FY 2003-2004 Progress Report

on activities of the

Florida Fish & Wildlife Conservation Commission

Endangered/Threatened Species Management & Conservation Plan

FLORIDA ENDANGERED AND THREATENED SPECIES MANAGEMENT AND CONSERVATION PLAN - FY 2003-2004 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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EXECTIVE SUMMARY

This document constitutes the 26th progress report and update of the Florida Endangered and Threatened Species Management and Conservation Plan as required under Section 5 of the Florida Endangered and Threatened Species Act of 1977 [s. 372.072, Florida Statutes (F.S.)]. That section of the Act required the preparation of an initial plan for submission to the 1978 Florida State Legislature, and that a revised and updated plan for management and conservation of endangered and threatened species shall be submitted annually.

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

This document consists of two main sections. The "Statutory Requirements" section covers five of the six elements listed in Statute, including a description of FWC's criteria for research and management priorities, a description of FWC's citizen awareness program, policies pertaining to listed species, required legislation, and a funding request. The sixth element required by Statute is a progress report. The "Progress Report" section provides a description of agency actions for listed species, and provides contact information for individuals who desire more knowledge about a specific species or action. This section includes reports of staff activities for six listed mammals, 14 listed birds, one listed amphibian, one listed reptile, two reports that cover a group of reptiles, one report that covers 10 listed fish, and three reports on listed invertebrates. In addition, this section covers agency actions to provide technical assistance and coordination, efforts with Critical Wildlife Areas, the Landowner Incentive Program, law enforcement actions for listed species, and a summary of listed species permitting.

I would like to express my appreciation to the many people who contributed to this report. Judy Gillan and Sandy Porter provided information regarding statutory requirements while Mike Allen, Gray Bass, Shane Belson, Joan Berish, Robin Boughton, David Cook, Stuart Cumberbatch, Michael Delany, Nancy Douglass, Steve Glass, Katherin Haley, Elsa Haubold, Walt Jaap, Dawn Johnson, Carol Knox, Karen Lamonte, Darrel Land, Adriene Landrum, Anne Meylan, Karl Miller, Steve Nesbitt, James A. Rodgers, Jr., Billy Sermons, Stephanie Simek, Robbin Trindell, Angela T. Williams, Chris Wynn, and Ricardo Zambrano contributed to the progress report. Special appreciation is expressed to Ms. Christine Yannett for her assistance with preparation of this report, and Thomas Eason, Jackie Fauls, Kipp Frohlich, Brad Gruver and Tim O'Meara for editorial review.

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OFFICIAL LISTS OF ENDANGERED SPECIES, THREATENED SPECIES AND SPECIES OF SPECIAL CONCERN

The first Florida endangered species list consisted of 23 species and was promulgated in 1972. The listing concept was expanded in 1973 to include threatened species, and again in 1979 to include species of special concern. The State lists are revised as needed and constitute Rules 68A-27.003 (endangered), 68A-27.004 (threatened) and 68A-27.005 (species of special concern) of the Florida Administrative Code (Title 68A, F.A.C.). Currently, the Florida Fish and Wildlife Conservation Commission (FWC) lists 118 species as endangered (41), threatened (26), and species of special concern (51; Table 1). A complete listing of Florida's imperiled wildlife species may be accessed at http://wildflorida.org/imperiled/pdf/Endangered-Threatened-Special-Concern-2004.pdf, or at the F.A.C. website, located under Chapter 68 - FWC, section 27.003 - .005 http://fac.dos.state.fl.us/. Fifty-seven species of wildlife listed by the United States Fish and Wildlife Service (USFWS) as threatened (36), endangered (20), or experimental non-essential (1) occur in Florida (Table 1). Additional information regarding federal listings may be accessed at http://endangered.fws.gov/wildlife.html#Species. A listing of plants that are protected under the jurisdiction of the Florida Department of Agriculture and Consumer Affairs (DOACS) may be accessed at http://www.doacs.state.fl.us/~pi/index.html.

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

Status Designation	Fish	Amphibians/ Reptiles	Birds	Mammals	Invertebrates	Total
FWC						
Endangered	3	6	8	20	4	41
Threatened	2	10	10	4	0	26
Special Concern	10	13	18	6	4	51
Subtotal	**15**	**29**	**36**	**30**	**8**	**118**
USFWS [a]						
Endangered	2	5	5	18	6	36
Threatened	1	8	5	2	4	20
XN[b]	0	0	1	0	0	1
Subtotal	**3**	**13**	**11**	**20**	**10**	**57**

[a] United States Fish and Wildlife Service
[b] Experimental Non-Essential

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

CITIZEN AWARENESS PROGRAM (*complied by Judy Gillan*)

Media Relations and Information Requests

The FWC issued 28 statewide news releases concerning listed species, nearly half of them concerning manatees and one fourth of them regarding Florida panthers. Others included alligators, black bears, woodpeckers, sea turtles and listed species in general. Staff also served as media spokespersons regarding listed species on 129 occasions, including 54 regarding manatees (*Trichechus manatus latirostris*), 36 regarding Florida panthers (*Puma concolor coryi*), 21 concerning American alligators (*Alligator mississippiensis*) and 10 regarding Florida black bears (*Ursus americanus floridanus*). Other species that were the subjects of media contacts were sea turtles, wood storks (*Myceteria americana*), woodpeckers and the Miami blue butterfly (*Cyclargus* [=*Hermiargus*] *thomasi bethunebakeri*).

In addition, staff produced 31 news releases and responded to 312 media contacts regarding listed species. Black bears, alligators, gopher tortoises (*Gopherus polyphemus*), panthers and manatees were the most common subjects of regional listed species news releases. Florida panthers, manatees, black bears, sea turtles and alligators composed the bulk of listed-species media contacts. Others included ospreys (*Pandion haliaetus*), eagles, owls, gopher tortoises and right whales (*Eubalaena glacialis*).

Items distributed by staff in 2003–2004 included: Manatees "Sea Stats"-3,000; Manatee Coloring Sheet-1,500; Commonly Asked Questions booklet-1,400; Manatee Coloring Book-1,200; Manatee Anatomy sheet-950; Where are the Manatees?-650; Miss Her Now or Miss Her Forever brochure-550; Manatee Behavior poster-45; Sea Turtles Sea Stats-4,500. In addition, the Manatee Sea Stat was downloaded 350 times and the Sea Turtles Sea Stat was downloaded 150 times from the web site at http://research.myfwc.com/education/view_article.asp?id=9602.

A total of 435 information requests were mailed or e-mailed to staff. Of these, 166 were bulk order requests for materials to be distributed through the requestor's organization. Over 2,000 e-mails related to manatee education programs were responded to during the course of the fiscal year.

Staff contacted numerous marinas in an outreach effort to supply them with manatee education materials. Research posters, county maps and monofilament recycling information are included with manatee related information.

Education

Staff received a grant to expand the Be Bear Aware educational campaign to four additional counties in Central Florida. A Bear Aware packet was assembled that included the "Living in Bear Country" brochure; two fliers, one called "If You See a Bear in Your Community" and another called "Please Don't Feed the Bears" an action checklist bear-shaped refrigerator magnet; a "We're Bear Aware" sticker for the garbage can; a "We Live in a Bear Aware Home" household pledge certificate and a postage paid return survey card. Packets were mailed to 9,262 households in Collier County, with an additional 18 schools, libraries and parks receiving the packet along with FWC's "Understanding Human-Bear Conflicts" video. Another 4,145 packets were mailed to households in Lake, Marion and Volusia counties. In order to assess the effectiveness of the campaign and the materials, FWC requested that recipients mail back the postage-paid response card. Responses showed an increase in bear awareness and positive behaviors suggesting the program should be continued.

Staff completed a production video entitled, "Too Close for Comfort: Disturbance Effects on Water Birds." Some distribution has occurred, particularly to the participants in the University of Florida's Institute of Food and Agricultural Sciences' Florida Master Naturalist program. Distribution will continue to beach front hotels, recreation outposts and recreational vehicle users. Species included in the video include: piping plovers (*Charadrius melodus*), snowy plovers (*Charadrius alexandrinus*), American oystercatchers (*Haematopus palliates*), brown pelicans (*Pelecanus occidentalis*), black skimmers (*Rynchops niger*), least terns (*Sterna antillarum*), reddish egrets (*Egretta rufescens*), snowy egrets (*Egretta thula*), little blue herons (*Egretta caerulea*), tricolored herons (*Egretta tricolor*), white ibis (*Eudocimus albus*), wood storks and roseate spoonbills (*Platalea ajaja*).

Two counties, Wakulla and Leon, utilized the "Way of the Manatee" Treasure Box program in its third school year of evaluation. The program served over 1,500 students from seventeen separate public and private classrooms. The program was used in pre-K thru fifth

grade including an English to Speakers of Other Languages (ESOL) class of combined grade levels.

In the 2003-2004 school year, staff participated in a variety of special events or teacher workshops to promote the Manatee Treasure Box program. The following are some examples of the outreach services from the use of the treasure boxes: (1) A local preschool demonstrated their teaching abilities to the National Accreditation Committee using the Manatee Treasure Box program; (2) A college education student interning at a local elementary school used the Manatee Treasure Box program to demonstrate teaching abilities and received college credits; (3) A teacher in the ESOL program at a local elementary school used numerous items from the Manatee Treasure Box Program to secure a grant for a unit of study on manatees. In this body of students nine different languages were represented. After the unit was studied the students participated at a local festival with a booth displaying their art projects and written reports about the manatee; and (4) Contents from the Manatee Treasure Box were used for a preschool program at a local museum. The parents and preschoolers did hands on activities for an hour each Saturday to learn about manatees. Staff of the museum taught the manatee program for three months.

Staff responded to inquiries from educators in other areas of the state who wanted to create their own Manatee Treasure Box program. A list of supplies and resources is provided for this request.

FWC staff compiled "Suitcase" curriculums that are provided to middle and high school teachers and students to help educate about manatees. The suitcases provide lesson plans and activities that are correlated to Florida's Sunshine State Standards; bone and biofacts to provide an up-close feel of the animal that could not be brought into the classroom; and different types of media to supplement the learning including books, videos, slideshows and computer activities. The suitcase curriculums are loaned out to surrounding counties in the Tampa Bay region for up to three months at no cost to the borrower. Due to staff changes, usage numbers are only available for the second half of the fiscal year. During this time, the suitcase was checked out nine times by groups varying from a college class, local middle high schools, a reformatory, and staff members utilizing the contents for various presentations. Staff is currently working on transferring some suitcase contents to an electronic format, so that the resources can be utilized by educators outside of the Tampa Bay region through the following web site, located at http://research.MyFWC.com. Staff members are currently working on the creation of a sea turtle suitcase curriculum similar to the manatee suitcase.

Web Page Outreach

An intranet company specializing in educational field trips online for classrooms worked with staff to develop an e-field trip about manatees. This engaging self-guided tour into the life of the manatee meant elementary and high school students nationally and internationally could learn about the manatee. The field trip reached students with much of the same information as the brochures, educational materials and the treasure boxes but certainly was more efficient in connecting with the student since 25,000 public private and home-schooled students in forty-five

states visited the e-field trip site. During the initial month the e-field trip was online, staff participated in a live chat with students about manatees (80 students participated). A written "Ask the Experts" question session provided contact with an additional 250 students. Of the student participants, 10,000 were from Florida alone.

FWC staff developed a Species Spotlight Web page http://floridaconservation.org/viewing/species in Fiscal Year (FY) 2002-2003 and a Wildlife Spotlight Web page http://myfwc.com/recreation in FY 2003-2004 that are active and available to the public. These web pages hold current information for the following listed species: American alligator, American crocodile (*Crocodylus acutus*), Southeastern American kestrel (*Falco sparverius paulus*), American oystercatcher, bald eagle (*Haliaeetus leucocephalus*), Big Cypress fox squirrel (*Sciurus niger avicennia*), Sherman's fox squirrel (*Sciurus niger shermani*), black skimmer, brown pelican, Florida black bear, burrowing owl (*Athene cunicularia*), Cape Sable seaside sparrow (*Ammodramus maritimus mirablis*), crested caracara (*Caracara cheriway*), Eastern indigo snake (*Drymarchon corais couperi*), Florida grasshopper sparrow (*Ammodramus savannarum floridanus*), Florida scrub jay (*Aphelocoma coerulescens*), gopher frog (*Rana capito*), gopher tortoise, green sea turtle (*Chelonia mydas*), snail kite (*Rostrhamus sociabilis plumbeus*), gray bat (*Myotis grisescens*), key deer (*Odocoileus virginianus clavium*), least tern, Lower Keys marsh rabbit (*Sylvilagus palustris hefneri*), Florida tree snail (*Liguus fasciatus*), limpkin (*Aramus guarauna*), loggerhead sea turtle (*Caretta caretta*), North Atlantic right whale (*Eubalaena glacialis*), peregrine falcon (*Falco peregrinus*), red-cockaded woodpecker (*Picoides borealis*), roseate spoonbill, sand skink (*Neoseps reynoldsi*), whooping crane (*Grus americana*), wood stork and Florida sandhill crane (*Grus canadensis pratensis*).

Workshops

Staff provided a shorebird education and curriculum workshop at the Florida Birding Festival to approximately 40 educators. Species covered included piping plover, snowy plover, American oystercatcher, brown pelican, black skimmer, least tern, reddish egret, snowy egret, little blue heron, tricolored heron and peregrine falcon.

Eleven Florida Black Bear Curriculum Guide (FBBCG) workshops were held teaching 206 participants about black bear biology, behavior, management, and resolving human-bear conflicts. An additional 23 people were trained at Project WILD's annual facilitator training workshop to teach other educators to utilize the FBBCG. Three teacher workshops were taught in the key counties of Lake, Volusia, and Collier utilizing the FBBCG and accompanying children's activity guide as part of the Be Bear Aware educational campaign.

A group of educators from a variety of government and private manatee-related organizations met together to work out a plan for the manatee education effort in Florida. One meeting has been held to date as members gather information for a matrix of existing materials.

Staff and volunteer facilitators provided approximately 100 one-day workshops to approximately 1,800 educators, including workshops involving Project WILD, Aquatic WILD, Schoolyard Activities and Ecosystems, and on topics such as the Florida black bear. Two

weekend Project WILD/Outdoor Adventure workshops, reaching approximately 62 educators, were also provided. K-12 program volunteers throughout the state continue to donate thousands of hours of their time and expertise annually, to provide one-day and weekend workshops to educators and promote our programs through their workplaces and networks. Species covered in Project WILD include the Florida panther, Florida black bear, key deer, Florida manatee (*Trichechus manatus latirostris*), American alligator, American crocodile, Eastern indigo snake, gopher tortoise, loggerhead sea turtle, green sea turtle, leatherback sea turtle (*Dermochelys coriacea*), hawksbill sea turtle (*Eretmochelys imbricata*), Kemp's ridley sea turtle (*Lepidochelys kempii*), osprey, Florida sandhill crane, whooping crane, red-cockaded woodpecker, and burrowing owl.

Call of the WILD, the annual volunteer advanced training, reached approximately 50 Project WILD facilitators. The theme for Call was predators and covered such species as the Florida panther, Florida black bear, Florida mastiff bat (*Eumops glaucinus floridanus*), gray bat, Indiana bat (*Myotis sodalis*), loggerhead sea turtle, green sea turtle, leatherback sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, Southeastern American kestrel, and Florida scrub jay.

Other Events and Information

This year, 825 campers participated in the summer camp programs at the Everglades Youth Conservation Camp in West Palm Beach, Florida, which included information about listed species. Staff also participated in a boy scout Trailblazer event with approximately 600 boy scouts. The scouts learned about fishing, hunting, archery, trapping, marine management, and wildlife management. Species covered included American alligator, Florida black bear, and osprey.

The state fair exhibit in Tampa featured live exhibits and information on the American crocodile, Florida panther, and various threatened and endangered bird species. Approximately 395,000 people visited the FWC exhibit at the 2003 Florida State Fair.

Over 10,000 people participated in the annual Florida Black Bear Festival in Umatilla, Florida (Lake County). FWC is a sponsor with several staff engaged in staffing two exhibits, giving talks, and leading field trips all themed around living in bear country and bear management.

The contract for participating with the State of Florida Nature and Heritage Tourism Center (Center) continued this year. The FWC's requirements are to provide free manatee related materials to the Center in exchange for free distribution of the materials to tourists driving into Florida. The Center is located in White Springs, a short distance away from I-75 near the Georgia-Florida border.

Articles and accompanying photographs or illustrations of listed species featured in *Florida Wildlife* magazine included the Florida black bear, Kemp's ridley turtle and the Florida

panther. *Florida Wildlife* magazine ceased publication after the November-December 2003 issue but will resume publication April 1, 2005.

Twelve, two-page features called, "Watching Wildlife with the Florida Fish and Wildlife Conservation Commission" were produced and published in *Florida Monthly* magazine. Estimated paid subscriber base is 200,000 with a readership of twice that. Listed species were featured in four issues this year – August 2003, least tern; October 2003, manatee and sea turtle decal program; January 2004, entire two-page feature on West Indian manatee and March 2004 featuring red-cockaded woodpecker.

Please note that additional outreach information may be listed under the Species Specific Reports section of this report.

STATEWIDE POLICIES PERTAINING TO LISTED SPECIES

Agency Actions to Modify the Listing Process (*Dan Sullivan*).--Prior to creating policy to protect imperiled species, one must first have a tool to determine which species are the most imperiled. The tool used to determine which species deserve Florida Fish and Wildlife Conservation Commission (FWC) listing is the listing process described in rule 68A-27.0012. This process was developed with the assistance of a stakeholder group in 1999. Since the implementation of the current criteria based listing process, one species was removed from the list, two species have been added, and one species moved from a threatened species to a species of special concern. However, controversy arose over efforts to apply the new criteria to two prominent species. The red-cockaded woodpecker (RCW) changed from a threatened species to a species of special concern, and the manatee has been proposed to change from an endangered species to a threatened species. These proposed listing changes caused some groups to conclude that the new listing process made it too difficult for a species to be listed as an imperiled species and would therefore decrease protection of the state's biodiversity.

In response, the FWC reconvened the stakeholder panel and added marine interest groups (to reflect the merger with the Marine Fisheries Commission and the resultant increases in responsibility). The newly-formed Listing Process Stakeholders Panel (LPSP) met on six occasions from December 2002 through October 2003 and was assigned four charges; (1) propose any change needed to address marine harvested species; (2) determine, by full consensus, if any change is needed to address confusion between the state and federal processes; (3) determine, by full consensus, if new International Union for Conservation of Nature and Natural Resources (IUCN) criteria should be applied; and (4) discuss concerns with the existing listing process criteria and bring changes recommended by full consensus.

The results of the meetings were presented to the Commission in November 2003. When consensus could not be reached on the main issues, the Commission directed staff to take the input from the stakeholders and draft a staff recommendation. Staff drafted a recommendation that is scheduled to be presented at the December Commission 2004 meeting. If the

recommendation is approved, staff will be directed to draft the required rule changes. It is anticipated that final action on this issue could occur at the April 2005 Commission meeting.

Prior to imposing the moratorium on listing actions, the Miami blue butterfly (*Cyclargus thomasi bethunebkeri*) was added to the list of endangered species. Additionally, a management plan was drafted as required by rule 68A-27.0012 for the Panama City crayfish (*Procambarus econfinae*). Although the management plan was drafted and approved, final action on changing the listing status of this species was placed on hold until after the listing process was evaluated and modified. For further information on listing actions and the listing process, please contact the Endangered Species Coordinator.

REQUIRED LEGISLATION

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

FUNDING REQUEST

Recommended Funding Level (*Sandy Porter*).--The recommended level of funding for the FWC endangered species programs in Fiscal Year (FY) 2005-2006 is approximately $18,089,823 (Table 2). This includes funding to maintain current programs, in addition to anticipated awards from federal grants that are designed to assist development of new recovery programs.

Table 2. Projected FWC Endangered/Threatened/Special Concern Species Budgetary Needs in FY 2005-2006.

Funding Source	Amount
Nongame Wildlife Trust Fund (NGWTF)	**$3,971,797**
State	$714,897
Federal	$3,256,900
Florida Panther Research & Management Trust Fund (FPRMTF)	**$2,384,414**
Save the Manatee Trust Fund (STMTF)	**$3,827,756**
Marine Resources Conservation Trust Fund (MRCTF)	**$6,937,144**
State	$6,316,313
Federal	$620,813
General Revenue (GR)	**$953,212**
Total	**$18,089,823**

PROGRESS REPORT

SPECIES 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 clues for how managers may alter this process through management actions. Research results have led to management actions that have aided in species stabilization and recovery, and 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 Commission (FWC) staff. Annual reports of these activities are available upon request.

Black Bear

Research and Management (*Bear Program Team*).--FWC staff are involved in research and management efforts to ensure the long-term perpetuation of the Florida black bear (*Ursus americanus floridanus*). In fiscal year (FY) 2003 - 2004, FWC personnel received 5% fewer calls (1,324) regarding bears while the number of reported roadkill increased 21% to 125 individuals.

Efforts to prevent human/bear conflicts continued with the previously established Bear Response Agent Program. Agents responded to 124 events which included 38 carcass recoveries, 53 site visits, and 33 capture efforts in FY 2003 - 2004. There has been an increased interest in black bears from the public. FWC staff has responded with information and education packets which were developed in cooperation with other staff. For further details please refer to the Citizen Awareness Program section of this report.

Staff coordinated and conducted a variety of projects in cooperation with researchers and managers from state, federal, university, and non-governmental organizations. Previously, FWC and Florida Department of Transportation (FDOT) jointly identified several areas with transportation related factors that were potentially impacting bear populations. As a result, three projects were implemented addressing impacts of roads on black bears. Data collection efforts continued on the "Non-invasive Assessment of Black Bear Movements and Abundance Relative to United States (US) 98 within the Aucilla Wildlife Management Area (WMA)" project. This project was designed to estimate the size of the local bear population and reveal the rates and specific locations where bears cross US 98. As part of the "Black Bear Movements and Habitat Use Relative to Roads in Ocala National Forest" project, FWC researchers compiled data and conducted analyses to investigate the movements, habitat use, and population dynamics of black bears along a portion of State Road (SR) 40 in Ocala National Forest. Data collection continued

and was completed in September 2003 for the "Statewide Assessment of Road Impacts on Bears in Florida" project. The final report will be completed in FY 2004 - 2005. The results will enable FDOT and FWC to make informed decisions regarding black bear populations and highway management issues such as design, placement, and mitigation.

Efforts on several research projects with the University of Florida continued through FY 2003 - 2004. These included an investigation on "Habitat Use and Genetic Relatedness of Female Black Bears in the Ocala National Forest" and "Cub Survival and Denning Ecology of Florida Black Bears in Ocala National Forest". These two studies further assisted FWC staff in understanding bear movements, seasonal and annual habitat use, and survival factors associated with bears in central Florida. A third study entitled "Genetic Structure and Gene Flow Among Florida Black Bear Populations" was conducted to investigate the genetic flow between fragmented black bear populations. This information is critical to understand the functional connectivity of corridors for the state-threatened Florida black bear.

Current activities and reports can be viewed on the FWC's black bear web page at www.wildflorida.org/bear.

Choctawhatchee Beach Mice

Grayton Beach Land Acquisition (*Stuart Cumberbatch*).--The FWC in concert with the Trust for Public Lands (TPL) assisted Walton County in the acquisition of the subject property at Grayton Beach in September 2003 under an award to the County from the United States Fish and Wildlife Service (USFWS). The purchase of property is benefiting one of three recovery populations of the endangered Choctawhatchee beach mouse [(*Peromyscus polionotus allophrys*) (CBM)] through conservation of suitable habitat for the subspecies. The acquisition increases public lands and closes the gap within existing State of Florida Park Service holdings at Grayton Beach State Park. Although the primary purpose of the land acquisition has been to promote recovery of the CBM, other State and Federal protected species are also benefiting from the land acquisition. Protection of turtle nesting habitats and minimization of effects from beachfront lighting are assisting the threatened loggerhead sea turtle (*Caretta caretta*), the endangered green sea turtle (*Chelonia mydas*), and the endangered leatherback sea turtle (*Dermochelys coriacea*). The inlet area of the property is used for feeding and resting by the threatened wintering piping plovers (*Charadrius melodus*) and feeding snowy plovers (*Charadrius alexandrinus*), a State threatened species.

Florida Mouse

Population Monitoring on Arbuckle Wildlife Management Area (WMA) (*Dawn Johnson*).--FWC staff have conducted annual monitoring of the Florida mouse (*Podomys floridanus*) populations on the Arbuckle tract of Lake Wales Ridge State Forest since 1999. Arbuckle WMA contains oak scrub habitats that are important to Florida mice. The goals of this project are to monitor temporal trends and detect responses to management activities.

Eight study sites were established in oak scrub, sand pine scrub, sandhill, and scrubby flatwoods habitats. On each study site, 10 trapping stations were established, each 49.2 feet (15 meters) apart, in a line transect. Two Sherman live traps were placed at each trapping station. Captured mice were marked, weighed, sexed, aged and released. A total of 30 Florida mice were captured on eight transects in 2004. Several old field mice (*Peromyscus polionotus*) were also captured during 2004 monitoring efforts. The scrubby flatwoods sites were the most productive in 2004, although the oak scrub sites have historically been the most productive.

Florida mouse populations on Arbuckle WMA appear to be stable based on monitoring data. Higher population levels in the oak scrub and scrubby flatwoods sites may be a result of burn regime, habitat preference or a combination of the two factors.

Florida Panther

Genetic Restoration and Management (*Darrell Land*).--Florida panthers (*Puma concolor coryi*) are endangered by a combination of population and habitat factors. Loss and fragmentation of habitat and unregulated killing over the past two centuries have reduced and isolated populations in the southeastern United States to the point where only one population, estimated in the late 1980's at 30-50 adults, exists on approximately 2 million acres of habitat in south Florida. Small population size and geographic isolation increase the risk of extinction of Florida panthers due to demographic instability inherent in small numbers and erosion of genetic diversity from restricted gene flow and inbreeding. In the spring of 1995, the FWC released eight female puma (*Puma concolor*) 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 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 was collected on 37 radio-collared Florida panthers in southern Florida during the reporting period. Seven new panthers were added to the radio-collared population monitored by FWC this past capture season. Staff documented six panther dens during the study period producing a total of 18 neonate kittens (9♀, 9♂). All of these kittens were handled successfully at their dens, permanently marked with subcutaneous transponder chips, and skin biopsies taken. FWC staff has radio-collared a total of 132 panthers since 1981 and handled 169 neonate kittens at dens since 1992. Seven radio-collared panthers and seven uncollared panthers died during the reporting period. Seven panthers died from vehicular trauma and three panthers, including one female, died from intra-specific aggression. Three dependent-aged kittens orphaned by the deaths of their mothers were captured and placed into temporary captivity last fiscal year. In August 2003, these 3 cats were released back into their mothers' former home ranges. One of these panthers, FP114 was killed by an uncollared male six weeks after the release. One radio-collared panther died of pneumonia and other infections that were likely secondary to concurrent feline leukemia virus infections. A four year-old radio-collared female panther was removed from the wild due to hind limb paralysis and was later euthanized because there was no chance of recovery. Three panthers died of unknown causes. Apparently, genetic introgression is reducing the occurrence of kinked tails, cowlicks, and cryptorchidism.

Preliminary analyses indicate that the likely representation of Texas puma genes is on target with the originally proposed introgression level of 20%.

Genetic analyses continues through a cooperative relationship with Dr. Stephen O'Brien at the National Cancer Institute. FWC has completed genotyping at 25 microsatellite loci of over 200 animals from several groups of different genetic ancestry. These included individuals from the Everglades subpopulation, the canonical Florida panther group, Texas females, crosses with some Texas heritage, captive animals of generally unknown origin held in various facilities throughout Florida, and pumas from Florida of unknown origin. For a large percentage of the population, staff assigned probable dams and sires; for animals that FWC was not able to assign probable parents, staff were successful in generally determining their ancestry. Staff continues to compare results from molecular genetic analyses with panther field data and also completed, to a large extent, a pedigree of the Florida populations spanning the last 30 years.

Staff is continuing evaluation of Global Positioning System (GPS) radio-collars and deployed eight units on panthers during FY 2003-2004. Four of the GPS radio-collars store location data on-board the unit and the other four store data on-board as well as transmit data to an Advanced Research and Global Observation Satellite (ARGOS) satellite; those data are then sent via e-mail to FWC. Preliminary evaluations indicate that the store-on-board capabilities perform well in south Florida, but dense vegetation habitats may reduce the number of useable GPS locations successfully acquired. It is too early to evaluate the success of remotely retrieving location data via satellite.

Staff is also continuing evaluation of the use of remote cameras to survey Florida panthers. Data collection has been completed and staff is now analyzing these data and summarizing results from this feasibility study. The remote cameras were successful at "capturing" panthers and provided other observations beyond mere presence and/or absence. Staff captured images of radio collared and uncollared panthers, females with kittens, males and females consorting, and other life history observations. Remote cameras show promise as an additional tool for monitoring panthers throughout their range.

Staff Directed Projects and/or Agreements with Both State and Non-State Entities (*Stuart Cumberbatch*).--Dr. Paul Beier coordinated a comprehensive review of all available Florida Panther data and analyses. The report identified strengths and weaknesses of existing panther data and previously conducted analyses of the data; identified incorrect or incomplete analyses and interpretation of the data; identified critical data gaps and elucidated questions that need to be examined. The report also provided recommendations and a framework for how these gaps and questions should be addressed.

Rancher's Supply, Inc. provided the FWC with assistance in the location, capture, and handling of Florida panthers. Additional services included training, consultation, necessary personnel, dogs, equipment and expertise necessary to assist with the location, capture, and handling of Florida panthers.

Dr. Marilyn Spalding investigated injured, sick, and dead specimens of panthers as they became available in order to determine the cause of morbidity and/or mortality. Specimens were treated and their health was evaluated and monitored. Additionally, analyses were provided of panther blood, tissue, fecal material and parasites for the diagnosis of medical conditions and for biomedical research.

For more information on current panther management and research, please contact the panther coordinator at 239-643-4220 or e-mail Darrell.Land@MyFWC.com. An extensive collection of panther reports and publications can be found at the following websites: http://www.wildflorida.org/critters/panther/index.asp and http://myfwc.com/panther/.

Manatees

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

FWC staff conducts conservation-based management activities for manatees and research on marine mammals. For more details about this 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.

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; (1) Manatee Protection Plans (MPPs) - This involves the development and implementation of county-based MPPs. Staff reviewed and prepared comments on the Brevard, Sarasota, Indian River, Duval, Volusia, Broward, and Clay County MPP drafts. The FWC approved the final MPP for Sarasota County and approved MPP amendments for Indian River County; (2) Rule Making - Staff members promulgate boat speed regulations to protect manatees statewide. New speed zone development was initiated for three counties in Tampa Bay, and in Lee County. Both efforts involve extensive work with county governments and stakeholder groups. Both rule efforts should be finalized next fiscal year; (3) Permits - A total of 633 projects were reviewed during the year. Staff offered biological opinions and recommendations to regulatory agencies such as Florida Department of Environmental Protection (DEP), water management districts, and the Department of Community Affairs about how to reduce or eliminate potentially negative effects to manatees; (4) 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 also completed an assessment of manatee foraging impacts to aquatic vegetation

in Manatee Springs off the Suwannee River (see publications); and (5) Public Outreach and Information - Programs focused on grade school students are ongoing involving various materials but particularly the Manatee Treasure Box program. The kits were developed to provide a free resource to teachers on a loan basis so that they could educate their students about manatees, habitat protection, and their environment. An intranet company specializing in educational field trips on line for classrooms worked with staff to develop an e-field trip about manatees. This is a self-guided tour into the life of the manatee and it is available to students nationally and internationally and is available at http://199.250.30.114/psm/manatee/EI_eFieldTrip.htm.

Manatee Mortality and Rescue (*Elsa Haubold*).--During the 2003 calendar year, 380 manatee carcasses were recovered. There were 73 watercraft related mortalities, down from the record high of 95 set the previous year. For the FY from July 1, 2002 through June 30, 2003, 276 manatee carcasses were documented in Florida. All but three of these carcasses were retrieved and necropsied in order to determine causes of death. An interactive searchable web-based database with manatee mortality information is available at http://research.myfwc.com/features/category_sub.asp?id=2241.

FWC staff and cooperators rescued 62 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 FWC. 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 (*Elsa Haubold*).--A biological status review of the Florida manatee was conducted based on the FWC's listing criteria. The Final Biological Status Review (BSR) was peer-reviewed and presented at the Commission meeting in November 2003. All decisions on species listings were put on hold until the listing process is reevaluated. The status review report is available at: http://research.myfwc.com/features/category_sub.asp?id=5199.

One interagency, statewide "synoptic" aerial and ground survey of manatees was conducted in February 2004 to meet legislative requirements of conducting an annual manatee census. These surveys yield a minimum manatee population count. Weather conditions were not as good as in 2001 and 2003, so the count of 2,505 manatees was lower than in those years. For more information about aerial surveys and the synoptic count please go to http://research.myfwc.com/features/category_sub.asp?id=2190.

Behavioral Ecology and Movements (*Elsa Haubold*).--Research on manatee use of Florida's coastal habitats is essential to understanding what resources are required to sustain a healthy population. By tracking the movements of individual manatees in fresh, brackish, and saltwater habitats, valuable information is obtained about their seasonal and daily movement patterns, migratory behavior, site fidelity, and habitat use. To study winter foraging movements and attendance patterns at industrial warm-water sources in Tampa Bay, researchers tagged six manatees at Apollo Beach outside the Tampa Electric Company (TECO) Big Bend power plant

discharge canal. The six manatees carried GPS tags, time-depth recorders, and temperature data-loggers that provided data about movements, diving behavior, and water temperature throughout the winter and early spring. A preliminary four-dimensional channel-crossing model (x and y coordinates, depth, and time) was developed in a Geographic Information System (GIS) using GPS location data and time-depth data collected in previous years.

FWC, in cooperation with United Stated Geological Survey (USGS) Sirenia Project and Mote Marine Laboratory, maintains an image-based, computerized database called the Manatee Individual Photo-Identification System (MIPS) that is used for photo-identification of individual manatees. This data provides life history information and assist scientists in estimating survival and reproduction rates, critical data required for determining the status of the manatee population. FWC maintains the west-central and southwest Florida MIPS catalog that currently contains 559 fully-documented animals. Staff continued to upgrade its photo-identification program by beginning the conversion to a completely digital system.

Contracts for Manatee Research (*Elsa Haubold*).--FWC managed a contract for Mote Marine Laboratory to conduct the following manatee research studies: Studies in Matlacha Isles and Other Areas of Southwestern Florida: Facilitating Adult Survival Estimations in Southwestern Florida and Documenting Manatee Habitat Use Patterns; Maintaining and Upgrading MIPS to Facilitate Studies of Adult Survival of Manatees In Southwestern Florida; Assessment of Thermal Biology and Potential for Thermal Stress; Inflammatory Mediators as Indicators of Manatee Immune Function; Boat Traffic Surveys in Manatee, Lee, and Collier Counties, Florida; Manatee Rescue and Verification; and Assessing the Acoustic and Behavioral Circumstances Surrounding Manatee-Boat Collisions in Florida I: Development of a Self-Releasing Tag. In addition, contracts related to manatee avoidance technology were managed through FWC. All seven of the initially funded projects were completed by FY 2003-2004. Completed project final reports are available at http://research.myfwc.com. Some of the technologies investigated by various scientists were the use of thermal imaging and voice-recognition designed to detect the presence of manatees. None of the technology investigated is yet ready to be used in Florida waterways to alert boaters to the presence of manatees. A request for proposals was issued in FY 2003-2004 to solicit further projects and three were selected for funding. See http://research.myfwc.com/features/category_sub.asp?id=4468 for more details.

North Atlantic Right Whale

Research Program (*Elsa Haubold*).-- FWC is involved in recovery efforts for endangered marine mammals, including the North Atlantic right whale (*Eubalaena glacialis*), one of the most endangered of the world's large whales. This work is supported almost entirely through grant funding provided by National Oceanic and Atmospheric Administration - National Marine Fisheries Service (NOAA-NMFS). Efforts have been heightened to prevent human-caused mortality in this species. Even one death per year has a significant impact on the population that is estimated to number approximately 325 individuals. In 1994, NOAA-NMFS designated Florida and Georgia coastal waters as critical habitat for the right whale as it is the only known calving ground of the North Atlantic right whale. FWC is instrumental in assisting a recovery

plan implementation team whose aim is to help NOAA-NMFS by providing advice to and support of recovery activities. During FY 2003-2004, FWC staff chaired this team.

During the 2003-2004 North Atlantic right whale calving season (December 01, 2003 – March 31, 2004) 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 60 aerial surveys this season. The effort resulted in a total of 50 sightings of right whales. The individual breakdown of these sightings was 10 mother/calf pairs and 17 single individuals.

There were many unusual right whale events in Florida during the winter calving season such as two right whales swimming into the St. Johns River on separate occasions, a right whale calf stranded on Amelia Island, and observations of a cow and calf off of Miami and in the Gulf of Mexico off of the Florida panhandle. The last confirmed report of a right whale in the Gulf of Mexico was during the 1960s. In March 2004, an entangled right whale "Kingfisher" was reported off of St. Augustine, Florida. FWC staff members were involved in the rescue response but several weeks of efforts to disentangle the whale failed and the animal has not been seen since.

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

Bald Eagle

Statewide Nesting Population Survey (*Steve Nesbitt*).--The bald eagle is currently listed as a threatened species by both the FWC and the USFWS. Florida traditionally has supported the largest nesting population of bald eagles (*Haliaeetus leucocephalus*) in North America south of the 40th parallel. Statewide eagle nesting surveys have been conducted annually since 1973 in an effort to monitor Florida's bald eagle population and identify trends in population status. The survey is conducted by using aircraft to visit all known nest territories in the State during the reproductive season. The goal of this study is to be aware of fluctuations in the bald eagle population that may be the result of development of Florida's wild lands, or other factors that may influence the eagle population.

The number of active bald eagle nesting territories documented in 2004 (1,158) was 2% greater than the number documented in 2003. The estimated number of young produced (1,318) was close to the number estimated last year. The number of young produced per active territory (1.14) and the number of young per successful nest (1.54) were similar to last year and to the

most recent 10 year average. These numbers represent an estimated population of between 3,080 (breeding adults and estimated non breeder subadults) and 4,398 (breeding adults, non-breeder subadults, and young produced in 2004). The recent tendency of the flattening of the population's growth continues. This flattening would be expected as available eagle nesting habitat in Florida reached the point of population saturation.

The FWC website (http://wildflorida.org/imperiled/eagle.htm) that displays the most current record of bald eagle nest site information received 35,050 inquires from the public during the year. Most use of this database (62% of the queries) was to search for nest locations.

Seasonal Movements (*Katherin Haley*).--Despite the recent population increase, concern remains for the long-term welfare of the bald eagle in Florida due to increased human development in bald eagle habitat and the species vulnerability to habitat loss. In order to better understand the risks that human development poses to Florida's eagles, it is important to determine how eagles nesting close to development fare compared to pairs nesting in more typical settings. Therefore, a project was initiated in 1997 to compare nesting success and post-fledgling survival of bald eagles from a random sample of developed (suburban) and undeveloped (rural) bald eagle nest sites over the next six years. To determine survival, five-year satellite transmitters [platform terminal transmitters (PTTs)] were attached to as many as 20 nestling bald eagles each year so that their fate can be determined.

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. 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. Since the study was initiated in 1997, 70 eagles have been fitted with satellite transmitters; 25 of these continue transmitting latitude, longitude, and mortality data. Ten of these birds have now reached breeding age. The locations are displayed on the internet with appropriate state and/or region views at http://wld.fwc.state.fl.us/eagle/eaglestudy/default.htm. The locations are updated to the project's web page monthly for public access and to facilitate interactions with other state, federal and local land managers. During the year there were 27,424 visits to access information from this website. 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 allowing managers to estimate summer and winter home range sizes and location. In 2005, FWC will continue to analyze and map location data for the remaining transmitter-equipped eagles, and plan to publish this information as a Florida Bald Eagle Atlas.

Aerial Nest Surveys Conducted on Apalachicola River Wildlife and Environmental Area (*Billy Sermons*).--The bald eagle was designated as a threatened species on March 11, 1967. The area in and around Apalachicola River Wildlife and Environmental Area (ARWEA) has long been used by nesting bald eagles. ARWEA is open to public use and various types of habitat management activities are used on the area to maintain and restore natural plant communities. Knowledge of the nest locations is vital to prevent disturbance by the public or through habitat management activities. Therefore annual aerial surveys are conducted to locate nests. Nests

status and any evidence of reproduction are recorded. All information is then shared with the coordinators of the statewide eagle population-monitoring program.

Aerial surveys are generally conducted in January of each year; however the 2004 survey was conducted in March, using a helicopter capable of carrying the pilot and two observers. Straight line transects are flown (both North and South and East and West) in a manner that provides approximately 100% survey coverage. When nests are encountered latitude and longitude coordinates are collected with a GPS unit to determine if the nest has been previously observed. Data recorded include: number of adults observed, number of eggs observed, number of nestlings observed, number of fledglings observed, and whether or not the tree is alive. The nest is determined to be active or inactive, based on these observations as well as anecdotal information such as apparent droppings on the limbs, obvious addition of new nesting material, etc.

On March 29, 2004, a total of 19 nests were observed, nine of which were recorded as active. Five of the nests observed had not been previously recorded, however; at least two of the new nests were very close to previously observed nests. Four adults were observed at four different nests. Eagle production confirmed by this survey included the documentation of 11 young eagles; which included eight nestlings and three fledglings.

Brown Pelicans

Population Monitoring (*Steve Nesbitt*).--The U. S. population of brown pelicans (*Pelecanus occidentalis*) experienced a major reduction in the 1950s and 1960s. The objective of this project is to monitor the population status and gross productivity of the brown pelican in Florida and investigate unexplained mortality of wild pelicans to diagnose the causes and actual significance to the population.

A statewide aerial survey of brown pelicans was conducted April 21, 2004 and May 5, 2004. Ground checks were not all completed until July. The number of nesting pairs estimated this year was 6,235 in 37 sites (Florida Bay and the lower Florida Keys being lumped as one site). This is a 22.4% decline in the number of nesting pairs compared to last year (8,039) and well below the average (8,254) since the survey began in 1968. Nesting success was measured on five Atlantic coast colonies. Based on 218 nests inspected, production was estimated to be 1.73 young per productive nest. This rate is well above the average for the past few years and leads to the interpretation that even though the nesting effort was reduced the reproductive success remained strong. There was one new nesting colony site (Barge Canal) found this year on a small spoil island in the Indian River, Brevard County. The total number of pairs was low (18), and based on the size of the island, is not likely to increase much. The above numbers are indicative of an estimated population of 16,585 adult and subadult brown pelican, and 10,186 young-of-the-year for 2004.

This decline in the annual brown pelican nesting effort continues a recent trend (see past progress reports). The decline is evident on both the Gulf Coast (particularly Tampa Bay and Charlotte Harbor) and Atlantic coast in 2004. The nesting effort and production of brown

pelicans in Louisiana and Texas continues to increase and may be attracting some of the pelicans produced in Florida to initiate nesting in the northwestern Gulf of Mexico. Staff should pay attention to environmental and sociological factors that may be contributing to a decline in Florida's brown pelican population. Things such as human population growth and declines in water quality which could affect availability of forage fish for pelicans would be worth investigating. In addition the population wide impact of hook and line injuries has not been measured in recent years and could be playing a role in reducing the pelican population in Florida. These issues may warrant increased studies. Staff should continue to pay close attention to nesting effort and success over the next few years. Staff may want to determine if there is a shift in nesting season with some pelicans beginning to nest in the fall rather than the spring. There is some historic evidence that a significant number of pelicans nested during the fall in the early part of the last century.

For more information please contact the project coordinator at FWC's Gainesville Wildlife Research Lab Field Office at 352-955-2230.

Burrowing Owl

Research and Conservation (*Katherin Haley*).--FWC staff and City of Cape Coral staff completed the third year of a five-year study to evaluate the effectiveness of FWC management policies for burrowing owls (*Athene cunicularia*) in urban areas. The burrowing owl is currently listed as a species of special concern. FWC policy regulates take of nests during land clearing and development, with more stringent restrictions 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 is being 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. In FY 2003-2004, staff found approximately 230 nests, banded 63 adults and 116 juveniles, observed 74 individuals banded in previous years, and monitored 80 nests to estimate nest success, which averaged 2.3 young/pair. The results of this project will be compared to the previous study in order to assess the need for modifying FWC management policy for burrowing owls in urban areas. Questions about the burrowing owl project can be directed to the Project Coordinator at 850-410-0656, extension 17320.

Crested Caracara

Habitat Suitability Model (*Stuart Cumberbatch*).--FWC contracted with Dr. Joan Morrison, Trinity College, to continue ongoing studies on crested caracara (*Caracara cheriway*). Steady progress has been made on the development of a habitat suitability model and map using the most current (2004) land cover database. Both the map and model will be used in the development of a spatially explicit population model and to conduct a Population Viability Analysis for the species to simulate changes in population size, dynamics, and persistence given changes in land use across the region.

Florida Grasshopper Sparrow

Distribution and Abundance (*Michael Delany*).--The Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) is an endangered subspecies endemic to the south-central prairie region of the State. Much of the native prairie has been altered by agriculture which likely caused the extirpation of the sparrow from some of its historic range. An assessment of the sparrow's status and habitat was needed to evaluate recovery efforts. Florida grasshopper sparrow distribution, abundance, and habitat availability were examined as part of a contractual agreement funded by the Department of Defense. Landsat satellite data, aerial photographs, and ground-truthing revealed a fragmented distribution of 175,212 acres (70,936 ha) of potential habitat for the sparrow with most acreage (58%) located on conservation lands. Results are congruent with previous work that indicated a significant loss of dry prairie in south-central Florida. Searches of potential habitat and surveys at known locations found 274 male Florida grasshopper sparrows during 2004 for a minimum total population estimate of 548 individuals. Populations were found at Three Lakes Wildlife Management Area (TLWMA) in Osceola County, Avon Park Air Force Range (APAFR) in Highlands and Polk Counties, Kissimmee Prairie Preserve State Park in Okeechobee County, and on two private ranches in Osceola and Okeechobee Counties. The current distribution evinces a considerable contraction in range; however other breeding aggregations may exist on private property where access was denied. The synchronous and unexplained decrease of three formerly large populations on APAFR is cause for concern. Florida grasshopper sparrows on APAFR decreased from an estimated 144 birds at three populations in 2002 to only 17 birds at two populations in 2003. FWC personnel are working with APAFR and the USFWS to determine the cause of the decline. The low number of individuals, and paucity and fragmentary distribution of suitable dry prairie will be limiting factors for recovery of this sedentary sparrow. Habitat expansion and management, and demographic improvements at existing locations may restore some populations. Large areas >936 acres (379 ha) of potential habitat found in Manatee, DeSoto, and Glades counties offer the best opportunities for the establishment of additional populations. The efficacy of experimental translocations of Florida grasshopper sparrows conducted at TLWMA should be evaluated and additional areas considered for the establishment of new breeding aggregations. The analysis of historical point-count monitoring data and land management information from occupied locations on public lands is needed for comparisons that may provide insight into population fluctuations and declines. The cooperative effort of public land managers from various agencies as well as private landowners will be needed to prevent the extinction of this bird.

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

Surveys Conducted on Three Lakes Wildlife Management Area (*Steve Glass*).--Point count surveys for Florida grasshopper sparrows have been conducted at TLWMA since 1991. The Florida grasshopper sparrow 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 2004, surveys estimated there were at

least 124 different male Florida grasshopper sparrows at the main site and at least seven different male Florida grasshopper sparrows at the translocation site. These data indicate an increase in Florida grasshopper sparrow numbers from 2003 surveys at both the main site (98 male FGS) and the translocation site (three male FGS). Monitoring of FGS will continue at TLWMA and efforts will be made to expand the population through habitat improvement.

Approximately 100 acres (40.5 ha) of dry prairie were mowed in an effort to decrease habitat fragmentation and improve conditions for Florida grasshopper sparrows. Most of the mowing focused on overgrown myrtle and palmetto along the edges of depression ponds, roads, and firebreaks.

Florida Sandhill Crane

Habitat Management Efforts (*Shane Belson*).--Habitat management for the Florida sandhill crane (*Grus canadensis pratensis*) occurred during this reporting period at Split Oak Forest Mitigation Park (SOMP) and Bullfrog Creek Mitigation Park (BCMP). The principal management strategy is to maintain and reestablish open grasslands for Sandhill Crane (SHC) foraging. At SOMP, 60 acres (24 ha) of improved and semi-improved pastures were mowed to provide foraging and loafing areas for SHCs. At BCMP, 40 acres (16 ha) of pasture containing extensive wax myrtle stands were roller chopped to reestablish extensive openings for resident, breeding SHCs. A juvenile and adult SHC were observed using roller chopped pasture near their depression marsh nest site.

Florida Scrub Jay

Demographics in Suburban Charlotte County (*Karl Miller*).--The Florida scrub jay (*Aphelocoma coerulescens*) is federally and State listed as threatened. FWC staff initiated a study of 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. Limited research has been done on scrub jay demographics in suburbs even though 30-40% of the statewide scrub jay population occurs in suburban habitats. Significant disagreement exists as to whether these landscapes function as a population source, a population sink, or something else. The primary goal of this color-banding study is to determine if this population is stable or declining. Second, if it is declining, the study will determine what life history stage is most affected (nest success, productivity, recruitment, or adult survival) and make recommendations about how the causative factors can be addressed.

During FY 2003-2004, FWC staff conducted a spring population survey to census the size, location, and composition of all Florida scrub jay family groups (N=69) in the study area. Staff captured and color banded 284 scrub jays in Charlotte County, including 67 males, 84 females, and 133 birds of unknown gender. Each scrub jay was fitted with a unique combination and sequence of three plastic color bands and one numbered aluminum United States Geological Survey (USGS) band. Family groups were monitored during the breeding season (February – July) to determine the onset and duration of breeding activity. Staff located and monitored 87 scrub jay nests, 36 (41%) of which succeeded in fledging young. Nest predation accounted for

nearly all of the nest failures. Most nests were located in wax myrtle (*Myrica cerifera*), scrub oaks (*Quercus spp.*), or ornamental shrubs and hedges at heights ranging from 3 – 13 feet (0.9 - 4.0 meters) above ground.

Approximate territory boundaries were digitized into a GIS program. A GIS database was assembled with scrub habitat polygons, housing density, and soil types. Analysis of relationships between territory size, group size, nesting success, and housing density is being conducted.

During FY 2004-2005, the project will continue to; (1) monitor group size and composition of family groups during bi-annual surveys; (2) determine juvenile production in July; (3) determine recruitment of young into the population as one year-old helpers; (4) determine adult survival; (5) monitor dispersal on and off the study site; and (6) examine correlates of demographic success on a territory-by-territory basis. In addition, special attention will be given to monitoring the effects of recent hurricanes on the study population. Educational efforts will continue with citizens and landowners. For further information on this project, contact Karl Miller at 352-955-2230.

Population Monitoring at Select Wildlife Management Areas .--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 FY 2003-2004. During the 2004 breeding season, staff color banded five Florida scrub jays and re-captured additional individuals to collect blood for genetics research. At the end of FY 2003-2004, the known population consisted of seven resident family groups, totaling approximately 24 scrub jays. During FY 2004-2005, FWC staff will continue to assist the Florida Park Service in training volunteers to monitor the number and composition of family groups and to color band adults and fledglings. Ongoing scrub jay population monitoring will be critical in assessing the effectiveness of scrub habitat restoration activities being conducted by agency partners.

A small, remnant population of scrub jays has existed within the cantonment area at Camp Blanding WMA for several years. It is believed that 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 activity conducted concerning scrub jays is an annual population survey. During this reporting period, tape recorded calls were used to locate three scrub jays in the portion of the cantonment area called the Kingsley Scrub. One of the birds was trapped and banded, and additional trapping and banding efforts are continuing. Seven jays were seen during last year's population survey.

It is believed that a significant population of scrub jays occurs in the artillery impact area, about 5 miles (8.045 km) south of the Kingsley Scrub at Camp Blanding WMA. This area is off limits to all personnel because dud artillery shells occur in the area. Therefore, no scrub jay surveys can be completed and the population level is unknown. However, this area is subject to frequent fires from munitions impact and aerial prescribed burning. Habitat in the impact area should be suitable for scrub jays for the foreseeable future, and scrub jays seen on other areas of Camp Blanding WMA likely benefit from jays dispersing from the impact area population.

FWC staff continued monitoring the scrub jay population on the 9,500 acre (3847.5 ha) Half Moon WMA in west-central Florida. In an effort to improve population monitoring, nine scrub jays were banded in FY 2003-2004 for a total of 57 birds banded since 2001. Half Moon WMA supports about eight family groups, but only one fledgling was observed this year. Almost 300 acres (121.5 ha) [(60 acres (24 ha) on Half Moon and 240 acres (97 ha) on adjacent private land] of occupied habitat was burned on February 12, 2004; this may have reduced the availability of nesting habitat just prior to nesting season. A scrub jay was observed in June in habitat that has not been occupied since 1997. The present population is estimated at about 30 birds.

Habitat management has focused on growing season prescribed burning and mowing overgrown oak trees. Growing season burns comprise 311 acres (126 ha) of potential or occupied scrub jay habitat. Oak trees and palmetto areas have been mowed where they are too dense or tall relative to scrub jay habitat preferences.

Florida Scrub Jays on Mitigation Parks (*Shane Belson*).--Scrub jay management and monitoring are priority activities at Hickey Creek Mitigation Park (HCMP) and Platt Branch Mitigation Park (PBMP). Annual population assessments and habitat enhancement projects were conducted at both sites during this reporting period. The scrub jay population at HCMP is apparently experiencing a gradual decline. Three families consisting of breeding pairs were recorded during this reporting period, which is the lowest number on record. No juveniles were documented. FWC worked with an outside, independent scrub jay authority to develop a site-specific scrub jay management plan for HCMP. The PBMP population consists of six family groups or 20 individuals averaging 3.3 individuals/family. Recruitment consisted of five juveniles or 0.83 individuals/family. Since initiation of FWC monitoring in 1995, this population has experienced a slight decline.

Scrub jay habitat enhancement included the roller chopping of 40 acres (16 ha) at HCMP and 40 acres (16 ha) at PBMP. At PBMP, 15 acres (6 ha) of sand pines and large oaks were felled to reduce canopy cover. Habitat enhancement projects will continue in an effort to facilitate scrub jay expansion at both sites.

A small scrub jay population in the southern Gulf Coast sub-region has been brought into management by FWC through the establishment of a perpetual conservation easement on the 672 acre (272 ha) Moody Branch Mitigation Park (MBMP) Wildlife and Environmental Area (WEA) in Manatee County. The site contains several individuals of unknown distribution or relation within high quality habitat. Management strategies at HCMP, PBMP, and MBMP will continue to focus on habitat enhancement that facilitates population stability or expansion. For additional information on scrub jay management at FWC mitigation parks, see the "FWC Mitigation Park Program FY 2003-2004 Annual Report" on file at the Kissimmee Field Office, which can be reached at 407-846-5300.

Sarasota County Scrub Jay Habitat Conservation Plan (*Stuart Cumberbatch*).--The FWC entered into an agreement as the State Partner for a USFWS grant awarded to Sarasota County

during the spring of 2003. During the reporting period, the project's subcontractor, Cornell University, focused on completing refinements and tests of the Florida scrub jay demographic model it has developed, continuing the accumulation of information about Sarasota County and its remaining extant jay territories relevant to running realistic scenarios for developing the Habitat Conservation Plan, and preparing and delivering status reports to the County and the participating stakeholders.

Peregrine Falcon

Annual Population Monitoring Contract (*Stuart Cumberbatch*).--HawkWatch International conducted another annual systematic population monitoring effort for peregrine falcons (*Falco peregrinus*) at Curry Hammock State Park. The project also recorded the relative abundance of other raptors migrating through the Florida Keys during the fall. The results of this study were submitted as an interim annual report and will be included in later, multi-year analyses that will analyze approximately 10 years of data including variation in weather, and comparison with other sites and previous studies.

Red-cockaded Woodpecker

Red-cockaded Woodpecker Management on Select FWC Managed Lands (*Robin Boughton*).--The red-cockaded woodpecker (*Picoides borealis*; RCW) is a Federally endangered species listed by Florida as a species of special concern. RCW population surveys continued on three wildlife management areas (WMA) in southern Florida – Three Lakes Wildlife Management Area (TLWMA) in Osceola County, Babcock Webb WMA in Charlotte County, and J.W. Corbett WMA in Palm Beach County. The scope of work scheduled for Fiscal Year (FY) 2003-2004 included monitoring the number of active clusters, monitoring active clusters for nests, color-banding nestlings, determining fledging success, and increasing population size and success through translocation of juvenile birds and installation of artificial cavities in existing clusters and recruitment clusters. In addition, area-specific RCW management plans for each WMA were finalized.

The number of active clusters at TLWMA has been stable since 1999. The number of active clusters at Babcock Webb WMA and J.W. Corbett WMA has stabilized following a decline between 2000 and 2002. During the 2004 nesting season, there were 48 active RCW clusters at TLWMA. Thirty-seven of these clusters fledged young, and fledgling production averaged 1.22 (1.49 per successful nest). At Babcock-Webb WMA, there were 25 active clusters in 2004, an increase of one over 2003. Twenty-five clusters fledged young, and fledgling production averaged 1.0 (1.19 per successful nest). At J.W. Corbett WMA, there were 12 active clusters in 2004, an increase of two clusters over 2003. Seven clusters fledged young, and fledgling production averaged 1.5 (1.71 per successful nest).

Corbett WMA received five juvenile RCWs from Apalachicola National Forest prior to the breeding season to increase the number of potential breeding groups. Four birds were paired and placed in new recruitment clusters created by installing artificial cavities in previously unoccupied habitat. The fifth was paired with a single bird occupying an existing cluster. In

total, sixteen artificial cavities were installed at TLWMA, eight were installed at Babcock-Webb WMA and 12 were installed at J.W. Corbett WMA.

During FY 2004-2005, active clusters will be monitored for nests, nestlings will be banded, and fledging success will be determined on each of the three WMAs. Work will continue to focus on active management to enhance reproductive success and to increase population size. For more information on this project, please contact Robin Boughton at 352-732-1225.

Conservation Planning (*Robin Boughton*).--Statewide conservation planning for the RCW continued throughout FY 2003-2004. Following the proposed change in the state listing status of the RCW, staff developed a species management plan during 2002-2003 to fulfill the requirements of Rule 68A-27.0012, Florida Administrative Code (F.A.C.). The species management plan was approved by the FWC on September 3, 2003. The complete management plan is available at http://wildflorida.org/imperiled/pdf/RCW.pdf. Implementation of the species management plan began in FY 2003-2004. Progress on the seven priority actions identified in the plan is outlined below:

Implement the proposed rules for the red-cockaded woodpecker - With the approval of the species Management Plan on September 3, 2003 the classification of the RCW was changed from Threatened to Species of Special Concern. The change in classification will continue the prohibition of direct take except through permit authorized by the executive director or his delegate.

Develop an Memorandum of Agreement (MOA) with the United States Fish and Wildlife Service (USFWS) - FWC staff have discussed development of an MOA with USFWS staff and determined that there is no immediate need for an MOA to guide conservation activities. Staff of the FWC and USFWS has a history of close cooperation on RCW recovery in Florida. Both agencies are currently under a MOA with the Forest Service that guides translocation activities in Florida. Upon completion of the Risk Assessment (see below) and identification of immediate management needs, staff will reevaluate the need for an MOA to accomplish management needs.

Develop and maintain a RCW database for Florida - An RCW database was developed and includes basic information on population size, ownership, habitat, and management activities. The database was updated in 2004. Spatial data associated with the database was compiled and mapped. The database was distributed in Florida to the field offices of the USFWS and to RCW population managers.

Conduct a risk assessment for each metapopulation and prioritize metapopulations according to their immediate management needs - The RCW database was expanded to include biological, spatial, and management data relevant to a risk assessment. Site visits were conducted for nearly every known Florida RCW population to evaluate management activities, habitat condition, and management needs. Risk assessment data was distributed and discussed at the Central Florida RCW Working Group meeting in August, 2004. Discussion at the meeting facilitated development of a list ranking risk factors for RCW populations. An analysis of

populations and metapopulations most at risk using this ranking system is under way and will likely be completed by fall 2004.

Establish and convene a meeting of the Florida RCW working group - Two Florida-specific RCW working groups currently meet; agenda items relevant to the Florida RCW management plan have been incorporated into working group meetings. In August of 2004, the Central Florida RCW Working Group held its second annual meeting. Discussion focused on the risk assessment and metapopulation dynamics in central and south Florida. The meeting also established a new program to facilitate swapping juvenile RCWs between small populations to promote population growth and offset potential genetic isolation. In 2005, meeting discussion will focus on immediate management needs identified in the risk assessment for each population and metapopulation. Management needs for west Florida populations will be discussed at the West Florida RCW population managers meeting held in April 2005.

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 - A draft RCW Safe Harbor Agreement was prepared and submitted to the USFWS for preliminary review. A revised draft will be prepared incorporating changes requested by the Service and will be submitted for FWC staff review. Pending internal review, FWC staff plan to submit a formal application for Safe Harbor by year's end.

At the close of the 2004 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. Continued implementation of the Management Plan will ensure cooperation among managing agencies and eventual recovery of the species.

Population Surveys, Nest Monitoring and Habitat Management at Camp Blanding Wildlife Management Area.--The FWC's role at Camp Blanding WMA is to assist the lead area manager with management, and provide technical assistance for the RCW population on the site. During the reporting period, useable RCW habitat increased to 46 cavity trees in 20 active clusters (19 family groups, mean group size = 3.63). A total of 12 clusters were reported as suitable (≥ four cavity trees per cluster), and two recruitment clusters were enhanced to suitable status. This continues a small but steady active cluster increase, due mainly to translocation of birds from a donor population at Ft. Stewart, Georgia. Seven birds were translocated last year, but no birds were translocated this year.

Of the 19 family groups, 16 nested; 12 of which were successful in hatching chicks. Twenty- eight nestlings were banded, and 16 were fledged (1.33 fledglings per nest). A total of 52 cavity inserts were intact and useable during the reporting period, including several inactive clusters. Debris was vacuumed out of 15 cavities and invasive animals were displaced from six cavities. Eight new cavity inserts were installed, resulting in three new clusters. Two of the recruitment clusters were moved to new areas, as opportunistic use of prescribed burning has improved habitat in new areas of the WMA. Five clusters were returned to a summer fire regime.

Population Surveys on Citrus Wildlife Management Area .--FWC staff, in cooperation with the Florida Division of Forestry (FDOF), continued monitoring the RCW population on the 49,000-acre Citrus tract of the Withlacoochee State Forest (SF) in west central Florida. Of 47 active RCW clusters, 43 nested and 38 of these were successful in fledging 53 young. The number of nesting clusters increased to 43 in 2004 from 33 in 1999. Color banding continued with 70 nestlings and five adults banded during FY 2003-2004. The current adult population stands at 103.

One adult male RCW was translocated from Citrus WMA to Croom WMA. Other active management to increase reproductive success, population size, and habitat quality included installation of artificial cavity inserts and hardwood control. In FY 2003-2004, eight recruitment clusters (at least three artificial cavities installed in a chosen area) were created while cavity numbers were augmented at existing clusters using cavity inserts and drilled starts for a total of 34 inserts and six starts. Encroaching oak trees were cut in at least 20 clusters while cavity trees at 30 clusters were protected by raking and pre-burning.

Monitoring on Blackwater Wildlife Management Area (*Billy Sermons*).--Since 1996, the FDOF has been intensifying efforts for managing the recovery of the RCW in cooperation with FWC staff on Blackwater WMA. The RCW population has been monitored through banding efforts in identified clusters on the area. In the last year, Blackwater WMA had a total of 31 active clusters, of which three clusters contained single birds. Since the beginning of the program approximately 30 birds have been translocated to Blackwater WMA, and the RCW population is close to the USFWS recommended minimum viable population of 40 clusters. Concerns of FWC staff are two-fold. First the area is in excess of 190,000 acres, and presently, only acreage encompassed by a known cluster is being routinely monitored or visited. As such, about 20,000 acres are monitored in a year. A comprehensive survey of the entire WMA is needed. Secondly, specific objectives dealing with habitat issues and maintenance of accurate and up-to-date records are needed.

Historically, staff has funded a part-time Other Personnel Services (OPS) to assist FDOF in RCW recovery. The assistance was under the direction of FDOF. However, beginning FY 2003-2004, one full-time OPS biologist has been funded solely by the FWC and dedicated to RCW monitoring, surveying and management, under direct supervision of the FWC area biologist. This OPS position will assist in enhancing RCW habitat management, surveying, and monitoring and database management. FWC and FDOF have had a long standing cooperative relationship on the Blackwater WMA and the addition of dedicated personnel to the RCW

project will provide benefit not only to the recovery of the RCW resource on Blackwater, but also will greatly facilitate management objectives across agency lines for the future.

Management Activities on Fisheating Creek (*Shane Belson*).--The management of the Fisheating Creek RCW population in Highlands and Glades Counties is conducted primarily under the direction of FWC. This population includes three clusters at Platt Branch Mitigation Park (PBMP) and 11 clusters at the adjacent Lykes Bros., Inc. (LBI) property. FWC conducts annual monitoring of cluster activity and breeding success by color-banding and surveying all known adults and hatchlings.

Annual monitoring of the population during this reporting period determined that all clusters were active. Eleven clusters consisted of breeding pairs, and three contained single individuals. A total of 31 birds were recorded, averaging 2.2 individuals/cluster. Eleven clusters successfully produced hatchlings. Of these, eleven hatchlings survived to fledging. Five adults and 10 nestlings were color banded.

FWC assists with the management of RCW habitat at the LBI property through a cooperative agreement with the USFWS and LBI. Extensive habitat improvement was completed on 1,000 acres (405 ha) at LBI through grants from USFWS and the Natural Resource Conservation Service. Territories of nine clusters were mowed and five subsequently burned. At PBMP, all clusters were burned. Additional measures of protection and habitat improvement conducted included: the installation of snake guards on all thirty active cavity trees; fuel reduction around cavity trees for fire protection; repair of degraded cavities; and the placement of alternative nest boxes for RCW cavity competitors.

The Fisheating Creek RCW population is likely limited by a shortage of suitable cavities. Several clusters have fewer than the minimum four cavities that are recommended in the USFWS RCW Recovery Plan. To minimize the effects of limited cavity availability, FWC installed seventeen drilled cavities or cavity starts at PBMP (eight) and LBI (nine) in accordance with USFWS guidelines.

FWC management of the Fisheating Creek RCW population will continue at PBMP and LBI with additional monitoring and habitat enhancement projects. For additional information on RCW management at FWC mitigation parks, see the "FWC Mitigation Park Program FY 2003-2004 Annual Report" on file at the Kissimmee Field Office, which can be reached at 407-846-5300.

Questions about RCW recovery efforts should be directed to the Division of Habitat and Species Conservation, Avian Coordinator at 352-732-1225.

Snail Kite

Lake Toho Drawdown Issue Team (*James A. Rodgers, Jr.*).--The snail kite (*Rostrhamus sociabilis plumbeus*) is listed as endangered by the FWC and United States Fish and Wildlife Service (USFWS) and is dependent upon shallow water habitats at a few lakes of Central Florida

and the Everglades of South Florida. Recent information provided by the Cooperative Fish and Wildlife Research Unit of the University of Florida indicated a downward trend in both kite survival and number of nests since 1992. The Senior Leadership Team (SLT) was concerned that the Lake Tohopekaliga (Toho) restoration project in Central Florida might adversely impact the snail kite. An Issue Team of 20 individuals from five state and federal agencies and two universities was established to examine the possibility that the Toho restoration project might adversely impact kites.

The Issue Team concluded there was ample evidence of a decline in snail kite abundance since 1999 but it was less apparent if kites were in a consistent long-term decline or what was causing the decline. The Toho restoration project will preclude kite nesting and most apple snail (primary food of kites) recruitment during most of 2004. However, of greater concern to the Issue Team was the potential effect of the drawdown on the long-term well being of apple snails at Lake Kissimmee to the south of Toho. Protecting snails in Lake Kissimmee would allow Lake Kissimmee to be used as a refuge for kites during the years Toho is recovering from the restoration project.

The Toho Restoration Project has the potential to affect kites and their habitats in lakes Toho and Kissimmee. Based on those potential impacts, the Issue Team recommended management guidelines that; (1) maintain minimum lake levels on Kissimmee that provide for more kite nesting habitat and more snail reproduction; (2) not allow low water levels on Kissimmee to exceed a duration of three months; (3) not allow scraping or any other physical alteration including herbicide application in areas previously identified as concentrated kite nesting areas on both Lakes Toho and Kissimmee; (4) reserve as much water as possible in East Lake Toho to be used to quickly re-flood Lake Toho when the construction phase is completed; (5) request of water management authorities that water levels in other areas of the kite=s nesting range be held at levels favorable for kite nesting and; (6) artificially support kite nests in danger of collapse at Lake Kissimmee to increase breeding success.

Due to the possible impacts of this lake restoration project on a state-listed species, the FWC assembled a diverse group of experts to look at the situation, and make recommendations that would allow for the protection of this species, while also allowing an important restoration project to move forward. To view the complete Snail Kite Issue Team Final Report, please visit http://www.myfwc.com/Fishing/issue-teams/SNailKites.pdf.

Surveys Conducted on the Kissimmee Chain of Lakes during 2004 (*Adriene Landrum*).--Monitoring of the endangered snail kite was conducted via airboat surveys on lakes Tohopekaliga, Kissimmee, Cypress, Hatchineha and Tiger during Fiscal Year (FY) 2003-2004. Results from these surveys are summarized in Table 3. Average number of kites on Lake Tohopekaliga decreased in FY 2003-2004 to five birds compared to the previous average of 15 kites in FY 2002-2003. This decline was probably due to an extreme drawdown and muck removal activities that were occurring at Lake Tohopekaliga. Following muck removal operations and during the refill period, surveys in July 2004 indicated more kites were using the lake and numbers should increase as water levels resume to normal levels. Average number of snail kites observed on Lake Kissimmee also declined during FY 2003-2004 compared to

observations in FY 2002-2003. Water levels in Lake Kissimmee were lowered in preparation for the Lake Tohopekaliga Habitat Enhancement Project in November 2003, which may have caused many kites to abandon Lake Kissimmee. However, nesting activities were observed in April 2004 and fledglings from these nests were sighted during July using the western shoreline. Few snail kites were sighted on Lake Cypress, Lake Hatchineha, and Tiger Lake, which is similar to previous years.

Table 3. Average number of Snail Kites observed during surveys on the Kissimmee Chain of Lakes.

Lake	FY 2002-03	FY 2003-04
Tohopekaliga	15	5
Kissimmee	52	30
Cypress	<1	0
Hatchineha	1.7	<1
Tiger	<1	<1

For more information on this project, contact the Kissimmee Fisheries Field Office at 407-846-5300.

Snowy Plover

Status and Distribution *(Karen Lamonte).*--The snowy plover (*Charadrius alexandrinus*), breeds and winters along Florida's coastal beaches. Loss of nesting habitat and a reduction in productivity has apparently led to a decline in snowy plover breeding populations in the southeast. As a consequence, the snowy plover is listed as Threatened by the FWC.

A cooperative agreement with the United States Fish and Wildlife Service (USFWS) provided funds to conduct a literature search and survey work. A reassessment of the status and distribution of the snowy plover in Florida was undertaken from January to August 2002. This survey documented between 252 and 305 wintering snowy plovers and 216 breeding pairs of snowy plovers in Florida. During Fiscal Year (FY) 2003-2004, this information was summarized in an interim report provided to the USFWS. An annotated bibliography was submitted to the USFWS in 2003. Field work has been completed yielding results suggesting that the number of snowy plovers detected in the Florida winter population is less than half the number of the breeding population. Additionally, there appears to have been a major shift in the distribution and density of the snowy plover population resulting in a decrease in the number of breeding pairs in the central Panhandle and a concurrent increase in birds in the eastern Panhandle. One major observation was in regards to banded snowy plover chicks with one banded chick being observed at both its own nest and on multiple occasions with banded chicks

from another nest. While chick adoption has been documented in other instances, this is the first such instance documented in Florida.

The cooperative grant agreement was extended to provide additional funds for a study of techniques for assessing productivity of snowy plovers, monitor plover populations (including the initiation of habitat data analysis), and the effectiveness of posted warning signs**.** This part of the project was initiated in March 2004. Data collection continues through August of 2004 with a final report due in September 2005.

For more information on the interim report or the ongoing study, please contact Ms. Karen Lamonte at 850-595-8978 / Suncom 695-8978.

Southeastern American Kestrel

Activities to enhance survival of the state threatened Southeastern American kestrel (*Falco sparverius paulus*) on Camp Blanding Wildlife Management Area (WMA) consist of providing and maintaining nest boxes and conducting surveys. During the reporting period, 27 nest boxes were maintained, and damaged boxes were replaced. In addition, 10 new boxes were built and erected. Of the 37 boxes available during the breeding season, only two boxes contained nesting kestrels. Five boxes contained gray squirrels (*Sciurus carolinensis*), four boxes contained screech owls (*Otis asio*) and one box contained fox squirrels (*Sciurus niger*).

Whooping Crane

Whooping Crane Reintroductions in Florida (*Steve Nesbitt*).--The whooping crane (*Grus americana*) is listed by the FWC as a species of special concern. Federally endangered, the Florida population is listed as experimental non-essential by the United States Fish and Wildlife Service (USFWS). The minimum criteria for federal down-listing from endangered to threatened are to meet the goal of establishing two self-sustaining wild populations in addition to the Wood Buffalo-Aransas population (USFWS 1994), and these populations must be reproducing at an acceptable rate for 10 years. The goal of the Florida release is to produce a population of $\geq$ 25 breeding pairs of non-migratory whooping cranes in Florida by 2020. The objective of this project is to release annually 20 to 40 whooping cranes between 7 - 10 months of age in central Florida and determine the rate and causes of mortality for released whooping cranes. Monitoring of dispersal and movements, and documenting reproductive efforts (pairing, territoriality, nesting) and the success of released whooping cranes also will be recorded.

Release procedures were based on modifications of the standard soft-release techniques developed during previous segments of this study. Two cohorts of 8 whooping cranes, captive-reared by International Crane Foundation (ICF), Patuxent Wildlife Research Center (PWC), United States Geological Survey (USGS), or other facilities were transported to Florida between October and April Fiscal Year (FY) 2003-2004 and released in Lake County. The birds were transported by private aircraft (cost of transport donated), or commercial carrier. Ages of the birds to be released were between 7 and 10 months. Birds were held in small (18m X 18m), portable pens for two weeks. Release pens were located in areas where Florida sandhill cranes

and whooping cranes are known to frequent and where bobcat populations are low. Handling methods and procedures are established (Ellis et al. 1991, Melvin et al. 1983). Monitoring of released birds, and disposition of sick, injured or dead birds is covered by a Memorandum of Understanding (MOU) between FWC and the USFWS.

As part of the population monitoring, we recovered 13 mortalities among the released population from previous years' releases; six due to predation, two struck power lines, one apparently struck a fence post, and four were undetermined. There were no mortalities among the 16 birds released this year. Since the first release conducted in 1993 a total of 284 cranes have been released (Table 4). At the end of this year we were monitoring 70 birds (13 pairs) and suspect that others survive but could not be tracked.

Table 4. Whooping Cranes Released by Year (as of April 2004).

Year Released	# Released	# Surviving	Males ♂	Females ♀
1993	14 released:	01 surviving	01♂	00♀
1994	19 released:	04 surviving	01♂	03♀
1995	19 released:	03 surviving	02♂	01♀
1996	47 released:	12 surviving	05♂	07♀
1997	28 released:	08 surviving	02♂	06♀
1998	22 released:	02 surviving	01♂	01♀
1999	28 released:	05 surviving	01♂	04♀
2000	30 released:	15 surviving	09♂	06♀
2001	21 released:	15 surviving	08♂	07♀
2002	27 released:	11 surviving	03♂	08♀
2003	13 released:	10 surviving	05♂	05♀
2004	16 released:	16 surviving	11♂	05♀
Total	**284 released:**	**102 surviving**	**49♂**	**53♀**

A constant effort is required to keep functional transmitters on all whooping cranes in the project. We captured 22 cranes this year; 21 were captured for radio replacement and one was to treat a broken wing tip.

There were no "extraordinary" movements among the non-migratory population this year. Though FWC is not directly involved in the project to establish a second experimental flock of whooping cranes that will migrate from Wisconsin to winter in Florida, we do issue a permit to cover instate activities and do participate in long range project planning. This year was the fourth year of the Whooping Crane Eastern Partnership (WCEP) project. Eighteen young whooping cranes are being raised to be led by ultra-light aircraft to wintering grounds in Florida. Once they have completed their fall migration sometime in November, there will be nearly 50 cranes in this new population. There were times when whooping cranes from the migratory WCEP project were within a few mi/km of some of the non-migratory cranes; however, no direct contact was documented between individuals of the migratory and non-migratory flocks. It is inevitable there will be contact between these two populations, and we look forward to evaluating the outcome.

This year, 11 pairs of whooping cranes laid eggs at 13 nests. In an extremely odd occurrence, an eight year-old male whooping crane nested with a female Florida sandhill crane (*Grus canadensis pratensis*). The nest did not hatch and the eggs were apparently infertile. Six of the nests completed by whooping crane pairs were infertile or experienced early embryo death. There seemed to be a remarkable number of infertile nests this year. Three of the nests did hatched and four chicks were produced, but only one chick was fledged. For the first time this year we manipulated nests to remove eggs from pairs we did not want to produce any more chicks to reduce the number of crossing in the population from one pair. They re-nested twice, and we moved an egg into their third nest from a captive pair. We also moved one of their eggs into the nest of another pair hoping to give that pair experience hatching and raising young. They did hatch the egg and raised it for about 10 days before the chick disappeared. Overall the nesting results from this year were disappointing compared to those from last year's nesting season.

There has been considerable public interest in seeing the re-introduced whooping cranes. As conditions allow, we will escort field trips to see the cranes. In all cases, these trips will be conducted so the birds will not be disturbed and the wishes of private landowners will be respected. Access will be contingent on our schedule and the behavior of the cranes.

Infectious Bursal Disease - As part of our on-going Infectious Bursal Disease (IBD) study, blood was periodically collected from sentinel chickens at the release site. Additionally, blood was collected from wild turkeys (*Meleagris gallopavo*). Project personnel assisted in capturing and bleeding 19 pre-fledged and one adult Florida sandhill crane. Analysis of the samples is ongoing. Ultimately, we hope this study will give us a better understanding the of prevalence and possible etiology of the disease in Florida and its effect on whooping cranes.

Activities on Three Lakes Wildlife Management Area (*Steve Glass*).--There have been several nesting attempts in recent years by Whooping Cranes at Three Lakes Wildlife Management Area (TLWMA). In the spring of 2004, a pair of cranes nested in a small depression pond adjacent to a cypress dome. In an effort to provide better foraging habitat, approximately 13 acres of palmetto were mowed adjacent to the nest. Although this nesting

attempt eventually failed, staff at TLWMA will continue to improve nesting habitat for whooping cranes by prescribed burning, mowing, and roller-chopping.

Investigations Into Crane Deaths and Injuries (*Stuart Cumberbatch*).--Dr. Marilyn Spalding investigated injured, sick, and dead specimens of whooping cranes as they became available in order to determine the cause of morbidity and/or mortality. Injured cranes were treated, and their health was evaluated and monitored. Additionally, analyses were provided of whooping cranes' blood, tissue, fecal material and parasites for the diagnosis of medical conditions and for biomedical research.

For more information on whooping cranes in Florida, please contact the FWC whooping crane project leader at 352-955-2230.

Wood Storks

Productivity in North and Central Florida *(James A. Rodgers, Jr.).*--The wood stork (*Mycteria americana*) once was a common breeding species throughout the southeast United States. However, precipitous declines in the species= range and population during the mid-1900s eventually lead to the United States population being listed as endangered in 1984. The primary objective of this study is to gather productivity data for storks nesting in north and central Florida, comparing the data with reproductive success of other colonies to determine if the stork population in the United States meets recovery criteria for down-listing the species.

Wood stork colonies were visited every two weeks throughout the breeding season of MarchBAugust. Either all nests (colonies less than 100 nests) or a sample of the nests (25-70% of nests at larger colonies) were monitored. Care was taken to reduce researcher effects on the breeding storks and other species of colonial waterbirds by: minimizing nest monitoring during the pair-formation period; visiting colonies during the cooler morning and late afternoon; and no visits occurring during inclement weather. After nestlings were 3 to 4 weeks old, all nests were counted from a distance with binoculars to avoid pre-fledging of nestlings. Most stork nests and trees were individually marked with numbers, colored flagging tape, or plastic tags.

The average fledging rate of wood storks at 19 colonies in Florida during 2004 was 1.53 fledglings/nest. About 71.3% of monitored nests fledged at least one bird. Significant differences in the mean fledging rate existed among colonies (range = 0.25 to 2.37 fledglings/nest) during 2004. Colonies exhibiting high or low fledging rates appeared to be evenly distributed across Florida. An examination of the distribution of the number of fledglings per nest provided additional insight into the fledging success within each colony. The Jacksonville Zoo and Chaires colonies exhibited high fledging rates due to below average number of complete nest failures (i.e., no fledglings) and above average number of 2-fledgling and/or 3-fledgling nests. In contrast, Bird Island, Lake Russell, Little Gator Creek, Matanzas Marsh, and Pelican Island exhibited low fledging rates due to below average number of 2-fledgling and 3-fledgling nests and above average number of complete nest failures.

Although the average fledging rate for all wood stork colonies was similar for 2003 (1.49 fledglings/nest) and 2004 (1.53 fledglings/nest), a comparison of the fledging rates for individual colonies monitored during both years indicates that 8 of 14 (57.1%) colonies exhibited greater fledging rates during the 2003 breeding season (Table 5). While several colonies rebounded in 2004 (Chaires, Devils Creek), other colonies (Little Gator, Lake Russell, Matanzas Marsh) exhibited lower productivity in 2004 compared to 2003. Previously published data on wood stork productivity in Florida dates mostly from the mid-1970s to mid-1980s but appears to be similar to the results of this current study.

Table 5. Comparison of the average fledging rate per nest of wood stork colonies in north and central Florida during the 2003 and 2004 nesting seasons.

Colony	2003	2004
Jacksonville Zoo	2.21	2.37
Devils Creek	0.21	2.21
Chaires	1.06	1.93
New Port Richey	1.85	1.73
Ochlockonee North	1.35	1.70
Lake Rosalie	1.52	1.62
Cypress Creek	1.85	1.59
Lone Palm	1.36	1.48
Dee Dot	1.51	1.42
Little Gator Creek	1.68	1.19
Croom	1.29	1.09
Lake Russell	1.71	1.05
Matanzas Marsh	1.39	.025
Pumpkin Hill	1.56	Inactive

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

Flatwoods Salamander

Management and Conservation (*David Cook*).--The flatwoods salamander (*Ambystoma cingulatum*), federally listed as Threatened in 1999, was listed by the State of Florida in 2001 as Species of Special Concern, based on evidence of habitat loss and the estimate of only 38 extant populations in Florida. The flatwoods salamander management plan developed as part of the listing process proposes that 129 self-sustaining populations would need to be located in Florida in order to de-list the species statewide. The plan is available at http://wildflorida.org/imperiled/pdf/Flatwoods-salamander.pdf. Progress in Fiscal Year (FY) 2003-2004 toward that goal is presented below in terms of implementation of the eight priority actions identified in the plan.

Develop a Memorandum of Agreement with Federal Land Managers – A Memorandum of Agreement (MOA) with the United States Fish and Wildlife Service (USFWS) was prepared and approved in February 2002; this document clarifies the respective roles the USFWS and the FWC will play in flatwoods salamander conservation activities in Florida. Preparation of MOAs with individual agencies for flatwoods salamander conservation on specific lands has not been pursued because interagency cooperation and communication has been forthcoming. The Department of Defense has actively supported salamander surveys on Eglin Air Force Base (AFB) by Virginia Tech, on Hurlburt Field by Florida Natural Areas Inventory (FNAI), and on Holley Outlying Landing Field (OLF) by FWC. The United States Department of Agriculture (USDA) Forest Service has actively supported surveys on Apalachicola National Forest (NF) and Osceola NF by The Nature Conservatory (TNC) and FWC personnel. FWC continued a contract with the United States Forest Service (USFS) to support continued flatwoods salamander surveys on USFS lands, and to elicit assistance in developing management plans and public information materials. St. Marks National Wildlife Refuge (NWR) provided FWC a special-use permit to conduct flatwoods salamander surveys, and has supported the United States Geological Survey (USGS) on drift fence studies through the Amphibian Research and Monitoring Initiative (ARMI) program. Preparation of population-specific management plans for flatwoods salamanders on federal lands (Apalachicola NF, Osceola NF, St. Marks NWR, Eglin AFB/Hurlburt Field, Holley OLF) is either underway or will begin in late 2004; all are scheduled for completion in June 2005. FWC personnel are participating on the USFWS flatwoods salamander recovery team to revise and expand the draft flatwoods salamander federal recovery plan, which is targeted for completion in late 2004.

Coordinate Initiation of Conservation Actions on Wildlife Management Areas (WMA) – FWC is not the lead management authority on the four WMAs currently known to harbor flatwoods salamander populations [Pine Log State Forest (SF), Point Washington SF, Tate's Hell SF, Flint Rock WMA]. However, these are among the 18 public lands where FWC personnel conducted flatwoods salamander surveys in 2004. Population-specific management plans for Pine Log and Point Washington are close to finalization; those for Tate's Hell and Flint Rock are under preparation. Despite extensive survey efforts across the Florida Panhandle, where there seemed to be sufficient and timely rainfall, flatwoods salamander larvae were encountered on very few areas in 2004. They were confirmed only on St. Marks NWR, Apalachicola NF, Eglin AFB/Hurlburt Field, Holley OLF, and Flint Rock WMA. In addition to surveys, drift fences

were installed and run in 2004 by FWC personnel at Pine Log SF, Point Washington SF, and Aucilla WMA. Non-FWC biologists ran drift fences on Eglin AFB and St. Marks NWR. Compared to 2003, flatwoods salamander presence was documented at fewer locations, and only on St. Marks NWR and Apalachicola NF. A proposed project to compare survey techniques on St. Marks NWR (including drift fence and funnel traps; daytime surveys; nighttime surveys) had to be aborted when the target species could be documented in the two known ponds.

Explore the Feasibility for Cooperative Agreements or Conservation Easements for Long-term Management for Flatwoods Salamanders on Private Lands – FWC received Safe Harbor grant funds from the USFWS to support survey work on non-federal lands and to develop a statewide Safe Harbor program for flatwoods salamanders. The latter is being developed in collaboration with Georgia and South Carolina, in consultation with USFWS personnel. A Safe Harbor program for flatwoods salamanders will need to be innovative to accommodate conservation of such a cryptic and seldom seen species as the flatwoods salamander. FWC biologists surveyed 151 wetlands on the lands of two large private landowners in 2004, and another 152 ponds on many smaller private lands. Although most of the wetlands surveyed on private lands were ranked as unsuitable for flatwoods salamanders due to habitat alteration, fire exclusion, and shrub encroachment, it was heartening that so many landowners granted permission for access.

Maintain a Comprehensive Database – All flatwoods salamander survey data from the 2004 season have been entered into the database. There are currently 48 extant (recorded since 1990) populations known in Florida; of these 28 occur on public land, 16 occur on private land, and four populations extend onto both public and private lands.

Explore the Potential for a Statewide Habitat Conservation Plan (HCP) – This is not currently being pursued. Instead, the feasibility of a statewide Safe Harbor program for flatwoods salamanders is being investigated (see above).

Collaborate with state wildlife agencies in Georgia, South Carolina, and Alabama – Constructive interaction among staff of the respective state agencies continues, and information pertinent to flatwoods salamander conservation is shared. With the exception of the Florida Panhandle, extended drought across most of the range generally reduced survey efforts in 2004. Florida requested and received a second 1-year extension to the Safe Harbor grant agreement with USFWS to provide an additional season (2005) to spend allocated funds on surveys and the development of statewide Safe Harbor programs. State and independent biologists from all 4 states have been meeting and participating on the USFWS flatwoods salamander recovery team, which is charged with revising and expanding the draft federal recovery plan, expected to be completed in late 2004.

Prepare a “how-to” Pamphlet for Land Managers – FWC personnel prepared, printed 2,000 copies, and distributed a full-color brochure entitled, “The Flatwoods Salamander: Tips for its Management on Private Lands.” An effort is currently under way to make an electronic version of the information in the brochure available via the agency website. The brochure provides color photographs of animals and habitat, basic life history information, habitat

requirements, and recommendations for land management activities that could enhance flatwoods salamander populations. Besides serving as an education tool to promote conservation of the species, the brochure may be helpful in encouraging private landowners to allow salamander surveys to be conducted on their property.

Encourage Research – Current emphasis on conducting statewide surveys for flatwoods salamanders has delayed proactive support of research.

Survey and Monitoring on Wildlife Management Areas (*Billy Sermons*).--The flatwoods salamander is an inhabitant of wet pine flatwoods in southwestern Alabama, through northern Florida and north through Georgia to southern South Carolina (Conant and Collins 1991). Within Florida, the species is known from only 38 localized breeding sites. Two of these known breeding sites occur on WMAs cooperatively managed by FWC personnel and Florida Division of Forestry (FDOF). One breeding site, documented once in 1992 by FNAI, and most recently with the capture of an adult in 2002 by local FWC staff, is located on the Pine Log SF/WMA in Washington County. The other site, documented once in 1998 by USFWS, is located on the Point Washington SF/WMA in Walton County.

Large-scale efforts were begun in December 2001 by staff to obtain basic information regarding flatwoods salamanders on these two areas. The chief objective was to document flatwoods salamander occurrence across the Point Washington and Pine Log WMAs. Secondary objectives were to examine characteristics of potential breeding ponds and to provide recommendations for management in order to perpetuate and recover this species on state lands in Florida. Detailed summary and analysis for 2003 surveying and monitoring is contained in complete Progress Reports for this species on the two aforementioned WMAs, available by contacting the Panama City Regional office at 850-265-3677.

Gopher Tortoise

Gopher Tortoise Issue Team (*Joan Berish*).--In September 2003, FWC staff received approval from the Senior Leadership Team (SLT) to initiate a gopher tortoise (*Gopherus polyphemus*) issue team. The team's mission was to create a comprehensive list of issues pertaining to gopher tortoise management, permitting, and relocation. Those issues would then be prioritized, and specific tasks to address each issue would be recommended to the SLT. Team members were chosen for their expertise and experience related to tortoise management or mitigation. The team currently consists of 21 FWC staff members, including non-game biologists, land managers, attorneys, law enforcement officers, permit reviewers, and administrators. The team first met in January 2004, then again in February, April, and June. Of the more than 30 issues listed, those needs that were deemed high-priority included: providing conservation value to permitted relocations; removing current ambiguity from rules related to taking of tortoises; developing a management plan; coordinating with local governments regarding tortoise conservation; restocking tortoise-depleted public lands; managing upland habitats to benefit tortoise populations; and educating the public regarding tortoise mitigation and management. During the April meeting, the team divided the issues into four "buckets" that would be further addressed by specific sub-teams: Permitting, Legal/Law Enforcement,

Education, and Partnerships. Examples of drafts generated by the sub-teams include a law enforcement protocol for consistent handling of tortoise/development conflicts; a clarification of "take" as it pertains to tortoises and burrows; revised options for addressing presence of tortoises on development sites; and a comprehensive public education plan. A draft management plan is being developed by FWC staff, and will address the issues and recommendations from the team. Sub-teams will continue their work during fall 2004, with a report going to the SLT in early 2005.

Burrow Counts Conducted on Point Washington Wildlife Management Area (*Billy Sermons*).--Recognizing the need to preserve and protect Florida's native fauna and flora, the State of Florida in 1992 authorized the purchase of land in southern Walton County under the Conservation and Recreational Land Program (CARL). Florida Division of Forestry (FDOF) became lead management agency with the FWC serving as a cooperating agency. In January 1993, approximately 14,000 acres of Walton County land in State ownership was added by the FWC to the Point Washington Wildlife Management Area (WMA). Since the spring of 1993, local FWC staff on this WMA has been surveying, monitoring and assessing the status of the gopher tortoise, a Florida Species of Special Concern.

Comprehensive surveys or burrow counts are used to determine the relative abundance of tortoise populations during May through September, annually. Comprehensive burrow surveys are conducted across gopher tortoise habitat on the area. Burrows are identified as active, possibly active, inactive, or abandoned. Given the relationship between gopher tortoise body size and burrow width/age, burrow size class distribution data are obtained during the comprehensive surveys. Boundaries have been drawn around mapped concentrations of tortoises. Each group of burrows was defined as a burrow cluster. Clusters are primarily delineated for devising management options. No attempt to group burrows using stringent behavioral or spatial criteria were made. Quite simply, the clusters are recognized for accounting and management purposes. Presently, gopher tortoise burrows on Point Washington are grouped into 33 clusters. Management recommendations for each gopher tortoise cluster are being formulated, along with a status report from this year's survey.

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. The Mitigation Park Program currently consists of nine facilities comprising 9,753 acres (3,950 ha). FWC has mitigation park partnership agreements with Orange, Osceola, Lee, Hillsborough, and Manatee Counties. The most recent addition (via a perpetual conservation easement) to the Mitigation Park Program is a 672 acre (272 ha) tract of gopher tortoise and Florida scrub jay habitat in Manatee County.

Most management activities at Mitigation Park Program facilities are intended to benefit the gopher tortoise and its habitat. Primary activities include population monitoring, habitat

assessment, and habitat enhancement. During this reporting period, triennial gopher tortoise density (individuals/unit area) assessments were conducted at Perry Oldenburg Mitigation Park (POMP) Wildlife and Environmental Area (WEA) [1.0/ac (2.47/ha)], Branan Field Mitigation Park (BFMP) WEA [1.75/ac (4.32/ha)], Hickey Creek Mitigation Park (HCMP) WEA [1.27/ac (3.14/ha)], Bullfrog Creek Mitigation Park (BCMP) WEA [1.05/ac (2.59/ha)], and Fort White Mitigation Park (FWMP) WEA [1.34/ac (3.31/ha)]. The overall estimated gopher tortoise density at the five surveyed facilities was 1.28 individuals/ac (3.17 individuals/ha). No significant mortality events were observed. Standard habitat assessments were conducted at POMP, Split Oak Forest Mitigation Park (SOMP) WEA, HCMP, Platt Branch Mitigation Park (PBMP) WEA, and BCMP.

As part of a multi-year sandhill restoration project at POMP, 60,000 wiregrass plugs were planted on 88 acres (36 ha) of degraded sandhills to facilitate herbaceous ground cover recovery. An additional 25 acres (10 ha) of hardwood-dominated sandhills were thinned by mechanical and herbicide treatments. This action brings the total enhancement area of POMP 113 acres (46 ha), or 30% of the site.

At BCMP, 40 acres (16 ha) of pastures were roller chopped to reduce shrub densities and promote herbaceous ground cover for gopher tortoise foraging. An additional 115 acres (47 ha) of scrubby and mesic flatwoods that were roller chopped at HCMP and PBMP for Florida scrub jay (*Aphelocoma coerulescens*) and red-cockaded woodpecker (*Picoides borealis*) habitat enhancement provided secondary benefits to gopher tortoise habitat.

Research on upper respiratory tract disease (URTD) impacts on gopher tortoise populations at FWC mitigation parks continued during this reporting period. As part of a multi-year grant from National Science Foundation, the University of Florida (UF) continued its work to understand the relationship between URTD and gopher tortoise population dynamics and health, with special emphasis on the impact of anthropogenic effects such as relocation practices and habitat alteration on disease transmission. During this reporting period, UF conducted gopher tortoise health assessments and habitat analyses at POMP and BFMP.

For additional information on gopher tortoise management at FWC mitigation parks, see the "FWC Mitigation Park Program Fiscal Year (FY) 2003-2004 Annual Report" on file at the Kissimmee Field Office, which can be reached at 407-846-5300.

Consequences of Upper Respiratory Tract Disease (*Stuart Cumberbatch*).--In a study funded by the FWC, Dr. Earl McCoy and Dr. Henry Mushinsky from the University of South Florida completed work on the final product for the study "Population Consequences of Upper Respiratory Tract Disease on Gopher Tortoise." This study resurveyed ten populations, collecting blood samples to determine serum levels that can be linked to chronic stress. It is believed that an increase in stress levels could compromise the animal's ability to recover from URTD. Results will be published and made available at a future date.

Herpetofaunal Monitoring Project on Wildlife Management Areas

Searching for Listed Species on Specific WMAs (*Dawn Johnson*).--In 2001, FWC staff began a herpetofaunal monitoring project on Arbuckle Wildlife Management Area (WMA) in cooperation with the Florida Division of Forestry (FDOF). In 2003, this project was expanded to include sites on Walk-in-the-Water WMA. These WMAs contain habitat that is critical to federally listed species such as sand skinks and blue-tailed mole skinks as well as the state listed gopher frog. The purpose of this project is to complete an inventory of the species on these WMAs and to track temporal trends in the rare species present.

Six trapping arrays were established on Arbuckle WMA (three in scrub, three in sandhill habitats), while three arrays were established in sandhill habitats on Walk-in-the-Water WMA. Each trapping array consisted of four metal drift fences with a box funnel trap placed in the middle. Eight 5-gallon pitfall traps were placed on either side of each arm in the middle and eight screen funnel traps were placed on either side of each arm at the distal end. Data recorded included species, age, sex, length and mass.

On Arbuckle WMA, 39 herpetofaunal species have been captured over the course of this project. An average of 1.1 reptiles and amphibians were captured per array day in Fall 2003, while 1.2 reptiles and amphibians were captured per array day in Spring 2004. Twenty different species of herpetofauna were captured during this period. At Arbuckle WMA, an average of 0.31 federal or state listed animals have been captured per array day over the course of this project, while 0.59 listed animals were captured per array day at Walk-in-the-Water WMA since trapping began there. The species inventory obtained as a result of this project shows that Arbuckle and Walk-in-the-Water WMA's contain a wide diversity of herpetofaunal species and provide important habitat to several rare species. Walk-in-Water WMA appears to support an even greater population of rare herpetofaunal species than Arbuckle WMA.

Questions about either of these two monitoring efforts can be directed to Dwight Myers at 863-635-4481.

Marine Turtles

Management Activities (*Robbin Trindell*).--Under the Florida Marine Turtle Protection Act (Florida Statute 370.12), the Florida Legislature indicated its intention to ensure that the FWC had the authority and the resources to implement the state's responsibilities under the United States Fish and Wildlife Service's (USFWS) Recovery Plans for five species of marine turtle: loggerhead, green, leatherback, hawksbill, and Kemp's ridley. To this end, staff works 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 participates in the review of ongoing and proposed human activities that could impact marine turtles and their nesting and foraging habitats, and in public education about marine turtles. FWC Marine Turtle Protection and Research Programs are fully supported by proceeds

from the sale of the marine turtle license plate and a marine turtle decal, and Federal section 6 funds.

Regulatory Permit Review - During Fiscal Year (FY) 2003-2004, staff reviewed approximately 269 requests for comments from the Florida Department of Environmental Protection's (DEP) District Offices, DEP's Bureau of Beaches and Coastal Systems, and the State Clearing House. Final recommendations for activities in marine turtle nesting and foraging habitat were provided for approximately 141 state permits.

Adaptive Management - FWC staff reviews monitoring from beach regulatory projects, including beach nourishment, summarizes this information, and recommends modifications to existing procedures to reduce unnecessary monitoring, to revise construction techniques for turtle protection or to reduce impacts to marine turtles, their nests, hatchlings and nesting habitat from successive projects. During FY 2003-2004, local governments and conservation organizations submitted a total of approximately 40 reports for review from completed or ongoing projects.

Marine Turtle Permit Program - Staff reviewed and approved approximately 160 applications for conservation activities with marine turtles, including nesting beach surveys (90 permits), stranding and salvage work (99 permits), research (38 permits), public turtle walks (28 permits), rehabilitation at captive facilities (15 permits) and educational display (18 permits).

Captive Facilities - A total of 26 captive facilities were authorized to rehabilitate marine turtles or to hold loggerhead and non-releasable turtles for research and educational display in Florida. Of these 26 facilities, three were inspected by FWC staff. Staff coordinated transfer and release of marine turtles during rehabilitation and participated in the annual Marine Turtle Rehabilitation workshop held at Hidden Harbor Sea Turtle Hospital. Staff presented a summary of five years (1999-2003) of captive facility data at the 24th Annual Symposium on Sea Turtle Conservation and Biology held in San Jose, Costa Rica.

Outreach and Education – FWC staff hosted the 2004 Marine Turtle Permit Holder Workshop, co-sponsored by Walt Disney World's Animal Kingdom, for approximately 300 Marine Turtle Permit holders and volunteers. This two-day event included approximately eleven presentations by agency management and research staff, conservation organizations, and local governments as well as summaries of Marine Turtle Grant projects.

Staff initiated 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 Volusia County, Franklin County, and the Florida Local Environmental Resource Agencies, Inc. (FLERA) organization. To date, approximately 197 individuals have taken the exam, which tests participant's knowledge of sea turtle behavior and specific lighting fixtures. Approximately 94% of individuals attending the course passed this exam.

Interagency Coordination – FWC staff were invited to participate as an expert for The Nature Conservancy's (TNC) "Marine Ecoregional Assessment for Central and South Florida". Staff also coordinated with the National Marine Fisheries Service (NMFS) to acquire, distribute, and conduct training in the use of various mouth gags and dehooking devices for marine turtles. Staff served on the following teams, working groups, and committees: Archie Carr Sea Turtle Refuge Working Group, DEP's Turtle Friendly Berm Working Group, the Marine Turtle Grants Committee, and FWC's Shorebird Issue Team.

For more information on the FWC's Marine Turtle Protection Program, visit the following web site at http://www.myfwc.com/psm/turtles/turtletemplate2.htm. Questions about Marine Turtle Permits, regulatory permit review, or education can be directed to the Imperiled Species Management Biological Administrator for the Marine Turtle Protection Program at 850-922-4330.

Marine Turtle Research (*Anne Meylan*).--Salvage, Rescue and Necropsy – FWC staff coordinated the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program administered by the NMFS. A total of 1527 dead or debilitated sea turtles were documented in Florida from 1 July 2003–30 June 2004. By species, there were 882 loggerheads, 459 green turtles, 90 Kemp's ridleys, 33 hawksbills, 30 leatherbacks, and additional 33 sea turtles not identified to species. Staff reviewed, edited, and entered all submitted STSSN reporting forms, responded to or coordinated the response to more than 900 reports of dead or debilitated sea turtles, and conducted gross necropsies on approximately 150 of the carcasses. Staff conducted five workshops to train STSSN participants in standardized data collection methodology. Florida stranding updates were provided weekly to NMFS for incorporation into the Sea Turtle-Shrimp Fishery Management Report. Detailed Florida stranding reports were generated weekly and monthly. Staff produced a peer-reviewed article based on work conducted through the STSSN. That article is in press for the Journal of Wildlife Diseases and is entitled "Fibropapillomatosis in Stranded Green Turtles (*Chelonia mydas*) from the Eastern United States (1980-1998): Trends and Associations with Environmental Factors".

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 nesting population is one of regional significance. FWC assesses nesting abundance and reproductive output by monitoring nesting beaches via a coordinated network of state, federal and volunteer permit holders. 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 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 2003, 186 survey areas were monitored, comprising 808.4 miles (1301 km) of beaches. This program documented a total of 63,446 loggerhead nests, 2,262 green turtle nests, 842 leatherback nests, and one Kemp's ridley nest. FWC disseminates results of the Statewide Nesting Beach Survey Program through scientific publications, presentations, reports, the Internet, and the CD entitled "Florida Atlas of Marine Resources."

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 (0.8 km) beach zone. Nests and nesting attempts have been monitored for 15 years at 480 index beach zones surveyed daily during each 109-day season, an effort that currently provides approximately 5 million records in the Index Nesting Beach Database. Annual surveyor training, on-site verification, and consistency of the methods used during the 15 years of the program and among the 247.5 mi (398 km) of index beaches make the resulting database a representative and unbiased assessment of sea turtle nesting. The program provides a reliable indication of temporal and spatial trends in Florida sea turtle abundance.

FWC assessed marine turtle habitat suitability through data collected on coastal armoring structures and other barriers to nesting. Data were collected in 2002 and 2003, compiled, verified, plotted in ArcView, analyzed, and reported with conclusions about the extent of Florida beaches available for marine turtle nesting. In this inventory of coastal armoring and barriers to nesting, FWC staff has mapped all structures that could be barriers to sea turtle nesting on approximately 450 miles (724.2 km) of index nesting beaches and additional randomly selected stretches of turtle nesting beach around the state. Randomly selected stretches were split into ten 5 mile (8 km) stretches of beach in each of four regions of the state (i.e., Northeast, Southeast, Southwest, and Northwest).

Biology, Ecology, Life History, Migration - 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, Florida Bay, the Key West National Wildlife Refuge (NWR), Bermuda, and Panama involve capturing live animals at sea. Studies target four species of marine turtles and several life history stages, and address population structure (including natural sex ratios), growth rates, genetic identity, life history, health, diet, habitat preferences, and migrations.

FWC research on the early neonate dispersal stage is critical to understanding and managing threats to marine turtles as they leave Florida waters and circulate throughout the North Atlantic. In 2003, FWC captured 170 neonate loggerheads, one neonate green turtle, and one 8 in (20 cm) straight carapace length, pelagic hawksbill during excursions to the Western Gulf Stream off Central Florida. Staff recorded physical oceanographic measurements, turtle behavior, the relationships of turtles to floating objects and other organisms, turtle weights and measures, and evidence of ingested plastics and tar. The data help describe the importance of

certain oceanographic surface features to young sea turtles and help researchers understand threats to sea turtle survival that occur there.

In March 2003, 20 loggerhead turtles were captured during a five-day sampling session in Florida Bay. All animals were measured and tagged. Five were released shortly after capture and 15 were transported to the Keys Marine Laboratory for further study. Ultra sound evaluations on all the turtles and laparoscopic examinations on the male turtles were conducted to determine their reproductive status. Satellite and sonic transmitters were placed on four of the adult males and one of the adult females to document reproductive movements and diving behavior. In June 2003, 83 loggerheads, one green turtle, and one Kemp's ridley were captured during an eight-day sampling session in Florida Bay. Twenty-three of the turtles had been previously marked, providing data on growth and residency in Florida Bay. Related to the Florida Bay project, collaborative assessments of turtle abundance in the Key West NWR between FWC and the In-Water Research Group took place July 12-16 and August 30-31 during which 68 loggerheads, 75 green turtles, seven hawksbills, and one unidentified species were sighted and/or captured.

As part of a cooperative research project with the government of Bermuda, 107 green turtles were captured in nets, tagged and released during 2003. Over 2700 green turtles have been tagged as part of this project, which has been ongoing since 1968. Deoxyribonucleic acid (DNA) sequence data have shown that the one-third of the population of immature green turtles that inhabit Bermuda waters is derived from Florida nesting beaches. Captures of flipper-tagged turtles 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, staff co-taught a course on the Biology and Conservation of Sea Turtles to nine resource managers and students drawn from Anguilla, the British Virgin Islands, the Turks and Caicos Islands, Grenada, St. Lucia, the Cayman Islands, and the United States.

Data on sex, size, maturity, and genetic identity were collected from 17 green turtles, three loggerheads and 12 hawksbills captured in nets or on the nesting beach at Zapatilla Cays, Panama. Captures of flipper-tagged turtles from this project have documented migrations to feeding grounds in Nicaragua, Costa Rica, Colombia, and Cuba. Genetic studies indicate that many loggerhead sea turtles captured in tropical lagoons in Panama were born on Florida nesting beaches.

A collaborative effort between FWC and the Archie Carr Center for Sea Turtle Research to genetically sample loggerheads from Index beaches was begun with FWC staff sampling skin biopsies from 150 turtles from Brevard County.

Staff conducted five training workshops around the state for permit holders who conduct surveys of turtle nesting beaches and assist with sea turtle stranding and salvage activities. FWC staff served on several scientific advisory committees, journal editorial boards and governing boards. At a meeting sponsored by Caribbean Conservation Corporation (CCC) and the Ocean

Conservancy on "Getting to know your neighbors: A day with Florida's sea turtles," staff presented a seminar entitled "Rough around the edges: Coastal issues affecting sea turtles." Staff served on the USFWS and NMFS loggerhead recovery team and participated in drafting an updated recovery plan for the loggerhead sea turtle. Staff also served on the Archie Carr Refuge working group and on the graduate committees of students at the University of Florida (UF) and Florida Atlantic University (FAU). Staff reviewed numerous research proposals for staff and all research-related proposals submitted for consideration by the small grants program of the Florida Sea Turtle License Plate. For educational outreach, staff gave presentations to school groups at MarineQuest. In addition, the following website, http://research.myfwc.com was updated with new articles, interviews, data, and video footage of research activities and turtle nesting in order to broaden educational outreach and improve efficiency in Florida's sea turtle data distribution.

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

Imperiled Fish

Statewide Survey of Imperiled Fish (*Gray Bass*).--The FWC recently completed a statewide survey of imperiled fishes. The investigation was cooperatively funded by the USFWS and FWC. A final report on this project is currently being compiled, thus the following species-summaries should be considered preliminary findings. The intent of the Florida Imperiled Fish Species Investigation was to survey the state for presence, distribution, and relative abundance of vulnerable fish and to implement long-term monitoring programs. At the beginning of the project the current status, or population trends, of many imperiled fishes of Florida was unknown. Much of the data concerning fish presence and distribution was obsolete and relative abundance of most species was unknown. With the exceptions of federally conducted projects related to Gulf sturgeon and Okaloosa darter, no on-going monitoring currently exists for imperiled fish in Florida. Although the study included numerous rare species that are not officially listed, only listed species are summarized herein.

During the study, imperiled fish were collected throughout the state from 783 sites, ranging from the Perdido River in the northwestern Panhandle to the Florida Keys. Specimens were obtained of most of Florida's vulnerable freshwater fish and future monitoring of imperiled fishes may be pursued at sites visited by this project.

Blackmouth shiner (*Notropis melanostomus*) - Blackmouth shiners were collected at 21 locations. They maintain viable populations in a number of backwaters off the Blackwater River and its tributary, Pond Creek, near Milton, Florida. Presence of blackmouth shiners in the Yellow River system was reconfirmed by this project (three samples), and additional efforts should be made to define relative abundance and distribution in that drainage. Because of its habit of random schooling in or near dense vegetation in backwaters, this species will be difficult to monitor quantitatively. The schools are easy to locate visually, and may be collected with dip nets. However, with reasonable effort it would be possible to decimate local populations by this

method. Therefore, we suggest this species be monitored by visual observations of schools within known habitats, a few individuals selectively taken by dip net, and the remaining number visually estimated. Presence of a school is sufficient evidence of a viable population for a given backwater. Existence of a number of schools distributed among several well-separated backwaters would confirm species viability throughout the drainage. Long-term monitoring sites may be established from results of this study and from sites sampled by Bortone (1993). Backwaters of the adjacent Escambia and Perdido rivers should also be further examined for presence of blackmouth shiners, to determine whether additional populations exist in Florida. Due to environmental threats within the lower Blackwater River drainage, primarily associated with rapid urbanization and development of the Milton urban area, the species should retain its' endangered status until substantial populations have been located in other drainages.

Bluenose shiner (*Pteronotrophis welaka*) - In Florida, bluenose shiners exhibit a disjunct distribution, with populations scattered throughout the northwestern section of the state and another in the St. Johns River drainage of eastern Florida. Bluenose shiners were collected from 21 sites in northwestern Florida, but were not observed in the St. Johns River system. They occupy a variety of habitats, but typically prefer sites where water flow is sluggish, deep holes are nearby and submersed aquatic vegetation is present. Drainages harboring bluenose shiners included the Escambia, Choctawhatchee, and Yellow rivers. Failure to locate a population within the Apalachicola River system was surprising. As with the blackmouth shiner, the difficulty of sampling some habitats occupied by bluenose shiners precludes quantitative monitoring at most sites. Some localities (e.g. Nichols Creek, in the Yellow River system) may be monitored by boat electrofishing. Other sites should be sampled for presence/absence, using appropriate methods for the site (seines, backpack electrofisher, dip nets). During the breeding season populations may be located visually by observing the blue-nosed males. Due to the fact that unexplained absence of bluenose shiners at sites where they have been known to occur is a common phenomenon, monitoring staff should not accept absence at a site as evidence of permanent extirpation without repeated sampling, conducted over several years. The current classification as a Species of Special Concern should be maintained, as a means of preventing over-exploitation by hobby or commercial collectors.

Key silverside (*Menidia conchorum*) - This threatened marine species is restricted to the Florida Keys. Sampling in the Keys failed to collect any Key silverside. As with many marine and estuarine species of unknown rarity, the distribution and abundance of this species should be the subject of an intensive, widespread investigation. It proved to be beyond the scope and logistical ability of the project to adequately sample the vast complex of habitats in the Florida Keys and Florida Bay. An appropriate next step in the conservation of Florida fishes should be an investigation of the conservation status of marine and estuarine fishes. Such a study would reveal information on the status of two other listed species that occur in the keys, the Rivulus (*Rivulus marmoratus*) and the Key blenny (*Starksia starcki*), both listed as a Species of Special Concern. Though not specifically targeted by this study, these species were searched for while sampling in the Florida Keys, without success.

Saltmarsh topminnow (*Fundulus jenkinsi*) - Currently classified by the state as a Species of Special Concern, this fish of low salinity estuaries occurs from Texas to northwestern Florida.

Saltmarsh topminnows were collected by staff from 15 sites in the Pensacola Bay and Perdido Bay systems. None were taken from the adjacent Choctawhatchee Bay system. Collections taken by the Imperiled Fishes project indicate this species is not as rare as has been assumed. Although populations are localized, they may be monitored by seining and/or dip netting at sites visited by this project. Saltmarsh topminnows are usually not abundant at any site, and may best be monitored on a presence/absence basis, and their vulnerability assessed by the number of sites at which they are found. This topminnow was collected at brackish sites, where emergent marsh vegetation exists. Long-term survival of this species likely depends on proper salinity regimes and persistence of marsh vegetation. The Pensacola Bay and Perdido Bay ecosystems are known to have substantial environmental problems. Actions to preserve existing emergent vegetation would likely benefit this species. This species may warrant consideration for delisting from the Florida endangered and threatened species list; however, its close ties to marsh vegetation and estuarine conditions may warrant further investigation. As the areas of distribution in Florida (Pensacola and Perdido bay systems) are affected by environmental problems, including losses of aquatic vegetation and water quality issues, this topminnow may serve as an environmental indicator species for these estuarine systems.

Lake Eustis pupfish (*Cyprinodon variegatus hubbsi*) - Currently listed as a Species of Special Concern by the state, this subspecies of the common marine and estuarine sheepshead minnow is landlocked into lakes forming the headwaters of the Ocklawaha River. Project personnel readily collected Lake Eustis pupfish from 10 sites in these eight lakes of central Florida. They may be efficiently collected by seining and may be monitored with standard seine hauls at locations visited by this project. Lake Eustis pupfish are abundant within their historical range and have adapted to anthropogenic environmental stresses in these lakes. This subspecies does not appear to be imperiled and may warrant re-evaluation for listing.

Suwannee bass (*Micropterus notius*) - Suwannee bass are endemic to the Suwannee and Ochlockonee river systems of Florida and Georgia, and the species has been introduced into the St. Marks River system, presumably by anglers. They were collected from the Suwannee, Santa Fe, St. Marks and Ochlockonee rivers by the Imperiled Fishes project. Suwannee bass were readily collected from the Suwannee River system, especially the Santa Fe River, where the largest native population occurs. Suwannee bass have successfully colonized the St. Marks River system, where they are now abundant. They may be quantitatively monitored by electrofishing at selected stations in the Santa Fe, Ochlockonee and St. Marks rivers. Populations in the Suwannee River proper should be assessed by FWC biologists during routine fishery investigations. Historical records, and fishery surveys by the FWC, indicate this species has always been uncommon in the Ochlockonee River. Sport fishing for this species is still permitted and has no detrimental effect on populations in the Suwannee River drainage; however, fishery biologists should periodically assess fishery impacts. The current minimum-size limit of 12 in (30 cm) total length imposed on bass harvested in this section of the state should protect this species from over-exploitation, as most individuals are less than this length. Although Suwannee bass do not appear to be threatened at present, they should remain on the FWC list as a Species of Special Concern.

Shoal bass (*Micropterus cataractae*) - Until recently shoal bass were considered an undescribed species related to the similar redeye bass. Shoal bass are endemic to the Apalachicola River drainage of Florida, Alabama and Georgia. They were readily collected from 10 sites in the Chipola and Apalachicola rivers by electrofishing and may be quantitatively monitored by standardized electrofishing. Shoal bass are closely associated with limestone shoals, and their long-term survival depends upon preservation of this habitat and prevention, or reduction, of pollution in the Chipola River. As the bulk of the Chipola River population lies downstream from the city of Marianna and Interstate Highway 10, shoal bass are vulnerable not only to general water pollution, but also to catastrophic chemical spills. Shoal bass may have been more abundant in the Apalachicola River prior to dredging and removal of limestone shoals for commercial vessel traffic; however, localized populations still exist. Sport fishing is still allowed for this species and apparently has no adverse effect upon populations; however, this fishery has not been critically examined. The current minimum-size limit of 12 inches (30 cm) total length imposed on bass harvested in this section of the state should protect this species from over-exploitation, as most individuals are less than this length. It would be desirable to conduct creel surveys and population studies to determine fishery characteristics. Because of their limited range in Florida, specific habitat requirements, and vulnerability to pollution, shoal bass should remain on the FWC's protected species list as a Species of Special Concern and should be routinely monitored.

Crystal darter (*Crystallaria asprella*) - In Florida, the crystal darter is only known to occur in the Escambia and (apparently) Perdido rivers. The Escambia River and tributaries have been sampled by fishery biologists of the FWC since 1977 without obtaining specimens. They are, however, known from the Alabama section of the Conecuh River. Recently, Walsh, et al. (2003) searched unsuccessfully for this species during an extensive one-year survey of the Escambia River. Staff also intensively sampled the Escambia River in search of this darter, finally collecting two specimens from the upper river, by boat electrofishing, in December 2003. These were the first collected in Florida since 1974. Subsequently, three additional individuals were collected from the same site in February 2004. Seining of sand and gravel bars, during both day and night, proved unproductive in sampling for this species. It is unlikely any suitable habitat has been overlooked, confirming the rarity of this fish in Florida. Considering observed scarcity, routine, quantitative monitoring may not be feasible, and this species will have to be monitored from presence/absence information. If additional occurrence data is desired, it should be collected from the upper Escambia River, by intensive electrofishing, targeting this species alone. FWC staff and other biologists should carefully examine darters collected during routine operations, to determine whether additional individuals exist. Our data strongly supports consideration of reclassifying this species from Threatened to Endangered, a conclusion reached previously by Walsh et al. (2003).

Harlequin darter (*Etheostoma histrio*) - In Florida, the harlequin darter is only known to occur in the Escambia River system, and is currently classified as a Species of Special Concern. Harlequin darters may be reliably collected by backpack electrofishing in snag habitats, as the darters position themselves directly upon submerged woody debris, typically snags, in flowing, usually swift, water. Such habitats are often difficult to sample and sampling efforts cannot be readily quantified by distance or time sampled. They have also been collected by seining,

backpack electrofishing, and boat electrofishing in the main channel of the Escambia River and some of its smaller tributaries. The Imperiled fishes project collected harlequin darters at eight sites, all in the Escambia River system. They have been collected from both small creeks and large rivers, in both snag and sand-gravel habitats. Most harlequin darter habitats do not lend themselves to quantitative sampling, thus it may best be monitored by presence/absence sampling at known sites. Possibly, the number of darters collected per snag or other instream structures, could be employed as a surrogate unit of abundance. During the course of this project, the major Florida population was located in Big Escambia Creek. A substantial tributary of the upper Escambia River near the Florida – Alabama border, this stream catastrophically abandoned its natural channel a number of years ago, and efforts are underway to redirect it into its original course. Although restoration of the creek to its proper floodplain channel will benefit the riverine ecosystem, the impact of snag removal during this restoration will be detrimental to harlequin darters. Preliminary observations suggest harlequin darters use snags as spawning sites, thus excessive snag removal will reduce numbers of this species. Currently, harlequin darters are relatively uncommon and have a very limited distribution in Florida. The key to maintenance of harlequin darter populations in Florida is preservation of in-stream structure, especially snags.

Southern tessellated darter (*Etheostoma olmstedi maculaticeps*) - The tessellated darter ranges from Canada southward along the Atlantic Coast to northeastern Florida. The southern subspecies ranges from North Carolina southward to the St. Johns River drainage of Florida. However, the St. Johns River population is disjunct from the northern distribution of the subspecies. Within the St. Johns River drainage, tessellated darters occur only in the Ocklawaha River system. Previously, FWC personnel collected tessellated darters from Orange Creek, and Florida Department of Environmental Protection (DEP) workers also collected specimens from Eaton Creek. Both creeks are tributaries of the Ocklawaha River. Southern tessellated darters were subsequently collected by staff from the Ocklawaha River proper and from Orange Creek, but not the Eaton Creek site. The Orange Creek population could be monitored by standardized backpack electrofishing procedures at the site visited by the project, and the Ocklawaha River population could be assessed by standardized boat electrofishing. Future collectors should be careful not to decimate the Orange Creek population by over-sampling, as this appears to be the best remaining assemblage in Florida. In terms of absolute numerical abundance and geographical range, tessellated darters are rare in Florida, where much of its original habitat was destroyed by construction of Rodman Reservoir. Preservation of in-stream habitat and water quality within the Ocklawaha River valley will be essential for the maintenance of limited, but viable populations. Fortunately, although their small-stream habitat is restricted, they also occur within the main channel of the Ocklawaha River, where they may be less vulnerable to environmental degradation. The size and geographic extent of the main channel population is unknown and would merit further investigation. Though currently listed as a species of special concern, the tessellated darter may warrant consideration for reclassification to a threatened species.

A final report on this project is currently being compiled, thus the preceding species-summaries should be considered preliminary. Once final, the report will be available at

http://myfwc.com/fishing/pdf/ImperiledFishReport.pdf. Questions about this report can be directed to the Division of Habitat and Species Conservation, Fish Coordinator at 850-957-6175.

Sponsored Imperiled Fish Projects (*Stuart Cumberbatch*).--Dr. Stephen Walsh of the United States Geological Survey (USGS), Florida Caribbean Science Center completed field work and submitted the final report for his project "A Distribution of the Crystal Darter (*Crystallaria asprella*), River Redhorse (*Moxostoma carinatum*), and Cypress Minnow (*Hybognathus hayi*)." Literature and field surveys were conducted to gather and present details on the current distribution and life history of the fish species, with particular emphasis being placed on surveying and collecting data from the Escambia River system in Northwest Florida.

Dr. Mike Allen of the University of Florida (UF) completed the "Shoal Bass Microhabitat Study in the Upper Chipola River, Florida" project and finalized the final report. Through this grant, previously unstudied microhabitats of the shoal bass, a recently described species restricted primarily to the upper Chipola River, were located and characterized. Emphasis was placed on the identification of nursery areas for young-of-year fishes, and the development of habitat-based models and Geographic Information System (GIS) maps useful for this species' long-term conservation.

Copies of the reports addressed in the above paragraphs may be requested via e-mail to BWDCPUBS@myfwc.com. This same location will provide current list of Scientific and Technical Publications produced by the Nongame Wildlife Grants Program.

Pillar Coral

Assessment and Status (*Walt Jaap*).--Corals are at risk from multiple stressors (Pew Ocean Commission, 2004, United States Commission on Ocean Policy, 2004). The pillar coral (*Dendrogyra cylindrus*) was listed as endangered by Florida, but not by the federal Environmental Protection Agency (EPA). Because of the concerns over the precipitous losses in corals in the past several decades, the FWC initiated a long-term monitoring program. Details on monitoring can be found in the "EPA/National Oceanic and Atmospheric Administration (NOAA) coral reef evaluation and monitoring project, 2002 executive summary, July 2003" available at http://floridamarine.org/engine/download_redirection_process.asp?file=2002_cremp_exec_summar_4623.pdf&objid=21400&dltype=article. The FWC monitors all species of zooxanthellate scleractinian corals at multiple sites off southeast Florida. Studies were initiated in 1996 and continue through 2004. Work is supported by grants from the EPA and NOAA; FWC staff salaries also contribute to this work. FWC and contractors collect data annually on the presence/absence and percent cover of the scleractinian corals at 54 monitoring sites.

The trend for pillar coral between 1996-2003 was that it occurred consistently at two sampling sites: Conch and Sand Key Reefs. Cover (percent of the surface area covered by the species in the sampling stations) decreased at Conch Reef (11.77%. in 1996 and 3.66% in 2003). Little change was observed at Sand Key Reef (1.75% in 1996 and 1.81% in 2003). Losses appear to be caused by a disease that infected the coral colonies at Conch Reef.

FWC staff participated in conservation activities for reefs and corals at the state, regional, and international level. This included attending and participating in meetings, symposia, workshops, and action committees. In 2003/2004, the activities included several meetings with the Gulf of Mexico and South Atlantic Fisheries Management Councils, the Florida Keys National Marine Sanctuary Water Quality Protection Program's Steering Committee and Technical Advisory Committee, The Southeast Florida Coral Reef Initiative Taskforce, and The Second International Deep Sea Coral Symposium. For more information on corals, visit http://floridamarine.org/features/view_article.asp?id=21400.

Miami Blue Butterfly

Recovery Efforts (*Ricardo Zambrano*).--The Miami blue butterfly (*Cyclargus* [= *Hemiargus*] *thomasi bethunebakeri*) received emergency listing as an endangered species in Florida on December 10, 2002 by the Executive Director of the Florida Fish and Wildlife Conservation Commission (FWC), under Rule 68A-27.003(1), Florida Administrative Code (F.A.C.) to prevent imminent extinction. The agency's commissioners directed staff to develop a species management plan which was drafted and approved by the Executive Director in October 2003, and endorsed by FWC at the November 2003 Commission meeting. This plan can be viewed at http://wildflorida.org/imperiled/pdf/Miami-Blue.pdf. As required in the management plan, FWC created the Miami Blue Butterfly Working Group (MBBWG) to exchange information between agencies, managers, biologists, mosquito control districts, and private landowners.

The MBBWG is comprised of several government agencies and non-profit organizations including the FWC, the United States Fish and Wildlife Service (USFWS), University of Florida (UF), Florida Department of Environmental Protection (DEP), National Park Service (NPS), Monroe County Mosquito Control District, Miami-Dade Parks and Recreation, Miami-Dade Mosquito Control, and the North American Butterfly Association. In the future, other organizations will be invited to join as is appropriate. From the groups' inception through June 2004, four meetings have occurred to discuss management achievements and failures, captive propagation techniques, reintroduction and monitoring progress, regulatory issues, and other topics deemed necessary.

Reintroduction efforts began in May 2004, lead by staff from UF, with funding from the FWC and USFWS. Between May and July 2004, FWC staff assisted UF with the release of 991 individuals at ten sites within Everglades National Park and one site within Biscayne National Park. Post monitoring of reintroduction sites by UF and FWC staff has yielded encouraging results for the eventual re-establishment of the species. Recent monitoring has found that reintroduced individuals are persisting in the environment and proliferating over time. Eggs, larvae, adults, and larval feeding damage have all been documented at the majority of the reintroduction sites.

FWC is funding UF to continue captive propagation, reintroduction, and post-release monitoring of Miami blues. Additionally, FWC is currently funding a study to determine the effects of mosquito adulticides on the Miami blue butterfly adults and larvae.

The formation of the MBBWG by FWC as well as assistance in the reintroduction and post-monitoring have provided the framework for a successful collaborative effort of many organizations working towards the recovery of the Miami blue butterfly. It is hoped these actions will serve as a model for future cooperative efforts to recover endangered species. For more information on the Miami blue butterfly, please contact the South Region's nongame biologist at 561-625-5122.

Panama City Crayfish

Conservation Efforts (*Karen Lamonte*).--The Panama City crayfish (*Procambarus econfinae*) is one of 30 endemic or near endemic species of crayfish in Florida. It is an inhabitant of wet pine flatwoods and is only known from a portion of Bay County in and around Panama City. The Panama City crayfish has been listed as a Species of Special Concern since 1989.

In August 2001 the Florida Fish and Wildlife Conservation Commission (FWC) received a petition to review the listing status of the Panama City crayfish. A comprehensive assessment of the biological status of the Panama City crayfish was undertaken. The biological assessment found that the Panama City crayfish meets the criteria for listing as a Threatened species. Final action has not been taken on the listing of this species and it remains listed as a species of special concern.

A species management plan was developed for the Panama City crayfish. The plan was completed and approved in October 2003, and is available at http://wildflorida.org/imperiled/pdf/PCC.pdf. The conservation goal of the management plan is to ensure the long-term survival of the Panama City crayfish in the wild, and the conservation objective is to secure and maintain sites with the Panama City crayfish throughout at least a 40 square mile area, while simultaneously increasing the net number of known sites. Implementation of the management plan was initiated after the management plan was completed. Initial work has focused on bringing a stakeholder group together to discuss the management plan and key issues.

For more information on the biological status report, management plan, or plan implementation, please contact the Species Conservation Planning Section at 850-488-3831.

COORDINATION AND TECHNICAL ASSISTANCE

Program Summary (*Dan Sullivan*).--Endangered species coordination involved overseeing, monitoring, facilitating and otherwise organizing endangered species projects and research; ensuring adherence to federal and state reporting and documentation requirements and

guidelines; implementing or facilitating protection through technical assistance, regulatory measures, and permit review; providing or facilitating consultation and technical assistance to private interests and interacting with state and federal agencies, conservation organizations and others regarding a wide range of endangered species matters. Mr. J. Daniel Sullivan, Jr. was principally responsible for such duties as the Endangered Species Coordinator and Protected Species Section Leader.

Funding for coordination was jointly derived from the USFWS via Section 6 of the Federal Endangered Species Act of 1973, the Nongame Wildlife Trust Fund (NGWTF) and the Florida Panther Research and Management Trust Fund (FPRMTF). Coordination included initiating and/or responding to correspondence dealing with various endangered species issues, processing numerous requests for endangered species information and representation of the FWC at various meetings and conferences. All endangered species activities funded from federal sources were monitored and overseen, and annual reports were prepared to document their progress. FWC representation on the Florida Panther Interagency Working Group and the USFWS's Whooping Crane, Bald Eagle, manatee, Florida Scrub Jay and Florida Panther Recovery Teams was maintained. Technical assistance in endangered species matters was provided to a number of state and federal agencies, consulting firms, private individuals and local regulatory authorities. All aspects of the Section 6 Cooperative Agreement were maintained, and the necessary paperwork for renewing this agreement was submitted.

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

CRITICAL WILDLIFE AREAS

Program Summary (*Nancy Douglass*).--Critical Wildlife Areas (CWAs) are established by the FWC to protect wildlife concentrations from human disturbance during critical nesting, feeding or resting periods (68A-19.005). The areas are defined in establishment orders and are closed to human entry during the period of time defined in the order. The five FWC regional nongame biologists are responsible for evaluating potential CWAs, drafting rules for their establishment, modification or deletion, and administering their posting and maintenance each year.

During FY 2003-2004 designated sites were monitored by biologists and signs posted seasonally to advise the public of the importance of the CWA. Protection efforts were coordinated with local government, other agencies, organizations and FWC law enforcement personnel. Seventeen of the 21 established CWAs supported varying amounts of nesting, resting or feeding habitat during the year (Table 6). All the active CWAs supported listed species, the most notable of which included: Bird Island (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); Big Marco Pass (least terns, black skimmers, plovers and wintering shorebirds); and Pelican Shoal [the primary United States nesting site for the Caribbean population of roseate terns (*Sterna dougalli*)].

Table 6. Name, County, Closure Period, and Status With Species and Numbers of Nests, for Critical Wildlife Areas in Florida in FY 2003-2004.

Region CWA name	County	Closure period	Primary taxa	Status[a]	Managed area
Southwest					
Bird Island	Hillsborough	1 Dec. to 1 Sept.	Herons, egrets, ibis, pelicans, spoonbills, oystercatchers	9,724 pairs	75 acres
Little Estero Island	Lee	1 April to 1 Sept.	Terns, plovers	57 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	Active[c]	1 acre
Northwest					
Tyndall	Bay	Year-round	Terns, skimmers, shorebirds	10 nests	10 acres
Alligator Point	Franklin	1 April to 1 Sept.	Terns, oystercatchers	Unquantified	145 acres
St. George Causeway	Franklin	1 April to 31 Aug.	Terns, gulls, oystercatchers, skimmers	5,234 nests	32 acres
Gerome's Cave*	Jackson	1 March to 1 Sept.	Bats	3,000 bats	2 acres
South					
Deerfield Island Park*	Broward	Year-round	Gopher Tortoise	4 burrows	56 acres
ABC Islands	Collier	Year-round	Herons, egrets, pelicans, glossy ibis, pelicans	552 nests	75 acres
Big Marco Pass*	Collier	Year-round	Terns, black skimmers, plovers, wintering shorebirds	946 birds	60 acres
Caxambas Pass*	Collier	1 April to 1 Sept.	Least Terns, wintering shorebirds	262 birds	1 acre
Rookery Island	Collier	Year-round	Herons, egrets, pelicans	103 nests	5 acres
Bill Sadowski*	Dade	Year-round	Shorebirds, herons, egrets (foraging only)	17 birds	700 acres
Pelican Shoal	Monroe	1 April to 1 Sept.	Roseate terns, bridled terns	376 birds	1 acre
Northeast					
Jennings Cave	Marion	15 Feb. to 31 Aug.	Bats	Inactive	1.9 acres
Matanzas Inlet*	St. Johns	1 April to 1 Sept.	Least terns, Wilson's plovers, willets	100 nests	28 acres
Ponce de Leon Inlet	Volusia	1 April to 15 Aug.	Least terns	Inactive	13.7 acres
North Central					
Amelia Island	Nassau	1 April to 1 Sept.	Least terns	50 nests	4 acres
Bird Islands*	Duval	1 April to 1 Sept.	Gull-billed terns, black skimmers, oystercatchers	200 nests	2 acres
Fort George Inlet*	Duval	1 April to 1 Sept.	Royal terns, black skimmers, laughing gulls	2,000 nests	10 acres

[a]Estimated peak numbers of individuals and/or successful nests at each site during the closed period in FY 2002-03.
[b]Inactive means the site was not used during FY 2002-03.
[C]Active means the site was documented as active, but counts not available during FY 2003-04.
*Indicates sites that may require re-description or merit deletion from the CWA system.

FLORIDA'S LANDOWNER INCENTIVE PROGRAM

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

Applicant properties are individually evaluated for natural resource value using a state-of-the-art Geographic Information System (GIS) based process that assigns a property rank based on the best available databases. These databases are layers of environmental information such as land cover imagery, current listed species habitats, wildlife occurrence data and potential listed species habitat models. Once ranked, FWC biologists recommend beneficial and cost-effective practices based on the GIS analysis, site visit, and the targeted listed species. To date, FWC biologists have visited 26 private landowners and have obligated $264,864 at a 50% cost-share rate to conduct practices across 48,896 acres (19,803 ha) to directly benefit those species identified from the GIS analysis (Table 7). Some of the management practices that have been funded include: prescribed fire [$56,166 being obligated to 21 of the visited landowners across 7,020 acres (2,843 ha)]; longleaf pine and natural groundcover restoration [$118,427 was obligated on 7,086 acres (2,870 ha) to establish native trees, shrubs, forbs or grasses to restore or improve habitat conditions]; habitat modification [$88,787 has been obligated to mechanically and chemically enhance over 2,000 acres (810 ha) by re-establishing more natural stand conditions that improve habitat for listed species]; nest platform/cavity creation [$1,483 has been obligated to install 17 red-cockaded woodpecker (*Picoides borealis*) inserts, 9 Southeastern American kestrel (*Falco sparverius paulus*) nest boxes and one osprey (*Pandion haliaetus*) nest platform]. Future expectations for Florida's LIP are being held to a high standard to meet the needs of private landowners in order to benefit the greatest number of at-risk species. To that end, it is imperative that future funding be secured for private landowners in order to perpetuate the success and sustain long-term meaningful benefits for those imperiled species dependent upon the LIP.

Please visit the LIP website at http://www.wildflorida.org/lip/ for more information on Florida's LIP or contact the LIP Coordinator at 850-410-0656, extension 17336 for questions regarding this report.

Table 7. Total listed species potential habitats (acres/hectares) identified within 26 properties enrolled in Florida's LIP from October 2003 to October 2004.

*State Listed	*Federal Listed	Species Common Name	Species Scientific Name	Acres	Hectares
		Mammals			
T		Everglades mink	*Mustela vison evergladensis*	29.5	11.9
T		Florida black bear	*Ursus americanus floridanus*	7285.0	2950.4
S		Florida mouse	*Podomys floridanus*	58.5	23.6
E	E	Florida panther	*Puma concolor coryi*	1953.7	791.2
S		Sherman's fox squirrel	*Sciurus niger shermani*	884.5	358.2
S		Sherman's short-tailed shrew	*Blarina carolonensis*	7270.4	2944.5
		Reptile/Amphibians			
S		Alligator snapping turtle	*Macroclemys temminckii*	2.5	1.0
S	T	American alligator	*Alligator mississippiensis*	4122.6	1669.6
T	T	Bluetail mole skink	*Eumeces egregius lividus*	9.0	3.6
S		Florida pine snake	*Pituophis melanoleucus mugitus*	136.0	55.0
S		Gopher frog	*Rana capito*	299.9	121.4
S		Gopher tortoise	*Gopherus polyphemus*	1620.5	656.3
S	T	Flatwoods salamander	*Ambystoma cingulatum*	67.7	27.4
T	T	Eastern indigo snake	*Drymarchon corais couperi*	19678.7	7969.8
T		Short-tailed snake	*Stilosoma extenuatum*	161.9	65.5
S		Suwannee cooter	*Pseudemys concinna suwanniensis*	217.8	88.2
		Birds			
S		Tricolored heron	*Egretta tricolor*	445.9	180.5
S		White ibis	*Eudocimus albus*	702.8	284.6
E	E	Wood stork	*Mycteria americana*	2935.3	1188.7
S		Little blue heron	*Egretta caerulea*	405.5	164.2
T	E	Red-cockaded woodpecker	*Picoides borealis*	18.1	7.3
T	E	Florida sandhill crane	*Grus canadensis pratensis*	4372.6	1770.9
T	T	Florida scrub jay	*Aphelocoma coerulescens*	1.3	0.5
S		Florida burrowing owl	*Athene cunicularia*	219.4	88.8
T		Southeastern American kestrel	*Falco sparverius paulus*	12.4	5.0
T	T	Crested caracara	*Caracara cheriway*	1033.3	418.4
S		Osprey	*Pandion haliaetus*	1149.8	465.6
		****Total**		**55094.3**	**22419.2**

*E=Endangered, T=Threatened, S=Species of special concern (state listing)
**Several of the participating properties include numerous species at risk.

LAW ENFORCEMENT

The Florida Fish and Wildlife Conservation Commission's (FWC) 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:

1. Regular patrols of the three Florida panther reduced-speed zones in Collier County (two on State Road 29 and one on United States [US] 41).
2. Enhanced patrols of the speed zones in all manatee sanctuaries and expanded public outreach efforts statewide with particular emphasis on high mortality areas.
3. Regular patrols and close coordination with the Monroe County Sheriff's Office in enforcing reduced-speed zones and other special accommodations on behalf of the key deer (*Odocoileus virginianus clavium*).
4. Florida panther enforcement support, which includes officers in the nine-county core of existing and potential panther habitat. The nine counties are Collier, Hendry, Sarasota, Charlotte, Lee, Hardee, Highlands, DeSoto and Glades. The purpose of the program is to provide enhanced targeted law enforcement patrol, intensified landowner coordination, investigation of panther sightings, panther/vehicle collision and depredation reports, assistance in conducting standard field surveys in proposed reintroduction areas, and assistance to FWC staff for panther research and management.
5. Regular patrols in Lee County in the wildlife corridor to reduce vehicle speeds for purposes of panther and prey protection and motorist safety.
6. Patrol efforts aimed at providing protection for marine turtles, especially during the nesting season when the turtles and their eggs are most vulnerable to poaching.

PERMITTING AND TECHNICAL ASSISTANCE

Program Summary (*Angela T. Williams*).--Florida Fish and Wildlife Conservation Commission (FWC) staff provided federal agencies, other state agencies, 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, possession and relocation permits for listed species.

Technical assistance for developers, consultants, and regulatory agencies usually consisted of any combination of the following mechanisms; (1) comments regarding individual species management plans; (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; (1) life history and general biological information regarding individual species; (2) locality/occurrence data; (3) listing status; and (4) solutions to nuisance situations (i.e., education on the species 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/species specific management plan. Others required adherence to the following FWC species management guidelines/policies: Florida Burrowing Owls (*Athene cunicularia floridana*) in Urban Areas, Osprey (*Pandion haliaetus*) Nest Removal

Policies, Guidelines for the Relocation of Gopher Tortoises (*Gopherus polyphemus*) on Lands Slated for Development. Scientific permits were conditioned on an approved research proposal. The permit review process usually involves coordination between FWC offices, environmental consultants, other state agencies, federal agencies and regional and local regulatory entities.

FWC staff technical assistance efforts resulted in more than 2,600 telephone accounts and hundreds of formal letters and emails. Additionally, 537 listed species scientific collection, captive possession and relocation permits (and 138 permit amendments) were issued during Fiscal Year (FY) 2003-2004. For more information on issued permits, contact the Imperiled Terrestrial Species Permit Coordinator at 850-921-5990 extension 17310.

Overall, FWC staff provided biological and regulatory guidance to ensure that the permitted activities would result in a net conservation benefit for the involved species. Additional information (including guidelines, policies, and applications) is available on our website at http://wld.fwc.state.fl.us/permits/default.html for those interested in applying for scientific collecting and relocation permits for terrestrial listed species.

APPENDICES

APPENDIX A. LIST OF SPECIES LISTED BY THE FWC AS ENDANGERED, THREATENED, OR SPECIES OF SPECIAL CONCERN

Common Name	Scientific Name	Designated Status		
		FWC	USFWS	NOAA NMFS
FISH				
Atlantic sturgeon (Gulf sturgeon)	*Acipenser oxyrinchus* (*Acipenser oxyrinchus desotoi*)	SSC (1)	T	
shortnose sturgeon	*Acipenser brevirostrum*	E	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	E	
Southern tessellated darter (tessellated johnny darter)	*Etheostoma olmstedi maculaticeps*	SSC (1)		
key blenny	*Starksia starcki*	SSC (1)		
AMPHIBIANS				
flatwoods salamander	*Ambystoma cingulatum*	SSC	T	
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)	T(S/A)*	
American crocodile	*Crocodylus acutus*	E	E	
key ringneck snake	*Diadophis punctatus acricus*	T		
Eastern indigo snake	*Drymarchon corais couperi*	T	T	
red rat snake	*Elaphe guttata*	SSC[1] (1)		
Atlantic salt marsh water snake (Atlantic salt marsh snake)	*Nerodia clarkii taeniata*	T	T	

Common Name	Scientific Name	Designated Status		
		FWC	USFWS	NOAA-NMFS
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	T	
Florida Key mole skink	*Eumeces egregius egregius*	SSC (1)		
sand skink	*Neoseps reynoldsi*	T	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	T	
green seaturtle (green sea turtle)	*Chelonia mydas*	E	E[a] & T[b]	
leatherback seaturtle (leatherback sea turtle)	*Dermochelys coriacea*	E	E	
hawksbill seaturtle (hawksbill sea turtle)	*Eretmochelys imbricata*	E	E	
Kemp's ridley seaturtle (Kemp's ridley sea turtle)	*Lepidochelys kempii*	E	E	
BIRDS				
piping plover	*Charadrius melodus*	T	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	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)		
tricolored heron	*Egretta tricolor*	SSC (1,4)		

Common Name	Scientific Name	Designated Status		
		FWC	USFWS	NOAA-NMFS
white ibis	*Eudocimus albus*	SSC (2)		
Florida sandhill crane	*Grus canadensis pratensis*	T		
whooping crane	*Grus americana*	SSC (5)	XN	
wood stork	*Mycteria americana*	E	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	T	
peregrine falcon	*Falco peregrinus*	E		
Southeastern American kestrel	*Falco sparverius paulus*	T		
bald eagle	*Haliaeetus leucocephalus*	T	T	
osprey	*Pandion haliaetus*	SSC[2] (1,2)		
snail kite (Everglades snail kite)	*Rostrhamus sociabilis plumbeus*	E	E	
Florida scrub jay	*Aphelocoma coerulescens*	T	T	
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E	E	
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	E	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	E	
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	E	
puma (= mountain lion)	*Puma* [=*Felis*] *concolor*		T (S/A)**	
red wolf	*Canis rufus*		E†1	
Florida black bear	*Ursus americanus floridanus*	T[3]		
Everglades mink	*Mustela vison evergladensis*	T		
key deer	*Odocoileus virginianus clavium*	E	E	

Common Name	Scientific Name	Designated Status		
		FWC	USFWS	NOAA-NMFS
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	E	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	E	
Key Largo woodrat	*Neotoma floridana smalli*	E	E	
Key Largo Cotton Mouse	*Peromyscus gossypinus allapaticola*	E	E	
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	E	E	
Southeastern beach mouse	*Peromyscus polionotus niveiventris*	T	T	
Anastasia Island beach mouse	*Peromyscus polionotus phasma*	E	E	
St. Andrews beach mouse	*Peromyscus polionotus peninsularis*	E	E	
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	E	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	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		E
North Atlantic right whale (right whale)	*Eubalaena glacialis* (*Balaena glacialis* [*incl. australis*])	E		E
humpback whale	*Megaptera novaeangliae*	E		E
sperm whale	*Physeter macrocephalus*	E		
Caribbean monk seal	*Monachus tropicalis*			E†d
Florida manatee (West Indian manatee)	*Trichechus manatus latirostris* (*Trichechus manatus*)	E	E	

Common Name	Scientific Name	Designated Status		
		FWC	USFWS	NOAA-NMFS
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)		
squirrel chimney cave shrimp (Florida cave shrimp)	*Palaemonetes cummingi*		T	
INSECTS				
Miami blue butterfly	*Cyclargus* [*=Hermiargus*] *thomasi bethunebakeri*	E		
Schaus' swallowtail butterfly	*Heraclides aristodemus ponceanus*	E	E	
MOLLUSKS				
Florida tree snail	*Liguus fasciatus*	SSC (1)		
Stock Island tree snail	*Orthalicus reses* *Orthalicus reses* [*not incl. nesodryas*]	E	T	
fat three-ridge	*Amblema neislerii*		E	
chipola slabshell	*Elliptio chipolaensis*		T	
purple bankclimber	*Elliptoideus sloatianus*		T	
shinyrayed pocketbook	*Lampsilis subangulata*		E	
Gulf moccasinshell	*Medionidus penicillatus*		E	
Ochlockonee moccasinshell	*Medionidus simpsonianus*		E	
oval pigtoe	*Pleurobema pyriforme*		E	

KEY TO ABBREVIATIONS AND NOTATIONS

LIST ABBREVIATIONS

FWC =	Florida Fish and Wildlife Conservation Commission
USFWS =	United States Fish and Wildlife Service
NOAA-NMFS =	National Oceanic and Atmospheric Administration-National Marine Fisheries Service
E =	Endangered
T =	Threatened
SSC =	Species of Special Concern
T (S/A) =	Threatened/Similarity of Appearance
XN =	Experimental Population, Non-Essential

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.

(USFWS)

[a] Breeding colony populations in FL and on Pacific coast of Mexico.

[b] Wherever found except where listed as endangered.

†[c] = (Except where XN) Presumed extinct in wild except experimental populations in NC & TN.

T (S/A)[*] = Similarity of Appearance to a Threatened Taxon in the Entire Range.

T (S/A)[**] = All subspecies except coryi. Similarity of Appearance to a Threatened Taxon in the U.S.A. (FL).

(NOAA-NMFS)

†[d] = No known populations in the wild, presumed extinct.

APPENDIX B. LIST OF ACRONYMS USED IN THIS REPORT

Term	Acronym
Advanced Research and Global Observation Satellite	ARGOS
Air Force Base	AFB
Amphibian Research and Monitoring Initiative	ARMI
Apalachicola River Wildlife and Environmental Area	ARWEA
Avon Park Air Force Range	APAFR
Balm Boyette West	BBW
Biological Status Review	BSR
Branan Field Mitigation Park	BFMP
Bullfrog Creek Mitigation Park	BCMP
Caribbean Conservation Corporation, Inc.	CCC
Center for Costal Fisheries and Habitat Research	CCFHR
Choctawhatchee Beach Mice	CBM
Conservation and Recreational Land Program	CARL
Critical Wildlife Area	CWA
Deoxyribonucleic Acid	DNA
Early Warning System Network	EWS
Endangered Species Act	ESA
English Speakers of Other Languages	ESOL
Environmental Protection Agency	EPA
Fiscal Year	FY
Florida Administrative Code	F.A.C.
Florida Atlantic University	FAU
Florida Black Bear Curriculum Guide	FBBCG
Florida Department of Agriculture and Consumer Services	DOACS
Florida Department of Environmental Protection	DEP
Florida Department of Transportation	FDOT
Florida Division of Forestry	FDOF
Florida Fish and Wildlife Conservation Commission	FWC
Florida Game and Fresh Water Fish Commission	GFC
Florida Grasshopper Sparrow	FGS
Florida Local Environmental Resource Agencies, Inc.	FLERA
Florida Natural Areas Inventory	FNAI
Florida Panther Research & Management Trust Fund	FPRMTF
Florida Scrub Jay	FSJ
Florida Statues	F.S.
Fort White Mitigation Park	FWMP
General Revenue	GR
Geographic Information System	GIS
Global Positioning System	GPS
Habitat Conservation Plan	HCP
Hickey Creek Mitigation Park	HCMP
Infectious Bursal Disease	IBD
International Crane Foundation	ICF
International Union for Conservation of Nature and Natural Resources	IUCN

Appendix B. Continued

Term	Acronym
Intra-costal Waterway	ICW
Landowner Incentive Program	LIP
Listing Process Stakeholders Panel	LPSP
Lykes Bros, Inc.	LBI
Manatee Individual Photo-Identification System	MIPS
Manatee Protection Plans	MPPs
Marine Resources Conservation Trust Fund	MRCTF
Memorandum of Agreement	MOA
Memorandum of Understanding	MOU
Miami Blue Butterfly Working Group	MBBWG
Moody Branch Mitigation Park	MBMP
National Forest	NF
National Marine Fisheries Service	NMFS
National Oceanic and Atmospheric Administration	NOAA
National Ocean Service	NOS
National Park Service	NPS
National Wildlife Refuge	NWR
Nongame Wildlife Trust Fund	NGWTF
Outlying Landing Field	OLF
Other Personnel Services	OPS
Patuxent Wildlife Research Center	PWC
Perry Oldenburg Mitigation Park	POMP
Platform Terminal Transmitters	PTTs
Platt Branch Mitigation Park	PBMP
Red-cockaded woodpecker	RCW
Sandhill Crane	SHC
Save the Manatee Trust Fund	STMTF
Sea Turtle Stranding Network	STSSN
Senior Leadership Team	SLT
Spilt Oak Forest Mitigation Park	SOMP
State Forest	SF
The Nature Conservatory	TNC
Three Lakes Wildlife Management Area	TLWMA
Trust for Public Lands	TPL
United States	US
United States Department of Aquaculture	USDA
United States Fish and Wildlife Service	USFWS
United States Forest Service	USFS
United States Geological Survey	USGS
University of Florida	UF
Upper Respiratory Tract Disease	URTD
Whooping Crane Eastern Partnership	WCEP
Wildlife and Environmental Area	WEA
Wildlife Management Area	WMA

APPENDIX C. FWC STAFF PUBLICATIONS DURING THE CURRENT FISCAL YEAR

Broadstone, M., B. Witherington, J. Gorham, M. Bresette, L. Ehrhart, D. Bagley, S. Kubis, and R. Herren. 2004. Abundance and distribution of green turtles within shallow, hard-bottom foraging habitat adjacent to a Florida nesting beach. (Poster) Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFC-503:242.

Brost, B., and A. Meylan. 2004. Florida's Statewide Nesting Beach Survey Program. (Poster) Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFC-503.

Conti, M.E., Robbin N. Trindell, Edward P. DeMaye, Tim Woody. 2004. Florida's Marine Turtle Holding Facilities: A Five-year Overview (1999-2003). (Poster) Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFC-503.

Florida Fish and Wildlife Conservation Commission. Florida Manatee (*Trichechus manatus latirostris*) Biological Status Review. 2003.

Gorzelany, J.F. 2004. Evaluation of Boater Compliance with Manatee Speed Zones along the Gulf Coast of Florida. Coastal Management 32:215–226.

Jaap, W.C., J.W. Porter, J. Wheaton, C.R. Beaver, M.K. Callahan, J. Kidney, K. Hackett, M. Lybolt, S. Kupfner, C. Torres, and K. Sutherland, 2004. EPA/NOAA Coral reef evaluation and monitoring project, executive summary for 2003. Florida Marine Research Institute, Fish and Wildlife Conservation Commission. St. Petersburg, FL.

Langtimm, C.A., C.A. Beck, H.H. Edwards, K.J. Fick-Child, B.B. Ackerman, S.L. Barton, and W.C. Hartley. Marine Mammal Science. In press.

Meylan, P., A. Meylan, J. Gray, and J. Ward. 2004. The hawksbill turtle in Bermuda (abstract). Proceedings of the 22nd Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFC-503:26.

Meylan, P., A. Meylan, and J. Gray. 2004. The Bermuda turtle project's international course on the biology and conservation of sea turtles, 2003. *Marine Turtle Newsletter* 103:14-15.

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Nowacek, S.M., R.S. Wells, E.C.G. Owen, T.R. Speakman, R.O. Flamm, and D.P. Nowacek. 2004. Florida manatees, *Trichechus manatus latirostris*, respond to approaching vessels. Conservation Biology. In press.

Reynolds, J.E., S.A. Rommel, and M.E. Pitchford. 2004. The Likelihood of Sperm Competition in Manatees—Explaining an Apparent Paradox. Marine Mammal Science. In press.

Rodgers, J.A., Jr., and S. T. Schwikert. 2003. Breeding chronology of snail kites (*Rostrahamus sociabilis plumbeus*) in central and south Florida wetlands. Southeastern Naturalist 2:293-300.

Rodgers, J.A., Jr., and S. T. Schwikert. 2004. Buffer zone distances to protect foraging and loafing waterbirds from disturbance by airboats in Florida. Waterbirds 26:437-443.

Rommel, S.A., J. Reynolds, and H. Lynch. 2004. Adaptations of the Herbivorous Marine Mammals. The Sixth International Symposium on Nutrition of Herbivores. Mexico.

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