Atlantic Coast. The Miami blue is now only found at one location, Bahia Honda State Park, in the Florida Keys. The wild population ranges from 50 to 100 individuals.

FWC has partnered with several government agencies, nongovernmental organizations, and the University of Florida (UF) to protect and recover this species, and a species management plan was developed. This plan can be viewed at: <http://myfwc.com/imperiledspecies/plans.htm>.

Captive Breeding and Reintroduction- FWC has coordinated closely with the University of Florida, the National Park Service, and the Florida Park Service with ongoing captive propagation and reintroduction efforts on the Miami blue. In April 2005, the captive colony, which at gone through 30 generations, was restarted with new wild specimens. Forty-six egg larvae were brought in from the Bahia Honda population to restart the colony. As of June 2006,

the captive colony was in its second generation and 660 viable pupae had been produced. Problems with disease in the captive colony and the lack of the larvae and adults resulted in no reintroductions to the wild in fiscal year 2005-2006. FWC staff has assisted with the release of larvae to reintroduction sites and has helped monitor these sites afterward. Monitoring by FWC staff and UF staff at release sites indicates that the butterflies have not yet been established at the sites.

FWC was awarded a grant through the Wildlife Foundation's Conserve Wildlife Tag grant program. The grant has been used to contract UF to continue captive breeding of the Miami blue at their McGuire Center for Lepidoptera and Biodiversity. The grant monies will also be used by UF to continue reintroducing Miami blues to suitable sites within their former range and to monitor released individuals post-release. Further, the grant has also allowed UF to continue monitoring the Bahia Honda State Park population.

Florida Coordinating Council on Mosquito Control- FWC staff now has a representative on this Council. A meeting was held in August that was attended by the FWC representative and additional staff. It was decided at this meeting to convene a Subcommittee which would try to resolve the issues and concerns between south Florida mosquito control districts and the FWC's effort to recover the Miami blue butterfly. This Subcommittee meeting took place on February, 2006. Several agreements were worked out which would allow FWC to proceed with reintroduction efforts and which would not prevent mosquito control districts from performing their duties.

For more information on the Miami blue butterfly, please contact the South Regional Nongame Biologist Ricardo Zambrano at (561) 625-5122 or email at ricardo.zambrano@myfwc.com.

Nongame Wildlife Grant - Miami Blue Butterfly Genetics (Stuart Cumberbatch)--Dr. Thomas Emmel, McGuire Center for Lepidoptera Research, University of Florida initiated a study to determine the molecular diversity of the endangered Miami blue butterfly (*Cyclargus thomasi bethunebakeri*) at Bahia Honda State Park. This study will focus on genetic analysis of the species, which has been identified as an action item in the Miami Blue Butterfly Management Plan. Efforts will include the examination of the gene flow between the 13 remaining colonies at the park, the genetic differentiation between the wild metapopulation and museum specimens, the diversity within the captive breeding colony, and the development of long-term strategies for the genetic conservation and management.

Nongame Wildlife Grant - Miami Blue Butterfly Insecticide (Stuart Cumberbatch)--Dr. Thomas Emmel, McGuire Center for Lepidoptera Research, University of Florida continued to examine the direct effects of various concentrations and application methods of mosquito control pesticides on the Miami blue butterfly. The study will also evaluate the concentrations deposited on host material and the longevity of the chemical in the field.

Black Creek Crayfish

Black Creek Crayfish Monitoring Activities, Camp Blanding Wildlife Management Area (Jim Garrison)--A total of seven sites on Camp Blanding Wildlife Management Area were surveyed for Black Creek crayfish (*Procambarus pictus*) from June 28-30, 2006. The survey

consisted of 20 minutes of sampling by dip net at each potential crayfish site for presence or absence of the Black Creek crayfish, as well as any other indicator species of crayfish. Black Creek Crayfish were found at five of the seven sites surveyed. Peninsular crayfish, an indicator of degrading habitat, were found at one of the five sites. Contact Jim Garrison at (904) 533-2768 for more information.

Panama City Crayfish

Listing Evaluation (Dan Sullivan).--In accordance with the listing process (68A-27.0012 F.A.C), the Commission approved a Biological Review Panel (BRP) to review the status of the Panama City crayfish (*Procambarus [Leconticambarus] econfinae*; PCC). This group consisted of two biologists from the FWC, one from the USFWS, one biologist from academia, and one private biologist. The BRP evaluated the best available information on the status of PCC and compared this to the listing criteria found in 68A-1.004 F.A.C. The information was compiled in the Biological Status Report (BSR) which is available at <http://myfwc.com/imperiledspecies/reports/PCC-BSR.pdf>. The BSR was distributed to scientists for peer review, then presented to the Commission at the June 2006 Commission meeting. The Commission agreed with the conclusion of the BSR that the PCC warranted listing as threatened and directed staff to move forward with management plan development. The PCC will remain a species of special concern until the rules proposed in the management plan are voted on by the Commission. It is anticipated a draft plan will be available in early 2007 with the final plan being presented in June 2007.

Management (David Cook).--The Panama City crayfish (*Procambarus [Leconticambarus] econfinae*; PCC) was listed by the Florida Game and Fresh Water Fish Commission (now – FWC) in 1989 as a species of special concern. This was due to its apparent rarity and a range restricted to part of Bay County in the vicinity of Panama City.

Candidate Conservation Agreement with Assurances (CCAA)– Although listed by the State of Florida, the PCC is not federally listed but considered a candidate species by the USFWS. Since 2004, meetings have been held between the USFWS, the FWC, the St. Joe Company (St. Joe), and several other interested parties to discuss drafting a candidate conservation agreement (CCA) that would provide protection for the PCC while allowing specified take. A subset of CCA participants comprising a scientific committee drafted proposed Best Management Practices (BMPs) for the PCC. St. Joe began drafting a proposal for a PCC conservation area that would be restored and managed for the conservation of the crayfish. Negotiations are currently underway to draft a 3-party CCAA for the PCC between St. Joe, the USFWS, and the FWC.

Research.--An investigation to evaluate whether the PCC is subject to disease pathogens is being conducted by FWC staff in the Fish and Wildlife Research Institute (FWRI).

For more information on the Panama City crayfish, please contact the Invertebrate Taxa Coordinator David Cook at (850) 410-0656 ext. 17315 or e-mail at: david.cook@myfwc.com. df

Habitat Modeling

Listed Species GIS Based Habitat Modeling (Mark Endries).--The FWC is in the final stages of completing a report entitled “Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas”. The report is the result of a

geographic information system (GIS) based assessment of the degree of security provided to listed and rare wildlife species by the current system of conservation lands in the state of Florida. The publication identifies and recommends protection for important habitat areas. The lands recommended for protection are referred to as Strategic Habitat Conservation Areas (SHCA). Sixty-one wildlife species have been selected for analysis. GIS based potential habitat models have been created for each species based on the FWC 2003 land cover dataset. A spatially explicit population viability analysis (PVA) has been performed to evaluate the likelihood that the species will persist for the next 100 years based upon the habitat identified in the potential habitat model. The security of each species was then assessed using the species' potential habitat model, PVA analysis, and public lands boundaries. If a species was deemed to not have an adequate base of habitat in the current system of conservation areas in Florida (public lands), then additional, privately owned lands, were identified as SHCA. The results of the analysis are intended to help guide land acquisition, wildlife management, land conservation, and land-use planning, as well as serve as an educational document for Florida's imperiled wildlife species. For more information please contact Mark Endries at (850) 488-6661.

COORDINATION AND TECHNICAL ASSISTANCE

Program Summary (*Dan Sullivan*).--Endangered species coordination involved overseeing, monitoring, facilitating and otherwise organizing endangered species projects and research; ensuring adherence to federal and state reporting and documentation requirements and guidelines; implementing or facilitating protection through technical assistance, regulatory measures, and permit review; providing or facilitating consultation and technical assistance to private interests and interacting with state and federal agencies, conservation organizations and others regarding a wide range of endangered species matters.

Funding for coordination was jointly derived from the USFWS via Section 6 of the Federal Endangered Species Act of 1973, the Nongame Wildlife Trust Fund (NGWTF) and the Florida Panther Research and Management Trust Fund (FPRMTF). Coordination included initiating and/or responding to correspondence dealing with various endangered species issues, processing numerous requests for endangered species information and representation of the FWC at various meetings and conferences. All endangered species activities funded from federal sources were monitored and overseen, and annual reports were prepared to document their progress. Technical assistance in endangered species matters was provided to a number of state and federal agencies, consulting firms, private individuals and local regulatory authorities. Greater than 2,000 phone calls, a large number of emails and formal letters were provided to provide this technical assistance. All aspects of the Section 6 Cooperative Agreement were maintained, and the necessary paperwork for renewing this agreement was submitted. This included drafting 49 emergency handling reports, administering the Section 6 grant paperwork, and drafting the Section 6 renewal packet.

In an effort to improve coordination of listed species efforts between the FWC and the USFWS, a second annual coordination meeting was held that included staff of the FWC, and staff from each of the three USFWS Florida offices. Additionally, staff of the FWC provided comments on proposed coral listings, proposed bald eagle guidelines and reclassification, and possible reclassification of the American crocodile.

During FY 2005-2006, staff coordinated the evaluation of four species via the listing process. For more information on this, please see the “Listing Process” summary in the “Statewide Policy” section of this report.

In an effort to make information more readily available to the public, the imperiled species website was updated, and information was added. For copies of previous legislative reports, the updated list of imperiled wildlife, information on listed species permits, or listed species management plans, please visit <http://myfwc.com/imperiledspecies/> or contact the Endangered Species Coordinator at 850-488-3831.

CRITICAL WILDLIFE AREAS

Program Summary (*Terry Doonan*).--Critical Wildlife Areas (CWAs) are established by the FWC under rule 68A-19.005 F.A.C to protect important wildlife concentrations from human disturbance during critical periods of their life cycles, such as nesting or maternity seasons. For each CWA, the boundaries and periods of time when portions of the area may be posted closed to entry by people are defined in the CWA establishment order. Five regional FWC biologists are responsible for evaluating needs for potential CWAs, developing or revising establishment orders, managing the posting of appropriate signage, and coordinating the monitoring of the wildlife populations using those areas each year. During FY 2005-2006, CWAs were monitored by biologists and sites were posted seasonally to reduce disturbance and advise the public of the importance of the CWAs. Protection efforts were coordinated with local government, other agencies, organizations, and FWC law enforcement personnel, as appropriate. Seventeen of the 21 established CWAs supported populations of important wildlife species during the year (Table 6). Almost all the active CWAs supported listed species, the most notable of which included: Alafia Banks (wading birds, oystercatchers and pelican rookeries); ABC Islands (wading birds and pelican rookeries); Fort George Inlet (terns and black skimmers); St. George Causeway (least terns); and Big Marco Pass (least terns, black skimmers, plovers and wintering shorebirds). Habitat at Pelican Shoal, which had supported the primary United States nesting site for the Caribbean population of roseate terns (*Sterna dougalli*), was no longer available as a result of impacts from hurricanes.

Table 6. Critical Wildlife Areas in Florida in 2006.

Region	CWA name	County	Closure period	Primary taxa	Status ^a	Managed area
Southwest						
	Alafia Banks	Hillsborough	1 Dec. to 1 Sept.	Hérons, egrets, ibis, pelicans, spoonbills, oystercatchers	12,236 pairs	75 acres
	Little Estero Island	Lee	1 April to 1 Sept.	Least terns, Wilson's plovers	73 pairs	25 acres
	Anclote River Islands	Pasco/ Pinellas	1 Feb. to 1 Sept.	Hérons, egrets pelicans	Inactive ^b	--
	Myakka River	Sarasota	1 March to 1 Nov.	Wood storks, egrets, herons, anhingas	175 nests	1 acre
North Central						
	Amelia Island	Nassau	1 April to 1 Sept.	Least terns	50 nests	10 acres
	Bird Islands	Duval	1 April to 1 Sept.	Royal terns, black skimmers, gull-billed terns, American oystercatchers	200 nests	2 acres
	Fort George Inlet	Duval	1 April to 1 Sept.	Royal terns, black skimmers, gull-billed terns, laughing gulls	>400, ~100, ~20, >3,000 nests	10 acres
Northwest						
	Tyndall	Bay	Year-round	Least terns, black skimmers, snowy plovers, Wilson's plovers, American oystercatchers	59, 0, 47, 27, five nests	10 acres
	Alligator Point	Franklin	1 April to 1 Sept.	Least terns, black skimmers, snowy plovers, Wilson's plovers, American oystercatchers	0, 0, 1, 5, 4 nests	145 acres
	St. George Causeway	Franklin	1 April to 31 Aug.	Least terns, laughing gulls, royal terns, sandwich terns, American oystercatchers, black skimmers	137, 3,747, 835, 128, 0, 0 nests	32 acres
	Gerome's Cave	Jackson	1 March to 1 Sept.	Southeastern myotis bats	15,000	2 acres
South						
	Deerfield Island Park	Broward	Year-round	Gopher tortoise	10 individuals	56 acres
	ABC Islands	Collier	Year-round	Hérons, egrets, glossy ibis, pelicans	552 nests	75 acres
	Big Marco Pass	Collier	Year-round	Least terns, black skimmers, plovers, wintering shorebirds	450 tern, 230 skimmer nests	60 acres
	Caxambas Pass	Collier	1 April to 1 Sept.	Least terns, wintering shorebirds	30 nests	1 acre
	Rookery Island	Collier	Year-round	Hérons, egrets, pelicans	Inactive	5 acres
	Bill Sadowski	Dade	Year-round	Shorebirds, herons, egrets (foraging only)	200 individuals	700 acres
	Pelican Shoal	Monroe	1 April to 1 Sept.	Roseate terns, bridled terns	Inactive - not emergent now	1 acre
Northeast						
	Jennings Cave	Marion	15 Feb. to 31 Aug.	Southeastern myotis bats	Inactive	1.9 acres
	Matanzas Inlet	St. Johns	1 April to 1 Sept.	Least terns, Wilson's plovers, willets	214 tern nests, 3 plover nests	28 acres
	Ponce de Leon Inlet	Volusia	1 April to 15 Aug.	Least terns, Wilson's plovers	terns inactive; five plover nests	13.7 acres

^aEstimated peak numbers of individuals and/or successful nests at each site during the closed period in FY 2005-2006.

^bInactive means the site was not used during FY 2005-2006.

FLORIDA'S LANDOWNER INCENTIVE PROGRAM

Program Summary (*Mike Blondin*).--In cooperation with the USFWS, the FWC has been working to implement the Landowner Incentive Program (LIP) since October 2003. Florida's LIP is a vital natural resource-driven tool used to promote stewardship on private lands while also playing a fundamental role in the conservation of imperiled species not only for Florida, but across the nation. Florida's LIP is a voluntary cost-share program designed to provide technical and financial support to private landowners interested in improving habitat conditions on their properties to benefit listed species. New technological advances amongst cost-share programs are being implemented to ensure that the federally funded dollars are being distributed in the most efficient and equitable manner possible on properties with the greatest potential benefits for listed species.

Applicant properties are individually evaluated for natural resource value using a Geographic Information System (GIS)-based process that assigns a property rank based on the best available databases. These databases are layers of environmental information such as land cover imagery, current listed species habitats, wildlife occurrence data and potential listed species habitat models. Once ranked, FWC biologists recommend beneficial and cost-effective practices based on the GIS analysis, site visit, and the targeted listed species.

During fiscal year 2005-06, FWC biologists have visited 35 private landowners and have obligated \$345,451 at a 50% cost-share rate to conduct practices across 38,045 acres (15,396 ha) to directly benefit those identified species. Some of the management practices that have been funded include: prescribed fire [\$115,400 being obligated across 14,368 acres (5815 ha)]; longleaf pine and natural groundcover restoration [\$101,890 was obligated on 1055 acres (427 ha) to establish native trees, shrubs, forbs or grasses to restore or improve habitat conditions]; habitat modification [\$101,263 has been obligated to mechanically and chemically enhance over 2640 acres (1068 ha) by re-establishing more natural stand conditions that improve habitat for listed species]; nest platform/cavity creation [\$4025 has been obligated to install 37 red-cockaded woodpecker (*Picoides borealis*) inserts].

Affected habitat included pine flatwoods, tropical hardwood hammocks, hardwood swamp, bottomland hardwoods, and mixed hardwood and pine. Treatments were applied to these plant communities to provide improved habitat conditions for flatwoods salamander (*Ambystoma cingulatum*), gopher frog (*Rana capito*), Eastern indigo snake (*Drymarchon corais couperi*), Florida pine snake (*Pituophis melanoleucus mugitus*), white ibis (*Eudocimus albus*), wood stork (*Mycteria Americana*), little blue heron (*Egretta caerulea*), red-cockaded woodpecker (*Picoides borealis*), sandhill crane (*Grus canadensis pratensis*), Southeastern American kestrel (*Falco sparverius paulus*), crested caracara (*Caracara cheriway*), Sherman's fox squirrel (*Sciurus niger shermani*), and gopher tortoise (*Gopherus polyphemus*).

Future expectations for Florida's LIP are being held to a high standard to meet the needs of private landowners in order to benefit the greatest number of at-risk species. To that end, it is imperative that future funding be secured for private landowners in order to perpetuate the success and sustain long-term meaningful benefits for those imperiled species dependent upon the LIP.

Please visit the LIP website at <http://www.myfwc.com/LIP/> for more information on Florida's LIP or contact the LIP Coordinator at 850-627-1773, extension 114 for questions regarding this report.

LAW ENFORCEMENT

Statewide Enforcement (*Capt. John West, Lt. Colonel Don Holway*).—The FWC Division of Law Enforcement (DLE) continued statewide enforcement activities to protect specific endangered and threatened species during the year. These special programs consisted of the following:

Regular patrols of the Florida panther reduced-speed zones in Lee and Collier County to protect panther and prey species and provide public safety.

Patrol efforts targeting coastal nesting areas of marine turtles to reduce nest destruction and unlawful egg removal or theft.

Enhanced statewide enforcement efforts directed towards utilizing radar and the Manatee Cam surveillance technology to ensure compliance and to prevent manatee vessel strikes.

Regular patrols in Monroe County enforcing the Key Deer speed zone on Big Pine Key.

DLE assisted FWC biologists working with the Perdido Key Beach mouse with increasing public awareness on sensitive habitat after several hurricanes.

The FWC DLE issued at least 72 citations involving Endangered, Threatened and Species of Special Concern during FY 2005-2006. The majority of these were for violation of a speed zone, or illegal take or possession. For more information please contact the Division of Law Enforcement at (850) 488-6253.

PERMITTING AND TECHNICAL ASSISTANCE

Program Summary (*Angela T. Williams*).--FWC staff provided federal agencies, other state agencies, environmental consultants, and regional and local regulatory authorities with technical assistance in protecting listed species on managed lands and lands slated for development. Many of these entities in addition to researchers, landowners, and educational facilities utilized the technical assistance and guidance when applying for scientific collecting, captive possession, relocation and incidental take permits for listed species.

Technical assistance for developers, environmental consultants, and regulatory agencies usually consisted of some combination of the following mechanisms: (1) comments on species management plans submitted for review; (2) development of individual species management plans or guidelines; and (3) on-site visits to determine species management needs. Generally, the public was provided information regarding listed species life history and other biological information, locality and occurrence data, listing status, and solutions to nuisance situations (i.e., education on the species behavior and habitat requirements and suggestions for coexisting with the species).

Applicants requested permits to handle or impact listed species throughout the state. Permits are issued in accordance with Rules 68A-9, 68A-12, 68A-25 and 68A-27 F.A.C. Some of those permits were issued conditioned upon implementation of an approved site or species specific management plan. Others required adherence to the following FWC species

management guidelines/policies: Florida Burrowing Owls (*Athene cunicularia floridana*) in Urban Areas, Osprey (*Pandion haliaetus*) Nest Removal Policies, Guidelines for the Relocation of Gopher Tortoises (*Gopherus polyphemus*) on Lands Slated for Development. Scientific permits were conditioned on an approved research proposal. The permit review process usually involves coordination between FWC offices, environmental consultants, other state agencies, federal agencies and regional and local regulatory entities.

FWC staff technical assistance efforts resulted in more than 2,052 telephone contacts and hundreds of formal letters and emails. Additionally, 534 listed species scientific collection, captive possession, relocation and incidental take permits (and 126 permit amendments) were issued during Fiscal Year (FY) 2005-2006. For more information on issued permits, contact the Imperiled Terrestrial Species Permit Coordinator at (850) 921-5990 extension 17310.

Overall, FWC staff provided biological and regulatory guidance to ensure that the permitted activities would result in a net conservation benefit for the involved species. Additional information (including guidelines, policies, and applications) is available on our website at <http://myfwc.com/permits/Protected-Wildlife/permits.html#gophertortoise>, for those interested in applying for permits to handle or impact terrestrial listed species.

APPENDIX A. CURRENTLY LISTED WILDIFE SPECIES.

Common Name	Scientific Name	Status
FISH		
Atlantic sturgeon (Gulf sturgeon)	<i>Acipenser oxyrinchus</i> (<i>Acipenser oxyrinchus desotoi</i>)	SSC (1)
shortnose sturgeon	<i>Acipenser brevirostrum</i>	E
shoal bass	<i>Micropterus cataractae</i>	SSC (1,2)
Suwannee bass	<i>Micropterus notius</i>	SSC (1)
rivulus (mangrove rivulus)	<i>Rivulus marmoratus</i>	SSC (1)
Lake Eustis pupfish	<i>Cyprinodon variegatus hubbsi</i>	SSC (1)
blackmouth shiner	<i>Notropis melanostomus</i>	E
bluenose shiner	<i>Pteronotropis welaka</i>	SSC (1,2)
saltmarsh topminnow	<i>Fundulus jenkinsi</i>	SSC (1)
key silverside	<i>Menidia conchorum</i>	T
crystal darter	<i>Crystallaria asprella</i>	T
harlequin darter	<i>Etheostoma histrio</i>	SSC (1)
okaloosa darter	<i>Etheostoma okalossae</i>	E
Southern tessellated darter (tessellated johnny darter)	<i>Etheostoma olmstedi</i> <i>maculiceps</i>	SSC (1)
key blenny	<i>Starksia starcki</i>	SSC (1)
AMPHIBIANS		
flatwoods salamander	<i>Ambystoma cingulatum</i>	SSC
Georgia blind salamander	<i>Haideotriton wallacei</i>	SSC (1,2)
pine barrens treefrog	<i>Hyla andersonii</i>	SSC (1)
Florida bog frog	<i>Rana okaloosae</i>	SSC (2)
gopher frog	<i>Rana capito</i>	SSC (1,2)
REPTILES		
American alligator	<i>Alligator mississippiensis</i>	SSC (1,3)
American crocodile	<i>Crocodylus acutus</i>	E
key ringneck snake	<i>Diadophis punctatus acricus</i>	T
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T
red rat snake	<i>Elaphe guttata</i>	SSC ¹ (1)
Atlantic salt marsh water snake (Atlantic salt marsh snake)	<i>Nerodia clarkii taeniata</i>	T

Common Name	Scientific Name	Status
Florida pine snake	<i>Pituophis melanoleucus mugitus</i>	SSC (2)
short-tailed snake	<i>Stilosoma extenuatum</i>	T
Florida brown snake	<i>Storeria dekayi victa</i>	T ¹
rim rock crowned snake	<i>Tantilla oolitica</i>	T
Florida ribbon snake	<i>Thamnophis sauritus sackeni</i>	T ¹
bluetail mole skink	<i>Eumeces egregius lividus</i>	T
Florida Key mole skink	<i>Eumeces egregius egregius</i>	SSC (1)
sand skink	<i>Neoseps reynoldsi</i>	T
gopher tortoise	<i>Gopherus polyphemus</i>	SSC (1,2,3)
Barbour's map turtle	<i>Graptemys barbouri</i>	SSC (1,2)
alligator snapping turtle	<i>Macrolemys temminckii</i>	SSC (1)
striped mud turtle	<i>Kinosternon baurii</i>	E ¹
Suwannee cooter	<i>Pseudemys concinna suwanniensis</i>	SSC (1,2)
loggerhead seaturtle (loggerhead sea turtle)	<i>Caretta caretta</i>	T
green seaturtle (green sea turtle)	<i>Chelonia mydas</i>	E
leatherback seaturtle (leatherback sea turtle)	<i>Dermochelys coriacea</i>	E
hawksbill seaturtle (hawksbill sea turtle)	<i>Eretmochelys imbricata</i>	E
Kemp's ridley seaturtle (Kemp's ridley sea turtle)	<i>Lepidochelys kempii</i>	E
BIRDS		
piping plover	<i>Charadrius melodus</i>	T
snowy plover (Cuban snowy plover)	<i>Charadrius alexandrinus</i>	T
American oystercatcher	<i>Haematopus palliatus</i>	SSC (1,2)
brown pelican	<i>Pelecanus occidentalis</i>	SSC (1)
black skimmer	<i>Rynchops niger</i>	SSC (1)
least tern	<i>Sterna antillarum</i>	T
roseate tern	<i>Sterna dougalli</i> (<i>Sterna dougallii dougallii</i>)	T
limpkin	<i>Aramus guarana</i>	SSC (1)
reddish egret	<i>Egretta rufescens</i>	SSC (1,4)
snowy egret	<i>Egretta thula</i>	SSC (1)
little blue heron	<i>Egretta caerulea</i>	SSC (1,4)
tricolored heron	<i>Egretta tricolor</i>	SSC (1,4)

Common Name	Scientific Name	Status
white ibis	<i>Eudocimus albus</i>	SSC (2)
Florida sandhill crane	<i>Grus canadensis pratensis</i>	T
whooping crane	<i>Grus americana</i>	SSC (5)
wood stork	<i>Mycteria americana</i>	E
roseate spoonbill	<i>Platalea ajaja</i>	SSC (1,4)
burrowing owl (Florida burrowing owl)	<i>Athene cunicularia</i> (<i>Athene cunicularia floridana</i>)	SSC (1)
crested caracara (Audubon's crested caracara)	<i>Caracara cheriway</i> (<i>Polyborus plancus audubonii</i>)	T
peregrine falcon	<i>Falco peregrinus</i>	E
Southeastern American kestrel	<i>Falco sparverius paulus</i>	T
bald eagle	<i>Haliaeetus leucocephalus</i>	T
osprey	<i>Pandion haliaetus</i>	SSC ² (1,2)
snail kite (Everglades snail kite)	<i>Rostrhamus sociabilis</i> <i>plumbeus</i>	E
Florida scrub jay	<i>Aphelocoma coerulescens</i>	T
Cape Sable seaside sparrow	<i>Ammodramus maritimus</i> <i>mirabilis</i>	E
Florida grasshopper sparrow	<i>Ammodramus savannarum</i> <i>floridanus</i>	E
Scott's seaside sparrow	<i>Ammodramus maritimus</i> <i>peninsulae</i>	SSC (1)
Wakulla seaside sparrow	<i>Ammodramus maritimus</i> <i>juncicolus</i>	SSC (1)
white-crowned pigeon	<i>Columba leucocephala</i>	T
Kirtland's warbler	<i>Dendroica kirtlandii</i>	E
Bachman's warbler	<i>Vermivora bachmanii</i>	E
ivory-billed woodpecker	<i>Campephilus principalis</i>	E
red-cockaded woodpecker	<i>Picoides borealis</i>	SSC
Marian's marsh wren	<i>Cistothorus palustris marianae</i>	SSC (1)
Worthington's marsh wren	<i>Cistothorus palustris griseus</i>	SSC (1)
MAMMALS		
Florida panther	<i>Puma concolor coryi</i> (<i>Puma [=Felis] concolor coryi</i>)	E
Florida black bear	<i>Ursus americanus floridanus</i>	T ³
Everglades mink	<i>Mustela vison evergladensis</i>	T
key deer	<i>Odocoileus virginianus</i> <i>clavium</i>	E

Common Name	Scientific Name	Status
Lower Keys marsh rabbit	<i>Sylvilagus palustris hefneri</i>	E
Big Cypress fox squirrel	<i>Sciurus niger avicennia</i>	T
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	SSC (1,2)
Eastern chipmunk	<i>Tamias striatus</i>	SSC (1)
Sanibel Island rice rat	<i>Oryzomys palustris sanibeli</i>	SSC (1,2)
silver rice rat (rice rat, lower FL Keys)	<i>Oryzomys argentatus</i> (<i>Oryzomys palustris natator</i>)	E
Key Largo woodrat	<i>Neotoma floridana smalli</i>	E
Key Largo Cotton Mouse	<i>Peromyscus gossypinus</i> <i>allapaticola</i>	E
Choctawhatchee beach mouse	<i>Peromyscus polionotus</i> <i>allophrys</i>	E
Southeastern beach mouse	<i>Peromyscus polionotus</i> <i>niveiventris</i>	T
Anastasia Island beach mouse	<i>Peromyscus polionotus</i> <i>phasma</i>	E
St. Andrews beach mouse	<i>Peromyscus polionotus</i> <i>peninsularis</i>	E
Perdido Key beach mouse	<i>Peromyscus polionotus</i> <i>trissyllepsis</i>	E
Florida mouse	<i>Podomys floridanus</i>	SSC (1)
Florida mastiff bat	<i>Eumops glaucinus floridanus</i>	E
gray bat	<i>Myotis grisescens</i>	E
Indiana bat	<i>Myotis sodalis</i>	E
Florida saltmarsh vole (Florida salt marsh vole)	<i>Microtus pennsylvanicus</i> <i>dukecampbelli</i>	E
Sherman's short-tailed shrew	<i>Blarina carolonensis</i> [= <i>brevicauda</i>] <i>shermani</i>	SSC (2)
Homosassa shrew	<i>Sorex longirostris eionis</i>	SSC (2)
sei whale	<i>Balaenoptera borealis</i>	E
fin whale (finback whale)	<i>Balaenoptera physalus</i>	E
North Atlantic right whale (right whale)	<i>Eubalaena glacialis</i> (<i>Balaena glacialis</i> [<i>incl.</i> <i>australis</i>])	E
humpback whale	<i>Megaptera novaeangliae</i>	E
sperm whale	<i>Physeter macrocephalus</i>	E
Florida manatee (West Indian manatee)	<i>Trichechus manatus latirostris</i> (<i>Trichechus manatus</i>)	E

Common Name**Scientific Name****Status**

Common Name	Scientific Name	Status
INVERTEBRATES		
<u>CORALS</u>		
pillar coral	<i>Dendrogyra cylindrus</i>	E
CRUSTACEANS		
Panama City crayfish (econfina crayfish)	<i>Procambarus econfinae</i>	SSC (1)
sims sink crayfish (Santa Fe cave crayfish)	<i>Procambarus erythropus</i>	SSC (1)
black creek crayfish	<i>Procambarus pictus</i>	SSC (1)
<u>INSECTS</u>		
Miami blue butterfly	<i>Cyclargus [=Hermiargus] thomasi bethunebakeri</i>	E
Schaus' swallowtail butterfly	<i>Heraclides aristodemus ponceanus</i>	E
<u>MOLLUSKS</u>		
Florida tree snail	<i>Liguus fasciatus</i>	SSC (1)
Stock Island tree snail	<i>Orthalicus reses</i> <i>Orthalicus reses [not incl. nesodryas]</i>	E

KEY TO ABBREVIATIONS AND NOTATIONS

LIST ABBREVIATIONS

FWC =	Florida Fish and Wildlife Conservation Commission
E =	Endangered
T =	Threatened
SSC =	Species of Special Concern

Reasons for SSC listings prior to January 1, 2001 are indicated by the number in parenthesis under the following criteria:

- (1) has a significant vulnerability to habitat modification, environmental alteration, human disturbance, or human exploitation which, in the foreseeable future, may result in its becoming a threatened species unless appropriate protective or management techniques are initiated or maintained;
- (2) may already meet certain criteria for designation as a threatened species but for which conclusive data are limited or lacking;
- (3) may occupy such an unusually vital or essential ecological niche that should it decline significantly in numbers or distribution other species would be adversely affected to a significant degree;
- (4) has not sufficiently recovered from past population depletion, and
- (5) occurs as a population either intentionally introduced or being experimentally managed to attain specific objectives, and the species of special concern prohibitions in Rule 68A-27.002, F.A.C., shall not apply to species so designated, provided that the intentional killing, attempting to kill, possession or sale of such species is prohibited.

(FWC)

- ¹ Lower keys population only.
- ² Monroe County population only.
- ³ Other than those found in Baker and Columbia Counties or in Apalachicola National Forest.

APPENDIX B. LIST OF ACRONYMS USED IN THIS REPORT

Term	Acronym
Advanced Magnetic Resonance Imaging and Spectroscopy	AMRIS
Air Force Base	AFB
All Terrain Vehicle	ATV
Apalachicola River Wildlife and Environmental Area	ARWEA
Archbold Biological Station	ABS
Best Management Practices	BMP
Biological Review Panel	BRP
Biological Status Report	BSR
Branan Field Mitigation Park	BFMP
Candidate Conservation Agreement	CCA
Candidate Conservation Agreement with Assurances	CCAA
Caribbean Conservation Corporation	CCC
Conservation Management Fund	CMF
Continuing Legal Education	CLE
Critical Wildlife Area	CWA
Deoxyribonucleic Acid	DNA
Differential Global Positioning System	DGPS
Direct Autumn Release	DAR
Division of Forestry	DOF
Early Warning System	EWS
Everglades and Francis S. Taylor Wildlife Management Area	EWMA
Federal Emergency Management Agency	FEMA
Female	F
Fiscal Year	FY
Fish and Wildlife Research Institute	FWRI
Florida Administrative Code	F.A.C.
Florida Black Bear Curriculum Guide	FBBCG
Florida Black Bear Standing Team	FBBST
Florida Cooperative Fish and Wildlife Research Unit	FCFWRU
Florida Department of Agriculture and Consumer Services	DOACS
Florida Department of Environmental Protection	DEP
Florida Department of Transportation	FDOT
Florida Fish and Wildlife Conservation Commission	FWC
Florida Game and Fresh Water Fish Commission	GFC
Florida Manatee Avoidance Technology	FMAT
Florida Panther Research & Management Trust Fund	FPRMTF
Florida Statutes	F.S.
Franklin County Initiative	FCI
Geographic Information System	GIS
Global Positioning System	GPS
Hickey Creek Mitigation Park	HCMP
Imperiled Species Management Section	ISM
Index Nesting Beach Survey Program	INBS
Infectious Bursal Disease	IBD

Appendix B. Continued

Term	Acronym
Kissimmee Chain of Lakes	KCOL
Lake Wales Ridge Wildlife and Environmental Area	LWRWEA
Landowner Incentive Program	LIP
Local Rule Review Committee	LRRC
Magnetic Resonance Imaging	MRI
Male	M
Manatee Individual Photo-Identification System	MIPS
Manatee Protection Plans	MPPs
Marine Mammal Pathology Lab	MMPL
Marine Resources Conservation Trust Fund	MRCTF
Memorandum of Agreement	MOA
Minimum Flow Levels	MFL
Mitigation Park Program	MPP
Moody Branch Mitigation Park	MBMP
Autoridad Nacional del Ambiente (National Environmental Authority of Panama)	ANAM
National Forest	NF
National Marine Fisheries Service	NMFS
National Oceanic and Atmospheric Administration	NOAA
National Park Service	NPS
National Wildlife Refuge	NWR
Nongame Wildlife Trust Fund	NGWTF
Ocala National Forest	ONF
Outlying Landing Field	OLF
Panama City Crayfish	PCC
Perry Oldenburg Mitigation Park	POMP
Platform Terminal Transmitters	PTTs
Platt Branch Mitigation Park	PBMP
Population Viability Analysis	PVA
Public Service Announcement	PSA
Red-cockaded woodpecker	RCW
St. Johns River Water Management District	SJRWMD
Salt Lake Wildlife Management Area	SLWMA
Save the Manatee Trust Fund	STMTF
Sea Turtle Stranding and Salvage Network	STSSN
Submerged Land Environmental Resources Program	SLERP
State Forest	SF
Statewide Nesting Beach Survey Program	SNBS
Strategic Habitat Conservation Areas	SHCA
Three Lakes Wildlife Management Area	TLWMA
United States	US
United States Army Corps of Engineers	USACE
United States Fish and Wildlife Service	USFWS
United States Geological Survey	USGS

Appendix B. Continued

Term	Acronym
University of Florida	UF
Upper Respiratory Tract Disease	URTD
Water Conservation Area	WCA
Whooping Crane Eastern Partnership	WCEP
Wildlife and Environmental Area	WEA
Wildlife Management Area	WMA

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