FY 2006-2007 Progress Report

on activities of the

Florida Fish and Wildlife Conservation Commission

Endangered and Threatened Species Management and Conservation Plan

FLORIDA'S ENDANGERED AND THREATENED SPECIES

MANAGEMENT AND CONSERVATION PLAN -

FY 2006-2007 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 29th progress report and update of the Florida Endangered and Threatened Species Management and Conservation Plan as required by the Florida Endangered and Threatened Species Act of 1977 [§372.072(5), Florida Statutes (F.S.)]. That subsection of the Act required the preparation of an initial plan for submission to the 1978 Florida Legislature, and the annual preparation of a revised and updated plan for management and conservation of endangered and threatened species.

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 Fisheries Commission and certain organizational programs 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 report covers the fiscal year (FY) 2006-2007, a period from July 1, 2006 to June 30, 2007. It consists of two main sections. The "Statutory Requirements" section covers five of the six elements listed in the Florida Endangered and Threatened Species Act, including a description of FWC's criteria for research and management priorities, a description of FWC's citizen awareness program, statewide 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. This progress report includes reports of staff activities covering listed mammals, birds, amphibians, reptiles, fish, and invertebrates. Additionally, this section covers agency actions to provide coordination and technical assistance, Critical Wildlife Areas, incentive-based conservation programs, law enforcement, and permitting for listed species. Please contact FWC's Endangered Species Coordinator if you would like more information about anything in this report.

This report includes four appendices to help the reader. Appendix A is the list of species listed by Florida as endangered, threatened, or species of special concern, as of June 30, 2007. Appendix B defines acronyms used in the report. Appendix C is a list of FWC staff publications published during 2006-2007. Appendix D is a list of the common and scientific names of species mentioned by common name in the report.

I would like to express my appreciation to the following people who contributed to this report: Lee Beach, Rob Beaton, Shane Belson, Joan Berish, Ashleigh Blackford, Brian Branciforte, Robin Boughton, Janell M. Brush, Kelly Bunting, Nathan Bunting, Jestin Clark, David Cook, Stuart Cumberbatch, Michael Delany, Terry Doonan, Nancy Dwyer, Mark Endries, Kevin Enge, Norberto Fernandez, H. Jared Flowers, Marty Folk, Derek Fussell, Brooke George, Jim Garrision, Terry Gilbert, Judy Gillan, Aaron Given, Jeff Gore, Katherin Haley, Allan Hallman, Tina Hannon, Blair Hayman, Ralph Holton, Don Holway,

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SUMMARY OF IMPERILED WILDLIFE LISTS

The first Florida endangered species list was promulgated in 1972 and consisted of 23 species. 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 (F.A.C.). Currently, the Florida Fish and Wildlife Conservation Commission (FWC) lists 118 species (Table 1) as endangered (41), threatened (26), or species of special concern (51). A complete listing of Florida's imperiled wildlife species as of June 30, 2007 is included as Appendix A. The current listing of Florida's imperiled wildlife may be accessed at http://myfwc.com/imperiledspecies/pdf/Threatened-and-Endangered-Species-2007.pdf. The rules noted above may be viewed at the F.A.C. website (https://www.fl-rules.org/Default.asp). Federal agencies also list species as endangered and threatened. The National Oceanic and Atmospheric Administration (NOAA)-National Marine Fisheries Service (NMFS) is responsible for listing most marine species and U. S. Fish and Wildlife Service (USFWS) is responsible for other species. The Federal list of animals and plants is administered by the USFWS, and is published in 50 CFR 17 (animals) and 50 CFR 23 (plants). Additional information regarding federal listings can be located at http://www.nmfs.noaa.gov/pr/ for NOAA-NMFS and http://www.fws.gov/endangered/ for USFWS.

The Florida Department of Agriculture and Consumer Services (DOACS) is responsible for the "Florida Statewide Endangered and Threatened Plant Conservation Program." More information on this program is available at http://www.fl-dof.com/forest_management/plant_conservation_index.html.

Table 1. Summary of Official Lists of Florida's Endangered Species (E), Threatened Species (T) and Species of Special Concern (SSC), as of June 30, 2007.

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 Florida Fish and Wildlife Conservation (FWC) uses a variety of tools to evaluate and prioritize research and management needs for State-listed species. One tool used is the state listing process described in Rule 68A-27.0012, 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, B. M., J. A. Gore, D. E. Runde, and S. I. Cerulean. 1990. Setting priorities for the conservation of fish and wildlife species in Florida. Wildlife Monographs 111). 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 were conducted by Florida Fish and Wildlife Conservation (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 43statewide news releases about listed species, including two on Panama City crayfish, one on red-cockaded woodpeckers, one on ivory-billed woodpeckers, one on roseate terns, three on Florida panthers, eleven on Florida manatees, three on Florida black bears, one on peregrine falcons, twelve on American alligators, four on gopher tortoises, one on green sea turtles, one on sea turtle permits, and two on reclassification generally.

Southwest region staff created eight news releases: three on Florida manatees, two on gopher tortoises, two on Florida panthers, and one on osprey. Northwest region staff distributed three news releases: one on alligators and two on Panama City crayfish. Northeast region staff distributed seven news releases: one on Florida black bears, one on Florida manatees, three on gopher tortoises, one on snail kites, and one on Florida panthers. North central staff produced and distributed numerous press releases about the jumping Gulf sturgeons. FWC Fish and Wildlife Research Institute (FWRI) staff distributed three press releases on manatees; four news announcements, three on manatees and one on right whales; and five media advisories regarding manatees.

In addition to statewide and regional news releases, public information staff responded to approximately 712 media inquiries about listed species. Another 20+ interviews with field biologists were conducted.

Video, TV and Photography.--Staff participated in filming of the PBS show, "Wild Florida," about Florida black bear. In addition, staff members also worked with two documentary film crews, one focusing on alligators and the other on alligator snapping turtles.

Staff produced several internal communication videos that featured listed species work, such as roseate terns, Florida black bears, and red-cockaded woodpeckers. FWC audio-visual staff provided video footage and photographs to the media for red-cockaded woodpeckers, Florida panthers and Gulf sturgeons.

Information Requests.--A total of 234 phone or mailed requests for manatee information were received for a response. Of these, 87 were requests for bulk orders of materials to be distributed through the requestor's organization.

The FWC Knowledge Base (also known as AskFWC) public service system was used to handle most of the routine imperiled species questions. This service provided the individual with an automatic response to their question and a link to the FWC Web pages for more information. Approximately 316 responses were handled for listed species including Florida panther, manatee, sea turtles, Florida black bear, gopher tortoise, Florida sandhill crane, wood stork, American alligator, snail kite and whales in general. Numerous telephone requests for information were fulfilled by staff for manatee, panther, black bear, bald eagle, gopher tortoise, Panama City crayfish, red-cockaded woodpecker and sea turtles.

School-based programs and presentations.—This activity included the following:

Workshops for K-12 Educators - Staff and volunteer facilitators provided approximately 47 one-day Project WILD and Aquatic WILD workshops to 862 educators. Species covered in Project WILD included the Florida panther, Florida black bear, West Indian manatee, American alligator, American crocodile, gopher tortoise, loggerhead sea turtle, green sea turtle, leatherback sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, osprey and burrowing owl.

Staff and volunteer facilitators provided 10 one-day Florida black bear workshops to approximately 179 educators. Species covered included the Florida black bear and Florida panther.

Staff and volunteer facilitators provided six one-day Flying WILD workshops to approximately 146 educators. Flying WILD was a bird-based education program teaching through festival-based activities about bird biology, migration and natural history. Species covered included osprey, burrowing owl, Florida scrub-jays, brown pelican, snowy egret, little blue heron, tricolored heron, peregrine falcon, wood stork and roseate spoonbill.

Pinellas County Great American Teach-In - Several research staff members participated in the Pinellas County Great American Teach-In in November. Two participants spoke to students about manatees, another participant spoke about sea turtles, and a third participant spoke to students about Gulf sturgeon.

Presentations- Two presentations on a combined topic of American alligator and Florida pine snake were given at elementary schools. Each presentation had an average of 50 students in attendance. Three presentations on a combined topic of American alligator, American crocodile,

and Florida pine snake were given at two elementary schools and an elementary-level home school group. Presentations had attendance levels ranging from 15 to 45.

Seven presentations on black bear ecology were given to students in elementary, middle, and high school. One presentation also included a hands-on exercise. Attendance levels ranged from 15 to 120. In addition, a special field trip for an elementary school teacher was arranged to allow the teacher to learn about bear denning work; the information to be used within the educator's classroom.

Four presentations were given to students, including one pre-K class, two elementary schools, and a home school science event. Attendance levels ranged from 25 to 150. In addition, one staff member gave a general lesson on manatee biology and behavior during judging of Earth Day posters in West Palm Beach prepared by fourth grade students.

One presentation was given during a wildlife biology course at the University of South Florida; 30 students were in attendance.

Staff presented Project WILD activities to 12 classes, 8 activities about osprey (*How many Ospreys?*) and eight activities about red knots (*Migration Headache*) reaching 410 students. A volunteer facilitator presented the Project WILD activity, *How Many Ospreys*, to 30 Girl Scouts.

School Based Presentations and Programs on Blackwater Wildlife Management Area (*Barbara Schmeling*) - Blackwater WMA Staff participated in two public programs held at the Blackwater Fish Hatchery. More than 300 school-aged children from Pensacola and Navarre were able to interact with live species found in the area, and learned about listed species including the gopher tortoise and the red-cockaded woodpecker. Staff also educated the groups about the natural history of the Florida black bear and how people can prevent attracting bears into their backyards.

Blackwater staff also participated in the National Park Service's Junior Ranger Camp held at the Naval Live Oaks section of Gulf Islands National Seashore. Students from local area schools attending Junior Ranger Camp during their spring breaks were educated on local forest species, including the red-cockaded woodpecker and gopher tortoise, as well as the natural history of the Florida black bear.

Educator Learning Kits.--The Outreach Coordination Office at FWRI has compiled "Suitcase" curriculums to be provided to the classroom teacher to help to educate about manatees and sea turtles. These kits have been designed for teachers of middle to high school-aged students to provide them 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 were loaned out to counties in the Tampa Bay area for up to a three-month period and were at no cost to the borrower. During 2006–2007, the manatee suitcase was checked out eight times by groups varying from a college class, local middle and high schools, informal educators teaching programs at local aquariums and staff members utilizing it for various presentations. The sea turtle suitcase was checked out four times.

Advertisement and promotion of the Suitcase curriculums is made through the FWRI website, teacher workshops, of which three were performed, and flyers distributed to educators at

various other outreach events. In total, 43 Florida teachers were trained in the use of these educational tools.

During 2006-2007, efforts were begun to revamp the Suitcase curriculums into something more readily distributable to teachers, throughout the State, who wanted to bring Florida's manatees and sea turtles into their classroom. This included a redesign so that materials could be provided on a single CD or DVD and an accompanying book. This will make the materials more economical to distribute, more universal for anyone requesting them, and more available for the teachers to permanently keep, while updating the scientific materials and the Sunshine State Standards covered to make these the best possible and most current for the teachers use. Anticipated completion of both the sea turtle and manatee Suitcase curriculums will be for the school year 2008-2009.

Way of the Manatee Treasure Box Program .--In addition to the manatee and sea turtle Suitcase curriculums described above, staff distributed the Way of the Manatee Treasure Boxes to other groups around the State who wanted to use the materials. Three new sites received materials and several existing manatee resource areas received more items and books for their boxes.

Web-based Outreach: eFieldTrips.--The manatee electronic on-line eFieldTrip provides an engaging self-guided tour into the life of the manatee and gives elementary to high school students, nationally and internationally, a tool to learn about the manatee without traveling to or within Florida. The on-line field trip provides students with much of the same information as our current FWC manatee brochures, educational materials and the treasure box but certainly is more efficient in connecting with a broader range of students. A student journal and a question/answer session go along with the on-line field trip. A total of 575 schools registered (approximately 11,562 students) to use the field trip during the 2006-2007 school year. To view the manatee electronic field trip, go to www.efieldtrips.org.

Staff developed an online North Atlantic right whale eFieldTrip which debuted late in the year. The eFieldTrip was designed to be an interactive web site that students could login to visit and explore the subject of right whales. More information about eFieldTrips can be found at the web link; http://www.efieldtrips.org.

PantherNet.--Many updates were added to PantherNet at www.MyFWC.com/panther.

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 624 to 880. Thirty-four total messages with updates to the database were sent to subscribers.

Community Outreach.--Three presentations on American alligators were given; one during the Great Florida Outdoor Communicators Day in April at the University of Florida, one to campers in the Nature and Science Family Literacy Camp and one in the northeast region. Five presentations were given during the last year with a combined topic of American alligators and the Florida pine snake. Presentation locations included two "Splash into Science" events at local elementary schools and various other outreach events and community groups. The attendance level at all presentations ranged from 150 to 500 people, with all ages in attendance. Two presentations with a combined topic of alligators, crocodiles, and pine snakes were given during the last year, one to a civic group and another at a nature center. Attendance level ranged from 20 to 90, with all ages in attendance.

Twenty-seven presentations were given on black bear ecology and human-bear interactions. Attendance levels ranged from 30 to 2,000, with all ages in attendance. Several static displays were employed at festivals such as the Wakulla Wildlife Festival and Kelly Park Day. Staff participated in two door-to-door campaigns delivering information about human-bear interactions to residents in specific Franklin County communities of Carrabelle, East Point, Lanark Village and St. Theresa Beach. Approximately 12 volunteers assisted. Sixty-nine children of FWC staff were educated about Florida black bear ecology during "Take Our Sons and Daughters to Work Day." Bear management staff gave presentations to FWC law enforcement personnel as well as officers with the Orlando Police Department and the Santa Rosa Sheriff's Office regarding proper bear capture techniques and human-bear interactions.

Six presentations on the gopher tortoise or the gopher tortoise management plan were given, and nine stakeholder meetings were attended.

Fourteen presentations on the manatee were given to civic groups and during outreach events. In addition, six training sessions were held for manatee interns and volunteers. Attendance at presentations ranged from four to 300 and attendance at outreach events ranged from 2,200 to 3,500. Attendance at training sessions ranged from three to 40. Four presentations on manatees were made to marine biology camp groups. Four tours of the Marine Mammal Pathobiology Laboratory were also conducted for stakeholder groups.

Five presentations on Florida panthers were given, reaching 121 participants. Presentations included those given as a part of Collier County Extension Office's Small Farm Workshop Series, one to 4-H children and their parents, and one given to attendees of the Conservancy of Southwest Florida's annual banquet.

Eight lectures and presentations on sea turtles were given throughout the last year at various locations including during several lecture series and the 27th Annual Symposium on the Biology and Conservation of Sea Turtles. Attendance levels ranged from 9 to 800.

Eight presentations were given on whooping cranes to groups ranging from Audubon meetings to The Nature Conservancy's board of directors annual meeting to civic groups. Attendance levels ranged from 15 to 100. One presentation on wood storks was given to the Beverly Hills)Florida) Audubon Society. Forty-five people, mostly senior citizens, were in attendance. One bald eagle presentation was given. Two snail kite presentations were given. One presentation on kestrels and crested caracaras was given at Chinsegut Nature Center to 48 people.

One presentation was given and one exhibit displayed on imperiled Species in general.

Seven presentations on the Lake Wales Ridge and the Ridge Rangers program were given, reaching 215 people. Species discussed included Florida scrub-jay, sand skink, gopher tortoise, and Florida black bear.

Finally, several presentations on Gulf sturgeon in the Suwannee River were given. Beginning in March, there were boaters injured by the jumping fish. By July 4, the sturgeon issue made the front page of the New York Times. The story also ran on Nightline, ABC World News, CNN and state television stations, in addition to appearing in local, state, national and international newspapers.

The FWC mounted an intense public awareness campaign to let people know these fish were present and could injure those boaters enjoying the Suwannee River. The agency crafted the message of "Go Slow on the Suwannee." A news release was put out in March to warn boaters that the fish were migrating back into the Suwannee River from the Gulf of Mexico. News releases were also generated after each reported strike to reinforce the "Go Slow" message. During the numerous media interviews that were conducted over the summer, the "Go Slow on the Suwannee" message was reiterated. Signs were posted at all Suwannee River boat ramps and "Go Slow" decals were handed out to remind boaters to go slow while traveling on the river.

Workshops.--Seven Sea Turtle Stranding Response Training Workshops were held in 2006-2007; locations included Panama City, Apalachicola, West Palm Beach, Sarasota, Dania, Jensen Beach, and Vilano Beach. Attendance levels ranged from 19 to 36. Five Sea Turtle Nesting Beach Survey Training Workshops were held throughout the year; locations included Marathon, West Palm Beach, Sarasota, Panama City Beach, and St. Augustine. Attendance level ranged from 21 to 147.

Two Florida black bear aversive conditioning workshops were held teaching 73 FWC staff and local law enforcement department personnel.

Stakeholder and public meetings.--Staff participated numerous stakeholder meetings, including nine on the gopher tortoise management plan, five on the Panama City crayfish management plan, and one meeting each on the bald eagle and Florida manatee management plans.

Staff participated in two town hall meetings in southwest Florida regarding Florida panther ecology and human-panther interactions with over 100 people in attendance.

Fairs, Festivals and Special Events.--The FWC exhibit at the 2007 Florida State Fair attracted 437,000 visitors and featured either live display or interpretive information on the following listed species: Florida panther, Florida black bear, American alligator, American crocodile, Eastern indigo snake, red rat snake, Florida pine snake, Florida brown snake, gopher tortoise, and alligator snapping turtle

Staff participated in organizing the event and provided Living in Bear Country talks, an interpretive exhibit with demonstrations, and field trip interpretation at the 8th Annual Florida Black Bear Festival in Umatilla, Florida. Approximately 10,000 people attended.

Staff participated in the kick-off event for Florida Panther Week at the Naples Zoo by giving talks and providing information at an exhibit table. Several hundred people participated throughout the day. In addition, staff provided an interpretive table at the Friends of the Florida Panther National Wildlife Refuge's Cause for the Paws event reaching approximately 200

participants. The FWC staff worked with the Governor's Office to develop a Save the Florida Panther Day proclamation recognizing the third Saturday in March as Save the Florida Panther Day. The Governor issued the proclamation February 28, 2007.

Chinsegut Nature Center staff held the annual Reptile and Amphibian Expo which included a gopher tortoise hike, a non-marine turtle talk, an alligator talk and a reptile and amphibian exhibit. The event was attended by 754 people.

Ninety Girl Scouts learned about gopher tortoises at the unique Girl Scouts Go for Gophers event at Chinsegut Nature Center.

Community Outreach on Blackwater Wildlife Management Area (*Barbara Schmeling*)- Each year FWC staff set up an interactive exhibit at the Munson Heritage Festival. Hundreds of people learn about forest animals and how habitat management protects the red-cockaded woodpecker, gopher tortoise and other rare species found in the area. A popular display was the Florida black bear exhibit, where people learned the life history of black bear and ways to reduce human-bear conflicts. Management staff set up similar displays for the annual "Beaches to Woodlands Tour - Coastal Awareness Festival" and the annual Forestry Conclave and Lumberjack Festival held at Pensacola Junior College, Milton campus.

MarineQuest is an annual open house of the FWC FWRI 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 2007 was held April 19-21. The event hosted 1,900 students and teachers during the School Daze program and 3,200 visitors during the general open house. Three 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. An outdoor exhibit focused on Florida's listed reptile species, including an American alligator and an American crocodile.

Three public talks focusing on listed species were presented as part of the MarineQuest auditorium program. "Florida's Native Crocodilians" addressed American alligators and American crocodiles and had 115 attendees. "Florida's Role in a Sea Turtle World" had 55 attendees. "Tracking Manatees from Land and Space" had 66 attendees.

Manatee outreach staff visited the following sites during 2006-2007: Citrus County (festival) in January, Homosassa Springs State Wildlife Park in January, FSU Coastal and Marine Laboratory Open House in April, and the St. Marks HuManatee Festival in May. In addition to providing information at these events/sites, staff participated in a Senior Days program and visited several senior citizen groups to give presentations.

Volunteer Opportunities.--Volunteers participated in 129 programs involving marine mammals. Most were for manatees, the rest were for right whales. Volunteers also participated in 20 programs for sea turtles: five programs for alligators, 16 programs for black bears, one program for beach mice, and one program for Florida scrub-jays.

Other Outreach and Education Activities.—A ceremonial signing of a Safe Harbor agreement for red-cockaded woodpeckers was held at Tall Timbers Research Station Wednesday, September 28, 2006. The event began at 6:30 a.m. with the release of 2 pairs of birds. A press conference was held to announce Florida's new Safe Harbor Program for red-cockaded woodpeckers. During the press event, Cynthia Dohner, Deputy Regional Director, USFWS; Ken Haddad, Executive Director, FWC; and Lane Green, Executive Director, Tall Timbers spoke on behalf of the new program. After speaking, the ceremonial signing of the agreement was held between the USFWS and FWC. Approximately 50 people were in attendance. Coverage was generated through seven statewide newspapers and coverage was provided via satellite to TV media. *Florida Wildlife* magazine also published an article with photos in the November/December issue.

Staff participated in Defenders of Wildlife's "pen builds" to demonstrate proper domestic livestock protection measures in Florida panther country. A demonstration pen was built at Collier County Extension Office and one for local residents. Print and TV media covered the event.

The contract for participating with the State of Florida Nature and Heritage Tourism Center (Center) continued this year. The 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 requested materials for distribution without the formal contract process that is used at this facility.

In April, a school press event was held to present awards to the high school 2007-2008 Manatee Decal Art Contest winner, Natasha Thornton, a 9th grade student at Coral Reef Senior High School. The FWC staff from south Florida and FWC Commission Chairman Rodney Barreto participated in this event. Sixty students sent entries to the manatee decal art contest. Each year, tax collectors participate by selling decals for $5 each at the tax collection sites around the State. The 2006-2007 decals were available for sale from July 1, 2006, to June 30, 2007. Approximately 10,000 decals were sold raising $50,000 for the Save the Manatee Trust Fund.

The manatee education assessment survey of the State's manatee education providers was completed this year. The Manatee Education Working Group has not met to discuss the results of the survey. Outreach staff has read the survey and will implement those suggestions that can be handled appropriately in-house.

Signs.--A sign about gopher tortoises was produced for FWC mitigation parks. The sign mentioned gopher tortoise burrow commensals, including gopher frogs, Florida mice, and Eastern indigo snakes. The sign also identified two other upland species, Florida scrub-jays and Sherman's fox squirrels. This sign was installed at Platt Branch Mitigation Park and Suwannee Ridge Mitigation Park.

A sign featuring wood storks and roseate spoonbills was created and installed at Guana River Wildlife Management Area. In addition, staff fulfilled two alligator sign requests and produced and installed signs informing boaters of a snail kite nesting area.

Publications.--Since 1998, FWC has published a two-page feature in *Florida Monthly* magazine called "Watching Wildlife." *Florida Monthly* magazine, formerly known as *Florida Living*, is Florida's only statewide monthly lifestyle magazine with an average paid circulation of 224,312 per month. An additional 2,300 copies are mailed each month to state and local government officials and leaders within the private sector. Five articles on listed species were featured this year: leatherback sea turtle, Florida black bear, North Atlantic right whale, American alligator, and loggerhead sea turtle.

Florida panther field staff assisted with content in a new children's book called Florida Panthers; Struggle for Survival, by Caper Bearport publishing.

Research and layout of "Christopher Columbus' Mermaids – An Environmental Education Journey of Discovery" continued as time allowed. The publication will debut sometime in 2007-2008.

In partnership with the USFWS and the National Park Service, FWC produced a new brochure entitled, "A Guide to Living with Florida Panthers." In addition, a table top display was developed and a safety tips fact sheet was produced.

The FWC's bimonthly magazine, *Florida Wildlife*, included 14 articles within the "News and Notes" section; two on gopher tortoise, one on red-cockaded woodpecker, four on manatee, one on bald eagle, one on sea turtle, one on black bear, one on American crocodile, one on Florida panther, one on manatee/sea turtle decals and one on management plans (Panama City crayfish, manatee, bald eagle and gopher tortoise). An additional 12 articles addressed the following species in greater length: nesting sea turtles (leatherback, loggerhead, and hawksbill), Florida black bears, North Atlantic right whales, ivory-bill woodpeckers, red-cockaded woodpeckers, roseate terns, Florida panthers, manatees, alligators, and one generally about wading birds.

The Sea Stats series of brochures provided information on some of FWC's areas of marine research including fish, manatees, and right whales. Approximately four pages in length, these brochures provided information on age and growth, distribution, migration, feeding habits, and more. Printing and distribution of the Manatees Sea Stats was on hold while the brochure was under review. The Right Whales Sea Stats was updated, 10,000 copies were printed, and 506 copies of the brochure were distributed. Ten-thousand copies of the Sea Turtles Sea Stats were printed this fiscal year, and over 4,400 copies were distributed.

FWRI staff also distributed 1,395 copies of "The Florida Manatee: A Florida Treasure" brochure and 204 copies of the Manatee Coloring Book.

STATEWIDE POLICIES PERTAINING TO LISTED SPECIES

Listing Process (*Brad Gruver*).--Prior to creating policy to protect imperiled species, one must first have a tool to determine which species are imperiled. The tool used to determine which species qualify for listing in one of the three levels of imperilment used by Florida is the listing process described in Rule 68A-27.0012, F.A.C. The FWC worked on four active petitions this year. These were the proposed delisting of the bald eagle, and the proposed reclassifications of the Florida manatee, gopher tortoise, and Panama City crayfish. For each of these petitions, a

biological status report was completed and the Commission had determined that the proposed listing action was warranted in 2005-2006. During 2006-2007, staff worked on development of a management plan for each species. Listing status of the species will not change until management plans are completed and approved by the Commission. The final biological status reports, draft and final management plans (when available) may be accessed at http://myfwc.com/imperiledspecies/petitions.htm.

REQUIRED LEGISLATION

Currently, the FWC has no requests for legislative changes affecting wildlife species that are listed as endangered or threatened. 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 2008-2009 is approximately $21,710,064 (Table 2). This includes funding to maintain current programs, in addition to anticipated federal grants designed to assist in development of new recovery programs. These grants 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 2008-2009.

Funding Source	Amount
Nongame Wildlife Trust Fund (NWTF)	**$1,737,177**
Florida Panther Research & Management Trust Fund (FPRMTF)	**$1,223,787**
Save the Manatee Trust Fund (STMTF)	**$3,567,428**
Marine Resources Conservation Trust Fund (MRCTF)	**$7,308,463**
Land Acquisition Trust Fund (LATF)	**$3,727,875**
State Game Trust Fund (SGTF)	**$201,368**
General Revenue	**$212,437**
Federal Grants	**$3,578,047**
Non-Federal Grants	**$153,482**
Total	**$21,710,064**

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 Florida Fish and Wildlife Conservation (FWC) staff. Annual reports of these activities are available upon request.

Black Bear

Black Bear Management and Research Program (*Stephanie Simek, Walt McCown*).--The FWC is involved in research and management efforts to ensure the long-term conservation of the Florida black bear. The Florida black bear is currently listed as a state Threatened species and exists primarily 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 intensity and complexity of issues related to bear management has become increasingly challenging. Bear conservation continues to be a contentious issue in Florida. Bear populations have expanded from historic lows while the human population has grown as well, resulting in increasing numbers of human-bear interactions and uncertainty over the security of the bear's future in Florida. Proactive conservation and management planning is necessary for maintaining the Florida black bear for the benefit of the species and the public.

The Florida Black Bear Standing Team (FBBST) continued efforts to synthesize the bear related issues and FWC's response to these issues with respect to conserving Florida black bears. The FBBST met one time during 2006-2007. The team wrote a draft "Florida Black Bear and Human/Bear Response Policy and Supplemental Guidance" document. The FBBST was later disbanded and replaced by the Bear Management Action Team (BMAT) in January 2007. The BMAT team plans to develop a comprehensive, statewide management plan for black bears in Florida that the FWC and its partners can work from in a unified and coherent manner. BMAT met five times during 2006-2007. Team plans are to develop conservation goals and strategies for the Florida black bear and have a draft document prepared by March 2008.

During 2006-2007, FWC personnel received 2,037 calls regarding bears (this includes sick and injured bears, bear in yard, complaints, etc.) and the number of reported bear roadkill totaled 142 individuals for the year. Efforts to reduce negative human/bear encounters continued through efforts associated with the Bear Response Agent Program and developing outreach programs to address garbage handling issues in local communities. These efforts emphasize

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 and expanded in 2006-2007 to include efforts in the North Central, South, and Southwest Regions. In the Northwest, Agents responded to 71 events; which included 25 carcass recoveries, 10 site visits, 33 capture efforts, and three unknown efforts in 2006-2007. In the Northeast, Agents responded to 172 events; which included 42 carcass recoveries, two hit/alive bears, 86 site visits, and 32 capture efforts in 2006-2007. In the North Central Region, Agents responded to five events; which included three carcass recoveries, one site visit, and one free-range effort. The South and Southwest Regions did not hire any Agents during 2006-2007.

FWC staff continued response to public inquiry by distributing information and education packets and through e-mail and telephone correspondence. FWC staff has also been involved in several outreach efforts during 2006-2007. Staff participated in many educational outreach opportunities at public schools, clubs, and organizations; including festivals such as the 2006 Umatilla Bear Festival and 2007 Wakulla Wildlife Festival. For further details on outreach efforts, please refer to the Citizens Awareness Program section of this report.

FWC staff began work to develop efforts focused on minimizing human/bear conflicts related to garbage within the City of Carrabelle in 2006-2007. FWC staff met with City officials, wildlife resistant container manufacturers, and waste removal service providers to resolve residential garbage issues through developing partnerships to bring wildlife resistant garbage canisters to residents within Carrabelle City limits. A partnership with Defenders of Wildlife, Waste Pro, and FWC was established to purchase several wildlife resistant containers during FY 2007-2008. Additional meetings with Carrabelle City officials and other partners are planned for FY 2007-2008 to expand this effort.

FWC staff continued human-dimensions related work established in FY 2005-2006, through further development of concepts for a statewide survey of public perception and attitudes towards bears. Funding through a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida, will enable FWC to contract Dr. Craig Miller at the University of Georgia for final survey development and implementation during FY 2007-2008. The results of this survey are anticipated to aid in the development of the draft bear management plan.

Staff conducted several Aversive Conditioning Workshops with funds received from the Wildlife Foundation of Florida Conserve Wildlife Tag Grants. The workshops were instructed in partnership with John Hechtel (Alaska Department of Fish and Game) and Lou Berchielli (New York State Department of Environmental Conservation). Each workshop included hands on training for FWC personnel and other partnering law enforcement personnel in both bear behavior and non-lethal deterrent techniques. The August 2006 Workshop was held over a four day period and included 29 participants. A survey was created from this workshop to gain the participants views for developing and conducting future workshops. Consequently, the April 2007 Workshop was shortened to a three day long course and had a total of 44 participants. Staff plans on using the remainder of the grant during FY 2007-2008 to hold additional workshops and purchase equipment for FWC Law Enforcement Officers and other FWC staff.

Work has concluded on the “Impact of Translocation on Nuisance Florida Black Bears” study which was conducted in partnership with the University of Florida and the U. S. Forest Service (USFS). FWC staff helped design this study and supervised all associated field activities. The purpose of this study was to determine the efficacy of translocation as a tool for the management of nuisance bears in Florida by FWC. Nuisance bears were captured in

peninsular Florida and translocated to Ocala National Forest (ONF) after being fitted with radio-collars. The project began in May 2004 and concluded in December 2006. The study assessed the movements, behavior, and survival of 41 translocated nuisance bears (33M, 8F) and surveyed 25 homeowners where bears were removed.

A final report to FWC is being prepared but many results were contained within the student's thesis published as the Master of Science degree requirement. Forty-six percent of all translocated bears engaged in a nuisance event at least once post-release and 34% engaged in nuisance events more than once. Thirty-two percent of bears returned to capture sites. The translocation distance for bears that successfully returned to capture sites was, in each case, less than 40 miles. Thirty-two percent of bears remained within ONF and 36% left ONF but did not return home. Survival estimates for translocated males were comparable to those reported for resident bears in ONF. Survival estimate for translocated females was somewhat lower than those reported for resident females in ONF but may have been due to low numbers of females translocated. Seventy-six percent of survey respondents said that bear problems had reoccurred within a year of the nuisance bear being removed from their property.

Field work concluded in July on the "Ecology of the Florida Black Bear in the Urban-Wildland Interface (UWI)" study which is being conducted in partnership with the University of Florida and the USFS. FWC staff helped design this project and supervised all field activities. This project began in June 2005 and seeks to closely monitor the movements and activities of Florida black bears living in the urban-wildland interface of ONF. Thirty-two bears (17M, 15F) were captured and radio-collared. Of these, 25 bears (13M, 12F) were captured at two different study sites and seven bears (4M, 3F) were captured in the interior of ONF as controls. Preliminary results suggest that bears that live in the UWI are more nocturnal then bears that live in the forest and that the distribution of bears in the UWI fluctuates significantly in response to seasonally available resources in the highly fragmented habitat. A thorough analysis of data is being conducted and results will be contained in a published thesis as a Master of Science degree requirement due in 2008.

Field work to determine the distribution of bears in a four county area of the Big Bend region (Dixie, Lafayette, Levy, and Taylor) concluded in August. This study is being funded through a grant from the Wildlife Foundation of Florida and a contract with Coastal Plains Wildlife. FWC staff wrote the grant proposal, selected the vendor, developed a contract, and worked with the vendor to ensure all elements of the contract were met. The Big Bend region constitutes the state's largest expanse of under-occupied bear habitat. Little is known about the current distribution of bears in the region although anecdotal information suggests that bears have expanded into the area from Apalachicola National Forest. The purpose of the study was to determine bear distribution and relative abundance of bears in the Big Bend. Work began on this study in May 2006. Field work consisted of constructing more than 200 rectangular double-stranded barbed-wire hair snare enclosures in the 4-county area. Hair snares were baited with corn, pastries, and a fruit-scented lure to entice bears to pass through the enclosure. Hair snares were monitored for two one-week periods and animal hair was removed from barbs and identified. Preliminary results indicate that bears were present in low numbers in some portions of Taylor, Lafayette, and Levy counties. A more thorough analysis is underway and a final report will be issued in December.

FWC staff served on an advisory committee with representatives from the USFS, Florida Division of Forestry (DOF), Florida Department of Environmental Protection (DEP), Florida Department of Transportation (FDOT) and several Non-Governmental Organizations that were

part of the Project Design and Environmental (PD&E) study to consider improvements to SR-40 in Marion, Lake, and Volusia counties. PD&E is a formal process that FDOT uses to ensure consideration is given to engineering design, project costs, environmental and social impacts in the development of major transportation projects. The committee that FWC staff was part of sought to advise FDOT on the design and placement of wildlife crossing structures to be incorporated into the traffic capacity enhancement project that is being planned for SR-40. SR-40 bisects a large bear population and currently accounts for more than 50% of the state's annual roadkilled bears and its impacts to bears in the area has previously been studied by FWC staff.

FWC staff attended scientific meetings to present results of research and were authors or co-authors of several articles either accepted for publication or published by scientific journals. Current activities and reports can be viewed on the FWC's black bear web page at http://myfwc.com/bear/.

Florida Mice

Small mammal trapping at Chassahowitzka Wildlife Management Area (*Aaron Given and Jenny Roberts*).--In 2006-2007, two sessions of small mammal trapping were completed in the winter and spring. Within each season, five habitat cover types were sampled; sandhill, gopher tortoise burrows (within sandhill), flatwoods, hardwood swamp, and scrub. Trapping sites were selected within areas that best represented communities delineated by a Florida Natural Areas Inventory (FNAI) conducted for Chassahowitzka WMA. All individuals were marked. A fall trapping session will be executed in 2007-08.

More individuals were captured in the flatwoods than any other habitat cover type. In both seasons, there were more Florida mice captured in the sandhill and at gopher tortoise burrows than any other species, however there were more Florida mice captured in the flatwoods transects than in the sandhill. Florida mice seem to be common in good habitat at Chassahowitzka WMA. Increased efforts to manage sandhill communities effectively should only benefit the status of the Florida mouse at Chassahowitzka WMA.

Beach Mice

Overview (*Jeff Gore*).--Several subspecies of the old-field mouse 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. An important management need is to be able to monitor changes in beach mouse populations in response to habitat loss and other impacts. Biologists have traditionally monitored beach mouse populations through periodic live-trapping, but trapping is labor intensive and typically not affordable as a long-term monitoring method. FWC biologists are currently finalizing a method of monitoring the distribution of beach mice that relies on detecting mouse tracks at bait stations (track tubes) rather than capturing mice. Presence of mice is determined from the track tube records and used to monitor the proportion of suitable habitat that is currently occupied.

Choctawhatchee Beach Mouse (*Jeff Gore*).--FWC staff continued preliminary testing of tracking tubes as a monitoring technique on the eastern population of the Choctawhatchee beach mice at West Crooked Island on Tyndall Air Force Base. In March 2007, track tubes were also installed at 32 stations in Topsail Hill State Park, with assistance of Florida Park Service staff.

Tubes were checked monthly for tracks. Mouse tracks have been recorded throughout available habitat within the park and West Crooked Island.

Perdido Key Beach Mouse (*Jeff Gore*).--In 2004, Hurricane Ivan overwashed most of Perdido Key and destroyed much of the dune habitat occupied by the Perdido Key beach mouse. Post-storm assessments showed that some mice at Perdido Key State Park survived the storm, as did mice on a small area of Gulf Islands National Seashore. In 2006-2007, FWC biologists continued a biweekly checking of the grid of tracking tubes that was established in 2005 on the two areas of public lands on Perdido Key. Based upon tracking results, the beach mouse population at Perdido Key State Park remains extremely small and has not expanded as habitat has recovered from the hurricane damage. Conversely, the population at Gulf Islands National Seashore, although still small, appears relatively secure and is expanding slowly as habitat recovers.

Beach mice that had been secured from Perdido Key State Park just prior to Hurricane Ivan had been maintained at a facility in South Carolina since 2004. These mice were deemed unlikely to be returned to the wild due to potential for disease transmission and because the mice had become acclimated to captivity. The original mice and their descendants were moved to three Florida zoos in 2007 in order to provide the public an opportunity to see beach mice and to educate visitors about beach mouse biology and conservation. In March 2007, FWC biologists participated in a workshop at Topsail Hill hosted by USFWS to discuss the potential benefits and risks associated with breeding beach mice in captivity to augment wild populations.

St. Andrew Beach Mouse (*Jeff Gore*).--In 2006, FWC biologists helped UFSWS complete a range-wide assessment of suitable habitat for the St. Andrew beach mouse. A total of 1,008 ha (2,489 acres) of suitable habitat were identified, of which 23% was privately owned. FWC biologists continued testing 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. Beach mice tracks were found in all monitored areas at East Crooked Island and at St. Joseph Peninsula State Park. Mice were also live-trapped at both sites in 2007. As in previous years, no beach mouse tracks were found at Cape San Blas. FWC biologists also monitored several areas of Tyndall Air Force Base that contained suitable habitat but had no prior record of mice. No sign of beach mice was found in any of the additional areas.

Southeastern beach mouse (*Terry Doonan*).-- FWC staff coordinated with USFWS staff on permit reviews and development of project methods for a proposed translocation of the southeastern beach mouse from Cape Canaveral Air Force Station (CCAFS) to restock suitable habitats in the Archie Carr National Wildlife Refuge (ACNWR), near Sebastian Inlet State Park. However the proposed translocation is not expected to be conducted until at least Autumn 2007, with potential assistance from FWC staff possible.

The main objectives of this project are 1) to minimize the incidental take of southeastern beach mouse habitat during an Air Force borrow site excavation within beach mouse habitat on CCAFS; 2) to establish a viable population of the southeastern beach mouse habitat on the ACNWR, within the historic range of that subspecies, but where mice are currently extirpated (surveys in 1995 and in March 2006 found no southeastern beach mouse habitat at ACNWR); and 3) to subsequently investigate the survivability of the translocated southeastern beach mouse habitat at the ACNWR.

The reintroduction plan would take genetics and demographics into consideration. Subsequent to the translocation of southeastern beach mouse habitat, quarterly trapping will be conducted for two years to better assess establishment of the mouse population on ACNWR and a report will be written that analyzes the success of the translocation event. FWC staff are coordinating on project methodology to ensure appropriate scientific methodologies are followed. FWC also will permit the proposed work upon approval of methodologies by staff.

Gray Bat

Monitoring (*Jeff Gore*).--The gray bat is a colonial cave-roosting species that occurs through much of the southcentral United States. Its rangewide population appears to be increasing after severe past declines due to disturbance of its cave roosts. In Florida, however, the gray bat occurs only in a few caves in Jackson County and the population is declining even though the roost caves have been protected. Gray bats occupy different caves in summer and winter based upon temperature, and some bats migrate out of Florida during winter. The size of the summer population cannot be easily determined because the bats roost within large colonies of another bat species, the southeastern bat. Still, no gray bats have been observed or captured at summer roosts in Florida for several years. In 2006-2007, emerging bats were counted at the 2 known maternity roosts and a sample of bats was captured at each site. No gray bats were captured in the small sample.

The gray bat winters in only two Florida caves and the hibernating bats can be readily counted at both sites. Biologists from FWC and the Florida Park Service conduct a single annual census of the winter roosts and the number of gray bats has steadily declined in recent years. In January 2007, no hibernating bats were observed in either cave for the first time since the censuses began. The absence of bats at the summer and winter caves suggests that the population of gray bats in Florida is extremely low, and the species may already be gone from the state. Because the roost caves have been protected from disturbance, other factors may be responsible for the decline. For example, protection of large roost caves in northern Alabama may have attracted bats that formerly raised young in Florida caves. Also, because the gray bat prefers low temperatures for hibernating, increases in winter temperatures at Florida caves may have made them unsuitable for gray bats.

Florida Panther

Florida Panther Restoration and Management (*Darrell Land*).--Florida panthers are endangered by a combination of small population size and habitat loss. Habitat fragmentation 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 80-100 adults and sub-adults, exists on approximately 2 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 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 8 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 38 radiocollared Florida panthers in southern Florida during the reporting period by FWC and our 2 federal cooperators, Big Cypress National Preserve and Everglades National Park. Two new panthers and two others that had failed radiocollars were added to the sample population monitored by FWC this past capture season. Fifteen panther dens were documented by the three agencies during the study period producing a minimum of 42 (20♂, 22♀) kittens. One of these female kittens was found dead at the den; all other kittens were permanently marked with subcutaneous transponder chips and genetic material acquired. A total of 154 panthers have been radiocollared since 1981and 252 neonate kittens have been handled at dens since 1992. Five (4♂, 1♀) radiocollared panthers and 18 (11♂, 6♀, 1 unknown sex) uncollared panther deaths were documented during the reporting period. One of the uncollared mortalities was handled as a neonate and identified by its transponder chip. Eighteen (12♂, 5♀, 1 unknown sex) panthers died from vehicular trauma and three panthers (2♂, 1♀) died from intraspecific aggression. Two panthers (1♂, 1♀) died of unknown causes.

We are continuing our evaluation of Global Positioning System (GPS) radiocollars. Our paper on habitat selection by 12 panthers equipped with GPS radiocollars has been accepted by the Journal of Wildlife Management and will be published during the next fiscal year. Our analyses showed that panthers selected upland and wetland forests; other habitat types were used in proportion to their availability. 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 U.S. Fish and Wildlife Service (FWS) in 2002. Current research initiatives include the development of a panther demographic model, improving estimates of adult and kitten survival, continuing to evaluate panther habitat selection analyses through use of GPS radiocollars, and analyzing nearly 30 years of panther genetic data. A paper on panther den site selection has been accepted by the Journal of Wildlife Management and will be published next fiscal year. 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, with the goal of 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 FWS. Public comments have been received and these need to be addressed before the plan is finalized and adopted. This interagency group has developed a Guide to Living with Florida Panthers and panther safety tips for public distribution. FWC participated in two Town Hall meetings to deliver our “living with panthers” message directly to the communities where human-panther interactions have occurred.

FWC investigated and confirmed that panthers were involved in attacking or killing domestic animals in nine reported cases, all from Collier County. Goats were preyed upon in 8 of the confirmed depredation events. One incident involved a miniature donkey that was attacked but not killed. Additionally, a sheep and several emus were killed or consumed at one residence. Depredations occurred at six residences. Two residences had multiple depredations accounting for five of the nine reported cases; these residents did not follow the domestic animal

husbandry guidance we gave to them. We believe that five or six individual panthers may have been involved in these depredations.

An extensive collection of panther reports and publications can be found at the following websites: http://www.wildflorida.org/critters/panther/index.asp, http://myfwc.com/panther/, and htttp://www.fws.gov/verobeach/Florida_Panther.htm.

Florida Manatee

Recovery Efforts (*Carol Knox*).--The FWC is involved in many recovery efforts for the Florida manatee. 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 participates 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. The FWC and the USFWS continue to work closely to address 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 (*Brad Gruver*).--In accordance with the listing process (68A-27.0012 F.A.C.), a draft management plan for the Florida manatee was submitted to the Commission for conceptual consideration at its June 2007 meeting. The Commission directed staff to proceed with preparing a final draft manatee management plan and associated rules for the September 2007 Commission meeting. The proposed listing action of reclassifying the manatee from an endangered species to a threatened species, previously determined by the Commission as warranted, will not occur until the management plan is approved.

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 assisted both Broward and Palm Beach Counties extensively this year as they continue to develop their MPPs. Staff also assisted Duval County in revising their existing MPP. Assistance was also provided to Clay and Flagler Counties regarding MPP development. The FWC approved the final MPP for Clay County. 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 Charlotte County were completed in July 2006 to modify speed zones for the Placida

Harbor area. The Local Rule Review Committee (LRRC) process was completed in Duval County to consider possible changes in the downtown Jacksonville area to incorporate the existing federal manatee protection zones into the FWC rule. The amendments were approved by the FWC Commission in December 2006 and filed for final adoption in January 2007. In June 2007 the city of Jacksonville adopted an ordinance to conform its local manatee protection zones to the FWC zones.

Permits - A total of 672 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 DEP and the various water management districts. Implementation of the Boat Facility portion of FWC-approved MPPs, is accomplished 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 continues to work on the many tasks required to address the potential loss of artificial warm water manatee habitat. Staff also focused on recovery tasks emphasizing determining habitat-based manatee population carrying capacity.

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. A total of 234 phone or mailed requests for information were received and completed. Of these, 87 were requests for bulk orders of materials to be distributed through the requestor's organization. An internet e-field trip about manatees is available at http://www.eFieldTrips.org. The e-field trip is popular nationally and is also accessed from outside the US.

Manatee Research Program (*Leslie Ward-Geiger*). The manatee research program included work in the following areas:

Manatee Mortality and Rescue- During calendar year 2006, 417 manatee carcasses were recovered. There were 92 watercraft related mortalities. For the fiscal year from July 1, 2006 through June 30, 2007, 389 manatee carcasses were documented in Florida. All but 28 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 the Fish and Wildlife Research Institute's (FWRI) web page (http://research.myfwc.com/features/-category_sub.asp?id=2241).

FWC staff and cooperators rescued 66 (2006-2007) 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 - Staff contributed to a population projection model for the Florida manatee (http://www.pwrc.usgs.gov/resshow/manatee/documents/OFR2007-1082.pdf). The model is a stochastic, stage-based model being used to integrate information about manatee life history to predict population changes under various environmental and management scenarios. A complementary analysis included a quantitative threats analysis conducted with federal partners. The threats analysis suggested that watercraft related mortality has the greatest impact on manatee population growth and resilience. In addition, staff developed measurable

biological goals (MBG's) that are related to the dynamics of the manatee population as described by the population model. The MBG's are a means of monitoring the contribution of management toward recovery by measuring improvements in survival rates, available warm water, and population size. Specifically the MBG's include: (1) mature population size exceeding 2,500 mature individuals statewide; (2) sufficient regional adult survival rates to support a stable or increasing manatee population. This will be achieved by ensuring a less than 1% probability of population declines greater than 30% over the next three generations (~ 60 years), given available warm-water resources; and (3) sufficient regional warm-water carrying capacity to support a stable or increasing manatee population, given the prevailing rate of adult survival.

One interagency, statewide "synoptic" aerial and ground survey of manatees was conducted in January and February 2007 to meet legislative requirements of conducting an annual manatee census. These surveys yield a minimum manatee population count. The 2007 winter survey count was 2,817. For more information about aerial surveys and the synoptic count please go to http://research.myfwc.com/features/category_sub.asp?id=2190.

This year the behavioral ecology program launched a new research initiative to study manatee interactions with motorized watercraft in collaboration with marine mammal bioacousticians at Florida State University (FSU) and marine engineers at Woods Hole Oceanographic Institution (WHOI). A thorough understanding of the behavioral and sensory mechanisms underlying manatee-boat collisions is necessary in order to devise effective avoidance approaches, whether they are technological or regulatory. The study is proceeding in two phases, a tag research and development component (year 1) and a field/analytical component (years 2-3). Work in 2006-2007 focused on research, development, and pilot testing of a state-of-the-art digital acoustic recording tag ("dTag") designed to record manatee response to vessels. In addition to the Save the Manatee Trust Fund (STMTF), this project was funded by the FWC Office of Boating and Waterways and a state Florida Manatee Avoidance Technology grant to FSU.

FWRI, in cooperation with the United States Geographical Service 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 over 2,200 manatees, each of which have met stringent criteria for cataloging. In a continued effort to transition to a digital platform, FWC initiated the scanning of manatee carcass slides. Over 31,500 slides dating back to 1980 have been scanned to date.

Contracts for Manatee Research - FWRI managed a contract for Mote Marine Laboratory to conduct the following manatee research studies: Photo-Identification Studies; Development of Methods for Field Sampling and Variable Genetic Markers in the Florida Manatee; Molecular Biologist Postdoctoral Position; Manatee Health Studies; Contaminants and Biomarkers of Effects; Recreational Boat Traffic Surveys of Brevard County, Florida; and Manatee Rescue and Verification.

Contracts for the Florida Manatee Avoidance Technology Program (FMAT) were managed through FWRI. Two new projects were awarded and initiated in Fall 2006 in response to a solicitation for proposals. The first project seeks to expand our knowledge of manatee hearing by performing behavioral hearing tests on two captive manatees. This work expands on research that was conducted previously on two additional captive animals and will double the

data set for behavioral hearing tests on manatees. The second project involves attaching a dTag, a state-of-the-art digital acoustics tag, which is designed to record the response of manatees to underwater sounds including boats. Both studies were awarded three year grants and are ongoing. We also expect to move forward with a solicitation for sonar projects through FMAT that was put on hold earlier in the year due to budget concerns. Awards are expected to be made in late 2007.

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, 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 Service. 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 less than 400 individuals. In 1994, NOAA Fisheries Service designated portions of Florida and Georgia coastal waters as critical habitat for the right whale as it is the only known calving ground for this species. FWC is instrumental in assisting a recovery plan implementation team whose aim is to help NOAA Fisheries Service by providing advice to and support of recovery activities. During 2006-2007, FWC staff continued to chair this team.

During the 2006-2007 North Atlantic right whale calving season (December 01, 2006 – March 31, 2007) 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 75 aerial surveys and responded to 17 sightings by land this season. The effort contributed to a total of over 70 individual right whale sightings and 22 cow/calf pairs. Staff also assisted with the retrieval and necropsy of two dead right whales. One of these whales, a juvenile male, was determined to be killed as a result of ship-strike and the other, a calf, due to complications associated with birth. In collaboration with Georgia Department of Natural Resources staff conducted 27 right whale biopsy sampling trips which resulted in 20 biopsy samples collected. Of the 20 biopsy samples collected, fifteen were of calves, two were adult females, and three were of juvenile whales. The skin samples will be used to generate information on kinship, individual gender and identification, stock identity, and genetic variability within the population. The blubber portion of the samples will be used to determine contaminate levels and to gain information about feeding ecology and nutritional condition.

A leading cause of right whale mortality is collisions with ships. Since the loss of even 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 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 juvenile right whale

fouled in commercial fishing gear during January 2007 off Georgia. This whale was seen again in the Northeast U. S. (identification confirmation pending) and appeared to have shed the gear.

Bald Eagle

Bald Eagle Population Monitoring (*Janell M. Brush*).--Annual statewide surveys for nesting bald eagles have been conducted by FWC biologists for 34 years. This years annual statewide nesting bald eagle survey was initiated in January 2007 and the last regular survey flight was flown mid March 2007. Additional surveys were conducted this breeding season and will continue the next two breeding seasons. These additional surveys aim to locate previously undiscovered nests by focusing on potential bald eagle habitat in areas where there are currently no known nests. A set of 16 plots located in previously under surveyed areas that held potential eagle nesting habitat were sampled. A total of eight confirmed and one potential nesting territories were located during those surveys resulting in 50% of the surveyed plots yielding new nests to add to the statewide survey effort. The number of active bald eagle nesting territories documented in 2007 was 1,218. The estimated number of young produced this year (1,263) was close to the number estimated for 2006 (1,325). The productivity rates for 2007 (based on 534 nests for which results were determined) were 1.07 per active territory and 1.46 per successful nest. These numbers represent an estimated population of between 3,240 (breeding adults and estimated non-breeders and subadults) and 4,550 (breeding adults, non-breeder subadults, and young produced in 2007). This survey does not include eagles that nest in Everglades National Park (traditionally 30 to 50 pairs) and if those numbers were included the estimated population would be increased by 112 to 187 eagles.

Geographic distribution of bald eagle nesting territories in Florida continues to be good. Sixty-one of Florida's 67 counties supported nesting bald eagles. Eight counties were represented by only one nesting pair, while 16 were represented by >25 nesting pairs. Polk and Osceola Counties have the greatest number of eagle nesting territories with 113 and 112 respectively.

In June, the bald eagle was removed from the list of endangered or threatened species by the USFWS. The Florida Fish and Wildlife Conservation Commission proposed to remove the bald eagle from the state list. An important research need that has been identified is to reevaluate the distance within which nesting bald eagles are disturbed. Upon delisting the bald eagle in Florida, it will be beneficial to determine the level of conservation needed to sustain the population in perpetuity. It is critical that the proper buffer zones around active bald eagle nests are identified and can be justified from a biological perspective. Survey protocols for eagle nest monitoring can be modified in conjunction with a well designed research project which takes into account the inference of the study, rural versus urban birds, historical nesting locations and developments. The study must use scientists to observe nesting bald eagles to determine the effectiveness of buffer zones and the individual levels of tolerance by the nesting pair. There is no reason to expect that with effective habitat management the species will not be able to sustain the current population level.

The Scientific Data Manager and staff are preparing to launch a new FWC bald eagle website. This website will include current eagle news, conservation, biology, management, research, literature, contact information, and links to partner's websites. The site will also incorporate a new user friendly, interactive bald eagle nest locator. For more information about

bald eagle monitoring, research or nest data, please e-mail baldeagle@MyFWC.com or call the Wildlife Research Lab in Gainesville at 352-955-2230.

Bald Eagle Seasonal Movements (*Katherin Haley*).--Current bald eagle 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] were attached to 70 nestling bald eagles over several years. The satellite transmitters transmitted latitude, longitude, and mortality data for each eagle. The final report is available on the web site: http://myfwc.com/eagle/eaglestudy/publications.asp. 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 report shows important use areas for Florida's sub-adult eagles to help state, federal and local land managers to better manage for bald eagles.

Nesting Surveys on the Apalachicola River Wildlife and Environmental Area (*Derek Fussell*).--Nesting surveys for bald eagles were conducted during January 2007 and February 2007 on the Apalachicola River Wildlife and Environmental Area (ARWEA). Systematic aerial transects were flown on the ARWEA and the surrounding area as well as St. Vincent Island Wildlife Refuge. All nests were recorded as either active or inactive and the number of eggs/nestlings was recorded for all nests. During the January 2007 aerial survey a total of 18 nests were visited with 16 of those being actively used (88.9%). During the February 2007 aerial survey there were 29 nests visited with 27 of those being actively used (93.1%).

Nest Monitoring on the Apalachee Wildlife Management Area (*Nathan Bunting*).--Nest monitoring on Apalachee Wildlife Management Area was prompted by the need to conduct a prescribed burn on a unit with a known bald eagle's nest. The conflict existed because of the long nesting season of bald eagles (Oct-May) and the timing needed to conduct a safe and beneficial burn within prescription parameters (Dec-Apr). Due to the heavy fuel loads in the unit, burning outside of the nesting season would potentially lead to detrimental loss of mature trees and increase the likelihood of fire escaping. Burning around an active eagle's nest could create a significant disturbance that could result in nest abandonment or mortality of young. In November, monitoring confirmed nest activity with two adult birds displaying nest repairing behavior. Monitoring continued to determine nest occupancy after brood rearing and fledging of the eaglet(s) in hope that a prescribed burn could be conducted within the prescription time frame and pose no threat to the eagles. Two eaglets in down feathers were observed in late February. In mid March, both eaglets had increased substantially in size and were observed with flight feathers. Monitoring continued into April where eaglets were observed perched on the rim of the nest displaying wing beating behavior; however they were not seen in flight. Monitoring ceased in April because the time frame for conducting the prescribed burn had been exceeded.

Surveys on John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area and J. W. Corbett Wildlife Management Area (*Valerie Sparling*).--Nesting surveys for bald eagles were

conducted in January 2007 and March 2007 on the John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area and J. W. Corbett Wildlife Management Area. Aerial flights were conducted to monitor known bald eagle nests. The status of nests (active or inactive) and number of young were recorded. Ten active nests were observed in January, 3 of which had nearly fledged young in March.

Management Plan Development/Listing Evaluation (*Robin Boughton*).--Following the guidance of the listing process (68A-27.0012 Florida Administrative Code, [F.A.C]) the Commission formed a team to develop a draft management plan for the bald eagle. This group consists of five biologists from the FWC, two biologists from the St. John's River Water Management District, and one FWC law enforcement colonel. Two drafts of the management plan have been published and public comments received. The draft plan is available at http://myfwc.com/imperiledspecies/petitions/bald-eagle.htm. 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 the final draft of the management plan will be presented in 2007-2008.

Brown Pelican

Brown Pelican Population Monitoring (*Janell M. Brush*).--Statewide surveys of nesting Eastern brown pelicans have been conducted by FWC staff from 1968 - 2006. The survey is conducted annually around the first week of May, traditionally corresponding to the peak of nesting season for the brown pelican in Florida. Two observers flew in a fixed-wing aircraft over 54 recently active historical brown pelican colonies in Florida. New colonies were searched for opportunistically while flying between locations. It was discovered that 51% of the known historical pelican colonies had nesting activity this year.

The number of nesting pairs estimated this year was 4,724 in 42 sites (Florida Bay and the lower Florida Keys being lumped as one site). This is below the mean for all past years (7,041), and a decrease of 33 % from last years totals. Nesting success was not measured this year due to the timing of nesting varying throughout the state. When counts were done in the panhandle, about half of the nests had produced young. However, it was a snapshot count and nesting continued late into the summer this year. The majority of the nesting birds this year were on the east coast of Florida in 5 colonies in Brevard County. Many of the East Coast colonies are large and productive. However, the largest colony comes from a single colony in Levy County, Seahorse Key (825). This number was similar to the number counted there last year (800).

There were fewer but larger colonies on the east coast while there were more but smaller colonies on the west coast. Three new colonies were observed. Overall, the nesting numbers were down for the state. This decrease in numbers may be due to differences in observers, timing of the survey, protracted breeding season trend, habitat degradation, or decreases in prey base that support nesting. The second part of the study goal is to investigate any reported die-off of brown pelicans in Florida. This part of the project is being covered by the Avian Influenza Surveillance Team year-round as they investigate all reported avian die-offs to determine cause.

Burrowing Owl

Burrowing Owl Research and Conservation (*Katherin Haley*).--FWC and City of Cape Coral staff completed a five-year study to evaluate the effectiveness of FWC management policies for burrowing owls in urban areas. 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. FWC staff are currently drafting the final report for this study. 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.

Crested Caracara

Nongame Wildlife Grant- Crested Caracara Population Viability Analysis (*Stuart Cumberbatch*).--Dr. Joan Morrison, Trinity College, completed the preparation of the final report for the study, "Habitat Suitability and Demographic Population Viability Models for Florida's Crested Caracaras." The report describes how the habitat needs of the crested caracara and known demographic information was used to develop a population model suitable for the assessment of extinction risks for the species. Modeling indicated that diverse habitat that includes improved pasture, unimproved pasture, and flowing waters is important to maintaining suitable caracara habitat.

Florida Grasshopper Sparrow

Habitat Assessment and Meta-population Analysis (*Michael Delany*).--The Florida grasshopper sparrow 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. The recovery objective is to reclassify 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. 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.

Florida grasshopper sparrows on protected lands are monitored with annual point count surveys. About 600 monitoring stations are visited three times each year. Point counts are a standard method used to obtain an index of avian abundance, however there has been no examination of aggregated point count data from Florida grasshopper sparrow monitoring efforts. With funding from the USFWS, historic annual point count data (1991-2005) from all five monitored populations on public lands (Avon Park Air Force Range, three locations; Kissimmee Prairie Preserve State Park; and Three Lakes WMA) were compiled and examined for changes in sparrow abundance and distribution. Trend line models of point counts indicated significant ($P < 0.0001$) decreasing trends for all populations except for Three Lakes WMA ($P = 0.687$). Annual station-visit point count means from 1998-2005 showed a significant decrease

(56-97%) for all populations except for Three Lakes WMA, which showed a 22.7% increase. A contraction in occupied range at some monitored locations corroborated the decline in abundance.

Florida grasshopper sparrow detection probabilities were calculated and adjusted estimates of abundance over the course of the study indicated 311-550 males on all surveyed areas. Assuming an equal sex ratio, the estimated meta-population size in 2005 consisted of 1,100 individuals. The meta-population may be too small to ensure against short-term extinction and current protected prairie may not provide adequate habitat to meet recovery goals. Habitat expansion and management, and demographic improvements at existing locations may restore some Florida grasshopper sparrow populations. Annual point count surveys should be continued and a standardized monitoring protocol needs to be documented to ensure that detected changes in populations are not artifacts of measurement. Future monitoring should be in conjunction with experimental manipulations to evaluate land management actions, especially prescribed fire. The sparrow is probably at its lowest numbers, and populations more fragmented than in the past. 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, FWC staff used remote sensing and ground and aerial surveys to identify potential habitat for Florida grasshopper sparrows range-wide. Study results indicating a continued decrease in available habitat were published during this reporting period (Delany et al. 2007).

Surveys Conducted on Three Lakes Wildlife Management Area (*Tina Hannon*).-- Point count surveys for Florida grasshopper sparrows have been conducted on 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 (0.40 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 2007, surveys estimated there were at least 125 different male Florida grasshopper sparrows at the main site and 2-3 different males at the translocation site. These data indicate an increase in Florida grasshopper sparrow numbers at the main site from 2006 surveys (112 males) and a slight increase at the translocation site from 2006 surveys (1-2 males).

Two Florida grasshopper sparrows were banded on the translocation site during the 2007 breeding season. Banding efforts on the translocation site will be conducted during the 2008 breeding season. Monitoring will continue at TLWMA in 2008 and stations will be expanded to monitor changes in population due to habitat improvement. Tree removal was conducted on 30.34 acres (12.28 ha) of TLWMA's main site during the 2006/2007 fiscal year with funding assistance from the Unites States Fish and Wildlife Service. Further tree removal, as well as rollerchopping, on TLWMA's main site will be conducted during the 2007/2008 fiscal year.

Florida Scrub-Jay

Florida Scrub-Jay Conservation Coordination (*Adam Kent*).--A Florida scrub-jay conservation coordination program was initiated at the end of November 2006. The goals of this program are to improve management of scrub habitats in peninsular Florida and to recover populations of Florida scrub-jays and other scrub-dependent species. Despite protected status for

three quarters of an estimated 400,000 acres of scrubby habitats in Florida, scrub-jay numbers have continued to decline in recent decades. Improved communication among land managers and people working with scrub-jay research and monitoring is now leading to better-coordinated conservation efforts.

Scrub working groups for Northeast and Southwest Florida were organized in 2006-2007. The Northeast Florida Scrub Working Group has more than 90 members. Its first meeting was held on July 26, 2007. The meeting was attended by 58 people from 17 agencies or organizations including state parks and forests, national forests, county governments, Florida Natural Areas Inventory, and The Nature Conservancy. The working group's area is bordered on the west by the Ocklawaha River, on the south by Orlando, on the east by the Atlantic coast and on the north by the Guana Tolomato Mantanzas National Estuarine Research Reserve and Camp Blanding. The meeting updated participants on the status of scrub management and Florida scrub-jay monitoring in the region; introduced regional land managers and scrub-jay biologists to each other; determined the future direction of the group; and formed subcommittees focusing on scrub-jay banding, education/outreach, land management, and scrub-jay monitoring.

A similar meeting for the Southwest Florida Scrub Working Group will take place in Sarasota on December 4, 2007. This working group includes southern Hillsborough, Manatee, Sarasota, Charlotte, Lee and northern Collier Counties. It has more than 100 members from many of the organizations that attended the Northeast Working Group and additionally from Archbold Biological Station, Cornell University, the University of Florida, the United States Geological Survey, and the United States Department of Agriculture Natural Resources Conservation Service.

FWC participated in three additional scrub working groups in 2006-2007: the Brevard Nature Alliance, the Southeast Florida Scrub Ecosystem, and the Lake Wales Ridge Ecosystem Working Groups. Various scrub management and scrub-jay conservation topics were discussed at each of these meetings, including priority land management actions and the FWC's role in scrub and scrub-jay conservation.

A Scrub-Jay SharePoint website was created. This site provides information about scrub management, scrub working groups, scrub-jay occurrences, and funding. It has links to more than a dozen scrub-jay websites in addition to scrub management and burning websites.

A letter detailing necessary steps to be followed in applying for a scrub-jay banding permit from the FWC was created. This letter will reduce the number of inquiries to the FWC's permitting office and will result in better-prepared applications for banding permits.

Site visits were made to several sites to advise on scrub habitat restoration and/or scrub-jay monitoring. These sites included: Jonathan Dickinson State Park, North Peninsula State Recreation Area, the Office of Greenways and Trails 'Triangle Property,' Rock Springs Run State Reserve, Cape Coral; and Sarasota County sites.

Demographics in Suburban Charlotte County (*Karl Miller*).--FWC staff continued to study Florida scrub-jay population demographics in suburban Charlotte County, focusing on the Deep Creek region which supports the second largest population of scrub-jays in southwest Florida. We captured and color banded 72 new scrub-jays and re-captured 27 banded scrub-jays to replace missing or faded color bands. At the end of the 2007 breeding season, the Deep Creek population consisted of 59 family groups comprising 170 scrub-jays, which was a slight decline from the previous year, while the East County population was unchanged at 20 family groups comprising 71 scrub-jays. Twenty-four of 59 (41%) family groups in Deep Creek had adult

nonbreeders (i.e., "helpers") whereas 12 of 20 (60%) family groups in East County had helpers. Fifty-nine nests were monitored in Deep Creek, including five nests where egg laying could not be confirmed. Nest success rate was estimated to be at least 33%, but not more than 35%. Nest predation accounted for nearly all of the nest failures, and most depredated nests were taken during the incubation or egg laying stage. The most commonly used nest substrate was oak shrub (37%), particularly *Q. geminata*, but scrub-jays also used at least 10 different species of non-native trees and ornamental shrubs.

Data collected on dispersal indicate that Florida scrub-jays in suburban areas of Charlotte County continue to provide a reservoir of birds that are dispersing into areas of superior habitat quality east of the Peace River. Mitigation, restoration, and management efforts need to focus on expanding and preserving scrub-jay habitat east of the Peace River. Research staff continued to attend interagency meetings for habitat conservation planning in Charlotte and Sarasota counties and to provide technical assistance and biological opinions to county, state, and federal agencies, as well as the public.

A peer-reviewed journal article authored by FWC staff was published in the *Florida Field Naturalist* describing disease documented in this population in 2005 following Hurricane Charley.

Florida Scrub-Jay Management on Mitigation Parks (*Shane Belson*).--Annual Florida scrub-jay (FSJ) monitoring at Hickey Creek Mitigation Park WEA (HCMP) was completed during 2006-2007 by FWC staff. The population at HCMP consisted of 8 individuals from three family groups, which is a decrease of one family and two birds from the previous year. In addition, FSJs were banded at HCMP and on surrounding properties. FSJ 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 2006-2007, FWC staff enhanced FSJ habitat on 18 ac (7 ha) by mowing oaks with mulching equipment. 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 FSJs at Platt Branch Mitigation Park (PBMP) has been conducted since 1992. The population has fluctuated over the years, varying from 6 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 2006-2007 at PBMP by FWC staff. The overall population at PBMP was 15 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 FSJ 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 FSJs. During 2006-2007, 15 ac (6 ha) of oaks were felled to enhance FSJ habitat. Prescription burning will be used to remove the debris and complete the enhancement of the project area.

A small population of FSJs occurs at Moody Branch Mitigation Park WEA (MBMP), which has been in public ownership since 2004. During 2006-2007, FWC staff coordinated with The Nature Conservancy's Jay Watch Program to conduct site monitoring. Jay Watch volunteers located two family groups consisting of a total of 7 individuals. The accompanying habitat monitoring indicates that vegetation characteristics within FSJ territories are satisfactory.

Mechanical treatments (mulching) of sand pine stands were completed on 125 ac (51 ha) of unoccupied habitat in order to promote conditions that will support additional territories and a general increase of the MBMP FSJ population.

Additional information on FSJ management activities at these sites is available in the "FY 2006-2007 FWC Mitigation Park Program Annual Report" on file at the Kissimmee Field Office.

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 population on the Salt Lake Wildlife Management Area (SLWMA) in east central Florida. SLWMA supports about three family groups with an estimated population of 14 birds. There was no recruitment among the three families in 2006-2007. 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 2006-2007, SLWMA staff began a partnership with Brevard Nature Alliance in order to develop a regional strategy for scrub-jay recovery and management thru the Adaptive Resource Management (ARM) program. In 2006-2007, as part of the ARM program, SLWMA staff with the assistance of David R. Breininger banded 6 scrub-jays, four in one family and two in another family. Monitoring and additional banding efforts are scheduled to continue into 2007-08.

In 2006-2007, scrub-jay habitat management on SLWMA has focused on the prescribed burning of 51 ac (20.6 ha) of overgrown oak scrub and scrubby flatwoods that was mechanically treated in 2005-06. An additional 100 acres (40.5 ha) of potential scrub-jay habitat was also prescribed burned in 2006-2007. Management activities slated for 2007-08 include the continued mechanical treatment and subsequent prescribed burning of approximately 61 ac (24.7 ha) of potential scrub-jay habitat.

Florida Scrub-jay Population Survey and Habitat Management on Half Moon Wildlife Management Area (*Nancy Dwyer*).--FWC staff continued to monitor Florida scrub-jays on the 9,500-acre (3845 ha) Half Moon Wildlife Management Area in west central Florida. Jays were surveyed biweekly. To better track the population, 14 more jays were color banded in 2006-2007 for a total of 80 birds banded since 2001. Half Moon WMA supports about 10 family groups which fledged at least 11 juveniles this year. The present population is estimated at 40 birds, an increase over past years.

Habitat management has focused on growing-season prescribed burning, roller chopping saw palmetto, and mowing overgrown oak trees. Prescribed burns in the past two growing seasons included about 300 acres (121 ha) of potential or occupied scrub-jay habitat. Half Moon likely harbors a maximum of 500 acres (202 ha) of potential jay habitat. Because most oak areas are no longer overgrown, habitat management in the future will focus on roller chopping saw palmetto and increasing open ground cover.

Florida Scrub-Jay Population Monitoring and Habitat Restoration at Cedar Key Scrub State Reserve / Wildlife Management Area (*Norberto Fernandez and Karl Miller*).--Monitoring of the Florida scrub-jay population in and around Cedar Key Scrub State Reserve / Wildlife Management Area (WMA) in Levy County, Florida, continued during 2006-2007. During the 2007 breeding season, Florida Park Service (FPS) staff, FWC staff, and volunteers monitored eight family groups, four of which were located within the WMA boundaries. Approximately 50

acres of scrub were burned during the dormant season to maintain scrub-jay habitat. One family group established itself this year in the south-central part of the WMA in an area that was treated with fire five years ago. Ongoing scrub-jay population monitoring will be critical in assessing the effectiveness of scrub habitat restoration activities being conducted by agency partners. This is the most isolated and imperiled Florida Scrub-Jay metapopulation.

Florida Scrub-Jay Monitoring Activities, Camp Blanding Wildlife Management Area (*Jim Garrison*).--A small, remnant population of Florida scrub-jays still exists within the cantonment area at Camp Blanding WMA. 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 concerning scrub-jays were bait stations and random surveys with tape recorded calls. During this reporting period, one or two scrub-jays were generally found in the portion of the cantonment area called the Kingsley Scrub when the area was surveyed. Approximately ½ of this scrub habitat was subject to growing season prescribed burning in 2004.

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 2006 by ABS include Carter Creek, Gould Road, Henscratch, Highlands Ridge, Highland Park Estates, Royce, Lake Placid Scrub, and McJunkin. In 2006, Jay Watch surveyed Gould Road, Holmes Avenue, Royce, Silver Lake, and Sun 'n Lake Sebring. ABS surveys were conducted between 22 June and 26 July 2006. Jay Watch surveys were conducted between 14 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- Between 2005 and 2006, most populations were stable or declined slightly. The exception was the McJunkin Tract, which increased from 21 to 33 groups (large area burned in 2002 wildfire became suitable for jays). The populations at Highlands Park Estates have fluctuated from 13 birds in 2002 to 15 birds in 2006. The population at Holmes Avenue showed similar increases. This may be due to relatively good reproductive seasons in 2002 and 2003. One of the populations most at risk is Carter Creek. Although this population remained stable at six groups, it has declined from 35 groups in the early 1990's and from 14 groups just since 2003. Most of this area is overgrown and, in most years, reproduction has been relatively poor. Highlands Ridge (Leisure Lakes) is another population of concern. Over the last 10 years, considerable human residential development has occurred at this site, despite the public acquisition of nearly 60% of the site. The population has declined in each year the surveys have been conducted, from 57 groups in 2000, to only 26 groups in 2006, more than a 50% decline in only six years. The remainder of the population surveyed by Archbold remained stable or has shown modest declines; Henscratch, Holmes Avenue, Royce, Gould Road, Highland Park Estates, and Lake Placid Scrub.

Jay Watch Results- The number of Florida scrub-jay groups increased from 8 to 9 at Gould Road where active management is occurring (Archbold located 7 groups). Jay Watch and

Archbold often conduct surveys on the same property as a comparison between the two organizations. At Holmes Avenue, Jay Watch determined that the number of Florida scrub-jays dropped to 7. At Royce Ranch, the number of jay groups declined from 8 to 7 and at Sun 'n Lake Sebring the number of jay groups remained stable at 4. The total number of Florida scrub-jays declined at Silver Lake from 13 to 7.

Summary- The results of Florida scrub-jay monitoring on the Lake Wales Ridge Wildlife and Environmental Area (WEA) properties are used to determine areas of successful habitat management or restoration and to assess areas still in need of management activities. For example, because of these results, the property located at Carter Creek is being fenced and there is a contract to burn 1,000 acres (approximately 1/3 of the area). Burn units were placed in relation to the six remaining scrub-jay groups. The fencing project should eliminate trash dumping, illegal shooting, and the continued degradation of habitat by ORV traffic. While not precedent setting, it is not the norm for FWC to fence an area containing private lots (approximately 400 private lots will be fenced). The Florida scrub-jay information for this site was instrumental in achieving the fencing project which FWC believes will benefit management.

As stated in the 2005 report, subdivision properties pose special management problems (e.g., 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 and these decreases persist in 2006; Holmes, Carter Creek, and Leisure Lakes. Some of the subdivision sites are showing stable populations although most have undergone drastic declines since a 1993 state-wide survey conducted by Archbold Biological Station. It is unknown why jays persist in these areas which contain overgrown habitat. Somewhat more puzzling are results from Silver Lake. FWC owns this property outright and it has undergone management. Jay Watch surveys suggest a declining population. In 2007, Archbold Biological Station will survey this site as well as Jay Watch. On a more promising note, seven of the 11 sites sampled in 2006 show a stable or slightly increasing population of the Florida scrub-jay.

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 2000-2006 by Archbold Biological Station. Information for the Royce Unit is provided by Jay Watch.

	Natural Areas				Urban Areas			Natural/Agricultural Mix
Demographic Variables by Year	Royce Unit (JW)	Lake Placid Scrub (ABS)	Silver Lake (JW)	Demographic Variables by Year	Royce Unit (JW)	Lake Placid Scrub (ABS)	Silver Lake (JW)	Demographic Variables by Year	Royce Unit (JW)
# Groups				# Groups				# Groups	
2000	NS*	21	NS	2000	NS*	21	NS	2000	NS*
2001	NS	24	NS	2001	NS	24	NS	2001	NS
2002	3	18	9	2002	3	18	9	2002	3
2003	5	22	8	2003	5	22	8	2003	5
2004	6	26	13	2004	6	26	13	2004	6
2005	8	25	13	2005	8	25	13	2005	8
2006	7	23	7	2006	7	23	7	2006	7
Mean Group Size				Mean Group Size				Mean Group Size	
2000	NS	2.67	NS	2000	NS	2.67	NS	2000	NS
2001	NS	2.50	NS	2001	NS	2.50	NS	2001	NS
2002	3.3	3.10	3.70	2002	3.3	3.10	3.70	2002	3.3
2003	2.4	2.68	3.80	2003	2.4	2.68	3.80	2003	2.4
2004	4	3.08	3.23	2004	4	3.08	3.23	2004	4
2005	4	3.36	2.54	2005	4	3.36	2.54	2005	4
2006	4	3.61	3.57	2006	4	3.61	3.57	2006	4
Mean Ind. Young/Group				Mean Ind. Young/Group				Mean Ind. Young/Group	
2000	NS	0.38	NS	2000	NS	0.38	NS	2000	NS
2001	NS	0.50	NS	2001	NS	0.50	NS	2001	NS
2002	1.00	1.05	1.00	2002	1.00	1.05	1.00	2002	1.00
2003	0.4	0.27	0.60	2003	0.4	0.27	0.60	2003	0.4

*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, completed a two-year continuation of the citizen-science approach to conduct large-scale monitoring of Florida scrub-jays in the Lake Wales Ridge area. Volunteer citizen scientists conducted annual surveys to contribute to the range-wide surveys needed to complete the five-year review of the listing status for the species. By examining the results from several test sites, it was determined that the citizen surveys were comparable to more intensive surveys conducted by avian biologists. This suggests that the expanded use of a standardized protocol could provide data suitable for use by land managers managing habitat for scrub-jay populations.

Nongame Wildlife Grant- Florida Scrub-jay Recovery (*Stuart Cumberbatch*).--Mr. David Breninger, Dynamac Corporation, initiated a study to quantify habitat and population dynamics for Florida scrub-jays in mainland Brevard and Indian River Counties. The study continues work started in 1997 to develop biological recovery criteria for several large scrub-jay populations. Many of the objectives of this study are the result of feedback from strategies currently being employed to manage these scrub-jay populations. The study will examine the effects that restoration efforts have had so far and how these efforts can be optimized to improve the poor quality habitat currently occupied by scrub-jays. The researchers will focus on the interactions of habitat edge and fire on population recruitment. Since large numbers of scrub-jays occupy fragmented habitats statewide, it is additionally expected that the results of this study will be used as a model for managing scrub-jays in fragmented landscapes.

Ivory-billed Woodpecker

Search Effort on the Apalachicola And Chipola Rivers; Study Objectives and Progress (*Karl Miller*).--FWC searched for the ivory-billed woodpecker in the Apalachicola and Chipola river basins from January through early June 2007 using volunteers. The search followed protocols established by R. Cooper and colleagues at the University of Georgia for randomly selecting search patches and collecting vegetation data. Staff and volunteers covered 23 2-km^2 search patches during an effort of approximately 820 hours in the field using 33 volunteers. No visual or audio detections of ivory-billed woodpeckers. Search information and vegetation data were sent to the University of Georgia for analysis in a habitat occupancy model.

If additional searches for ivory-billed woodpeckers are to be conducted in river basins in Florida in the future, such efforts can benefit from lessons learned during this study. First, if the Cooper protocols are going to be used, it is crucial to have the search patches selected in advance of the field season. This will greatly aid in logistics and will provide additional time for training of volunteers. Second, when possible, searchers should consider collecting vegetation data during the fall prior to the search, when leaves are still on the trees to facilitate species identification. This also would allow reconnaissance of individual search blocks prior to the actual field season. Third, for safety reasons a minimum of two searchers should be in the field together. Fourth, if spacing replicate search visits over time is important to maximize scientific or statistical value, then the use of several big efforts during the course of a few months should be considered. This could be achieved by visiting all blocks once during a "sweep" of the river basin, then repeating the visits during subsequent sweeps.

Although ivory-billed woodpeckers were neither seen nor were any substantive signs observed, the Apalachicola and Chipola rivers have a considerable amount of potentially suitable habitat under public ownership. If ivory-billed woodpeckers are found elsewhere in the

Southeast, the Apalachicola River basin should be considered as a potential site for establishing a population.

Search Effort in the Choctawhatchee River Basin (*Brad Gruver*).--The FWC contracted with Auburn University to search for ivory-billed woodpeckers in the Choctawhatchee River basin. The objectives of the work were to seek evidence for either the presence or absence of ivory-billed woodpeckers along the Choctawhatchee River in Florida, and, if birds were detected, to map detection locations and identify areas of greatest activity. Field work started in January 2007 and ended in May 2007. Methods included walked or paddled transect searches for potential ivory-billed woodpecker cavities, time-lapse cameras to monitor promising cavities, and automated sound recording stations.

A total of 1480 transects were walked/paddled, covering 740 linear km and 37 km^2 documenting 3,147 large cavities and 494 dead tress with bark scaling consistent with descriptions of bark scaling done by ivory-billed woodpeckers. There were 315 camera deployments monitoring 236 promising cavities and 74 feeding trees (i.e., trees with scaled bark). Automated sound recording stations recorded 58 double knocks and 94 kent calls. A total of 21,428 person-hours were spent searching for ivory-billed woodpeckers along the Choctawhatchee River.

The study did not provide definitive evidence that ivory-billed woodpeckers were present in the Choctawhatchee River basin. The researchers believed they gathered substantial evidence that at least one ivory-billed woodpecker exists in the area. They noted that on seven occasions searchers saw what they identified as ivory-billed woodpeckers, that on 47 occasions searchers heard what they thought were kent calls or double knocks, and that the automated recording stations recorded both kent calls and double knocks. However, the researchers did not find any evidence of roost cavities, nest cavities, or signs of family groups, and concluded it was hard to explain the lack of this type of evidence if a breeding population of ivory-billed woodpeckers existed in the Choctawhatchee River basin.

Red-cockaded Woodpecker

Conservation Planning (*Robin Boughton*).--Statewide conservation planning for the red-cockaded woodpecker (RCW) continued throughout 2006-2007. 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. Staffs 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 an MOA was not needed to promote RCW conservation efforts.

Develop and maintain an 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.

At the close of the 2007 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.

Red-cockaded Woodpecker Management at J. W. Corbett Wildlife Management Area (*Katie Roscoe*).--J.W. Corbett Wildlife Management Area (Corbett) is managed by the FWC, and all monitoring and management of the red-cockaded woodpecker (RCW) population is conducted by FWC staff. The scope of work for fiscal year 2006-2007 included monitoring the number of active clusters, monitoring active clusters for nests, color-banding nestlings, determining fledging success, and installation of artificial cavities in existing and recruitment clusters. Habitat management included maintaining a three-year, growing season burn rotation within RCW habitat. Habitat restoration within RCW habitat included mowing 800 acres (324 hectares) of saw palmetto to reduce midstory, and treating 500 acres (203 hectares) of the exotic plant species *Melaleuca quinquenervia* and *Lygodium microphyllum*.

Before the onset of the nesting season, three pairs of RCWs were translocated from Fort Stewart, Georgia and the Apalachicola National Forest. A single female was also brought from Three Lakes Wildlife Management Area to increase the number of potential breeding groups. To prepare for their arrival a total of 36 artificial cavities were installed and 3 recruitment clusters were created.

At Corbett, there were eight potential breeding groups occupying 14 active clusters during the 2007 nesting season. Seven clusters fledged a total of eight young, the same number that fledged during the 2006 nesting season. Corbett's RCW population remained stable but did not grow despite the addition of new birds.

In cooperation with the National Park Service, Corbett biologists designed a plan for FWC staff to assist with management and monitoring of RCWs at Big Cypress National Preserve. Data collected will be used to evaluate the potential for using the Big Cypress population as a donor for other south Florida populations, including Corbett and the John G. and

Susan H. Dupuis, Jr. Wildlife and Environmental Area. Monitoring will also provide demographic and habitat use data for RCWs using South Florida hydric slash pine, in contrast to the better understood longleaf pine ecosystem. Candidates for a new FWC biologist were interviewed and equipment purchased for 2007-2008.

During 2007-2008 at Corbett, active clusters will continue to be monitored for nests, nestlings banded and fledging success determined. Cavities will be installed as needed and prescribed fire and exotic plant removal will be continued to enhance RCW habitat. Preparations will be made for another translocation event in the fall of 2008. Corbett will continue extensive management to promote reproductive success and increase population size of RCWs.

Red-cockaded Woodpecker Management at John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area (*Valerie Sparling*).--Red-cockaded woodpeckers (RCW), a federally-endangered species, were last observed on the John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area (Dupuis) in 1989. The FWC, in conjunction with the South Florida Water Management District (SFWMD) and the USFWS, developed a plan to reintroduce RCWs to the area. In the fall of 2006, FWC biologists identified habitat improvement activities critical for reintroduction, which included mechanical clearing of understory, frequent prescribed burning, and installation of artificial nest boxes, and coordinated these activities with the SFWMD. Ten fledgling RCWs were captured and translocated from public lands in Florida and Georgia to Dupuis. During the spring 2007 breeding season, monitoring and banding efforts showed six birds paired up with established territories on Dupuis. One of these pairs produced a female fledgling.

As part of the plan, FWC will release an additional 10 woodpeckers on the area this fall. Three additional clusters have been established to accommodate the new birds. During the next breeding season, clusters will continue to be monitored for nests, nestlings will be banded, and fledging success determined. In addition, habitat management activities to reduce midstory height and enhance RCW habitat will continue.

Restoration of the woodpecker at Dupuis will provide an important additional population in southeastern Florida as part of the Federal Recovery plan. The only other group of RCWs in southeastern Florida is at J.W. Corbett Wildlife Management Area.

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 red-cockaded woodpeckers (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 2006-2007, during which 31 active clusters were monitored. Twenty-six clusters contained potential breeding groups and five clusters contained solitary males. Of the 26 potential breeding groups, 25 produced eggs and 14 of these produced 14 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. Six artificial cavities were installed during the 2006-2007 fiscal year to maintain adequate cavity numbers in five clusters.

The USFWS approved management strategy of installing drilled starts in active clusters was implemented on the Babcock/Webb WMA for 2006-2007. Drilled start construction has been shown to reduce excavation times for RCW's and improve the availability of cavities in clusters where availability is a limiting factor. Three drilled starts where constructed in two clusters during 2006-2007.

Habitat management consisted of dormant season burns (December 1- February 28) totaling 18,673 acres and growing season burns (March 1- November 30) of 1,855 acres. Fuel loads around all 527 RCW cavity trees were reduced prior to burning to decrease the risk of damage during prescribed fires. Roller chopping of 1,247 acres was used to diminish the understory of saw palmetto. This occurred within some of the allotted RCW foraging areas but not within close proximity to any cavity trees. The drought condition experienced in southwest Florida has resulted in a low survival rate for planted pine seedlings. Because of this, the 250 acres planted with south Florida slash pine during 2005-2006 were replanted with the same species during 2006-2007 for the purpose of improving foraging habitat under the direction of the South/Central Florida Recovery Unit's Standard for Managed Stability Foraging Guidelines.

Red-cockaded Woodpecker Management at Platt Branch Mitigation Park WEA (*Steve Shattler*).--Monitoring of red-cockaded woodpeckers (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 2006-2007 indicate there were nine potential breeding pairs within the population prior to nesting season. Successful nesting occurred in three clusters, resulting in five hatchlings. One additional cluster experienced nest failure and there were no observed re-nesting attempts. All hatchlings were banded with unique color band combinations and five of the nestlings fledged and became part of the population. Four artificial cavities were drilled within clusters and two existing cavities were repaired and were fitted with excluder devices. Snake excluders were installed on all new active trees.

Habitat enhancement within the RCW population is a priority management concern. FWC contracted the mowing of 48 acres of overgrown habitat within an inactive cluster at PBMP. A timber thinning was conducted within 120 acres of slash pine flatwoods which has the potential to become foraging habitat. Additional information on red-cockaded woodpecker management activities at this site is available in the "FY 2006-2007 FWC Mitigation Park Program Annual Report" on file at the Kissimmee Field Office.

Population Management on Blackwater Wildlife Management Area (*Barbara Schmeling*).--The red-cockaded woodpecker (RCW) has been intensively managed on Blackwater Wildlife Management Area (WMA) by the DOF cooperatively with FWC since 1996. The population is monitored using leg bands, banding of nestlings and unmarked adults, "fledge checks", translocations and installation of artificial cavities where appropriate. In October 2006, three pairs of birds were translocated from Apalachicola National Forest. Currently, there are 52 potential nesting groups and five single bird clusters on the WMA, consisting of approximately 142 adult birds. Active clusters successfully fledged 76 nestlings this past year.

Due to a combination of recent hurricane activity and drought events, many of the clusters were not burned the past 3 years. FWC staff initiated a habitat enhancement program to reduce midstory and hardwood encroachment in several clusters. Since the fall of 2006, Blackwater staff improved habitat in 51 RCW clusters using a combination of a Brown tree cutter and a skid steer. Habitat improvement was followed by herbicide treatment of hardwoods in preparation for future prescribed burning.

Population Augmentation and Monitoring on Apalachicola River Wildlife and Environmental Area (*Phil Manor*).-- In an effort to sustain and augment existing red-cockaded woodpecker (RCW) populations, both natural and artificial clusters (colonies) within the Apalachicola River Wildlife and Environmental Area (ARWEA) were monitored throughout the breeding season. There is currently a total of six known clusters being monitored on the ARWEA; three natural and three artificial. Five of the six clusters showed signs of activity, and three of the clusters contained RCW nests. Of the three nests, one occurred in a natural cluster and the other two nests were in artificial cavity trees in recruitment clusters that were established in March 2005. RCW recruitment clusters are located in suitable but unoccupied habitat by installing Allen technique artificial cavity inserts into live pines of sufficient diameter. The nest within the natural cluster produced two fledglings this past breeding season. The two active clusters with artificial cavities both had nestlings, but only one nest produced successful fledges.

Potential sites for new artificial cavities were scouted during July 2007 and a total of 15 new cavity inserts are planned on being installed in the coming year. The cavity inserts will be used to form two new RCW recruitment clusters as well as supplement existing clusters.

Red-cockaded Woodpecker Population Survey, Nest Monitoring and Habitat Management on Citrus Wildlife Management Area (*Rick Spratt*).--FWC staff, in cooperation with the DOF, continued monitoring the red-cockaded woodpecker (RCW) population on the 49,317-acre (19,959 ha) Citrus tract of the Withlacoochee State Forest in west central Florida. Of 70 active RCW clusters, 51 nests were observed and 43 of these were successful in fledging 68 young. The number of active clusters increased 13% from 2006 to 2007. Color banding continued with 86 nestlings and 5 adults banded during 2006-2007. The current known adult population is 155, up from last year's 134.

Due to its successful growth, the Citrus population will, for the first time, donate RCWs under federally-supervised translocation projects. In October 2007, three females will be moved to St. Mark's National Wildlife Refuge and three male-female pairs will be donated to Picayune State Forest.

Active management to increase reproductive success, population size, and habitat quality included installation of artificial cavity inserts, prescribed burning and hardwood control. In 2006-2007, five recruitment clusters (at least three artificial cavities installed in a chosen area) were created. Cavity numbers were augmented at existing clusters using cavity inserts for a total of 86 inserts installed. Encroaching oak trees were cut in clusters where needed while cavity trees were protected from fire by raking and pre-burning.

Monitoring and Management of Red-cockaded Woodpeckers on the Goethe WMA (*Norberto Fernandez*).--The FWC currently assists the DOF in monitoring and managing the red-cockaded woodpecker (RCW) population on Goethe State Forest / Wildlife Management Area (WMA) in Levy County, Florida. During 2006-2007, there were 44 active clusters of

RCWs on Goethe WMA. The monitoring program for 2006-2007 included roost checks at each of the 44 active clusters, cavity and tree inventories at 44 active 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). Fourteen artificial cavities were inserted as required for the obtainment of three pairs of RCWs translocated from the Apalachicola National Forest. In addition, two RCWs were translocated within the forest for an intra-population translocation. Prior to conducting 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 2007-2008, 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 WMA is to assist the lead area manager with habitat improvement and restoration, and provide technical assistance for the red-cockaded woodpecker population. At the end of the reporting period there were 90 active cavity trees in 27 active clusters (23 potential breeding groups, mean group size = 2.7). Twenty-seven out of the 28 clusters were considered suitable this year (≥ four cavity trees per cluster or three cavities and two starts in active cluster sites). There has been a 108% increase in the number of active clusters between the years of 2000 – 2007. On October 12th of 2006, four birds were donated to the Dupuis WMA.

Of the 23 family groups, 22 nested and 16 were successful in fledging chicks. Thirty-one nestlings survived to banding age (six days), and 26 were fledged (84% successful fledgling rate). Four artificial cavity boxes were installed and three cavity boxes were replaced. Habitat surrounding two clusters was subject to prescribed fires during the growing season. Herbicide was applied to hardwoods in at least 6 clusters.

Red-cockaded Woodpecker Management on Three Lakes, Triple N Ranch and Bull Creek Wildlife Management Areas(*Ashleigh Blackford and Tina Hannon*).-- The red-cockaded woodpeckers (RCW) inhabiting Three Lakes, Triple N Ranch and Bull Creek Wildlife Management Areas (WMAs) are part of the same meta-population as determined by the USFWS Recovery Plan. The scope of work for 2006-2007 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 translocations and installation of artificial cavities in existing clusters and recruiting clusters.

The number of active clusters on Three Lakes WMA has been stable since 1999 and consisted of 46 in 2006. Within the 46 clusters, there were 45 potential breeding groups. Fifty-four nestlings were banded and 31 of the 40 nesting attempts made were known to be successful. The average fledgling production was one fledgling per attempt **(**1.3 per successful nest). Thirteen artificial cavity inserts were placed in January 2007 to augment the nesting sites in established clusters.

Bull Creek and Triple N Ranch are adjacent to one another, and supported six active clusters and five potential breeding groups combined. Five nestlings were banded, and four of the six nesting attempts were successful, fledging an average of 0.5 fledglings per attempt (one per successful nest). In 2006, six artificial cavity inserts were installed. In addition, four RCWs were placed in recruitment clusters. No additional recruitment clusters were established these WMAs.

During 2007-2008, RWC 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.

Population Surveys, Nest Monitoring and Habitat Management at Osceola Wildlife Management Area (*Ralph Holton*).--The FWC's role is to assist the lead area manager (USFS) with population monitoring, nest monitoring and habitat improvement for the red-cockaded woodpecker. Of the 266,270 acres (107,750 ha) in Osceola WMA, 92,400 acres (37,390 ha) are designated as RCW habitat, all occurring on the Osceola National Forest portion of the WMA.

At the end of the reporting period, there were 97 active clusters with 356 active cavity trees. Of the 97 active clusters, there are 92 potential breeding groups and five single male clusters. Of the 92 potential breeding groups, 84 nested with the eventual loss of seven nests. Three groups re-nested resulting in 80 successful nests which produced 160 nestlings that reached banding age (6+ days). Habitat management efforts were actively achieved through prescribed fire, hardwood removal near clusters, and artificial cavity inserts. For this reporting period prescribed fire was utilized in or around 10 clusters and 52 inserts were installed. Of these, six recruitment clusters (four inserts each) were created. An additional 28 inserts were installed in active clusters to maintain a minimum of four suitable cavities per cluster.

Roseate Tern

Management Actions (*Ricardo Zambrano*).--The roseate tern 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 one to two 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 found 33 roseate tern nests. A few weeks later, 16 chicks of varying ages were found, indicating that the small colony had been successful in their nesting attempts. In April of 2007, FWC and NPS biologists again placed social attraction equipment on Long Key at Dry Tortugas National Park. This year, 39 pairs of roseate terns nested at Dry Tortugas National Park. 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 Government Center rooftop colony to conduct nest, egg, juvenile, and adult counts. Nineteen pairs of roseate terns nested at this rooftop colony during the 2007 season. A sample of chicks was captured, banded, and released onsite.

Roseate terns were also found to be nesting among least terns on a condominium rooftop in Marathon during the 2007 nesting season, and FWC biologists located and monitored two roseate tern nests at this location.

Roseate terns were again observed on Bruce Key, a small sandbar approximately 6.5 miles west of Key West, Florida (this species first nested here in 2006). FWC and USFWS staff posted the area "No trespassing" with symbolic fencing to prevent disturbance to birds and to encourage nesting. Roseate terns did not successfully nest at this site in 2007, presumably due to high levels of human disturbance.

Everglade Snail Kite

Surveys Conducted on the Kissimmee Chain of Lakes during 2006-2007 (*Adriene Landrum*).--The Everglade snail kite population remains endangered. The overall population estimate is 1,600 birds, which is approximately one half of the 1999 population estimate conducted prior to the 2000-2001 drought (Martin et al. 2006). In 2006-2007, quarterly, roving surveys of the Everglade snail kite continued on the Kissimmee Chain of Lakes (KCOL). These surveys are conducted in compliance with the Lake Tohopekaliga Environmental Impact Statement issued by the U.S. Army Corps of Engineers.

From the data collected, it is evident that snail kite utilization of Lake Tohopekaliga has recently increased. Annual mean number of snail kites has expanded from 16 in 2004-2005 to 49 in 2006-2007. The majority of nesting activity normally occurs in the Water Conservation Areas (WCA) and on Lake Okeechobee. The prolonged drying period in South Florida may have affected apple snail production and subsequently impacted foraging and nesting attempts (Martin et al. 2006). Dry conditions in South Florida from 2006 through 2007 seem to have caused the birds to nest in more northern areas of their range such as the KCOL. Additionally, increased snail kite activity on Lake Tohopekaliga may be due to an abundance of exotic apple snails (formerly misidentified as P. canaliculata) and the availability of this forage near suitable nesting habitat. During the 2007 nesting season, which ran from February through mid-October, approximately 85% of the total active nests statewide occurred on Lake Tohopekaliga (FWS, 2007).

With this knowledge and with complaints regarding observed snail kite nest disturbances, the USFWS and the FWC commenced on an educational campaign to protect snail kite nesting areas on Lake Tohopekaliga. USFWS and FWC officials met with the local airboat tour companies to inform them about snail kites and their limited nesting situation. The airboat tour companies were given guidelines to follow to prevent further impact to snail kite nests. A media event was held in May 2007 to inform the public of the concentrated snail kite nesting activity on Lake Tohopekaliga. All government aquatic herbicide management programs were notified of the situation. A "no activity" zone map was produced by USFWS and distributed to the airboat tours and local aquatic plant management crews. All nesting areas were marked with signs stating: "Stay Back Endangered Snail Kite Nesting." Signage was provided and posted by the FWC. Overall, the collaborated effort between the USFWS, FWC and University of Florida was successful in preventing further impacts to kites on Lake Tohopekaliga in 2007.

The annual mean number of snail kites on Lake Kissimmee has declined in recent years. In 2006-2007, the annual mean was 14 birds. Although nesting habitat and native forage availability has improved on Lake Kissimmee, the birds seem to be attracted to the foraging opportunities provided by the exotic apple snail on Lake Tohopekaliga.

No snail kites were observed on lakes Cypress, Hatchineha and Tiger during the report period.

In recent years, the KCOL has become increasingly important in providing refugia for the snail kite. As long as poor habitat conditions persist in South Florida, the KCOL will become increasingly crucial in the immediate success of the species. More efforts to enhance or revitalize Lake Okeechobee and the WCAs may become a priority as prolonged dry conditions occur in these areas.

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 on Camp Blanding Wildlife Management Area consist of providing and maintaining nest boxes and conducting surveys. During February - May, 35 nest boxes were cleaned and maintained. Six nest boxes were verified as having been or currently being used by kestrels. Other wildlife utilizing the nest boxes included screech owls, flying squirrels, gray squirrels and fox squirrels.

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 on Jennings Forest Wildlife Management Area consist of providing and maintaining nest boxes and conducting surveys. During February of the reporting period, 14 nest boxes were cleaned and maintained.

White-crowned Pigeon

Nongame Wildlife Grant- White-Crowned Pigeons in the Lower Florida Keys (*Stuart Cumberbatch*).--Dr. Kenneth Meyer, Avian Research and Conservation Institute, completed the telemetry study of white-crowned pigeons in two Florida Keys National Wildlife Refuges. During the study, adult pigeons were tracked from the ground and air, and the food species consumed and the foraging habitats used were examined. The study determined that 15-20% of the Florida breeding population winters in Florida and survival was estimated between 55-95%. During the study, the researchers organized meetings with managers from the Caribbean with major pigeon populations. The meetings included discussions on range-wide conservation strategies to offset declines due to hunting and loss of critical habitat in those areas.

Whooping Crane

Whooping Crane Reintroductions in Florida (*Marty Folk*).--Non-Migratory Population - The goal of the Florida release is to produce a population of ≥ 25 breeding pairs of non-migratory whooping cranes in Florida by 2020. No captive-reared whooping cranes were released into the wild this fiscal year, due to concerns about the productivity and survival of released birds. This year, though no captive-reared young were released, staff continued to monitor the surviving members of the flock in order to document mortality, productivity, and other general biology of the birds.

Staff documented three mortalities (all due to trauma) and six birds going "missing," and at the end of the fiscal year, tracked 40 birds (16 pairs) in the population. Staff captured 22 birds, primarily to replace transmitters and conduct health-checks. Despite drought, three pairs nested, resulting in one chick fledged into the population. This was the 9th chick to fledge in the wild for this project. Analysis of productivity data shows a strong correlation with water levels prior to the breeding season. We marked power lines and redesigned radio transmitters in an effort to reduce mortality and morbidity resulting from collisions with the lines. Important crane habitats, where ≥ ½ of the flock reside, are slated for development, providing an opportunity to study the effects of habitat conversion on whooping and sandhill cranes. Kristi Candelora finished her Master's Degree on Infectious Bursal Disease, perhaps the most important disease affecting the flock.

Table 4. Whooping cranes released in Florida by year.

Year	Number Released
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
2007	0

Eastern Migratory Population – The Whooping Crane Eastern Partnership (WCEP) is reintroducing migratory whooping cranes that summer in Wisconsin and winter in Florida. The primary technique used is to guide captive-reared birds on a migration from Wisconsin to Florida by use of ultralight aircraft. This was the sixth year of releases of whooping cranes into the migratory population and the population stands at 58 (as of June 30, 2007). FWC's contributions to the reintroduction of migratory whooping cranes consisted mainly of aerial tracking in Florida and advisory support.

Wood Stork

Productivity of Wood Storks within the St. Johns River Water Management District of north and central Florida (*James A. Rodgers Jr.*).--The wood stork 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 is to gather productivity data for storks nesting within the St. Johns River Water Management District (SJRWMD) of Florida. These data will 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 2007 was 0.71 fledglings/nest for six active colonies. Six other colonies (Pumpkin Hill, Matanzas Marsh, Lake Disston, Hontoon Island, Pelican Island, and Horseshoe Island) active in 2006 contained no stork nests in 2007. For only successful nests (nests that fledged at least one stork), the average fledging rate was 1.70 fledglings/nest (n=93 nests).

Only about 50.0% of monitored nests fledged at least one bird and only 31.1% of nests fledged ≥2 birds. Significant differences in the mean fledging rate existed among colonies (range=0.27 to 1.45 fledglings/nest) during 2007. With the exception of North Fork (St. Lucie County), the greatest fledging rates were at two colonies along the northeast region in Duval County (Jacksonville Zoo and Dee Dot).

Several unusual events occurred during the 2007 nesting season. Storks did not nest at Pumpkin Hill, Matanzas Marsh, Lake Disston, Hontoon Island, Pelican Island, and Horseshoe Island. The reason for lack of nesting at Pumpkin Hill, Matanzas Marsh and Hontoon Island probably was due to little or no water present under the nest trees (primarily cypress) prior to the nesting season. The reason for no nesting at the other sites is unclear but Pelican Island and Horseshoe Island have exhibited a continued decrease in nest numbers during recent years. Fewer nests were recorded at the six active colonies in 2007 compared to previous years, indicating lower breeding effort by storks across the region. Finally, about 55 storks were observed loafing at Dee Dot during a visit in late April. However, these storks did not initiate nesting. A similar event was observed at Lake Disston in 2006.

Staff also attempted to locate historically active or recent reports of wood stork colonies in Brevard, Volusia, and Putnam counties at both interior freshwater and coastal marine sites in April-June of 2007. None of these sites were found to contain breeding storks. A small colony (n=22 nests) was active at the St. Augustine Alligator Farm but staff did not monitor this site because it contained too few nests.

A comparison of the combined fledging rate for all colonies within the SJRWMD region of Florida indicates the rate of 0.71 fledgling/nest in 2007 was the second lowest fledging rate recorded during the past four nesting seasons of this study. Six of 12 colonies monitored in 2007 were inactive and all colonies exhibited the fewest number of nests. Only the 2005 nesting season exhibited similarly low fledging rates to 2007. A comparison of the fledging rates among years for colonies monitored for at least four 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 each of 2004 and 2005. No colonies exhibited their highest fledging rate in 2007. Single visits to other stork colonies in Florida in 2007 indicated only one of three colonies were active in Leon County and only two of five colonies were active in Pasco-Hillsborough counties, suggesting the effects of the drought on stork nesting were occurring statewide.

Most of the area within the SJRWMD has experienced considerable variation in the amounts of rainfall and water levels in wetlands from 2004 to 2007. 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 of 2003, water levels were generally higher entering the 2005 nesting season due in part to the large amounts of rainfall from the post-August 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. The low fledging rates in 2007 probably are due to a continuation of the drought conditions that began in 2006, which storks are experiencing at the wetlands used for feeding around their colonies.

Whereas lower water levels may contribute to lower fledging rates via lower availability of 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. These same low water levels in wetlands used for foraging may have facilitated the higher fledging rates by concentrating prey as wetlands dried up and made for easier capture by adults. However, unlike the 2006 nesting season that exhibited some of the greatest fledging rates among colonies and years via concentration of prey in drying wetlands, these same wetlands were mostly dry and lacking any prey in 2007.

Wading Birds

Wading Bird Surveys - Ecofina Creek Wildlife Management Area, Carter Tract (*Kelly Bunting*).--Numerous wetlands and water bodies present on the Carter Tract of Econfina Creek Wildlife Management Area (WMA) in Washington County 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 on nests include: snowy egret (n= 14) and little blue heron (n= 45). Tricolored herons (n= 2) were present on the rookery, but a nest could not be confirmed during the survey. Wood storks have been documented numerous times feeding on several area ponds, and roseate spoonbills were documented on one area pond in September 2006, in a group with white ibis and great egrets. In April – June 2007, all waterways were surveyed by roadside or shoreline visual surveys; however, drought conditions on the area left several ponds and the existing rookery dry, and no bird nesting activity was documented. Numerous wading birds were present feeding on the area, including snowy egrets, little blue herons, and wood storks. All waterways on the Carter Tract will continue to 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.

Wading Bird Surveys - Apalachicola River Wildlife and Environmental Area (*Jestin Clark*).--The Apalachicola River Wildlife and Environmental Area (ARWEA) consists of a matrix of upland, wetland, and riverine habitats that potentially contain several rare or threatened species. The numerous wetlands on the ARWEA provide habitat for several species of colonial wading birds, including the tricolored heron, little blue heron, snowy egret, white ibis, and wood stork. In order to monitor the relative success of wading bird populations on the area an annual aerial rookery survey is conducted in the spring of each year. Aerial transects were flown within the lower Apalachicola River basin on May 1, 2007; May 3, 2007; and May 29, 2007. There were a total of four great blue heron rookeries and two great egret rookeries located throughout the course of the survey.

Gopher Frog

Nongame Wildlife Grant- Habitat Use by Florida Gopher Frogs (*Stuart Cumberbatch*).--Dr. Steve Johnson, University of Florida, completed the second year of a study using telemetry and a geographic information system (GIS) to determine the extent of upland use by the gopher frog in Florida longleaf pine-wiregrass uplands. Researchers deployed and continued to track juvenile and adult gopher frogs fitted with transmitters in study areas adjacent to several breeding ponds in the ONF. Movements by transmitted frogs were recorded as infrequent and were relatively short distances from the ponds. Frogs used a variety of underground retreats, thick vegetation, and leaf litter when away from the ponds. Persistent drought conditions during the past year severely reduced water levels in the ponds which may adversely affect the study. Researchers expect to include information and data from this study with results of a long term monitoring effort of the use of isolated ephemeral ponds by amphibians.

Eastern Indigo Snake

Florida's State Wildlife Grants Program- Genetic Diversity of the Eastern Indigo Snake *(Brian Branciforte)*.--Dr. Kenneth Krysko, University of Florida, initiated a project to examine genetic information for the Eastern Indigo Snake in Florida and south-eastern Georgia. The project will evaluate current genetic diversity and regional population structure and relate this information to the development of effective relocation and reintroduction programs. The most notable benefit of the results of this study is the knowledge of current genetic diversity and health of major populations of eastern indigo snakes. This information along with the synthesis of current published and unpublished studies on population ecology and habitat use will benefit future planning and management for conservation reserve systems.

Flatwoods Salamander

Taxonomic Status (*David Cook*).--A recent publication (Pauly, G. B., O. Piskurek, and H. B. Shaffer. 2007. Phylogeographic concordance in the southeastern United States: the flatwoods salamander as a test case. Molecular Ecology 16: 415–429) demonstrated that the flatwoods salamander, (*Ambystoma cingulatum sensu lato*), represents two species that can be distinguished through mitochondrial DNA. The Flint and Apalachicola rivers form the boundary separating the two species; the species to the east is recognized as *Ambystoma cingulatum sensu stricto*; that to the west is recognized as *Ambystoma bishopi*. The split in geographic distribution of the two species of flatwoods salamanders may warrant a re-evaluation of their current state listing status of special concern.

Management and Conservation (*David Cook*).--No systematic range-wide surveys for flatwoods salamanders were conducted in 2007. FWC staff spent one day in March unsuccessfully surveying ponds for the species at Stony Bayou Field in St. Marks National Wildlife Refuge (NWR). This is an area that had been agricultural fields, and the refuge was considering putting a parking lot in a portion of it. The current flatwoods salamander management plan (http://myfwc.com/imperiledspecies/pdf/Flatwoods-salamander.pdf) was prepared in 2001. This plan is due to be evaluated over the next year as regards the progress that

has been made toward its implementation. Staff will also consider whether any change in the listing status of the two flatwoods salamanders may be warranted.

Research (*Kevin Enge*).--In February, FWC staff assisted the Oak Ridge National Laboratory in their research, "Maximizing sampling efficiency and minimizing uncertainty in presence/absence classification of rare salamander populations," on St. Marks NWR. FWC staff also met with U.S. Geological Survey (Amphibian Research and Monitoring Initiative) staff to discuss their research plans for looking at the impacts of feral hog disturbance on flatwoods salamander breeding ponds at St. Marks NWR, and provided them with the coordinates of the most productive ponds for sampling larvae.

Survey and Monitoring of Flatwoods Salamanders on Pine Log and Point Washington Wildlife Management Areas (*Fred Robinette*).--In February of 2007, the USFWS proposed designated critical habitat for the flatwoods salamander, which included two known flatwoods salamander breeding sites located within cooperatively managed Wildlife Management Areas (WMA) in Florida's Northwest Region. WMA staff based out of FWC's Northwest Regional Office in Panama City participated in statewide efforts coordinated by the FWC to determine the status of the flatwoods salamander on select WMAs in the Panhandle. The first abovementioned breeding site, reconfirmed in April 2005, is located within Pine Log WMA in Washington County, while the other lies on Walton County's Point Washington WMA. With the recent reclassification of the flatwoods salamander into two distinct species, these breeding sites are now particularly critical for the newly described reticulated flatwoods salamander which is confined to the west of the Apalachicola River.

Sampling of potential breeding ponds at Pine Log and Point Washington WMAs occurred from October 2006 through April 2007 in an effort to reconfirm known sites and possibly document new breeding populations. Unfortunately, this year's flatwoods salamander breeding season was again disrupted by drought conditions that have plagued the Panhandle for several years. Consequently, very few of the 161 ponds (91 classified as potential breeding sites) on Point Washington WMA and 44 ponds (26 classified as potential breeding sites) normally monitored on Pine Log WMA were wet enough to be sampled during the winter and spring of 2007.

In addition to previously used methods, such as drift fence and dipnet surveys, the use of minnow traps was explored as a potential addition to the flatwoods salamander sampling effort. Although no flatwoods salamander larvae or adults were captured in the minnow traps, the presence of larval and adult mole salamanders, in addition to several other amphibian species, suggested that minnow trapping could be a potential protocol in future sampling efforts. When used in conjunction with other survey methods, minnow trapping enables more ponds to be sampled and/or monitored in a single season.

Local FWC staff continues to work with the DOF year round to improve potential breeding pond habitat through prescribed fire, mowing and chopping. On the eastern section of Point Washington WMA, local staff in recent years had provided recommendations for mitigation practices (mowing, burning or combinations of such) based on pond suitability criteria. In summary, sites with an abundance of grass within the pond and ecotone but with thick shrubs (i.e. *Cyrilla racemiflora* or *Cliftonia macrophylla*) on the pond edge were considered the most ideal candidates for mitigation mowing since opening up these areas would create suitable habitat for flatwoods salamanders. Similar ponds that were non-grassy were less

suitable for mitigation, but were still considered since the mowing of shrubs and the encouragement of herbaceous growth might create adequate flatwoods salamander habitat. Other ponds ranked lower in mowing priority because they possessed a smaller amount of vegetation or were unsuitable for flatwoods salamanders due to other reasons such as water depth.

This year, many of the identified ponds have been improved greatly. Local staff continues to monitor and document the effects of such habitat practices on these ponds. This cooperative venture between FWC and DOF, on-site ecotone restoration and improvement of select potential flatwoods salamander breeding ponds, will continue. It is hopeful that as time and budget allows mitigation rankings and pond recommendations for the remaining portions of Point Washington WMA as well as the entirety of Pine Log WMA could be completed also.

Surveys for Flatwoods Salamanders on Blackwater Wildlife Management Area (*Barbara Schmeling*).--Blackwater staff has surveyed the WMA for flatwoods salamanders for the past few years. As of March 2006, there were no confirmed flatwoods salamander breeding ponds on the WMA. However, these surveys highlighted the need to continue monitoring ponds for the declining eastern tiger salamander, which has been documented on the WMA. A three-year sampling protocol designed to survey and monitor 118 pond sites throughout the WMA was implemented in early 2007. Priority ponds, sampled annually, consist of historically confirmed tiger salamander breeding ponds, while potential breeding sites are sampled on a three-year cycle.

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.

Surveys for Flatwoods Salamanders on the Goethe Wildlife Management Area (*Norberto Fernandez*).--The FWC currently assists the DOF in attempts to document flatwoods salamander populations on Goethe State Forest / Wildlife Management Area (WMA) in Levy County, Florida. Surveys of potential ephemeral ponds were again conducted during 2006-2007 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.

American Crocodile

Crocodile Management Efforts (*Lindsey Hord/Blair Hayman)*.--The American crocodile is an endangered species success story. Since its initial federal listing as endangered in 1975, annual production has increased from 20-22 documented nests to 145 in 2007. The non-hatchling population has increased from 200-400 individuals to 1,500 to 2,000 in 2007. In March 2007, the USFWS reclassified the Florida population of the American crocodile from endangered to threatened. The species is currently still listed as endangered by the State of Florida. Crocodile sightings have become relatively common in southeast Florida and the upper keys, particularly in Miami-Dade County and on Key Largo. Crocodile occurrences have been documented as far north as Brevard County on the east coast (circumstances of this occurrence are suspicious, however) and Punta Gorda on the west coast.

Concurrent with the increasing crocodile population has been an increase in crocodile-human conflicts. The FWC manages these conflicts under a plan developed by FWC, USFWS, National Park Service, and the University of Florida. The plan outlines guidance for dealing with all crocodile-human interactions, and promotes public safety while recognizing the needs of recovery and conservation of a listed species. The plan is being revised to reflect the species current status. During 2006-2007, over 100 complaints were received by FWC staff. Most of these complaints were resolved through telephone calls and site visits. Eight complaints resulted in crocodile captures. Of these, five were males and two were females. The males averaged 8.37 feet (2.55 m) in length, with the largest one being 11.21 feet (3.42 m) in length. The females averaged 8.87 feet (2.71 m) in length, with the larger one being 8.97 feet (2.74 m) in length. Additionally, one 3.54 feet (1.08 m) long male crocodile was captured by a citizen in Brevard County, turned over to FWC staff and relocated. Animals were translocated to canals in close proximity to the Southern Glades Wildlife and Environmental Area. One female 8.25 feet (2.51 m) long crocodile in western Palm Beach County was mistaken as an exotic and captured. She was determined to be from the Florida population through genetic testing, and subsequently released near the capture site. Animals were translocated to canals in close proximity to the Southern Glades Wildlife and Environmental Area. FWC staff were involved in the recovery of seven carcasses, five of which were killed by vehicle collisions. Of these road kills, one was male (10.99 feet [3.35m] in length) and four were female. The females averaged approximately 8.60 feet (2.62 m), with the largest being 9.33 feet (2.85 m) in length. Two of the female road kills were previously relocated.

Gopher Tortoise

Listing Evaluation (*Brad Gruver*).--In accordance with the listing process (68A-27.0012 F.A.C.), a draft management plan for the gopher tortoise was submitted to the Commission for conceptual consideration at its June 2007 meeting. The Commission directed staff to proceed with preparing a final draft of the management plan and associated rules for the September 2007 Commission meeting. The proposed listing action of reclassifying the gopher tortoise from a species of special concern to a threatened species, previously determined by the Commission as warranted, will not occur until the management plan is approved.

Gopher Tortoise Management Plan (*Joan Berish*).--A gopher tortoise management plan that was drafted during 2006-2007 is the result of intensive efforts by two FWC issue teams and a dedicated stakeholder advisory group. The close collaboration of agency staff and stakeholders to create this blueprint for gopher tortoise conservation is unprecedented and has been highly commended. The first FWC tortoise issue team of 21 members met in 2004; a smaller 11-person issue team convened in 2005 and worked with the stakeholders, who also first convened in 2005.

The draft plan was posted on the FWC website for public comment in February and May 2007 and was presented for preliminary approval at the June Commission meeting. Over 2300 people provided input during the public comment periods. The gopher tortoise has been listed as a Species of Special Concern in Florida since 1979, but has been approved for reclassification to Threatened. This reclassification is tied to final approval of the species management plan. The gopher tortoise 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.

The management plan's overall conservation goal is to restore and maintain secure, viable populations of gopher tortoises throughout the species' current range in Florida. Specific objectives include increasing the amount of protected habitat; conducting appropriate vegetation management to maintain tortoise habitats (e.g., prescribed fire); restocking tortoises to protected, managed, suitable habitats where densities are low; and drastically decreasing tortoise mortality on lands proposed for development. Numerical targets for these objectives are given to help measure progress.

A suite of conservation actions are proposed for the plan's first five-year cycle: general categories include regulations, permitting, law enforcement, local government coordination, habitat preservation and management, population and disease management, landowner incentives, education and outreach, and monitoring and research. An adaptive management approach will be used to implement the many actions proposed in the plan, allowing easy adjustments to policies, guidelines, and techniques, based on observed conservation benefits/detriments and sound science.

In June 2007, FWC commissioners approved an interim incidental take policy that will greatly reduce tortoise entombment associated with urban development until the new permitting system outlined in the management plan can be implemented. Under this policy, all incidental take permits issued for applications received by the FWC after 30 July 2007 will include a provision requiring developers to relocate tortoises out of harm's way. Although this relocation requirement does not apply to existing incidental take permits, the FWC is contacting those developers holding current permits to determine the status of construction, and, if development has not yet occurred, FWC staff will encourage developers to relocate tortoises and will expedite the review process to facilitate such relocations.

For additional information regarding the status of the gopher tortoise management plan, please visit the FWC's website at http://myfwc.com/imperiledspecies/plans.htm.

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. Primary management emphasis at mitigations parks is gopher tortoise habitat enhancement and restoration.

As part of ongoing habitat enhancement activities at Perry Oldenburg Mitigation Park Wildlife Environmental Area (WEA), FWC applied mechanical mulching treatments to 125 ac (51 ha) of hardwood-dominated sandhills. These treatments create an open canopy habitat structure that promotes the recovery of desirable ground cover vegetation. Also, FWC staff provided logistic support to the University of Florida 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.

During this reporting period, 125 ac (51 ha) of scrubby flatwoods were roller chopped at Split Oak Forest Mitigation Park WEA to improve habitat structure and prescribed burning

conditions. In addition, a 53 ac (21 ha) gopher tortoise restocking enclosure was erected in preparation for planned population augmentation following a documented population decline.

At Hickey Creek Mitigation Park WEA, 45 ac (18 ha) of mesic and scrubby flatwoods received mechanical treatments with a hydro-ax mower and chainsaws to remove excessive understory and canopy hardwoods. Prescription burning of mowed areas will complete the project.

At Platt Branch Mitigation Park WEA, 125 ac (51 ha) of pasture, scrub, and mesic flatwoods were mowed and/or roller chopped to improve habitat conditions for gopher tortoises. Follow-up prescription burns will be conducted to complete the treatments.

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.

Gopher tortoise surveys at Chassahowitzka Wildlife Management Area (*Aaron Given*).--Since incidental take of gopher tortoises during development is no longer considered an acceptable mitigation option, wildlife management areas and wildlife environmental areas are being considered as potential restocking sites. Gopher tortoise surveys were conducted at Chassahowitzka Wildlife Management Area (WMA) and Chinsegut Wildlife Environmental Area (WEA) to determine and identify potential restocking sites. Initially, tortoises will only be released in areas identified to have high quality habitat, low gopher tortoise densities, and at least 50 ac (20 ha) of contiguous area. Once those areas have been sufficiently restocked, sites with medium quality habitat and low gopher tortoise densities may be considered.

Chassahowitzka WMA and Chinsegut WEA were identified as possible restocking sites. Using aerial photos and geographic information system, FWC identified 89 management units (GTID) at Chassahowitzka WMA and 31 GTID at Chinsegut WEA totaling 4674 and 438 ac (1892 and 177 ha), respectively, as having potential habitat for restocking gopher tortoises. After assessing the habitat on the ground using the criteria provided in the gopher tortoise surveying protocol, 33 blocks had a high quality habitat rating, 18 had medium quality, and 39 had low quality habitat. Of the 31 blocks at Chinsegut WEA, three had high quality habitat, 11 had medium quality, and 19 had a low rating.

Gopher tortoise surveys were conducted in units where habitat was assessed at medium or high quality thus reducing the potential gopher tortoise acreage to 3825 ac (1548 ha) at Chassahowitzka WMA and 213 ac (86 ha) at Chinsegut WEA. Mean gopher tortoise density at Chassahowitzka WMA was 1.2 gopher tortoises per acre for medium and high quality management units. Only 3 GTIDs at Chassahowitzka WMA met the initial criteria for restocking-high quality habitat and low gopher tortoise density. However, only one (126 ac) of these GTIDs were over 50 ac (20 ha) in size. Mean gopher tortoise density for Chinsegut WEA was 0.9 GT/ac (0.4 GT/ha). Only two GTIDs at Chinsegut WEA met the initial criteria for restocking having high quality habitat and low gopher tortoise density. However, both of these GTIDs were well under 50 ac (20 ha) in size.

Surveys and Monitoring of Gopher Tortoise Populations on Point Washington and Pine Log Wildlife Management Areas (*Fred Robinette*).--Annually, since the spring of 1993, local FWC staff has been surveying, monitoring, and assessing the status of the gopher tortoise, a state threatened species, on Point Washington WMA. Moreover, each spring since 2004, gopher

tortoise surveys have also been conducted on Pine Log WMA following the same monitoring and management protocol established at Point Washington.

Initially, aerial photographs were used to identify suitable gopher tortoise habitat. Identified sandhills were divided into clusters and systematically surveyed for the presence of gopher tortoise burrows. Presently, Point Washington WMA's sandhills are grouped into 33 clusters whereas sandhill habitat located within Pine Log WMA is grouped into14 clusters. Clusters were primarily delineated for devising management options. No attempt to group burrows using any behavioral, demographic or spatial criteria was made.

Both quantitative and qualitative data are collected at each burrow. Burrows are classified as active, possibly active, inactive, or abandoned. Using burrow widths, the burrows are further grouped into size class specifications. Burrow locations are recorded using GPS units, and the data points are downloaded into ArcGIS® 9.1. Data collected each year provides practical comparative information used to determine population trends and demography of the gopher tortoise populations within the WMAs. Staff recognizes the inherent biases of burrow counts when trying to correlate the data with robust gopher tortoise population density estimates. Nonetheless, as a tool for habitat monitoring strategies recommended and implemented on Point Washington and Pine Log WMAs, this survey methodology is practical and effective.

In addition to annual survey methods used in previous years, this year's FWC staff also conducted camera burrow surveys. The surveys were initially begun as an attempt to detect presence of Eastern indigo snakes, a state and federally threatened species. Camera work commenced in mid January, which could be considered a somewhat belated start date for locating indigos at burrows. Although Eastern indigo snakes were not located in this survey, the data was useful in determining gopher tortoise presence and aided in calibrating occupancy rates from those classified locally. As a result, a crude minimum number of tortoises was established for Pine Log and Point Washington WMAs. Subsequent camera investigations beginning earlier in the winter may provide better insight as to the presence or absence of Eastern Indigo snakes on these two WMAs.

Working in cooperation with the DOF, the lead management agency, habitat management recommendations for individual gopher tortoise clusters continued. 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. Sand pine removal is an additional high priority objective in restoring these areas for gopher tortoise repatriation. A most recent collaboration between FWC and DOF led to the rerouting of a new horse trail on Point Washington WMA. Initial plans positioned the horse trail within a densely populated gopher tortoise cluster.

Survey and Monitoring of Gopher Tortoise Population on Blackwater Wildlife Management Area (*Barbara Schmeling*).-- Local FWC staff continued conducting a multi-year comprehensive burrow survey of the gopher tortoise population, designed to evaluate the entire 198,000 acres of Blackwater WMA. The purpose of the survey was to provide DOF, the lead land manager on the area, with habitat improvement recommendations for gopher tortoises across the WMA. FWC staff surveyed the WMA using the DOF designated management units, which were further broken down into compartments and burn units. Burrow clusters were defined by DOF burn units, so that habitat improvement recommendations provided to DOF could be more easily translated into management actions.

Survey and Monitoring of Gopher Tortoise Population on the Carter Tract of Econfina Creek Wildlife Management Area (*Kelly Bunting*).--Gopher tortoise survey and monitoring began this year on the Carter Tract of Econfina Creek WMA. The 2100-acre tract contains about 1200 acres of sandhill uplands. This is the first comprehensive gopher tortoise burrow survey for the area. The data collected in this survey will serve as a baseline. The same monitoring and management protocol established for Point Washington WMA was followed on the Carter Tract. For logistical and accounting purposes, gopher tortoise burrows on the area are grouped into five clusters. Surveys in 2006 yielded 194 total burrows, with 65 being classified as active or possibly active. Of these, 47% were estimated to have carapace lengths corresponding to sexual maturity (greater than 23cm). Many habitat improvements on the area are currently underway to restore the sandhill ecosystem. Habitat improvements in 2006 and 2007 include prescribed burning, scrub oak reduction, removal of sand pine and slash pine plantations, and planting of longleaf pine and wiregrass. These improvements will allow for future expansion of gopher tortoise populations on the area. Surveys will be conducted annually on the area between May and October. Future work will provide comparative data on tortoise population trends within the Carter Tract following land management and mitigation strategies.

Gopher Tortoise Burrow Survey, Tide Swamp Unit of the Big Bend Wildlife Management Area (*Dan McDonald*).--A gopher tortoise burrow survey (line transect) was conducted at the Tide Swamp Unit within two sandhill communities on 11 May 2007. The objective was to identify areas as potential recipient sites for gopher tortoises from sites undergoing development. The purpose of the survey was to assign a density category (low, medium, or high) to each area surveyed and to identify areas with absent or low tortoise densities in apparent good habitat. Twenty-six gopher tortoise burrows were observed (seven active, seven inactive, 12 abandoned) on both sites combined. Burrow density calculations indicated that there were a total of 4.25 burrows per acre on site one and 1.0 burrows per acre on site two. The estimated gopher tortoise population on site one and site two is 2.125 / acre and 0.5 / acre, respectively (Calculations were based on procedures outlined by Ashton and Ashton in "Monitoring Tortoise Populations and Forage").

Gopher Tortoise Technical Assistance, Camp Blanding Wildlife Management Area (*Jim Garrison*).--Technical assistance was provided by FWC staff to Camp Blanding Joint Training Center personnel regarding a population survey of gopher tortoises. This consisted of line transect sampling and burrow survey techniques training.

Upper Respiratory Tract Disease (URTD) Research funded by the National Sciences Foundation at Branan Field Mitigation Park (*Christopher Tucker*).--Research projects on upper respiratory tract disease (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 2008. Dr. Mary Brown, of the University of Florida is the principal investigator.

Candidate Conservation Agreement for the Gopher Tortoise (*Thomas Ostertag*).-- FWC is currently partnering with the USFWS, Alabama, Georgia, South Carolina, several NGOs and federal agencies to develop a Candidate Conservation Agreement (CCA) for the Gopher tortoise. The Agreement will outline voluntary management recommendations for the partners to implement. These actions will benefit the species and may help to preclude federal listing within the eastern portion of the range.

With this Agreement, the Parties hope to organize a cooperative, range-wide approach to gopher tortoise management and conservation. This Agreement will allow the Parties to leverage knowledge and funding within a common conservation approach and framework. The Agreement is voluntary and flexible in nature, and has been developed so different conservation and management actions can be agreed to and implemented at different levels.

The Agreement benefited greatly from the FWC Gopher Tortoise Management Plan which served as a general guide for development of the CCA. FWC staff attended all of the CCA workshops over the course of the development process and wrote the habitat management sections of the document.

Marine Turtles

Marine Turtle Management Activities (*Robbin Trindell*).--The Marine Turtle Subsection works 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 2006-2007, 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 provided expertise for requests to conduct human activities that could impact marine turtles and their nesting and foraging habitats. FWC's Marine Turtle Management Subsection is fully supported by proceeds from the sale of the marine turtle license plate and voluntary donations.

Marine Turtle Permit Rule - Marine Turtle Subsection staff amended Florida Administrative Code Rule 68E-1, Marine Turtle Permits. The FWC approved rule making during their December 2006 meeting. Public meetings and workshops were conducted through out the state. Following approval of the final rule at the April 2007 Commission meeting, the rule was amended to respond to comments from the Joint Administrative Procedures Committee as well as a rule challenge filed by Palm Beach County. Subsequent to resolution of issues raised by both entities, the Commission is expected to approve a rule amendment at the September 2007 meeting.

Environmental Commenting - During 2006-2007, Marine Turtle Subsection staff provided approximately 500 responses to requests for comments from the DEP District Offices, DEP's Bureau of Beaches and Coastal Systems, the USFWS, the Army Corps of Engineers and the State Clearing House. Projects reviewed included Coastal Construction Control Line applications, Environmental Resource Permit applications, and Joint Coastal Permit applications. Staff participated in several meetings and conference calls with Tallahassee DEP staff each week

on general project impacts. Staff traveled to meetings and site inspections around the state to discuss regulatory projects as part of our environmental commenting responsibilities.

Marine Turtle Permit Program - Staff reviewed and approved approximately 186 applications for conservation activities with marine turtles, including nesting beach surveys, stranding and salvage work, research, public turtle walks, rehabilitation at captive facilities and educational display.

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 facility inspections.

Outreach and Education – FWC staff hosted the 2007 Marine Turtle Permit Holder Workshop at Harbor Branch Research Facility in St. Lucie County for approximately 300 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 Lauderdale-by-the-Sea, St. George Island, Fort Walton Beach, Cocoa Beach and Bradenton Beach, as well as staff from the DEP.

Staff participated in the 2007 International Sea Turtle Symposium in Myrtle Beach, South Carolina, presenting papers on lighting and management techniques for the protection of marine turtles.

Interagency Coordination – FWC staff were invited to participate as an expert for the USFWS 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 Shorebird, Coastal Wildlife, and Permit Teams, the Marine Turtle Grants Committee, Department of Transportation's Coastal Roadway Lighting Team. Staff coordinated with local officials on lighting inspections in numerous coastal communities.

Grants - FWC staff are responsible for administering the USFWS Section 10 Habitat Conservation Planning Grant for Walton County, and serve on the Steering Committee for this project. Program staff were also awarded a Sea Turtle License Plate grant to conduct additional lighting workshops around the state.

For more information on the FWC's Marine Turtle Protection Program, visit the following web site at http://www.myfwc.com/seaturtle.

Marine Turtle Research (*Anne Meylan*).—During 2006-2007, marine turtle research included the following activities:

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 1,684 dead or debilitated sea turtles were documented in Florida from 1 July 2006 - 30 June 2007. By species, there were 1120 loggerhead sea turtles, 368 green sea turtles, 102 Kemp's ridley sea turtles, 31 hawksbill sea

turtles, 23 leatherback sea turtles, and an additional 40 sea turtles not identified to species. Staff reviewed, edited, and entered all submitted STSSN reporting forms, responded to or coordinated the response to approximately 1,200 reports of dead or debilitated sea turtles, directly responded to 45 reports of dead sea turtles, responded to 113 reports of sick or injured sea turtles and transported the turtles to rehabilitation facilities, and conducted gross necropsies on approximately 70 carcasses. Staff conducted seven workshops in seven counties 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.

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 2006, 194 survey areas were monitored, comprising 823 miles (1,324 km) of beaches. Statewide, the program documented 49,786 loggerhead nests, 4,970 green turtle nests, 540 leatherback nests, five hawksbill nests and five 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 19 years at 478 index beach zones surveyed daily during each 109-day season, an effort that currently provides more than 5 million records in the Index Nesting Beach Database. Annual surveyor training, on-site verification, and consistency of the methods used during the 19 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.

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, 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 2007, 109 loggerheads were captured during an eight-day sampling session in Florida Bay. All animals were measured and tagged. Twenty-nine of the turtles had been previously marked, providing data on growth and residency in Florida Bay. This project has been conducted continuously since 1990. Some individual turtles have now been captured numerous times over periods as long as ten years.

FWC staff studies 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. Five sampling trips were conducted between July and September of 2006. This effort completes a study in which 239 miles (384 km) of search transects were conducted between 2004 and 2006. On these search transects, a total of 352 turtles were observed. Of these, 302 were loggerheads, 28 were green turtles, 14 were Kemp's ridleys, and four were hawksbills. Survey locations included Gulf of Mexico waters offshore from Apalachicola and Sarasota, and Atlantic waters offshore from Sebastian Inlet. 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. In related research, dead neonate sea turtles were recovered following storm events on Atlantic beaches. These turtles were necropsied and examined for their gut contents. A high proportion of dead stranded loggerhead (72%, n=124) and green turtle (76%, n=25) neonates had ingested plastics or tar.

As part of a cooperative research project with the government of Bermuda, 176 green turtles were captured in nets, tagged and released during 2006. 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 two-week course on the Biology and Conservation of Sea Turtles for nine resource managers and students drawn from Aruba, Bermuda, Colombia, Jamaica, Trinidad and Tobago, the United Kingdom and the United States.

Data on gender, size, maturity, and genetic identity were collected from 20 green turtles, nine 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. One hundred seventy-two hawksbill nests were documented by beach surveys; productivity assessments on 141 nests showed that over 13,000 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, the Smithsonian Tropical Research Institute, the National Environmental Authority of Panama, and the indigenous authorities of the Ngöbe-Buglé Comarca. Two adult female hawksbills were satellite-tracked. 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 (523 attendees) around the state for permit holders who conduct surveys of turtle nesting beaches, and seven workshops (148 attendees) for volunteers assisting with sea turtle stranding and salvage activities. FWC staff served on several scientific advisory committees and governing boards: the Loggerhead Recovery Team, the Loggerhead Expert Working Group, the 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 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 permitholders at the 10th Annual Permit Holders Workshop, the Scripps Howard Institute on the Environment, Florida Institute of Technology (InSTEP Lecture Series), the Environmental Studies Center (Mars Lecture Series), the Bermuda Aquarium, a Brevard County Code Enforcement training session, and the Gumbo Limbo Nature Center. Staff presented one paper and nine posters at the 27th 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.

Smalltooth Sawfish

Smalltooth Sawfish Research (*Ed Matheson/Gregg Poulakis*).--Smalltooth sawfish 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 lack 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 that provide high quality fisheries data. Some of these data 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 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 2006 and June 2007, two complimentary sampling methods were used to collect smalltooth sawfish in the Charlotte Harbor estuarine system, which is located on the southwest Gulf coast of Florida. Monthly, randomized sampling was conducted using a large (600 ft; 183 m) seine in the Caloosahatchee River, which 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 (PIT) 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 PIT tags are about the size of a grain of rice and contain a uniquely numbered microchip that can be detected by an electronic reader. These tags remain with the sawfish for life, and the reader can be carried into the field by researchers in order to detect recaptures. The acoustic tags are used by researchers to track sawfish movements with manual and automated hydrophones. Manual hydrophones are used for determining short-term, fine-scale movements and the automated hydrophones listen for acoustic tags at moored stations 24 hours a day.

During this 12 month period, 27 smalltooth sawfish were collected (two during randomized sampling and 25 from directed sampling), including eight recaptures. Three additional sawfish were recaptured by anglers. 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 3.3 to 6.6 feet (996–1931 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 are using acoustic technology to determine the movements of individual sawfish. Between July 2006 and June 2007, 23 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 member is part of the Smalltooth Sawfish Recovery Team and will become a member of the Smalltooth Sawfish Recovery Implementation Team when the Recovery Plan document is published. This group includes members with federal, state, academic, and non-profit affiliations and was assembled by

the National Marine Fisheries Service to draft (and implement) a recovery plan for this species. Data from the FWC's sampling are provided to the teams as needed.

Information on the FWC's smalltooth sawfish research and the status of the species was presented at a variety of venues, including scientific presentations at the Charlotte County Coastal Seminar series in July, the Southeastern Estuarine Research Society meeting in October, and the Florida Chapter of the American Fisheries Society meeting in February, as well as general presentations for fishing groups (16 presentations throughout Southwest Florida) and local school classes. Thirty-two permanent sawfish informational signs were posted at popular boat ramps and fishing piers in 12 counties statewide. In addition, laminated 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 take 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 FWRI web site (http://research.myfwc.com/features/category_sub.asp?id=6610)

Gulf Sturgeon

Gulf Sturgeon Coordination and Technical Assistance by the Species Conservation Planning Section (*Jeff Wilcox*).--Several Gulf sturgeon management and research coordination efforts were performed by the Fish Taxa Coordinator in the Species Conservation Planning Section. These included: attendance at the 8th Gulf sturgeon conference at White Springs, training of terrestrial regional biologists in nongame fish/sturgeon biology and impacts of upland management activities on these fish (education/outreach), proposal submission to the Aquatic Habitat Restoration and Enhancement Section (AHRES) for a sturgeon fish ladder prototype development for the Ochlocknee River, field testing of the Didson acoustic camera on the Suwannee River, participation in the human protection protocol meetings regarding leaping sturgeon in the Suwannee River, review of numerous permit applications that might impact Gulf sturgeon, and observation of sturgeon for the FWC team during the blasting of the main piers of the I-10 Escambia Bay span damaged by Hurricane Ivan.

Collection of juvenile Gulf sturgeon in the Santa Fe River (*H. Jared Flowers and William E. Pine III*).--On December 6, 2006 a Gulf Sturgeon was collected from the Santa Fe River approximately 32-km upstream of the Suwannee River confluence and 2-km upstream of Rum Island Park, Columbia County, Florida, at a depth of 1-m. The Suwannee River is believed to contain the largest existing population of Gulf sturgeon, however this specimen is only the third recorded Gulf sturgeon collected from the Santa Fe River. Based on these observations, it could be inferred that the Santa Fe should be studied further to determine its importance as Gulf sturgeon habitat, especially in the face of future management plans that may alter the hydrology of the system. This individual was collected during a routine quarterly assessment of the fish community in the Santa Fe River being performed by a joint group from the FWC and the University of Florida. The specimen was a juvenile, approximately 8-9 months old, 372-mm FL, 426-mm TL. The specimen was photographed, tagged with a T-bar tag in each pectoral fin (#'s 1245 and 1246), then released and observed to swim away. This Gulf sturgeon was captured on the last day of a three day sampling event and sampling had occurred along the same 1-km stretch of river each day.

Ongoing evaluation of hatchery reared Gulf sturgeon releases in the Hillsborough River (*Daniel Roberts*).--In 2000, hatchery-reared sub-adult Gulf sturgeon were released in the Hillsborough River, Tampa Bay, Florida. Fish were released into sites representing six separate habitats, three located in the lower estuarine reach and three in the upper freshwater reach of the river. Release sites in the upper river included: Hillsborough River Reservoir (Temple Terrace), adjacent to the north side of the dam, Dead River County Park, and Hillsborough River State Park. Release sites in the lower river included: River Crest, between Hillsborough Avenue and Columbus Drive, Lowry Park, and Sulfur Springs, adjacent to the dam. These fish were tracked using acoustic telemetry for a period of almost two years. Data analysis of this study was hampered due to conflicting location data. Data analysis of this study continued in 2007 after satellite location data was corrected by ground truthing. GPS locations were refined in areas of the upper river where satellite signal fidelity was obscured by dense river canopy. Movement and habitat associations of these fish are currently being characterized using spatial analysis and GIS thematic mapping. Classification based and distance based methods for quantifying sturgeon habitat use in this highly modified river system are being evaluated.

Gulf Sturgeon strike hazard outreach (*Maj. Lee Beach*).--Gulf sturgeon, a federally and state listed fish, have been a contributing factor in 18 boating-related injuries during the two-year period 2006-2007. These fish are found in the Suwannee River from early spring to early fall where they migrate from the Gulf to spawn each year. Periodically, and frequently at times, the sturgeon, which grow to 6+ ft. and weigh up to 200 lbs., jump several feet in the air which can pose a navigational hazard to vessels.

Commission personnel from five divisions and two offices have been involved in an extensive outreach effort to inform boaters of this hazard. Signs were posted at most boat ramps on the Suwannee River and decals were handed out to remind boaters to go slow. FWC coordinated with officials from the five counties in north Florida affected by this issue. In addition, staff took advantage of the "unusualness" of this issue and engaged media locally, statewide, nationally and even worldwide. Articles and video appeared in numerous media outlets including the New York Times (front page), Nightline, ABC World News, CNN and Fox News.

Additionally, new signs warning of the dangers of jumping sturgeon are now in the process of designed. These signs will be posted on docks, bridges and at key locations along the river before the fish begin their annual migration next spring from the Gulf back into the Suwannee. These signs will be visible to boaters while they are recreating and will be additional reminders to go slow. Also, FWC is working to develop a tri-fold brochure on the Gulf sturgeon for next year's migration. These brochures will be distributed to local marine vendors, bait and tackle shops, and issued during law enforcement boating safety inspections serve to educate the public about this unique and listed fish while also being an added reminder to the danger it can pose.

Nongame Wildlife Grant- Historical Population Trends of Gulf Sturgeon in Florida Waters (*Stuart Cumberbatch*).--Dr. William Pine, University of Florida, initiated a study that will use 20 years of sampling data along with historical landings from the late 19th and early 20th century to reconstruct the historical population size of Gulf Sturgeon in Florida. Using retrospective population modeling the researchers will attempt to address whether declines were

caused by impacts to recruitment due to alteration of essential habitat or intensive harvesting. Since initiation of the study the researchers have focused on the development of the database that will be used to manage all the current and historical information collected, and have begun refining the analysis techniques that will be used in the modeling.

Other Imperiled Fish

Gulf Coastal Plain Stream Monitoring Program (*John R. Knight and Costas Katecho*).--The FWC's Gulf Stream Monitoring Program recently completed the second year of a three year State Wildlife Grant funded research project. The goal is to provide a long-term strategy to monitor freshwater fish communities from the Gulf Coastal Plain ecosystem. While imperiled fish taxa were not specifically targeted, several collections/observations were made during this reporting period. Data collected are essential to properly fill in the gaps of knowledge pertaining to population trends, status, and distribution of these species. All information gathered is critical for developing proper conservation/management strategies to protect Florida's imperiled freshwater fish species.

Blackmouth shiner--Blackmouth shiners are listed as Endangered in Florida. No blackmouth shiners were encountered during this reporting period. Numerous fish community samples were collected within the known range of the species (Blackwater and Yellow Systems), but specific habitats where this species is most likely occurs were not targeted. AS noted in previous work, this species is likely difficult to monitor quantitatively, warranting an alternative monitoring strategy to properly assess the status of the species. Known locations of blackmouth shiners have not been recently sampled and no new populations of blackmouth shiner have been discovered in the past two years.

Bluenose shiner --Bluenose shiners are listed as a Species of Concern in Florida. This species was collected at one location during the past year. Fish community samples taken from Natural Bridge Creek, a tributary to the Choctawhatchee River, encountered bluenose shiners. This collection represents a range extension in Florida and the second new collection record discovered from a small section of northwest Florida that drains north to the Pea River (a major tributary to the Choctawhatchee River in Alabama). Again, habitats where bluenose shiner were most likely to occur, were not targeted. As with the blackmouth shiner, this species appears difficult to quantitatively monitor. While these two collections do represent a range expansion for the species in Florida, a population expansion cannot be inferred due to the scarcity of fish community data collected from this region of Northwest Florida.

Saltmarsh topminnow--Saltmarsh topminnow are listed as a Species of Concern in Florida. Habitats where salmarsh topminnows typically occur were not sampled by FWC during this previous year. Therefore no new records were discovered and existing collection records were not re-visited. Euryhaline species such as saltmarsh topminnows are rarely encountered in freshwater lotic habitats and have yet to be collected by the Gulf Stream Monitoring Program. Additional research is needed to properly assess the status of the species in Florida.

Shoal bass--Shoal bass are listed as a Species of Concern in Florida. Populations of shoal bass from the Chipola watershed appear locally abundant and secure, although fragmented from

it source population (in Georgia and Alabama) due to Woodruff Dam. This structure represents a barrier to gene flow from this source population located north of the dam and populations residing in Florida. This fragmentation makes the species highly susceptible to catastrophic events, since no significant population exists capable of recolonizing the Chipola watershed.

In spring of 2007, FWC's Gulf Stream Monitoring Program discovered the first evidence of range overlap for two black bass species, spotted bass and shoal bass from the Chipola River (a large tributary to the Apalachicola River), located approximately 5.75 miles northeast of Clarksville Florida. This record represents a northward range expansion for spotted bass and a southward range expansion of shoal bass from the Chipola River.

The Chipola River population of shoal bass represents the only significant extant population of the species in Florida. Previous evidence suggested that the Dead Lakes area of the Chipola River likely acted as a physical boundary for the two species. Due to the species' restricted range and affinity to limestone habitats (primarily limited to the Chipola River, north of the Dead Lakes Region), the FWC is concerned about genetic introgression between the two species. This potential introgression could represent a loss of genetic fitness (through outbreeding depression) and a decline of native stocks of shoal bass in Florida. Evidence from other research suggests that the spotted bass will hybridize with several black bass species. Research in currently ongoing by FWRI biologists to determine population size, genetic structure, and the extent of this range overlap between spotted bass and shoal bass populations in Florida. The long-term goal of this research is to develop management strategies to conserve and protect the genetic diversity of shoal bass in Florida. Additional research is also still needed to determine the effects of angler harvest on populations.

Crystal darter--Crystal darters are listed as Threatened in Florida. This species is only known to occur in the Escambia River system. Numerous fish community samples collected from the Perdido River and Escambia watersheds did not encounter any crystal darters. While the only recent historical record was not targeted, inspection of this location during the previous year indicated drought conditions caused a complete desiccation of the only previously known location. Concurring with previous research, the species' classification may need to be re-evaluated.

Harlequin darter--Harlequin darters are listed as a Species of Concern in Florida. It is also only known to occur in the Escambia River system, in Florida. The species was collected from the Escambia River (north of SR 4) during the previous year. While restricted in range, the species is regularly collected from both tributaries and mainstem Escambia River, when suitable habitats were present. The USFWS and FWC continue to monitor stream fish communities from Big Escambia Creek, following a stream restoration project on this system. This year's monitoring from this system indicated an initial population size of harlequin darters. Samples collected from Big Escambia Creek during the previous year indicate the population is likely stabilizing. Additional long-term monitoring from this system is still needed to confirm this trend.

Miami Blue Butterfly

Miami Blue Butterfly Management *(Ricardo Zambrano)*.--The Miami blue butterfly received emergency listing as an endangered species in Florida on December 10, 2002 by the

Executive Director of the 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. From 2002-2006 the butterfly was found at only one location – Bahia Honda State Park in the Florida Keys. The wild population in the park ranges from 50-100 individuals.

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

FWC has coordinated closely with the University of Florida, the National Park Service (NPS), and the Florida Park Service (FPS) for ongoing captive propagation and reintroduction efforts on the Miami blue. In April 2005, the captive colony was restarted after 30 generations. 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. During 2006-2007, FWC staff assisted with the release of larvae at reintroduction sites and has helped monitor these sites after reintroduction. Unfortunately, monitoring by FWC staff and UF staff at these release sites has not found butterflies to be flourishing on their own.

In 2006, staff from the USFWS discovered Miami blue butterflies on eight islands within the Key West National Wildlife Refuge. These are the first populations to be found outside of Bahia Honda State Park in Marathon. Biologists from FWC and UF have conducted additional surveys on some of these islands to better estimate the population.

FWC has a representative on the Florida Coordinating Council on Mosquito Control and on the Council's Imperiled Species Subcommittee. The purpose of the Subcommittee is to resolve the issues and concerns between South Florida Mosquito Control districts and the FWC's efforts to recover the Miami blue butterfly. Several agreements have been reached which allow FWC to proceed with reintroduction efforts but do not prevent mosquito control districts from performing their duties.

FWC is providing funding to UF to determine the effects of mosquito control insecticides on Miami blue butterfly larvae. This research will also examine the effects of insecticide drift on larvae. Recommendations on buffer zone distances around Miami blue colonies may result from this study. In addition, FWC has permitted a study being conducted by Florida A&M University to determine the effect of current Florida Keys Mosquito Control District insecticide spraying on Miami blue butterfly larvae. FWC staff have assisted with research trials during 2006-2007 and plan to stay involved with the study during the next fiscal year.

FWC is also funding UF to conduct research on the molecular diversity of the Miami blue butterfly. To date, researchers from UF have successfully extracted DNA from butterfly wing fragments taken from the wild population at Bahia Honda State Park and have identified two microsatellites (genetic markers that can indicate the amount of genetic diversity in a population). A partial genomic library has also been developed for this species, which will assist in determining the molecular diversity at the population level. Researchers are also using older, museum specimens to obtain DNA samples with the goal of comparing historical levels of genetic diversity with current levels in the Miami blue population. Results of this study should allow UF to develop a long-term strategy for reintroduction efforts and for the genetic conservation and management of the existing wild colonies and captive colony.

FWC has recently expanded the Miami Blue Butterfly Workgroup, which was composed of several governmental agencies, organizations, and mosquito control districts into the

Imperiled Butterflies of South Florida Work Group. This new work group will take a more proactive approach to butterfly conservation in south Florida. Several imperiled butterfly species, including the Miami blue butterfly, will be addressed by this new Work Group.

Nongame Wildlife Grant- Miami Blue Butterfly Molecular Diversity (*Stuart Cumberbatch*).--Dr. Thomas Emmel, University of Florida, completed the second year of molecular diversity examinations of the Miami blue butterfly populations at Bahia Honda State Park and of a captive colony. Work during the past year has yielded a partial genomic library that will be used as the foundation for all other subsequent genetic work for this species including work on inbreeding and gene flow determinations. This information is vital to the implementation of the conservation strategies outlined in the Miami Blue Butterfly Management Plan. During the upcoming year the researchers will continue to work on completing the genomic library and will expand their focus to include genetic material collected from museum specimens. The museum samples should yield sufficient historical genetic information about the species to be compared with the genetic profiles of the current populations.

Panama City Crayfish

Listing Evaluation (*Brad Gruver*).--In accordance with the listing process (68A-27.0012 F.A.C.), a draft management plan for the Panama City crayfish (PCC) was submitted to the Commission for consideration at its June 2007 meeting in Melbourne. This draft, dated May 7, 2007, is available on the FWC website at http://myfwc.com/imperiledspecies/plans/Revised-Draft-PCC-Plan.pdf. The Commission directed staff to proceed with finalization of the draft PCC management plan, which is expected to be submitted for approval in 2008. When the plan and its rules are approved, the listing status of the PCC will be reclassified from a species of special concern to threatened.

Management and Conservation (*David Cook*).--Following Commission approval of the 2006 Biological Status Report on the PCC (http://myfwc.com/imperiledspecies/reports/PCC-BSR.pdf), a PCC management plan team was formed to prepare a new management plan for the species. The PCC management plan team includes five members representing the Division of Habitat Species and Conservation, the FWRI, the Senior Leadership Team, and Law Enforcement. In addition to team meetings (the first held in August 2006, at least 20 since) to direct plan development and discuss plan issues, the group contacted potential PCC stakeholders and hosted seven stakeholder advisory group meetings and two public meetings between September 2006 and May 2007. Most of these meetings included at least 15 stakeholders or other members of the public, who assisted staff in drafting parts of the plan.

Highlights of the draft management plan include: (1) conservation objectives and strategies that, if achieved, will cause the PCC to no longer meet the criteria for listing; (2) the inclusion of Best Management Practices (BMPs), developed through considerable stakeholder input, that enable road maintenance, development, silviculture, and other activities to proceed without the need for an incidental take permit if BMPs are followed; (3) a rule establishing a no-cost permit for crayfish recreational harvest that will enable staff to collect information on the possible impact of this activity on the species; and (4) an implementation strategy and schedule that include the hiring of an OPS position dedicated to PCC conservation issues.

The finalization of a Candidate Conservation Agreement with Assurances is proceeding between the FWC, USFWS, and the St. Joe Company. This agreement will establish a Panama City crayfish conservation area in the core of the species' distribution in the eastern part of the range and guide habitat restoration and management activities to ensure the species' long-term conservation.

Habitat Modeling

Listed Species GIS Based Habitat Modeling (*Mark Endries*).--The FWC completed the analysis for and a final draft report entitled "Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas". The report is the result of a 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 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.

The Integrated Wildlife Habitat Ranking System (IWHRS) is a GIS assessment tool that ranks the Florida landscape based upon the habitat needs of listed and rare wildlife species as a way to identify ecologically significant lands in the state, and to assess the potential impacts of land development projects. The IWHRS incorporates a wide variety of land cover and wildlife species data and presents it in an easy to understand classification schema. The IWHRS is provided as part of the FWC's continuing technical assistance to various local, regional, state, and federal agencies, and entities interested in wildlife needs and conservation in order to: (1) determine ways to avoid or minimize project impacts by evaluating alternative placements, alignments, and transportation corridors during early planning stages, (2) assess direct, secondary, and cumulative impacts to habitat and wildlife resources, and (3) identify appropriate parcels for public land acquisition for wetland and upland habitat mitigation purposes. The IWHRS was originally developed in 2001 and was revised in 2007 using updated datasets.

Table 5. Florida listed species for which potential habitat models have been created within the habitat modeling update project. Federal and state listing status provided (E: Endangered, T: Threatened, SSC: Species of Special Concern, N: Not currently listed). Strategic Habitat Conservation Areas were developed for the species in bold.

Species Common Name	Species Scientific Name	Federal Status	State Status
Amphibian and Reptiles			
American crocodile	**Crocodylus acutus**	**E**	**E**
Bog frog	Rana okaloosae	N	SSC
Flatwoods salamander	Ambystoma cingulatum	T	SSC
Florida Keys mole skink	Eumeces egregius egregius	N	SSC
Gopher tortoise	Gopherus polyphemus	N	SSC
Pine barrens tree frog	**Hyla andersonii**	**N**	**SSC**
Rim rock crowned snake	Tantilla oolitica	N	T
Atlantic salt marsh snake	**Nerodia clarkii taeniata**	**T**	**T**
Sand skink	**Neoseps reynoldsi**	**T**	**T**
Striped mud turtle*	Kinosternon baurii	N	E
Mammals			
Gray bat	**Myotis grisescens**	**E**	**E**
Beach Mice			
Anastasia Island beach mouse	**Peromyscus polionotus phasma**	**E**	**E**
Choctawhatchee beach mouse	**Peromyscus polionotus allophrys**	**E**	**E**
Southeastern beach mouse	**Peromyscus polionotus niveiventris**	**T**	**T**
St. Andrews beach mouse	**Peromyscus polionotus peninsularis**	**E**	**E**
Florida black bear	Ursus americanus floridanus	N	T+
Florida Key deer	**Odocoileus virginianus clavium**	**E**	**E**
Florida mouse	**Podomys floridanus**	**N**	**SSC**
Florida panther	**Puma concolor coryi**	**E**	**E**
Florida salt marsh vole	Microtus pennsylvanicus dukecampbelli	E	E
Fox squirrels			
Big Cypress fox squirrel	**Sciurus niger avicennia**	**N**	**T**
Sherman's fox squirrel	Sciurus niger shermani	N	SSC
Lower Keys marsh rabbit	**Sylvilagus palustris hefneri**	**E**	**E**
Sanibel Island rice rat	**Oryzomys palustris sanibeli**	**N**	**SSC**
Silver rice rat	**Oryzomys palustris natator**	**E**	**E**
Birds			
Audubon's crested caracara	Caracara cheriway	T	T
Black skimmer	Rynchops niger	N	SSC
Cuban snowy plover	**Charadrius alexandrinus**	**N**	**T**
Florida burrowing owl	**Athene cunicularia floridana**	**N**	**SSC**
Florida grasshopper sparrow	**Ammodramus savannarum floridanus**	**E**	**E**
Florida sandhill crane	Grus canadensis pratensis	N	T
Florida scrub- jay	**Aphelocoma coerulescens**	**T**	**T**
Florida snail kite	**Rostrhamus sociabilis plumbeus**	**E**	**E**
Limpkin	Aramus guarauna	N	SSC
Red-cockaded woodpecker	Picoides borealis	E	SSC
Scott's (Wakulla) seaside sparrow	**Ammodramus maritimus peninsulae**	**N**	**SSC**
Southeastern American kestrel	Falco sparverius paulus	N	T
Southern bald eagle	Haliaeetus leucocepahlus	T	T

Wading birds			
Reddish egret	Egretta rufescens	N	SSC
Snowy egret	Egretta thula	N	SSC
Little blue heron	Egretta caerulea	N	SSC
Tricolored heron	Egretta tricolor	N	SSC
White ibis	Eudocimus albus	N	SSC
Roseate spoonbill	Platalea ajaja	N	SSC
Wood stork	Mycteria Americana	E	E
White crowned pigeon	**Patagioenas leucocephala**	**N**	**T**

+Other than those found in Baker and Columbia counties or in Apalachicola National Forest
*****Lower Keys population

COORDINATION AND TECHNICAL ASSISTANCE

Species Conservation Planning Section (*Brad Gruver*).--Listed species are those that are listed as endangered, threatened, or as a species of special concern. Listed species coordination involved overseeing, monitoring, facilitating and otherwise organizing listed 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 listed 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 listed species issues, processing numerous requests for listed species information and representation of the FWC at various meetings and conferences. All listed species activities funded from federal sources were monitored and overseen, and annual reports were prepared to document their progress. Technical assistance in listed species matters was provided to state and federal agencies, consulting firms, private individuals and local regulatory authorities. Numerous telephone calls, e-mails, and formal letters provided 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 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 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 Federal listings and reclassifications.

During 2006-2007, 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 Policies Pertaining to Listed Species" section of this report.

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

Fish and Wildlife Research Institute (*Richard Kiltie, Paul Kubilis, Kristin Rogers*).--Staff from the FWRI Center for Biostatistics and Modeling (CBM) provided biostatistics, quantitative modeling, and data management support for multiple projects focused on threatened and endangered species. Activities performed by CBM staff focused on: temporal changes in the spatial distribution, detection probability, and population abundance of five geographically distinct populations of Florida grasshopper sparrows; the influence of environmental factors and organochlorine compounds on American alligator egg viability; environmental contaminants in Florida panthers; environmental influences on reproductive success in whooping cranes and red-cockaded woodpeckers; and population trends of American alligators, bald eagles, Florida black bear, Florida scrub-jays, gopher tortoise, green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, loggerhead sea turtle, and Gulf sturgeon.

Habitat Conservation Scientific Services Section (*Terry Gilbert*).--The Habitat Conservation Scientific Services Section of the FWC performed a total of 83 reviews of highway projects in support of the Florida Department of Transportation's (FDOT) Efficient Transportation Decision Making (ETDM) Process from July 1, 2006 to June 30, 2007. Each review included a biological assessment of the direct and indirect impacts of the transportation project on bird, mammal, amphibian, and reptile species which are listed by our agency as endangered, threatened, or species of special concern, and on the wetland, upland, and aquatic habitat resources which support these species. Recommendations were provided to the FDOT's seven Districts and the Turnpike Enterprise on methods to avoid, minimize, or mitigate these effects on listed species.

Also during this period, Habitat Conservation Scientific Services Section staff provided technical assistance during more than 300 phone calls and 25 inter-agency coordination meetings statewide with state and federal agency representatives of the Florida Department of Environmental Protection (DEP), Division of Forestry, USFWS, National Marine Fisheries Service, U. S. Army Corps of Engineers, the Water Management Districts, and FDOT to provide technical assistance tailored to reduce the effects of specific highway projects on listed fish and wildlife species. This technical assistance specifically related to road design issues, location and design of Florida black bear and Florida panther wildlife underpasses, wildlife species occurrence information and field survey methodologies, wetland and upland habitat restoration strategies and techniques, and suitability evaluations of a moderate number of land parcels for mitigation through public land acquisition.

Division of Habitat and Species Conservation (*Joseph Walsh*).--During 2006-2007, the Division of Habitat and Species Conservation provided technical assistance to public and private land use planning activities that had the potential to impact on imperiled wildlife species and their habitats. Technical assistance was provided both formally and informally through numerous letters, emails, and meetings. The content of consultations were based on established best management practices, species management guidelines and geographic information systems analyses. Division staff assisted the DEP with Environmental Resource Permits and coordinated all reviews for FWC-issued imperiled wildlife permits. In addition to these, the Division received 515 requests for technical assistance from other various regulatory permitting programs through the FWC's Office of Policy and Stakeholder Coordination. Of that number, staff responded to 56 with formal consultation letters and 12 with informal consultations. Another 206 requests were reviewed but were deemed to have addressed wildlife issues appropriately and received no formal comments from our division.

CRITICAL WILDLIFE AREAS

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 coordinate responsibilities for evaluating needs for potential CWAs, developing or revising establishment orders, managing the posting of appropriate signage, and the monitoring of those areas each year. During 2006-2007, 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 governments, 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, was no longer available as a result of impacts from hurricanes.

Table 6. Critical wildlife areas in Florida in 2007.

Region CWA Name	County	Closure period	Primary taxa	Status[a]	Managed area
Southwest					
Alafia Banks	Hillsborough	1 Dec. to 1 Sept.	Herons, 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.	Herons, 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	100 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	>500, ~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, 5 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	Herons, 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	Herons, egrets, pelicans	103 nests	5 acres
Bill Sadowski	Dade	Year-round	Shorebirds, herons, egrets (foraging only)	1,000 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, southeastern beach mice	terns inactive; plovers active	13.7 acres

[a]Estimated peak numbers of individuals and/or successful nests at each site during the closed period in 2006-2007.
[b]Inactive means the site was not used during 2006-2007.

FLORIDA'S INCENTIVE-BASED CONSERVATION PROGRAMS

Landowner Assistance Program Summary (*Chris C. Wynn*).--In cooperation with the USFWS, the FWC has been working to implement the Landowner Assistance Program (LAP) since October 2003. Florida's LAP 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 LAP 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 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 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. Properties within predetermined priority habitat focus areas receive the highest value. Once ranked, FWC biologists recommend beneficial and cost-effective practices based on the GIS analysis, site visit, and the targeted listed species.

During 2006-2007, FWC biologists visited 57 private landowners and obligated $444,354 at a 50% cost-share rate to conduct practices across 99,164 acres (40,130 ha) to directly benefit listed species. Some of the management practices that have been funded include: prescribed fire [$243,582 being obligated and $12,633 being spent across 14,407 acres (5,830 ha)]; longleaf pine and natural groundcover restoration [$71,653 was obligated and $28,152 was spent on 1,495 acres (605 ha) to establish native trees, shrubs, forbs and/or grasses]; mechanical vegetation enhancement [$62,087 was obligated and $4,369 was spent on 2338 acres (946 ha) to re-establish more natural stand conditions that improve habitat for listed species]; and chemical vegetation enhancement [$71,653 was obligated and $28,152 was spent on 1321 acres (534 ha) to re-establish more natural stand conditions to improve habitat for listed species].

Improved habitat includes 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, gopher frog, Eastern indigo snake, Florida pine snake, white ibis, wood stork, little blue heron, red-cockaded woodpecker, Florida sandhill crane, Southeastern American kestrel, crested caracara, Sherman's fox squirrel, and gopher tortoise.

Expectations for Florida's LAP are being held to a high standard to meet the needs of private landowners and to benefit the greatest number of at-risk species. 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 LAP. Please visit the LAP website at www.myfwc.com/lip for more information on Florida's LAP.

Safe Harbor Conservation Program Summary (*Katherine Marois*).--A Safe Harbor program for state-listed species other than red-cockaded woodpeckers was initiated in May 2007. So far this program has partnered with the American Forest Foundation to host a gopher tortoise workshop for private landowners in the panhandle. In addition, staff are investigating the possibility of participating in the development of a multi-species Safe Harbor agreement for the

Florida Ranchlands Environmental Services Project (FRESP), a project involving private ranchers in south Florida, the World Wildlife Fund, South Florida Water Management District, Florida Department of Environmental Protection, Florida Department of Agriculture and Consumers Services, and U. S. Department of Agriculture Natural Resources Conservation Service. Finally, we are working with other FWC staff and the USFWS to investigate the feasibility of creating Safe Harbor agreements for Florida panthers, crested caracaras, and scrub habitat.

LAW ENFORCEMENT

Statewide Enforcement (*Captain Rob Beaton and Lt. Colonel Don Holway*).-- FWC's Division of Law Enforcement 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, and manatee harassment. Over 52,000 water patrol hours were dedicated to manatee enforcement; resulting in nearly 3,000 citations, and 5,846 warnings.

Regular patrols in Monroe County as part of a multi agency task force enforcing the Key deer speed zone on Big Pine Key.

The Division of Law Enforcement has coordinated several meetings in Collier County with other governmental agencies and citizen groups to work through issues concerning the Florida panther. Law Enforcement also works closely with FWC biologists on black bear, Perdido Key beach mice, and other species to provide public education and awareness about the various species and their habitats.

Several cases regarding bald eagle investigations were conducted during the reporting period. Following is a brief description of one of the more significant cases that was initiated in 2005; however, the case went to court in 2006: In November 2005, Investigator Larry Jernstedt and Lieutenant Greg Stanley responded to a complaint of destruction of an active eagle's nest. Their investigation discovered heavy equipment was used to knock down a tree with the nest in it and the nest material was removed from the area. USFWS was contacted and a joint investigation was completed with a confession from the heavy equipment operator. The operator admitted he knocked down the tree so construction would not be halted. He thought it would appear to be hurricane damage. He also admitted to taking the nest material and burying it at another job site. The operator pled guilty in federal court. He was sentenced Sunday, July 25, 2006 in Federal Court to a fine of $2,000, one year of probation, and 50 hours of community service at the Southwest Florida Conservancy assisting with the rehabilitation of injured bald eagles.

FWC's Division of Law Enforcement issued at least 59 citations separate from manatee involving endangered, threatened and species of special concern during 2006-2007. The majority of these were for illegal take or possession of gopher tortoise.

PERMITTING AND TECHNICAL ASSISTANCE

Program Summary (*Angela T. Williams*).—FWC staff provided federal agencies, other state agencies, environmental consultants, 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 typically 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, including; (1) life history and other biological information; (2) locality and occurrence data; (3) listing status; and (4) 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 Florida Administrative Code (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: Burrowing Owl Nest Protection Guidelines and Procedures in Urban Areas, Osprey Nest Removal Policies, Available Options to Address the Presence of Gopher Tortoises 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 thousands of telephone accounts and hundreds of formal letters and emails. Additionally, 1,607 listed species scientific collection, captive possession, relocation and incidental take permits (and 91 permit amendments) were issued during 2006-2007. 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 at the following website http://myfwc.com/permits/Protected-Wildlife/permits.html for those interested in applying for permits to handle or impact terrestrial listed species.

APPENDIX A. LISTED WILDIFE SPECIES AS OF JUNE 30, 2007.

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

APPENDIX A. Continued.

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

APPENDIX A. Continued.

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

APPENDIX A. Continued.

Common Name	Scientific Name	Status
Florida black bear	Ursus americanus floridanus	T[3]
Everglades mink	*Mustela vison evergladensis*	T
key deer	*Odocoileus virginianus clavium*	E
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	E
Big Cypress fox squirrel	*Sciurus niger avicennia*	T
Sherman's fox squirrel	*Sciurus niger shermani*	SSC (1,2)
Eastern chipmunk	*Tamias striatus*	SSC (1)
Sanibel Island rice rat	Oryzomys palustris sanibeli	SSC (1,2)
silver rice rat (rice rat, lower FL Keys)	*Oryzomys argentatus* (*Oryzomys palustris natator*)	E
Key Largo woodrat	*Neotoma floridana smalli*	E
Key Largo Cotton Mouse	*Peromyscus gossypinus allapaticola*	E
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	E
Southeastern beach mouse	*Peromyscus polionotus niveiventris*	T
Anastasia Island beach mouse	*Peromyscus polionotus phasma*	E
St. Andrews beach mouse	*Peromyscus polionotus peninsularis*	E
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	E
Florida mouse	*Podomys floridanus*	SSC (1)
Florida mastiff bat	*Eumops glaucinus floridanus*	E
gray bat	*Myotis grisescens*	E
Indiana bat	Myotis sodalis	E
Florida saltmarsh vole (Florida salt marsh vole)	*Microtus pennsylvanicus dukecampbelli*	E
Sherman's short-tailed shrew	Blarina carolonensis [=*brevicauda*] *shermani*	SSC (2)
Homosassa shrew	*Sorex longirostris eionis*	SSC (2)
sei whale	Balaenoptera borealis	E
fin whale (finback whale)	*Balaenoptera physalus*	E
North Atlantic right whale (right whale)	*Eubalaena glacialis* (*Balaena glacialis* [*incl. australis*])	E
humpback whale	*Megaptera novaeangliae*	E

APPENDIX A. Continued.

Common Name	Scientific Name	Status
sperm whale	*Physeter macrocephalus*	E
Florida manatee (West Indian manatee)	*Trichechus manatus latirostris* (*Trichechus manatus*)	E
INVERTEBRATES		
CORALS		
pillar coral	*Dendrogyra cylindrus*	E
CRUSTACEANS		
Panama City crayfish (econfina crayfish)	*Procambarus econfinae*	SSC (1)
sims sink crayfish (Santa Fe cave crayfish)	*Procambarus erythrops*	SSC (1)
black creek crayfish	*Procambarus pictus*	SSC (1)
INSECTS		
Miami blue butterfly	*Cyclargus* [=*Hermiargus*] *thomasi bethunebakeri*	E
Schaus' swallowtail butterfly	*Heraclides aristodemus ponceanus*	E
MOLLUSKS		
Florida tree snail	*Liguus fasciatus*	SSC (1)
Stock Island tree snail	*Orthalicus reses* *Orthalicus reses* [*not incl. nesodryas*]	E

APPENDIX A. Continued.

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
Adaptive Resource Management	ARM
Air Force Base	AFB
Apalachicola River Wildlife and Environmental Area	ARWEA
Aquatic Habitat Restoration and Enhancement Section	AHRES
Archbold Biological Station	ABS
Archie Carr National Wildlife Refuge	ACNWR
Bear Management Action Team	BMAT
Best Management Practices	BMP
Biological Review Panel	BRP
Branan Field Mitigation Park	BFMP
Cape Canaveral Air Force Station	CCAFS
Candidate Conservation Agreement	CCA
Center for Biostatistics and Modeling	CBM
Critical Wildlife Area	CWA
Deoxyribonucleic Acid	DNA
Direct Autumn Release	DAR
Division of Forestry	DOF
Early Warning System	EWS
Efficient Transportation Decision Making Process	ETDM
Female	F
Fiscal Year	FY
Fish and Wildlife Research Institute	FWRI
Florida Administrative Code	F.A.C.
Florida Black Bear Standing Team	FBBST
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 Natural Areas Inventory	FNAI
Florida Panther Research & Management Trust Fund	FPRMTF
Florida Park Service	FPS
Florida Ranchlands Environmental Services Project	FRESP
Florida Scrub-Jay	FSJ
Florida State University	FSU
Florida Statutes	F.S.
Geographic Information System	GIS
Global Positioning System	GPS
Gopher Tortoise Management Unit	GTID

APPENDIX B. Continued.

Term	Acronym
Hickey Creek Mitigation Park	HCMP
Infectious Bursal Disease	IBD
Integrated Wildlife Habitat Ranking System	IWHRS
Kissimmee Chain of Lakes	KCOL
Lake Wales Ridge Wildlife and Environmental Area	LWRWEA
Landowner Assistance Program	LAP
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 Resources Conservation Trust Fund	MRCTF
Measurable Biological Goal	MBG
Memorandum of Agreement	MOA
Mitigation Park Program	MPP
Moody Branch Mitigation Park	MBMP
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
Panama City Crayfish	PCC
Passive Integrated Transponder	PIT
Perry Oldenburg Mitigation Park	POMP
Platt Branch Mitigation Park	PBMP
Population Viability Analysis	PVA
Project Design and Environmental	PD&E
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
South Florida Water Management District	SFWMD
Strategic Habitat Conservation Areas	SHCA
Three Lakes Wildlife Management Area	TLWMA
United States	US
United States Fish and Wildlife Service	USFWS
United States Forest Service	USFS

APPENDIX B. Continued.

Term	Acronym
University of Florida	UF
Upper Respiratory Tract Disease	URTD
Urban-wildlife Interface	UWI
Water Conservation Area	WCA
Whooping Crane Eastern Partnership	WCEP
Wildlife and Environmental Area	WEA
Wildlife Management Area	WMA
Woods Hole Oceanographic Institution	WHOI

APPENDIX C. FWC STAFF PUBLICATIONS DURING 2006-2007.

Delany, M. F., M. B. Shumar, M. E. McDermott, P. S. Kubilis, J. L. Hatchitt, and R. G. Rivero. 2007. Florida Grasshopper Sparrow distribution, abundance, and habitat availability. Southeastern Naturalist 6:15-26.

Dixon, J.D., Oli, M.K., Wooten, M.C., Eason, T.H., McCown, J.W., and Cunningham, M.W. 2006. Genetic consequences of habitat fragmentation and loss: the case of the Florida black bear (*Ursus americans floridanus*). Conservation Genetics, DOI 10.1007/s10592-006-9184-z., 9 pp.

FWS, 2007. Personal communication 10/29/2007. Tylan Dean, Fish and Wildlife Biologist. U.S. Fish and Wildlife Service, South Florida Ecological Service Office, Vero Beach, FL 32960

Lightsey, J.D., Rommel, S.A., Costidis, A.M., Pitchford, T.D. 2006. Methods used during gross necropsy to determine watercraft-related mortality in the Florida manatee (*Trichechus manatus latirostris*). Journal of Zoo and Wildlife Medicine, v.37 no.3, p.262-275.

Martin, J., W. Kitchens, C. Cattau, A. Bowling, M. Conners, D. Huser and E. Powers. 2006. Snail Kite Demography, Annual Report 2005. Prepared for the U.S. Fish and Wildlife Service, Vero Beach, Florida by U.S. Geological Survey, Florida Cooperative Fish and Wildlife Research Unit and University of Florida.

Meylan, A., and Redlow, A. 2006. *Eretmochelys imbricata* -- hawksbill turtle. Chelonian Research Monographs, No.3, p.105-127. In: Meylan, P.A. ed. Biology and Conservation of Florida Turtles.

Miller, K. E., and C. A. Faulhaber. 2007. Avian pox-like lesions in a Florida Scrub-Jay population. Florida Field Naturalist 35:39-42.

Ordoñez, C., S. Troëng, A. Meylan, P. Meylan, and A. Ruiz. 2007. Chiriqui Beach, the most important leatherback nesting beach in Central America. Chelonian Conservation and Biology 6(1):122-126.

Rommel, S.A., Costidis, A.M., Pitchford, T.D., Lightsey, J.D., Snyder, R.H., and Haubold, E.M. 2007. Forensic methods for characterizing watercraft from watercraft-induced wounds on the Florida manatee (*Trichechus manatus latirostris*). Marine Mammal Science, v.23 no.1, p.110-132.

Seitz, J.C., and Poulakis, G.R. 2006. Anthropogenic effects on the smalltooth sawfish (*Pristis pectinata*) in the United States. Marine Pollution Bulletin, v.52, p.1533-1540.

Sella, K. N., M. Salmon, and B. E. Witherington. 2006. Filtered streetlights attract hatchling marine turtles. Chelonian Conservation and Biology 5(2):255-261.

APPENDIX C. Continued.

Temsiripong, Y., Woodward, A.R., Ross, J.P., Kubilis, P.S., and Percival, H.F. 2006. Survival and growth of American alligator (*Alligator mississippiensis*) hatchlings after artificial incubation and repatriation. Journal of Herpetology, v.40 no.4, p.415-423.

Witherington, Blair. 2006. *Sea Turtles: An Extraordinary Natural History of Some Uncommon Turtles.* St. Paul, MN: Voyageur.

Witherington, B., Bresette, M., and Herren, R. 2006. *Chelonia mydas* -- green turtle. Chelonian Research Monographs, No.3, p.90-104. In: Meylan, P.A., ed. Biology and Conservation of Florida Turtles.

Witherington, B., Herren, R., and Bresette, M. 2006. *Caretta caretta* -- loggerhead sea turtle. Chelonian Research Monographs, No.3, p.74-89. In: Meylan, P.A. ed. Biology and Conservation of Florida Turtles.

Yabsley, M.J., Murphy, S.M., Cunningham, M.W. 2006. Molecular detection and characterization of *Cytauxzoon felis* and a *Babesia* species in cougars from Florida. Journal of Wildlife Diseases, v.42 no.2, p.366-374.

APPENDIX D. COMMON AND SCIENTIFIC NAMES OF SPECIES MENTIONED BY COMMON NAME IN THE REPORT.

Common Name	Scientific Name
FISH	
blackmouth shiner	*Notropis melanostomus*
bluenose shiner	*Pteronotropis welaka*
crystal darter	*Crystallaria asprella*
Gulf sturgeon	*Acipenser oxyrinchus desotoi*
harlequin darter	*Etheostoma histrio*
saltmarsh topminnow	*Fundulus jenkinsi*
shoal bass	*Micropterus cataractae*
smalltooth sawfish	*Pristis pectinata*
spotted bass[1]	*Micropterus punctulatus*
AMPHIBIANS	
flatwoods salamander	*Ambystoma cingulatum sensu lato*
gopher frog	*Rana capito*
mole salamander[1]	*Ambystoma talpoideum*
reticulated flatwoods salamander[1]	*Ambystoma bishopi*
REPTILES	
alligator snapping turtle	*Macroclemys temminckii*
American crocodile	*Crocodylus acutus*
American alligator	*Alligator mississippiensis*
Eastern indigo snake	*Drymarchon corais*
Florida brown snake	*Storeria dekayi victa*
Florida pine snake	*Pituophis melanoleucus mugitus*
gopher tortoise	*Gopherus polyphemus*
green sea turtle	*Chelonia mydas*
hawksbill sea turtle	*Eretmochelys imbricate*
Kemp's ridley sea turtle	*Lepidochelys kempii*
leatherback sea turtle	*Dermochelys coriacea*
loggerhead sea turtle	*Caretta caretta*
red rat snake	*Elaphe guttata*
sand skink	*Neoseps reynoldsi*
BIRDS	
bald eagle	*Haliaeetus leucocephalus*
brown pelican	*Pelecanus occidentalis*
burrowing owl	*Athene cunicularia*

APPENDIX D. Continued.

Common Name	Scientific Name
crested caracara	*Caracara cheriway*
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*
Florida sandhill crane	*Grus canadensis pratensis*
Florida scrub-jay	*Aphelocoma coerulescens*
great blue heron[1]	*Ardea herodias*
great egret[1]	*Ardea alba*
ivory-billed woodpecker	*Campephilus principalis*
kestrel	*Falco sparverius*
little blue heron	*Egretta caerulea*
osprey	*Pandion haliaetus*
peregrine falcon	*Falco peregrinus*
red-cockaded woodpecker	*Picoides borealis*
roseate spoonbill	*Ajaia ajaja*
roseate tern	*Sterna dougalli*
snail kite	*Rostrhamus sociabilis*
Southeastern American kestrel	*Falco sparverius paulus*
snowy egret	*Egretta thula*
tricolored heron	*Egretta tricolor*
white-crowned pigeon	*Columba leucocephala*
white ibis	*Eudocimus albus*
whooping crane	*Grus americana*
wood stork	*Mycteria americana*
MAMMALS	
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*
Florida black bear	*Ursus americanus floridanus*
Florida manatee	*Trichechus mantus latirostris*
Florida mouse	*Podomys floridanus*
Florida panther	*Puma concolor coryi*
gray bat	*Myotis grisescens*
North Atlantic right whale	*Eubalaena glacialis*
old-field mouse[1]	*Peromyscus polionotus*
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*
puma[1]	*Puma concolor stanleyana*
Sherman's fox squirrel	*Sciurus niger Shermani*
southeastern bat[1]	*Myotis austroriparius*
southeastern beach mouse	*Peromyscus polionotus niveiventris*
St. Andrew beach mouse	*Peromyscus polionotus peninsularis*

APPENDIX D. Continued.

Common Name	**Scientific Name**
INVERTBRATES	
apple snail[1]	*Pomacea insularum*
Miami blue butterfly	*Cyclargus thomasi bethunebakeri*
Panama City crayfish	*Procambarus* [*Leconticambarus*] *econfinae*

[1]Animals not listed as endangered, threatened, or species of special concern.

PLANTS	
Florida slash pine	*Pinus elliottii var. densa*
longleaf pine	*Pinus palustris*
oak, oak scrub, scrub oak	*Quercus* spp.
sand pine	*Pinus clausa*
saw palmetto	*Serenoa repens*
slash pine	*Pinus ellioti*
wiregrass	*Aristida* spp.