FY 2009-10 Progress Report

on activities of the

Florida Fish and Wildlife Conservation Commission

Endangered and Threatened Species Management and Conservation Plan

FLORIDA'S ENDANGERED AND THREATENED SPECIES MANAGEMENT AND CONSERVATION PLAN FY 2009-10 PROGRESS REPORT

by the

Florida Fish and Wildlife Conservation Commission

Prepared by Staff of the
Florida Fish and Wildlife Conservation Commission

January 31, 2011

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EXECUTIVE SUMMARY

This document constitutes the 32nd progress report and update of the Florida Endangered and Threatened Species Management and Conservation Plan as required by the Florida Endangered and Threatened Species Act of 1977 [§379.2291(5), Florida Statutes (F.S.)]. The Act required the preparation of an initial plan for submission to the 1978 Florida Legislature, and the annual preparation of a revised and updated plan for management and conservation of endangered and threatened species. Species of special concern also are included in this report. Species designated as endangered, threatened, or species of special concern are collectively referred to as listed species.

The initial plan submitted in March 1978 remains the basic reference document for the annual updates. Subsequent annual reports may be consulted regarding a chronological history of the listed species activities by State agencies. Copies are available from the Division of Habitat and Species Conservation, Species Conservation Planning Section, of the Florida Fish and Wildlife Conservation Commission (FWC), Tallahassee or at http://www.myfwc.com.

This report covers the fiscal year (FY) 2009-10, a period from July 1, 2009 to June 30, 2010. It includes a description of FWC's criteria for research and management priorities, statewide policies pertaining to listed species, required legislation, a funding request, a progress report providing a description of agency actions for listed species, and a description of FWC's citizen awareness program. The progress report section includes reports of staff activities covering listed mammals, birds, amphibians, reptiles, fish, and invertebrates. Additionally, this section reports on agency actions to provide coordination and assistance, Critical Wildlife Areas (CWA), incentive-based conservation programs, law enforcement, and permitting for listed species. Please contact FWC's Listed Species Coordinator if you would like more information about anything in this report. Contact information is listed below.

We would like to express our appreciation to each person who contributed to this report. Special appreciation is expressed to Caly Murphy for her assistance in the preparation of this report, and Elsa Haubold and Lawson Snyder for editorial review.

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Editor's note – This report covers FY 2009-10. After FY 2009-10 ended and before this report was finalized, the Commission approved revisions to the listing process, structure of the listing categories, and what the categories are called. Details will be included in the FY 2010-11 report.

SUMMARY OF IMPERILED WILDLIFE LISTS

The first Florida Endangered Species List for wildlife was promulgated in 1972 and consisted of 23 species. The listing concept was expanded in 1973 to include threatened species, and again in 1979 to include species of special concern. The official State lists for wildlife are kept in Florida Administrative Code (F.A.C.) as Rules 68A-27.003 (endangered), 68A-27.004 (threatened) and 68A-27.005 (species of special concern). Currently, the Florida Fish and Wildlife Conservation Commission (FWC) lists 116 species (Table 1) as endangered (40), threatened (26), or species of special concern (50). Though research was not conducted on all listed species this year (and therefore, all species are not discussed in detail in this report), a complete listing of Florida's listed wildlife species as of June 30, 2009 is included as Appendix A. Florida's listed wildlife species may also be accessed at http://myfwc.com/imperiledspecies/pdf/Threatened-and-Endangered-Species-current.pdf. The rules noted above may be viewed at the F.A.C. Website https://www.flrules.org/gateway/ChapterHome.asp?Chapter=68A-27. Federal agencies also list species as endangered and threatened. The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA-Fisheries) is responsible for listing most marine species and the Department of the Interior, U.S. Fish and Wildlife Service (USFWS) is responsible for other species. The Federal list of animals and plants is administered by USFWS, and is published in 50 CFR (Code of Federal Regulations) 17 (animals) and 50 CFR 23 (plants). Additional information regarding Federal listings can be located at http://www.nmfs.noaa.gov for NOAA-Fisheries and http://www.fws.gov/endangered/species/us-species.html for USFWS.

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

Table 1. Summary of Official Lists of Florida's Endangered Species (E), Threatened Species (T), and Species of Special Concern (SSC), as of June 30, 2010.

STATUS DESIGNATION	FISH	AMPHIBIANS	REPTILES	BIRDS	MAMMALS	INVERTEBRATES	TOTAL
E	3	0	6	7	20	4	40
T	2	0	11	9	4	0	26
SSC	10	5	7	18	6	4	50
TOTAL	15	5	24	34	30	8	116

STATUTORY REQUIREMENTS

CRITERIA FOR RESEARCH AND MANAGEMENT PRIORITIES

The Florida Fish and Wildlife Conservation Commission (FWC) uses a variety of tools to evaluate and prioritize research and management needs for State listed species. One tool used is the State listing process described in Rule 68A-27.0012, F.A.C. This process uses a quantitative system to identify Florida's most imperiled species and directs the development of a management plan for each species undergoing a listing action. In addition to the listing process, FWC uses a species ranking process that was developed by FWC staff and published in Wildlife Monographs (Millsap, B. M., J. A. Gore, D. E. Runde, and S. I. Cerulean. 1990. *Setting priorities for the conservation of fish and wildlife species in Florida*. Wildlife Monographs 111). This ranking process provides a biological score, which ranks 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, FWC must also consider available funding sources and activities required by legislation, court rulings, grant agreements, and approved management plans when setting priorities. FWC uses the listing process, the species ranking process, available funding sources and consideration of other required activities including approved management plans to allocate resources for the management and conservation of Florida's State listed species.

STATEWIDE POLICIES PERTAINING TO LISTED SPECIES

Listing Actions (*Brad Gruver*). – The Commission did not work on any listing actions during FY 2009-10. Previously completed biological status reports and management plans are available at http://myfwc.com/imperiledspecies/petitions.htm.

Imperiled Species Management System and the Listing Process (*Brad Gruver*). – In 1999, FWC adopted an imperiled species listing process modeled, with the assistance of stakeholders, upon listing criteria developed by the International Union for the Conservation of Nature (IUCN). However, because of controversy surrounding some listing actions, the FWC placed a moratorium on listing actions in 2002 and, again with stakeholder input, re-evaluated the listing process. The Commission modified the listing process in April 2005 based on stakeholder consensus of some items; however, the stakeholders could not reach consensus on several other issues and controversy continued to surround the listing process. In December 2007, the Commission directed staff to review the listing process and further explore options for listing species in Florida. Additionally, the Commission asked staff to better define the context of the listing process within a broader imperiled species management system. A leadership team that was developed began working on these issues in early 2008. A summary of the team's progress was presented to the Commission in June 2008, and the team received additional direction from the Commission to continue development of a revised listing process and

imperiled species management system. During FY 2008-09, the team began working on a vision and concept for an imperiled species management system, met with major stakeholder groups, and began development of a package of proposed rule changes to establish a revised listing process within an imperiled species management system.

During the first half of FY 2009-10, the team continued work on the draft proposed rule package, and presented it to the Commission in December 2009. The team worked during the second half of FY 2009-2010 meeting with stakeholders, reviewing public comment on the proposed rule changes, and refining the draft proposed rule package. The final rule package will go to the Commission in September 2010. Additionally, the team continued working on development of the imperiled species management system in FY 2009-10.

Editor's note – This report covers FY 2009-10. However, in September 2010 before this report was finalized, the Commission approved the proposed rule changes. The revised rules include changes to the listing process, the structure of the listing categories, and what the categories are called. Details will be included in the FY 2010-11 report.

REQUIRED LEGISLATION

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

FUNDING REQUEST

Recommended Funding Level (*Sandy Wilson*).--The recommended level of funding for the FWC listed species programs in FY 2011-12 is $25,448,943 (Table 2). This includes funding to maintain current programs and allow for the continuation of awards from Federal grants designed to assist in development of recovery programs.

Table 2. FWC Endangered/Threatened Species Budget Request for FY 2011–12.

Funding Source	Amount
Nongame Wildlife Trust Fund	**$1,861,130**
Florida Panther Research & Management Trust Fund	**$936,807**
Save the Manatee Trust Fund	**$3,564,986**
Marine Resources Conservation Trust Fund	**$7,745,647**
Land Acquisition Trust Fund	**$3,428,091**
State Game Trust Fund	**$814,051**
Conservation and Recreation Lands Trust Fund	**$15,713**
Federal Grants	**$7,082,518**
Total	**$25,448,943**

PROGRESS REPORT

The mission of the Florida Fish and Wildlife Conservation Commission (FWC) is "managing fish and wildlife resources for their long-term well-being and the benefit of people." Management of endangered, threatened, and special concern species includes: surveying and monitoring of species; habitat improvement and restoration; development and implementation of management plans; conservation planning; agency commenting on potential impacts to species; and citizen awareness. Research is a systematic means of generating the scientific information necessary to support and guide management of endangered, threatened, and special concern species. Research is also leading to a better understanding of how wildlife managers may alter population processes through management actions, as well as leading to management actions that have aided in species stabilization and conservation. This section briefly describes the progress of ongoing listed species management and research by FWC.

Black Bear (*Dave Telesco and Walter McCown*)

The black bear is currently a State-listed threatened species and exists primarily on large segments of public and private land throughout the state. FWC continues to engage in research and management efforts to ensure the conservation of the Florida black bear for future generations of Floridians.

Conservation efforts have allowed Florida black bear populations to rebound from historic lows in many areas throughout the state. As the bear populations expand and Florida's human population grows, human-bear conflicts continue to increase in number and intensity. Bears require large areas to live and their populations are fragmented. Increasing human activity could threaten the remaining black bear populations and their habitats and create an uncertain long-term future for black bears in Florida. FWC provides proactive conservation and management planning tools to citizens and partnering organizations to maintain the Florida black bear for the benefit of the species as well as Florida citizens and visitors. A major focus of FWC's Bear Program is increasing awareness of bears and avoidance of conflicts with them.

In summer 2010, FWC completed work on a comprehensive, statewide draft management plan designed to conserve Florida black bears. The plan establishes a framework for community involvement for the benefit of bears and citizens. An eight member, cross-divisional FWC team in consultation with a 12 member Technical Advisory Group (TAG) began drafting the plan in Spring 2007. The TAG, which included stakeholders from other agencies and private organizations, helped FWC understand issues and differing points of view. The FWC team solicited comments from within the agency, and from other State and Federal agency staff, as well as from private stakeholders. Many of the resulting suggestions were incorporated into the plan. After three years of work, the draft plan was released for public comment on June 1, 2010. A Website accessible to the public for receiving comments on the plan was established at http://share2.myfwc.com/BearMP/default.aspx. Public meetings will take place in summer and fall 2010 to solicit additional public feedback. Once comments have been reviewed and addressed, FWC will meet with an expanded TAG to review the comments and how they were addressed. The plan will be finalized and presented to the Commission for their review in summer 2011.

During FY 2009-10,

- FWC received 3,773 calls regarding bears (i.e., sightings, bears in garbage, complaints).
- The number of bears killed by vehicles totaled 126 individuals.
- Several requests were received from citizens and organizations requesting bear crossing signs at various locations. These requests were forwarded to the Florida Department of Transportation.

The contracted Bear Response Agent Program, implemented to assist biologists with the bear management tasks of educating the public, carcass recoveries and capture efforts as needed, remains active in North and Central Florida. The Program's schedule was modified to be more cost-efficient for FY 2009-10. Contracted bear response agents were dispatched by FWC to respond to 172 requests for assistance during the fiscal year. The majority (63%) of responses were to provide education to the public in order to prevent human-bear conflicts from continuing in neighborhoods. Other responses were divided between carcass retrieval and assistance with trapping efforts (22% and 15%, respectively). The Bear Response Agent Program allows FWC to meet rising public demand for service without jeopardizing other FWC responsibilities.

FWC runs an internship program to develop future conservation professionals and expand the abilities of the agency to address bear related topics. The internship program is designed to allow students to gain credit through their universities for their experience, while acquiring training in the profession of wildlife management and research. Fifteen interns from Florida State University and one from the University of Florida participated in the fall 2009 and spring and summer 2010 sessions. These students contributed 2,955 hours of time to bear management and research. Intern projects have provided valuable information on a wide range of bear management and research topics, including conducting a follow-up study on citizens who have contacted FWC about bear problems, mapping potential bear travel corridors, redesigning the FWC Black Bear Website, examining the relationship between human population density and frequency of bear sightings, developing activities for the Florida Black Bear Festival, and coordinating public events and volunteer efforts to increase public awareness of bears.

Through partnerships with local governments, businesses and communities, FWC has reduced bear access to garbage across the state. Results of those efforts include: shifting waste service pick-up times so residents can more easily take garbage out the morning of pick-up rather than the night before and making bear-resistant equipment like cans, sheds, and electric fencing more readily available. FWC also provided comments on impacts to bears from proposed residential developments and highway projects.

FWC worked on several important management and policy documents during FY 2009-10. The Bear Incident Response Plan was revised and finalized in fall 2009. The plan provides guidance to FWC and others who may be called upon to assist in investigating a report of a incident involving contact between bears and humans. The Bear Management Program has continued to train law enforcement officers on bear behavior and conflict response. FWC trained 176 personnel, including FWC law enforcement officers and personnel from 12 local and State law enforcement and natural resource agencies. A permit system was developed to authorize non-FWC personnel who have been trained by the Bear Management Program to respond to human-bear conflicts. Those permits were issued to eight agencies authorizing 50 staff members to assist FWC with conflict response.

FWC policy allows orphaned bear cubs to be rehabilitated for release into the wild. In order to increase the chances for successful reintroduction, FWC developed the Rehabilitation of Orphaned Black Bear Cubs protocol in spring 2010. With assistance from two interns, FWC was

able to compare and contrast successful bear cub rehabilitation methods and select preferred techniques. The protocol was reviewed by bear cub rehabilitators and veterinarians. The document will be provided to any rehabilitators in Florida who are considering working with bear cubs.

The Bear Management and Research Programs held a training workshop in summer 2010 for 24 FWC employees who are involved in responding to bear conflicts. The two-day workshop included both presentations and field exercises to ensure staff have the best information and are comfortable with current techniques. In addition, participating staff contributed their knowledge to a new document, the Bear Management Handbook. The document captures institutional knowledge on bear management protocols and includes important documentation such as accidental exposure to immobilization drugs and drug dosage charts.

FWC continued a study to estimate the minimum number and range of bears in Citrus, Hernando and Pasco counties. This population is the smallest and is the most at risk n the state and information gathered in this study will help FWC and other State and Federal land managers conserve bears in the area.

FWC secured a Conserve Wildlife Tag grant and contracted with the University of Kentucky to estimate the range and abundance of bears in Glades and Highlands counties. This population is small and fragmented and exists on remaining parcels of Florida scrub within a patchwork of public and private ownership.

Research staff published two articles in peer-reviewed scientific journals that examined how bears interact with a highway near Ocala and a new bear capture technique.

Florida Mouse (*Randy Havens, Sharon Hester, Jayde Roof and Brent Howze*)

The Florida mouse is a State species of special concern. Florida mice are surveyed during the course of small mammal trapping efforts in Wildlife Management Areas (WMA) and Wildlife and Environmental Areas (WEA) around the state. Trapping typically is conducted along line transects with trap stations established at 32.8 feet (ten meter) intervals. Stations typically consist of one large and one small Sherman live trap. Representative habitat types sampled may include: sandhill, flatwoods, scrub, scrubby flatwoods, mesic flatwoods, wetland, cutthroat seep, bayhead, salt marsh, and blackgum swamp. These habitat types range from dry, upland areas to seasonally and permanently inundated areas.

Andrews Wildlife Management Area in Levy County – A small mammal survey was completed in June 2010 on a sandhill site in the southeast portion of Andrews WMA. The Florida mouse was the only imperiled species captured and documented in any of the 250 traps set (five nights with 50 traps). Out of those 250 traps, 15 Florida mice were captured and released. Several Florida mice were observed to enter small “mouse sized holes” upon release.

Big Bend Wildlife Management Area in Taylor and Dixie Counties – Small mammal surveys were conducted to determine the suite of species using the five different management units on Big Bend WMA, including small listed mammals. Two small mammal trapping surveys were completed in fall and winter 2009, and spring 2010. Three transects were set up on the WMA. These three transects were trapped for a total of 1,080 (540 in each) trap nights. A total of 53 imperiled Florida mice were captured and released from five habitat types (salt marsh, mesic flatwoods, scrubby flatwoods, scrub and sandhill).

Beach Mice (*Jeff Gore and Melissa Tucker*)

Several subspecies of the field mouse inhabit dune habitat along Florida's coast and are collectively known as beach mice. Due to the extensive development of their coastal habitat, all but one of the beach mouse subspecies are State or Federally listed as threatened or endangered, including: Choctawhatchee beach mouse; Anastasia Island beach mouse; St. Andrews beach mouse; and Perdido Key beach mouse (all State and Federally endangered); and the Southeastern beach mouse (State and Federally threatened).

Conservation and Population Monitoring – For the past few years, FWC biologists have worked with land management partners to monitor beach mouse populations with track stations set in dune habitat on public lands. Track stations contain PVC baited tubes with inked pads that record tracks of beach mice as they enter the tubes. Track stations have been established within the range of each of the subspecies in northwest Florida and they are checked monthly to determine the presence of mice. In FY 2009-10, FWC expanded the monitoring to one new area, revised the written monitoring protocol for use by interagency personnel, and managed volunteers and one intern through the FWC volunteer program to assist with beach mouse monitoring.

FWC biologists monitored St. Andrews beach mice at two public areas – East Crooked Island at Tyndall Air Force Base in Bay County and at Rish Park on the St. Joseph Peninsula in Gulf County. At East Crooked Island, 42 track stations were monitored during FY 2009-10. All of the tubes recorded tracks in some month during FY 2009-10 and an average of 95% of the stations checked each month detected mouse tracks. All 21 stations at Rish Park also recorded tracks and a monthly average of 77% of stations detected mouse tracks. In May 2010, trapping for St. Andrew beach mice was conducted in Gulf County for three consecutive nights at the Stumphole (a location just north of Eglin Air Force Base property on Cape Sans Blas), and for two consecutive nights at the St. Joseph Bay State Buffer Preserve. No mice were captured at either location.

The Florida Department of Environmental Protection (FDEP) and FWC continued to monitor the population of Choctawhatchee beach mice at Topsail Hill Preserve State Park in Okaloosa County, Deer Lake State Park in Walton County, and Grayton Beach State Park in Walton County. During FY 2009-10, 29 of the 32 stations at Topsail Hill recorded tracks in at least one month and a monthly average of 75% of stations detected mouse tracks. Thirteen of the 16 stations at Deer Lake recorded tracks in at least one month and 51% detected tracks on average each month. In August 2009, 100 traps were set for one night in the eastern portion of Deer Lake State Park to confirm what species were present. One beach mouse was captured. None of the 30 track stations at Grayton Beach recorded tracks. Ten tracking stations were at Camp Helen State Park and 11 tracking stations at St. Andrews State Park, both in Bay County. However, no mouse tracks were detected during FY 2009-10 at either park. Three consecutive nights of trapping resulted in the capture of six individual beach mice in Bay County at Non-Commissioned Officers Beach at Tyndall Air Force Base in May 2010.

The Perdido Key beach mouse currently has the smallest distribution of all the subspecies of beach mice and populations have dropped to low levels. The population still has not recovered fully from the impacts of Hurricane Ivan in 2004. In FY 2009-10, FWC biologists along with partners from FDEP and the National Park Service monitored track stations in

Perdido Key State Park (Escambia County) and Gulf Islands National Seashore (Escambia, Okaloosa and Santa Rosa counties in Florida; Jackson and Harrison counties in Mississippi) that were first established in 2005. Beach mouse tracks were detected in 74 of 80 tubes checked at Gulf Islands National Seashore with a monthly average of 58% of stations with tracks. In March 2010, personnel from local agencies assisted FWC in trapping across the Perdido Key Unit of Gulf Islands National Seashore. In five nights of trapping, 20 individuals were captured among 39 total captures, with 19 of those being recaptures.

At Perdido Key State Park, detections of mouse tracks had been declining steadily since 2006, but a single track was found in May 2009. Since then, tracking stations and live trapping have indicated the population has been gradually increasing. Two beach mice were captured in September 2009 confirming that the park had been repopulated. Of the 81 track tubes at Perdido Key State Park, tracks were detected at 46 tracking stations in FY 2009-10. Two consecutive nights of trapping were conducted at Perdido Key State Park in February 2010, yielding 11 individual beach mice. Five additional nights of trapping were conducted in May 2010 and 37 individuals were captured among 100 total captures of beach mice. The 37 individuals included six mice captured and marked during the February trapping.

Perdido Key Beach Mouse Captive Breeding – Just prior to landfall of Hurricane Ivan in 2004, eight beach mice were collected from Perdido Key State Park in Escambia County and transferred to a holding facility at the University of South Carolina. These mice were deemed unlikely to be returned to the wild due to potential for disease transmission and because the mice had become acclimated to captivity. In 2007, the original eight mice and their descendants were moved to three Florida zoos (Santa Fe Teaching Zoo, Palm Beach Zoo and Brevard Zoo) in order to provide the public an opportunity to see beach mice and to educate visitors about beach mouse biology and conservation. As of summer of 2010, the zoos continued to support captive, reproducing colonies of Perdido Key beach mice, providing opportunities for the public to view the mice and learn about their status in the wild. In March 2010, individuals from the breeding program were reintroduced into the Florida Point Unit of Gulf State Park, Alabama as part of cooperative effort between FWC, Alabama Department of Conservation and Natural Resources, USFWS, Brevard Zoo, The Teaching Zoo at Santa Fe Community College and Palm Beach Zoo. FWC conducted a radio-telemetry survey of 28 of the 48 released mice. After several days of radio-tracking, FWC biologists thought that a population of red fox on private lands had depredated an unknown number of released mice. The U.S. Department of Agriculture was contracted for predator removal, and seven fox were removed from the park. At 12 weeks post-release, biologists trapped 11 of the 48 released mice as well as 17 new mice born in the wild. The successful reintroduction marks the first population of beach mice to inhabit Gulf State Park in approximately 12 years, and the first time in at least 25 years that all three public managed lands on Perdido Key were occupied by beach mice. The status of beach mice on private lands across Perdido Key is unknown.

Development Impacts – Because habitat loss is a primary cause for the decline of beach mouse populations, regulation of land development within beach mouse habitat is a critical component of beach mouse conservation. FWC works with USFWS, developers, and local governments to identify ways to mitigate the loss of beach mouse habitat while allowing development to continue. During FY 2009-10, FWC biologists responded to permitting issues

regarding development at several sites in beach mouse habitat on both the Atlantic and Gulf coasts.

Key Largo Cotton Mouse (*Dan Greene*)

Population Monitoring – The Key Largo cotton mouse is a State and Federally endangered subspecies endemic to Key Largo, the northernmost island in the archipelago of the Florida Keys. The Key Largo cotton mouse represents the southernmost subspecies of its genus and is restricted to about 2,102 acres (851 hectares) of tropical hardwood hammock. Habitat destruction on Key Largo in the late 19th century resulted in a loss of two-thirds of the original hardwood hammock habitat, contributing to population declines in many species. Because the small, nocturnal cotton mouse is seldom observed, land managers have little information about the status of the population or how current land management activities affect distribution and abundance.

From 2007-2009, a plan for long-term monitoring of the Key Largo cotton mouse population was developed based upon live trapping of a sample of the population. During December 2009, FWC biologists evaluated this plan by trapping at the recommended 12 sampling sites. During the five nights of trapping, FWC captured 65 mice. FWC estimated the mean density of cotton mice was approximately 13.5 individuals/hectare in the areas trapped. Extrapolating that density to the total available habitat, FWC estimated a total population of approximately 11,528 cotton mice.

These densities and total population estimates are approximately one-half the past estimates of density and population size. Due to the low number of captures, error rates in the estimates were too high to determine if a decrease in the population size had actually occurred. Because cotton mouse populations fluctuate in size both seasonally and annually, multiple years of surveys will be needed to determine the range of variation in population size that cotton mice experience seasonally and annually.

Florida Bonneted Bat (*Josh Birchfield and Jennifer Morse*)

The Florida bonneted bat is the largest and rarest bat species in Florida and is a State and Federally listed endangered species. There was only one known colony statewide (in a bat box at a private residence in Ft. Myers) until 2006 when bonneted bats were detected via acoustic surveys by the Florida Bat Conservancy on Babcock Webb Wildlife Management Area (WMA) in Charlotte County. In 2007, FWC installed four roosts, each consisting of one pair of single-chambered bat houses, on the WMA. In December 2008, two roosts were occupied by bonneted bats, tripling the number of known roosts for this species. FWC staff confirmed that two more bat houses were being used by Florida bonneted bats in May 2010, bringing the total confirmed occupied bat roosts on Babcock Webb WMA to four. These roosts are checked periodically by FWC to monitor occupancy.

Gray Bat (*Jeff Gore*)

The gray bat, a State and Federally endangered species, is a colonial cave-roosting species that occurs throughout much of the south-central U.S. The gray bat's range-wide population previously suffered severe declines due to disturbance of its cave roosts, but it now

appears to be increasing. In Florida, however, the gray bat roosts only in a few caves in Jackson County where the population appears to be declining in spite of the fact that the roost caves are protected.

Gray bats occupy different caves in summer and winter based upon temperature, and some bats migrate out of Florida during winter. The size of the summer population of gray bats in Florida cannot be easily determined because the bats roost within large colonies of a similar bat species, the Southeastern myotis. Observations made within caves and during counts conducted in the evening as bats exit their roosts are not definitive because of the presence of the other species. Regardless, no gray bats have been observed or captured at summer roosts in Florida for several years. In spring of 2010, emerging bats were counted at Judges Cave in Jackson County, an FWC-managed site and formerly the location of the largest maternity roost for gray bats in Florida. No gray bats were present in a sample of bats captured at Judges Cave and no gray bats were observed during a visit inside the cave.

The gray bat winters in two Florida caves (Judges Cave and Old Indian Cave in Jackson County) and the hibernating bats can be readily counted at both sites. Few gray bats have been observed in recent years during the annual census of the winter roosts conducted by biologists from FWC and the Florida Department of Environmental Protection's Division of Parks and Recreation. In February 2010, biologists found five gray bats in Old Indian Cave (Jackson County). In comparison, no gray bats were seen in 2009, seven in 2008, and none in 2007.

More frequent surveys or a more thorough census might provide a better estimate of the number of roosting bats, but surveys are limited to once annually to minimize disturbance of the hibernating bats. Despite the apparent fluctuation, the number of gray bats in Florida remains critically low and the species may soon be absent from the state. Since the roost caves are protected, factors other than disturbance of roosts may be responsible for the decline. Gray bats occur in much larger numbers in other states such as Alabama, Georgia and Tennessee, but the new wildlife disease known as White Nose Syndrome may soon adversely affect those populations.

Florida Panther (*Darrell Land, Mark Lotz, Dave Onorato, Marc Criffield and Mark Cunningham*)

The Florida panther is a State and Federally endangered subspecies of the puma (also called cougar or mountain lion) that at one time occurred throughout much of the southeastern U.S. Unregulated harvest of panthers through the mid-1900s and, more recently, habitat loss and fragmentation due to the growth of the human population reduced the panther population and isolated it from other puma populations. When FWC began investigations into the status and distribution of panthers in the early 1970s, there were an estimated 30-50 panthers still living in South Florida. The small population size and geographic isolation from other puma populations made the Florida panther very vulnerable to extinction. Therefore, the FWC released eight female puma from Texas into areas occupied by Florida panthers in the mid 1990s to increase the health of the panther population by increasing the diversity of the population's genetic composition. Of the eight female Texas puma that were introduced into the Florida panther population, five died and the other three were removed from the population in 2002 and 2003 to avoid including too much of their DNA in the Florida panther population. These three puma were placed in captivity. FWC continues to monitor the effects of this genetic infusion and its

impact on the panther population. Today, the Florida panther population is estimated to be between 100-160 adults in south Florida due in part to these actions.

The FWC and its partner, Big Cypress National Preserve (BCNP), monitor the panther population using radio telemetry. A sample of panthers are captured and fitted with radio collars containing radio transmitters. Panthers are located and their locations recorded several times a week. Since 1981, 182 panthers have been radio-collared, providing essential data for the management and conservation of the population. Radio telemetry data were collected on 34 Florida panthers in FY 2009-10. In addition to monitoring by radio telemetry, FWC and BCNP biologists sample panther dens to record data on newborn kittens. In FY 2009-10, ten panther dens were sampled by FWC and BCNP biologists resulting in the documentation of 26 kittens (17 males, nine females). Kittens handled at these dens were permanently marked with transponder chips called PIT tags placed below the skin. Since 1992, 306 kittens have been handled (weighed, sexed, dewormed, inserted transponder chip, samples collected) at dens.

In FY 2009-10, 27 wild Florida panthers were known to have died, including six (four males, two females) radio-collared panthers and twenty-one (13 males, eight females) uncollared panthers. Twenty panthers died after being hit by vehicles, four were killed by other panthers (called intraspecific aggression), and three died from undetermined causes. The remaining uncollared panther death is currently under investigation; the skeletal remains of the male panther were recovered from Rookery Bay National Estuarine Research Reserve, but it is unknown whether the panther died during the reporting period or what contributed to this panther's death.

In addition to monitoring the Florida panther population, several panther management and research activities were conducted during FY 2009-10. FWC continued to evaluate Global Positioning System (GPS) radio collars in FY 2009-10. These radio collars worked reasonably well on panthers and offer a significant advancement over traditional monitoring of panthers. Traditional monitoring was conducted from an aircraft by collecting multiple locations over a 24-hour period. GPS systems that send data locations via text messaging also have shown promise as a means of avoiding data loss associated with store-on-board GPS collars, and reducing flight costs and risks to personnel during low elevation aerial searches. GPS collars only function for 330 days on average before the batteries are exhausted. FWC also initiated testing of GPS pods that attach to traditional VHF (very high frequency) collars. This system allows for the collection of location data at a more rapid rate than tradition VHF collars while also permitting long term monitoring of collared panthers.

FWC investigates human-panther interactions in accordance with the Interagency Florida Panther Response Plan (http://www.fws.gov/verobeach/images/pdflibrary/R4FWS_Panther%20EA.final.pdf). FWC verified that panthers were responsible for preying upon domestic livestock (called depredations) in eleven separate events during FY 2009-10. Three panther-people interactions qualified as encounters according to the definitions outlined in the Response Plan. Panthers were encountered by a jogger on public land, laborers in an orange grove, and motorists on a rural road. Home owners were provided guidance on best animal husbandry practices and offered informative brochures for living in areas where panthers occur. FWC assisted the Defenders of Wildlife and other volunteers in the distribution of 2,000 "Living with Panthers" information packets. This door-to-door event was focused in a semi-rural area of Collier County where a female panther with kittens was involved in four of the eleven depredation events.

FWC provided information and reviews of numerous road and development projects throughout southern Florida. Three proposed major road projects fall within important panther habitat and FWC has been providing guidance on minimizing or avoiding panther impacts.

An FWC staff member participated on an independent team to review the Florida Panther Protection Program proposed for the Rural Lands Stewardship Area of Collier County. Information about the Florida Panther Protection Plan referenced above may be accessed at: http://www.floridapantherprotection.com. A group of large landowners and non-governmental organizations developed this program with the goal of achieving better panther conservation than current policies provide across 196,000 acres while at the same time providing for diverse economic opportunities within the Rural Lands area. The review team completed their final report during FY 2009-10 and the report is available on-line at http://www.floridapanthernet.org/.

FWC was contacted by U.S. Senator Bill Nelson's office in response to constituent concerns with the high number of Florida panthers hit and killed by cars and trucks. FWC provided the Senator's staff with information on the impacts of roadways and traffic on panthers and other wildlife. Wildlife crossings are the most effective solution to alleviating panther deaths on roads but they are also expensive. The last two wildlife crossings, completed a few years ago, cost an estimated $4.5 million each. FWC discussed with Senator Nelson's staff the idea that a new panther crossing design could be developed that would be less expensive but equally effective. Through Senator Nelson's efforts, $955,000 of Federal funds was secured for this pilot project. Collier County Department of Transportation Planning is working with the Florida Department of Transportation and FWC to design and build a smaller and less expensive wildlife crossing on a Collier County road. Collier County expects to issue a Request for Proposals for this project during FY 2010-11.

Research continues to be an important part of Florida panther conservation. Research plans are vetted with FWC's partners to ensure that the research and monitoring efforts are well-designed, coordinated, and meet priority needs. FWC has continued several research projects that were deemed a priority by the Florida Panther Scientific Review Team commissioned by FWC and the U.S. Fish and Wildlife Service in 2002. This research included development of a panther demographic model, improving estimates of adult and kitten survival, continuing to evaluate panther habitat selection through use of GPS radio collars, and finalizing analyses on nearly 30 years of panther genetic data. These projects will all be completed in FY 2010-11. New research initiated in FY 2009-10 focused on the movement rates of panthers and the impact of various factors on these rates as well as more fine-scale habitat selection modeling. FWC is preparing manuscripts on genetic introgression (adding new genes to the population), adult and kitten survival, reproductive performance, and habitat selection of panthers. FWC staff served as lead or co-authors on four peer-reviewed publications and six abstracts presented at five different professional meetings.

An extensive collection of additional panther reports and publications on current panther management and research may be found at the following websites:
http://www.wildflorida.org/critters/panther/index.asp,
http://www.floridapanthernet.org/index.php,
http://www.fws.gov/verobeach/Florida_Panther.htm,

Florida Manatee (*Leslie Ward-Geiger and Carol Knox*)

The Florida manatee is native to Florida's coastal estuaries and riverine waters and is a State and Federally endangered species. Manatees have been protected by Florida since 1892. The manatee is also Federally protected under the Marine Mammal Protection Act and the Endangered Species Act. Florida's efforts to conserve the manatee are funded primarily by the Save the Manatee Trust Fund that derives approximately 1/3 of its funds from the sale of the specialty license plates. Conservation efforts are guided by the Florida Manatee Sanctuary Act of 1978, the Florida Manatee Management Plan approved in December 2007 (which may be accessed at http://www.myfwc.com/docs/WildlifeHabitats/Manatee_Mgmt_Plan.pdf), and the U.S. Fish and Wildlife Service (USFWS) Florida Manatee Recovery Plan of 2001.

FWC and the USFWS continue to work closely on manatee issues, particularly human-related risks and habitat loss. For more information regarding manatee conservation efforts, please see the Save the Manatee Trust Fund annual report provided to the President of the Florida Senate and the Speaker of the Florida House of Representatives each year, available at: http://myfwc.com/docs/AboutFWC/legislative/2010_SessionReport_SaveTheManatee.pdf. Manatee management activities are directed by the FWC Manatee Management Plan and focus on five program areas:

Manatee Protection Plans (MPPs) – This work involves the development and implementation of comprehensive county-based MPPs and the approval of MPPs by the Commission. FWC is currently assisting Duval, Collier, and Sarasota counties as they work to revise their existing plans. FWC is analyzing new manatee data and assisting the counties in drafting revisions to their current plans that should be completed in FY 2010-11. FWC provided Miami-Dade County with comments on several possible revisions to their existing MPP and provided assistance to Charlotte County as they consider whether or not to develop their first MPP.

Rule Making – FWC developed boat speed and safe haven regulations to protect manatees statewide. Extensive work is required involving county governments, stakeholder groups, and the public in order to complete rule-making efforts. Work to evaluate and modify the existing speed zones in Sarasota County was completed and the final rule was adopted in June 2010. FWC began the process of evaluating the existing rules in Broward County and considering the need for new speed zones in Flagler County. FWC completed extensive data analysis in both counties and identified areas that should be evaluated for possible modifications to existing rules in Broward County and areas where new regulations may be required in Flagler County. The counties each formed a Local Rule Review Committee to provide local perspective to FWC as part of the rule development process. Those committees met during the summer of 2010 and continue to discuss the FWC proposal.

Permit Reviews – FWC produced 323 final comment letters for projects reviewed during the year. These biological opinions and recommendations on ways to reduce potential impacts to manatees were provided to regulatory agencies. Implementation of the boat facility citing portion of FWC-approved MPPs is accomplished during the permit review process. Comments also call for public information about manatees as facilities are required to post informational signs on manatees and distribute written materials to boat users.

Manatee Habitat – FWC participated in various inter-governmental groups and task forces regarding minimum flows at springs, invasive aquatic plant control, seagrass monitoring and protection, and other habitat related concerns. FWC worked to address the potential loss of

warm water manatee habitat provided by power plant discharges by continuing to work on monitoring plans for power plant conversions in Palm Beach and Brevard counties. In an effort to secure more natural warm water habitat provided by springs, FWC helped remove barriers in Warm Mineral Springs in Sarasota County, which provided manatee access to more areas in this spring. FWC is working with other agencies and The Nature Conservancy on a project in Fanning Springs to improve manatee access to that spring run.

Research Activities – The manatee research program included work in the following areas:

Mortality and Rescue – A network of researchers and law enforcement agencies was established in 1974 to recover manatee carcasses and assist injured manatees. During FY 2009-10, 756 manatee carcasses were documented in Florida. All but 72 of these carcasses were recovered and examined in order to determine causes of death. Collision with watercraft accounted for 94 of the 756 cases. Other causes of manatee death are perinatal issues, cold stress, natural causes, and human influence. A statewide Unusual Mortality Event was declared during FY 2009-10 by the Federal Working Group for Marine Mammal Mortality Events because prolonged cold temperatures during the winter of 2010 resulted in unprecedented numbers of cold-related mortalities and numerous rescues of cold stressed animals. An interactive searchable web-based database with manatee mortality information is available at http://research.myfwc.com/features/category_sub.asp?id=2241.

FWC and cooperators rescued 108 sick or injured manatees under the Federally permitted statewide rescue program. Three oceanaria (Lowry Park Zoo in Tampa, Miami Seaquarium and Sea World in Orlando) participate in the rehabilitation program for critical care treatment and are partially reimbursed by FWC for their costs. As of June 2010, 45 of these rescued manatees were released back into the wild. FWC participated as a contributing organization to multi-agency efforts to release and track rehabilitated manatees that were rescued due to injury, cold stress, or other problems. As part of that partnership, FWC participated in pre-release health assessments and releases of rehabilitated manatees in various parts of the state, and assisted in monitoring two manatees in Brevard County. The information obtained during manatee rehabilitation, treatment, and necropsy assists in reducing manatee mortality by identifying important threats.

FWC worked on the Deepwater Horizon oil spill response including participation on both wildlife response and resource damage assessment teams related to marine mammals. FWC participated in several aerial surveys to look for manatees and other marine mammals in areas impacted by oil.

Population Assessment – FWC uses a variety of methods to assess and monitor the current and future status of the Florida manatee population. Population assessments currently include conducting manatee counts at winter aggregation sites, distributional aerial surveys used to determine regional distribution of manatees and to assess habitat use, and estimating survival, population growth, and reproductive rates through photo-identification and the recent application of genetic markers.

The annual statewide manatee synoptic survey was conducted in winter 2010. A team of 21 observers from ten organizations counted 5,076 manatees statewide during the week of January 19, 2010. The count exceeded all previous counts and is considered to be a minimum count. For more information about aerial surveys and the synoptic count please refer to http://research.myfwc.com/features/category_sub.asp?id=2190.

On a regional basis, FWC uses distribution surveys to determine the seasonal distribution and habitat use of manatees. These surveys are usually flown twice monthly in specified counties for a period of two years. In September of 2008, FWC staff initiated a manatee distribution survey of the western part of Pinellas County and it was completed during FY 2009-10. A distributional survey was initiated during FY 2009-10 in eastern Pinellas County and will continue for two years. FWC also carried out or funded studies to provide baseline data on abundance, distribution, movements, and behavior of manatees overwintering (staying throughout the winter) in Brevard County, where they are most vulnerable to the cold. Currently, researchers are developing new aerial survey techniques that will provide precise and reliable estimates of distribution and population size. These new methods and resultant data will contribute to models that incorporate information about how well observers detect manatees from the air and will relate environmental variables to the number of animals counted by observers. Details are described in the "Monitoring Activities" and "Ongoing and Future Research" sections of the Manatee Management Plan (pages 84-114) that may be found at http://www.myfwc.com/docs/WildlifeHabitats/Manatee_MgmtPlan.pdf. FWC, in cooperation with the U.S. Geological Survey (USGS) Sirenia Project and Mote Marine Laboratory, maintains an image-based, computerized database called the Manatee Individual Photo-Identification System that is used for photo-identification of individual manatees. These data provide life history information and assist scientists in estimating survival and reproduction rates, critical data required for determining the status of the manatee population.

Critical data gaps still exist in Florida manatee population assessments. In particular, it has been very difficult to estimate vital statistics for Florida manatees in southwest Florida through photo-identification because of photographic conditions, animal accessibility, and other extrinsic factors. Three demographic parameters are in need of refinement to better model manatee status: annual reproductive rates, annual gender-specific movement probabilities between the northwest and southwest regions, and gender-specific adult survival rates in the southwest region. Genetic testing offers an additional means of identifying individual manatees and its application could greatly enhance existing monitoring and assessment studies. The Manatee Management Plan identified the need for optimal genetic tissue-sampling protocols for free-swimming manatees in order to implement a robust genetic identification program for the above-described monitoring applications. FWC successfully tested a new method to collect skin samples from free swimming manatees in winter 2008. During the winter of 2009-10, FWC conducted prospective, "dedicated" genetic sampling surveys with the main objective of collecting manatee skin biopsy samples. These prospective surveys provided a number of samples and the results will help design future genetic sampling surveys. Additionally, FWC staff is collaborating with USGS Sirenia Project to develop statistical models that integrate data from photo-identification and genetic-identification surveys, as well as the carcass recovery program, to estimate population vital rates.

Behavioral Ecology – In FY 2009-10, FWC's behavioral ecology program continued to enter, verify, and analyze data from a two-year field research project on tagged manatee interactions with motorized watercraft in southwest Florida. This work was in collaboration with researchers at Florida State University, Duke University, and Woods Hole Oceanographic Institution. A thorough understanding of the behavioral and sensory mechanisms underlying manatee-boat collisions is necessary in order to devise effective methods of avoidance. The goal of the project is to create a combined picture of manatee behavior, acoustics, and vessel

trajectories to better understand the responses displayed by manatees when approached by boats and the acoustic cues that may mediate such responses. The research combined state-of-the-art, electronic tags attached to manatees with boat-based observations and aerial videography. In addition to the Save the Manatee Trust Fund, this project was funded by FWC's Florida Manatee Avoidance Technology Program and the Disney Worldwide Conservation Fund.

Warm-water habitat that is found around two power plants in Florida is of particular interest to FWC and agency partners because the predicted future loss of this habitat is deemed a key long-term threat to the manatee population. Although warm-water carrying capacity is an important parameter in population viability models, current estimates of carrying capacity are based on expert opinion. A conceptual framework of studies to determine carrying capacity is needed, as identified within the Manatee Management Plan. Such a framework will help to identify critical information gaps to ensure that limited resources are directed towards the highest-priority research needs. The aim is to place warm-water research in the context of over-arching management needs and to provide a common vision for the future on this important issue. FWC and agency partners developed a draft warm water research framework to conceptualize research needs and connectivity among projects. Over the past year, FWC scientists and managers, along with USGS, Mote Laboratory, and Florida Power and Light partners, have formulated plans to monitor how manatees will respond to a major change at traditionally used warm-water sites – two power plants along the east coast that are scheduled to be repowered over the next few years.

North Atlantic Right Whale (*Leslie Ward-Geiger*)

The North Atlantic right whale is a State and Federally endangered species. The only known calving grounds for this species are off the coast of northeast Florida and southeast Georgia. The southeastern U.S. calving season for the North Atlantic right whale is approximately November 15 – April 15. FWC conducted aerial surveys to monitor seasonal presence of right whales, mitigate vessel-whale collisions, and assess population dynamics. Most of this work was supported by funds from the National Oceanic and Atmospheric Agency (NOAA)-Fisheries. Photographs taken by aerial observers are used to identify individual right whales based on the callosity (a natural growth of cornified skin) pattern on their head as well as natural marks and human-related scars. Over time, population demographics, reproductive success, mortality and trends in health are monitored, in part, through this photo-identification research. FWC is one of a handful of major contributors to the North Atlantic Right Whale Catalog – the central repository for archiving and maintaining photographs and sighting data on right whales. FWC has also worked closely with Federal, State, and non-governmental organization partners to compile years of aerial-survey data into a GIS database. Analyses of these spatial data help scientists and managers to evaluate right whale distribution patterns in the calving grounds in relation to environmental factors, such as sea surface temperatures and water depth, and human activities such as vessel traffic. FWC analyzed ship traffic data to help monitor compliance with vessel speed regulations.

Nineteen mother/calf pairs were documented in the southeastern U.S. during FY 2009-10. Preliminary photo analysis indicates FWC documented 162 adult individual right whales (excluding calves). This is the highest number of individual right whales documented by FWC during a single calving season (from November 15 to April 15) for the past several years. Mothers are photo-identified and have a unique ID code per individual whereas calves do not

have distinguishing features yet so they do not have a code. In addition, The FWC team documented 11 humpback whales, including one severely entangled individual.

Four right whale entanglement related cases were documented in the southeastern U.S. during the FY 2009-10 calving season. FWC, along with other organizations including the Georgia Department of Natural Resources, New England Aquarium, NOAA-Fisheries, Wildlife Trust, and the Provincetown Center for Coastal Studies, participated in the documentation and disentanglement responses. No right whale carcasses were sighted or stranded in the southeastern U.S. during this calving season; however one calf was recorded as dead since the mother had been re-sighted repeatedly in the southeast calving season without its calf (that had been born that same season).

FWC in collaboration with Georgia Department of Natural Resources staff and NOAA-Fisheries conducted 34 right whale biopsy sampling trips, which resulted in ten biopsy samples collected from calves, and several previously unsampled juvenile and adult whales. The skin samples will be used to generate information on kinship, individual identification and gender, stock identity, and genetic variability within the population. The blubber portion of the samples will be used to determine contaminant levels and to gain information about feeding ecology and nutritional condition.

Peregrine Falcon (*Robin Boughton*)

The peregrine falcon was delisted by the U.S. Fish and Wildlife Service in 1999. Following a Biological Status Review, a Florida Peregrine Falcon Management Plan was developed and approved by the Commission at their June 2009 meeting and the peregrine falcon was removed from the State's Endangered Species List. The Management Plan is available at http://www.myfwc.com/docs/WildlifeHabitats/ImpSpp_Peregrine_Plan.pdf . FWC will continue reporting work on peregrine falcons for the five-year post-delisting period established by the USFWS. Peregrine falcons do not breed in Florida and are only present as migrants or uncommon winter residents. The conservation actions in the Management Plan are to manage and continue to acquire habitat for the peregrine falcon, and to conduct a migration count.

- *Habitat Management* – Ongoing land management practices on wildlife management areas and other public lands that benefit other species also benefit peregrine falcons.
- *Habitat Acquisition* – Coastal properties are of particular importance to both migrating and overwintering peregrine falcons. Acquisition of coastal land is included in the Florida Forever program. Of particular importance is the high priority "Florida Keys Ecosystem" Florida Forever project. The narrowness of the Middle Keys serves to concentrate migrating peregrine falcons and therefore, preservation of roosting and foraging habitat in this area is essential. Important parcels have been identified including Boot Key, Lower Matecumbe, and other large, relatively undeveloped parcels in the Middle Keys. Acquisition of lands identified in the Florida Forever program is not possible at this time due to a lack of funding.
- *Monitoring* – FWC has had a monitoring project for peregrine falcons in the Keys for the past ten years. The grant programs that funded this migration count in the past are not intended to fund long-term projects. Although FWC places a high value on migration count monitoring, continued funding has not been secured. FWC continues to seek funds to continue this monitoring project.

Bald Eagle (*Robin Boughton, Ulgonda Kirkpatrick, Kim Sash, Morgan Wilbur and Valerie Sparling*)

The bald eagle was removed from the Federal Endangered Species List in August 2007. It was removed from the State of Florida's Endangered Species List in April 2008. FWC, however, will continue reporting work on bald eagles for the five-year post-delisting period established by the U.S. Fish and Wildlife Service (USFWS). Even though the bald eagle is no longer listed by the State or Federal government, it is still afforded protection under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. FWC continues to issue permits (mostly disturbance) for bald eagles under 68A-16.002 F.A.C.

Management Plan Implementation and Permitting – Bald eagle management and monitoring is funded by the Wildlife Foundation of Florida. The Commission approved a final management plan and delisted the bald eagle in April 2008. An internal implementation team was formed immediately following the adoption of the State plan. A public Website was developed and is updated periodically to accommodate all current information including the final management plan, permitting information, and latest nest locations. It can be found at http://myfwc.com/WILDLIFEHABITATS/Eagle_Index.htm.

FWC is working with the U.S. Fish and Wildlife Service (USFWS) to coordinate permitting efforts between the two agencies. In November 2009, the USFWS began issuing bald eagle permits under the Bald and Golden Eagle Protection Act. FWC provides assistance on projects, reviewing permit applications, and issuing State bald eagle permits. The goal for FWC is to have a single permitting system between the two agencies. Population monitoring is ongoing to ensure that Florida is achieving the management plan goal of maintaining a stable or increasing population of bald eagles throughout Florida in perpetuity. The first five-year plan review is scheduled for 2013.

Nesting Surveys – Nesting surveys for bald eagles were conducted in December 2009 and again in January 2010 on the Apalachicola River Wildlife and Environmental Area (WEA) in Gulf and Franklin counties to monitor the relative success of nesting eagles. Systematic aerial transects are flown on the Apalachicola River WEA and the surrounding area, as well as St. Vincent Island National Wildlife Refuge. All nests were recorded as either active or inactive and the number of eggs/nestlings was recorded for all nests. During the FY 2009-10 aerial survey, 29 eagle territories were visited. Of these, 25 were active; seven nests were being incubated, three had eggs, eleven had chicks, and two had eagles present. Thirty-six adult eagles were observed during the flight. Active eagle nests increased by six nests compared to FY 2008-09.

Nesting surveys for bald eagles were conducted during December 2009 on the Aucilla Wildlife Management Area (WMA) in Jefferson and Taylor counties and the L. Kirk Edwards Wildlife and Environmental Area (WEA) in Leon County. The only known eagle nest on Aucilla WMA was not active in 2007 or 2008 although adult eagles were still observed in the area during the nesting season. As such, area staff conducted an aerial nest survey in an attempt to identify another active nest. Aerial transects along the Wacissa River basin and Lower Lake Lafayette were flown on the WMA and WEA respectively. The previously identified nest was determined to be inactive again and a previously unrecorded nest was found further south with an adult eagle present at the nest. No new nests were identified during the survey on L. Kirk

Edwards WEA. Two previously recorded nests that do not occur on these public properties but are adjacent were also monitored during the survey. Both were active with an adult eagle present at each nest. Additionally, during the annual wading bird nest colony survey, a previously unrecorded nest was found on Aucilla WMA in late April 2010. The nest is in a large living pine tree and appears to be an eagle nest. While the nest was not active at the time it was found, it was in good condition and appeared to have been active that year. The nest will be monitored in December 2010 to confirm if it is an active eagle nest.

Aerial nest surveys for bald eagles were conducted in January and March of 2010, and ground surveys were conducted throughout the breeding season at both John G. and Susan H. Dupuis, Jr. WEA and J.W. Corbett WMA in Palm Beach County. The initial helicopter surveys determined active nests and later surveys monitored success. Volunteers with Audubon's Eaglewatch program assisted with ground surveys. The status of nests (active or inactive) and number of young were recorded. Seven active nests monitored at Dupuis produced seven fledglings. Four active nests at Corbett produced three fledglings.

Florida Grasshopper Sparrow (*Michael Delany and Tina Hannon*)

The Florida grasshopper sparrow is a State and Federally endangered subspecies occurring in the dry prairie landscape of south-central Florida. Florida's dry prairie is a distinct floristic region of the state characterized by flat, open expanses dominated by fire-dependent grasses, saw palmetto, and low shrubs. Following a status survey conducted by FWC, the Florida grasshopper sparrow was Federally listed as endangered in 1986 because of its low numbers, restricted distribution and habitat loss. The Federal recovery objective is to down-list the sparrow to threatened when ten protected locations contain stable, self-sustaining populations of more than 50 breeding pairs each. Although the Florida grasshopper sparrow is known to exist at seven locations, only two populations meet recovery criteria: Three Lakes Wildlife Management Area (WMA) in Osceola County and Kissimmee Prairie Preserve State Park in Okeechobee County. Only three populations of Florida grasshopper sparrow persist on Florida's public lands; these include the Three Lakes WMA, Kissimmee Prairie Preserve State Park, and Avon Park Air Force Range in Highlands and Polk counties. Florida grasshopper sparrows on protected lands are monitored by annual point count surveys, a standard method used to assess the relative abundance of bird populations.

<u>Monitoring on Three Lakes Wildlife Management Area in Osceola County</u> – Point count surveys for Florida grasshopper sparrows have been conducted on the Three Lakes WMA since 1991. The surveys consist of a grid of 190 stations spaced 0.25 mi (0.40 km) apart. Each station is surveyed for five minutes, three times each spring (April – June), and all Florida grasshopper sparrows heard or observed are recorded. In 2002, 60 stations were established north of the main population on what is called "the island" to determine if translocation of 18 juvenile sparrows in 2001 and 2002 were successful. In FY 2009-10, surveys estimated there were at least 92 different male Florida grasshopper sparrows at the main site, up from 89 in 2008-09. A single male was detected on the island. This is the first Florida grasshopper sparrow detected on the island since 2007. Oaks and cabbage palms that have encroached on the dry prairie as a result of past fire suppression were mulched to ground level in 2007 and 2008 on a site adjacent to the main site and 18 survey stations were added to that area in 2008. No birds were detected in 2008; however, one bird was detected in the restored area in 2009 and again at the same location

in 2010. Monitoring will continue. In an effort to maintain and restore the dry prairie that became overgrown with palmetto, rollerchopping was conducted during FY 2009-10 on 137 acres (55 hectares) on the main site and on 499 acres (202 hectares) in a disjunct, overgrown portion of dry prairie where tree removal was conducted in 2009. New survey stations will be added to this area in FY 2010-11.

Florida Scrub-Jay (*David Turner, Nicole Ranalli, Craig Faulhaber, Norberto Fernandez, Jim Garrison, Travis Blunden, Stuart Cumberbatch and Steve Shattler*)

The Florida scrub-jay is a State and Federally threatened Florida species. Habitat loss and degradation have caused widespread declines throughout the scrub-jay's range. Despite protected status (land under public or private ownership that is dedicated for conservation) for three quarters of the remaining scrubby habitats in Florida, scrub-jay numbers have continued to decline on conservation lands largely due to habitat degradation caused by decades of fire suppression and inadequate habitat management. Most of the remaining protected scrub-jay habitat is owned by county, State, or Federal government. Conserving this species requires the efforts of multiple local, State, and Federal agencies as well as non-governmental organizations and private landowners. The Florida Scrub-Jay Conservation Coordination project assists these efforts by facilitating communication among partners, collecting and distributing information regarding monitoring and management, working with partners to establish priority management actions, and developing standards and guidelines for conservation efforts. Typical habitat management efforts include prescribed burning and mechanical treatments such as roller chopping and cutting of trees that have encroached on scrub-jay habitat to increase open areas.

Conservation Coordination – The Florida Scrub-Jay Conservation Coordination project continued to facilitate communication among partners and to help land managers and biologists overcome obstacles to managing this threatened species and its habitat. Four regional working groups were developed that focused on management and monitoring of scrub-jays and scrub-jay habitat. The working groups provide an excellent opportunity for participants to network, share ideas and experiences, and learn about new developments. Working group meeting attendees included representatives from all major public land management entities: U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service, Florida Department of Agriculture and Consumer Services' (FDACS) Division of Forestry, Florida Department of Environmental Protection (FDEP), FWC, Water Management Districts, and county governments, as well as nongovernmental organizations and private landowners. FWC also helped organize the Northeast Florida Scrub Working Group's Groundcover Restoration Workshop, which had over 80 participants. Project personnel are currently planning meetings of the West Central Florida Uplands Working Group and Southwest Florida Scrub Working Group. FWC organized a Land Management Field Trip for the Southeast Florida Scrub Ecosystem Working Group, with the goal of sharing experiences and generating ideas regarding scrub-jay habitat management. FWC also organized a Private Lands Committee meeting for the Northeast Florida Scrub Working Group to identify priority areas of scrub-jay habitat and to share options for engaging private landowners in scrub-jay conservation.

Project staff maintained the Florida Scrub-Jay SharePoint, (http://share2.myfwc.com/scrubjay/default.aspx), a clearinghouse of information on upcoming

events, working groups, funding opportunities, and options for habitat management and scrub-jay monitoring.

FWC worked with partners to help establish priority management actions and monitoring for scrub-jays and their habitat. Activities in FY 2009-10 included more than a dozen site visits to discuss scrub-jay habitat management with land managers and biologists from the FDACS Division of Forestry, Florida Park Service, St. Johns River Water Management District, FWC, USFWS, Archbold Biological Station, and several county governments. FWC provided financial assistance to Archbold Biological Station to produce a report and maps of the current status of scrub-jays on managed conservation lands. FWC provided assistance for the Brevard Zoo's scrub-jay translocation project. This experimental project involved moving scrub-jays from areas permitted for development to managed conservation lands. FWC worked with partner organizations to promote continuation of The Nature Conservancy's highly successful Jay Watch monitoring program. FWC worked with the U.S. Forest Service to develop monitoring protocols for scrub-jays in Ocala National Forest. FWC also participated in initial pilot surveys for this project as well as scrub-jay surveys in Levy and Marion counties.

Finally, FWC worked with partners to develop agency guidelines to benefit scrub-jay conservation and to draft Florida Scrub-Jay Translocation Guidelines. When approved, these guidelines should help partners conduct successful translocations that involve moving scrub-jays to areas of suitable habitat for conservation purposes. FWC staff developed the agency's Position on Hardwood Control in Restoration of Fire-Adapted Natural Communities. This position statement seeks to address stakeholder concerns regarding important restoration actions in scrub-jay habitat.

Conservation--Nongame Wildlife Grant – David Breininger, Dynamac Corporation, completed his Nongame Wildlife Grant study demonstrating demographic differences in Florida scrub-jay populations occupying different quality habitats in mainland Brevard and Indian River counties. Multiple Florida scrub-jay populations and their habitats, including potential habitats, were surveyed to determine population health and habitat conditions relative to current management practices and information needs. Results indicated most occupied areas that were actively managed included marginal habit that was improving and was expected to continue improving. Results also indicated that only a small portion of the suitable and currently occupied areas in the study supported recruitment rates that matched or exceeded the mortality rate for the population. This resulted in average annual population declines, which is of concern considering the small population size and increasing isolation of the areas dedicated to Florida scrub-jay conservation.

The study concluded that management efforts and decisions should be guided by the current status of Florida scrub-jay populations and their respective habitats with a primary aim being to maintain habitats with vegetation at optimal heights. Further, the study determined that both rigorous land management and ecological data are needed to help conserve Florida scrub-jays and the habitats they occupy. Information and data from this study will be utilized by organizations responsible for land management activities that impact Florida scrub-jay populations in the study area.

Salt Lake Wildlife Management Area in Brevard County – FWC continued to monitor the Florida scrub-jay population on the Salt Lake Wildlife Management Area (WMA) in Brevard County. As part of FWC's new Wildlife Conservation, Prioritization, and Recovery program, which focuses on strategic management of imperiled wildlife species on WMAs, roughly 104

acres of scrub, scrubby flatwoods, and mesic flatwoods were targeted for specific management in FY 2009-10 to benefit scrub-jays. Salt Lake WMA supports about six family groups with an estimated population of 19 scrub-jays. There was documented recruitment among three of the six families in FY 2009-10. Recruitment totaled six individuals, with two individuals in three separate family groups. All six scrub-jay family groups are located in proximity to the Salt Lake WMA boundaries and each family group has territories that extend onto adjacent public and private properties. During FY 2009-10 one of the scrub-jays banded on Salt Lake WMA relocated to Buck Lake Conservation Area, which is located several miles to the north. Continued monitoring and additional banding efforts are scheduled to continue into FY 2010-11

Scrub-jay habitat management focused on roller chopping eight acres (2.2 hectares) and prescribed burning of 104 acres (42.1 hectares) of potential scrub-jay habitat. Management activities slated for FY 2010-11 include continued use of roller chopping and prescribed fire on approximately 118 acres (47.8 hectares) of potential scrub-jay habitat as well as removal of some trees in proximity to suitable habitat.

Arbuckle and Walk-in-the-Water Wildlife Management Areas in Polk County – The Arbuckle and Walk-in-the-Water WMAs are part of the Lake Wales Ridge State Forest (LWRSF) and encompass nearly 20,000 acres of various habitat types, including scrub and sandhill. Scrub habitat contains a mix of oak trees and shrubs, herbaceous plants, and bare patches of sand, while sandhill habitat contains a mix of vegetation types, including wiregrass and native pines. Both tracts are managed using prescribed fire and nearly half of these habitats are potentially suitable for Florida scrub-jays. FDACS' Division of Forestry is the lead management agency on these areas and FWC is a cooperating agency.

Past scrub-jay monitoring and banding was conducted by Archbold Biological Station under contract with the FDACS' Division of Forestry from February 2003–February 2006. FWC initiated scrub-jay surveys in FY 2008-09 using a pilot survey by Jay Watch, The Nature Conservancy's citizen science program. This pilot survey work was followed by a comprehensive survey at Arbuckle WMA in FY 2009-10, during which ten scrub-jay family groups (27 adults, 19 juveniles) were observed. Of these families, six occur in areas that were surveyed in 2008. When comparing the 2008 and 2009 survey areas, the total population increased from 14 birds to 26 birds. Twenty additional scrub-jays in four families were found in surveys of the area at Arbuckle WMA in 2009. This was the second year of Jay Watch at the Walk-in-Water WMA with a limited pilot area surveyed along the eastern third of the tract. In FY 2009-10, six scrub-jay family groups were located at Walk-in-the-Water WMA totaling 19 birds (12 adults, five juveniles, two unknowns). This is down from seven family groups totaling 25 birds (17 adults, seven juveniles, one unknown) in 2008 in the same survey area.

In 2002, the FDACS' Division of Forestry initiated a Scrub-Jay Management Plan on the LWRSF. Since this time, more than 2,500 acres at Arbuckle WMA have been treated with fire, mechanical treatments or a combination thereof, but no scrub-jay habitat was burned on Arbuckle WMA during FY 2009-10.. During FY 2009-10, 2,934 acres were burned with FWC assistance at Walk-in-the-Water WMA. Since implementation of the Scrub-Jay Management Plan, more than 4,400 acres have been treated at Walk-in-the-Water WMA to benefit scrub-jays. FWC plans to continue surveying scrub-jays on Arbuckle and Walk-in-the-Water WMAs using the Jay Watch program (http://www.nature.org/wherewework/northamerica/states/florida/volunteer/art7303.html) and protocol.

Lake Wales Ridge Wildlife and Environmental Area in Highlands and Polk Counties – The Lake Wales Ridge Wildlife and Environmental Area (WEA) consists of nineteen tracts, twelve of which contain known groups of Florida scrub-jays. The FWC monitors scrub-jay populations on select tracts of the Lake Wales Ridge WEA in cooperation with Archbold Biological Station and The Nature Conservancy's Jay Watch program. During FY 2009-10, tracts surveyed by Archbold Biological Station included Carter Creek, Gould Road, Leisure Lakes, Henscratch, Lake Placid Scrub, McJunkin, Silver Lake, and Sun 'n Lake Sebring. The Nature Conservancy's Jay Watch program staff surveyed at Gould Road, Holmes Avenue, Royce Unit, Clements, Silver Lake, Sunray, Sun 'n Lake Sebring, and Highland Park Estates.

The number of scrub-jay groups decreased at all locations except one (Sun 'n Lake Sebring) from the last time the survey was conducted during FY 2008-09. The number of juveniles decreased on seven (58%) tracts and increased or remained stable on five tracts (42%), and the group size remained relatively consistent. Six of the Lake Wales Ridge WEA tracts (Carter Creek, Henscratch, Leisure Lakes, Holmes Avenue, Sun 'n Lake Sebring, Highland Park Estates) containing scrub-jays are subdivision sites. These sites contain a checkerboard pattern of State and private land, which limits the ability of FWC to employ necessary habitat management actions on State-owned property. One of the populations most at risk of extirpation is found at the Carter Creek tract. This population has steadily declined from 35 groups in the early 1990s to 14 groups in 2003 to three groups in 2009. Florida scrub-jay monitoring results are used as a tool to guide management actions.

Controlled burns during FY 2009-10 included roughly 318 acres (129 hectares) of potential or occupied scrub-jay habitat. Additionally, habitat restoration has commenced at several sites and additional prescribed burns are planned for FY 2010-11 to enhance currently occupied habitat and to restore degraded or unoccupied habitat.

Half Moon Wildlife Management Area in Sumter County – FWC continued to monitor Florida scrub-jays on the 9,500-acre (3,845 hectares) Half Moon WMA. Individuals are color banded to better track the population. In FY 2009-10, only one juvenile was banded, for a total of 112 birds banded since 2001. Reproduction was down this year and only one fledgling was recorded from the eight to ten family groups found on Half Moon. The present population on the WMA is estimated at 30-35 birds.

Habitat management has focused on growing-season prescribed burning, roller chopping saw palmetto, and mowing, cutting, or applying herbicide to overgrown oak trees. Prescribed burns in the 2010 growing season included about 250 acres (101 hectares) of potential or occupied scrub-jay habitat. Half Moon likely harbors a maximum of 500 acres (202 hectares) of potential scrub-jay habitat. To expand potential habitat, overgrown oaks were cut on 70 acres adjoining the existing scrub-jay habitat. Future habitat management will focus on palmetto reduction through rollerchopping, increasing open ground and cutting overgrown oaks in and surrounding potential habitat.

Camp Blanding Wildlife Management Area in Clay County – Monitoring activities were conducted during March 2010 by playing tape recorded calls to attract scrub-jays. During this reporting period, one scrub-jay was found in the portion of the cantonment area called the Kingsley Scrub when the area was surveyed. Approximately ½ of this scrub habitat was subject

to a growing season burn in 2004. One additional pair of scrub-jays was found in an area managed for scrub near Lowry Lake during the summer of 2010.

Cedar Key Scrub Wildlife Management Area in Levy County – FWC currently assists the Florida Department of Environmental Protection's Division of Recreation and Parks in the monitoring and management of Florida scrub-jays on the Cedar Key Scrub WMA. During FY 2009-10, there were five family groups of scrub-jays documented in and around Cedar Key Scrub WMA (four within the WMA) consisting of ten individuals. The monitoring program includes monthly monitoring of birds at specific sites, a The Nature Conservancy's Jay Watch route, banding chicks of the year (chicks born that year), and sexing the adults through territorial and nesting behavior.

Mitigation Parks – The goal of mitigation parks is to provide an off-site alternative for resolving certain wildlife resource conflicts. Most mitigation park facilities are developed in cooperation with other local, State and Federal agencies, usually following the signing and execution of a Memorandum of Understanding (MOU). The MOU's function is to establish an orderly process for administering monetary transactions and to provide a process for land acquisition and management. The responsibility for the management of lands acquired through the Mitigation Park program rests with the Commission. These parks are managed primarily to enhance listed species populations, particularly those animals for which State and Federal approvals are required prior to their being impacted by new land development. All mitigation parks are designated by the Commission as Wildlife and Environmental Areas.

Annual monitoring of Florida scrub-jays during FY 2009-10 occurred at three mitigation parks. Moody Branch Wildlife and Environmental Area (WEA) in Manatee County was monitored using a private contractor. Three groups totaling 11 total birds were recorded at the site; a decrease of one bird from the previous year. Five birds were banded for future monitoring. FWC continued habitat management by completing controlled burns on 80 acres (32 hectares) during the growing season and 62 acres (25 hectares) during the dormant season.

Scrub-jay monitoring at Hickey Creek WEA in Lee County revealed three groups of scrub-jays with a combined total of nine individuals, with two juveniles being observed after the nesting season. Although the number of individuals has fluctuated over time, the number of groups has remained unchanged for many years and the population appears to be stable. Scrub-jay habitat management included 129 acres (52 hectares) of growing season controlled burns and 30 acres (12 hectares) of mechanical treatments to overgrown scrub.

At Platt Branch WEA, in Highlands County, the scrub-jay population consists of 16 individuals among six groups, which is unchanged from last year. Four juveniles were identified post-nesting season. Management efforts focused on reducing vegetation heights in overgrown scrub and maintaining existing high-quality habitats, including the controlled burning of 48 acres (19 hectares) during the dormant season and the felling of large oaks on 30 acres (12 hectares) of overgrown habitat.

Red-Cockaded Woodpecker (*Robin Boughton, Michelle Wilcox, Steve Shattler, Wendy Wilsdon, Barbara Almario, Adam Warwick, Matthew Hortman, Jim Garrison, Norberto Fernandez, Mary Dowdell, Michael Baranski, Ross Scott and Valerie Sparling*)

Conservation Planning – The red-cockaded woodpecker is a State species of special

concern and a Federally endangered species. Statewide conservation planning for the red-cockaded woodpecker continued in FY 2009-10. At the close of FY 2006-07, implementation of most of the conservation actions identified in Florida's Red-cockaded Woodpecker Management Plan was complete. Progress on the remaining conservation actions in the plan are ongoing and are outlined below:

- *Develop and maintain a red-cockaded woodpecker database for Florida*. The red-cockaded woodpecker database previously developed is updated with current information on population size, ownership (which landowners have red-cockaded woodpeckers on their property), habitat and management activities every three years.
- *Establish and convene a meeting of the Florida red-cockaded woodpecker working groups.* One red-cockaded woodpecker working group currently meets. Agenda items relevant to the Florida Red-cockaded Woodpecker Management Plan have been incorporated into working group meetings and will continue as needed in the future.
- *Coordinate with the USFWS to develop a statewide Safe Harbor program for red-cockaded woodpeckers in Florida.* The statewide Red-cockaded Woodpecker Safe Harbor program was initiated in November 2006 through an agreement between the U.S. Fish and Wildlife Service and the FWC under the Federal Endangered Species Act. Red-cockaded woodpeckers are protected under the Endangered Species Act, meaning landowners have a legal obligation to protect the birds and their habitat. Safe Harbor Agreements make sense whenever landowners are interested in restoring or enhancing habitats that may benefit this endangered species but are concerned about incurring additional regulatory restrictions on the use of their land. It effectively freezes a landowner's ESA responsibilities as long as the owner agrees to restore, enhance or create habitat that benefits red-cockaded woodpeckers. The program and has had a full time coordinator funded by the Wildlife Foundation of Florida's Conserve Wildlife Tag. By the end of FY 2009-10, 17 properties were enrolled in the program with a total of 64,500 acres committed for habitat management by the landowners. The program continued to be advertised through newsletter and magazine articles and through attendance by the coordinator at landowner workshops. In spring 2009, funds were allocated to the Safe Harbor program through U.S. Fish and Wildlife Services' Partners in Wildlife Grant. These funds were awarded to landowners enrolled in Safe Harbor as cost-share assistance for land management practices that benefit red-cockaded woodpeckers. This has provided an important incentive for landowners to enroll in the program.

At the close of the 2010 red-cockaded woodpecker breeding season, Florida red-cockaded woodpecker populations continued on a track to achieve and in many cases, exceed the year 2020 population and metapopulation goals outlined in Florida's Red-cockaded Woodpecker Management Plan. Field visits to red-cockaded woodpecker populations have confirmed that large red-cockaded woodpecker 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 red-cockaded woodpecker recovery in Florida.

The activities above will continue until the species meets its conservation goals. These activities include meetings of the red-cockaded woodpecker working groups, updating the red-cockaded woodpecker database, and implementation of the statewide Red-cockaded Woodpecker Safe Harbor program.

Blackwater Wildlife Management Area in Okaloosa and Santa Rosa Counties – FDACS' Division of Forestry and FWC have cooperatively managed the red-cockaded woodpecker population on Blackwater WMA since 1996. The population is monitored using leg bands. Banding of nestlings and unmarked adults, fledge checks, translocations, and installation of artificial cavities are conducted where appropriate. The Division of Forestry has been responsible for reporting the banding of nestlings. During the winter of 2009, FWC helped install 25 artificial cavities to fulfill translocation requirements. FWC continued the habitat improvement program initiated in 2006 by reducing the amount of hardwood vegetation encroachment in three existing clusters.

Camp Blanding Wildlife Management Area in Clay County – FWC's role at Camp Blanding WMA is to assist the lead area manager with habitat improvement and restoration for the red-cockaded woodpecker population. A total of 16 red-cockaded woodpecker clusters and surrounding foraging areas were cooperatively burned by Camp Blanding Forestry and FWC personnel. Aerial burns of 1,131 acres in March and 1,565 acres in May were conducted using a FWC helicopter and included nine of the 16 clusters.

Citrus Wildlife Management Area in Citrus County – FWC, in cooperation with Florida's Department of Agriculture and Consumer Services' (FDACS) Division of Forestry, continued monitoring the red-cockaded woodpecker population on the 49,317-acre (19,959 hectares) Citrus tract of the Withlacoochee State Forest. Of 74 active red-cockaded woodpecker clusters, 54 nested and 53 of these were successful, fledging 97 young. The number of active clusters increased 7% from 2009. Color banding continued with 99 nestlings banded during the 2010 nesting season. Three adult birds were also color banded.

Habitat management included prescribed burns on 12,404 acres (5,020 hectares), hardwood control and artificial cavity inserts. Encroaching oak trees were cut and treated with herbicide in all clusters that did not receive fire. Staff and volunteers protected 201 cavity trees in 27 clusters from fire by mechanical means and raking. Three inserts were installed in established clusters where artificial cavity trees had died due to lightening strikes.

Monitoring and habitat management for this population has allowed it to have enough birds that it can donate some to smaller populations though translocations. Twelve juveniles are to be translocated from Citrus to Corbett Wildlife Management Area (WMA) in the fall of 2010.

Goethe State Forest Wildlife Management Area in Levy County – FWC currently assists FDACS' Division of Forestry in monitoring and managing the red-cockaded woodpecker population on Goethe State Forest WMA. During FY 2009-10, there were 43 active clusters of red-cockaded woodpeckers. An annual monitoring program at the forest includes roost checks, cavity and tree inventories, search for new cavities, cavity tree maintenance, the banding of chicks of the year and any un-banded adults that are found, and sexing the chicks when fledged.

Sixty artificial cavities were inserted into 15 clusters for intra-population dispersal. Fifty acres were mowed in a red-cockaded woodpecker cluster to improve forage habitat and to advance that cluster to a growing season burn regime. The cavity trees are protected by mowing or burning within a 30-foot (nine meter) buffer of tree(s) prior to conducting a prescribed burn on the stand.

J.W. Corbett Wildlife Management Area in Palm Beach County – J.W. Corbett WMA is managed by the FWC, and all monitoring and management of the red-cockaded woodpecker population is conducted by FWC. During FY 2009-10, FWC determined the number of active clusters, monitored active clusters for nests, color-banded nestlings, determined fledging success, and installed artificial cavities in existing and recruitment clusters. Habitat management included maintaining a three-year, growing season burn rotation within red-cockaded woodpecker habitat and treating approximately 10,000 acres (4,040 hectares) of exotic plant species. A total of eleven artificial cavities and four artificial starts were installed in cavity-limited clusters.

There were 15 active clusters and 12 potential breeding groups during the 2010 nesting season. Nine out of 12 potential breeding groups attempted nesting, with eight clusters successfully fledging 12 birds. This is the highest number of fledges since FWC began monitoring red-cockaded woodpeckers at Corbett WMA.

Corbett WMA received five pairs of birds from Apalachicola National Forest in the fall of 2009. Of the ten birds, three females and three males have been observed following the move, resulting in a 60% retention rate. For the first time, two translocated birds paired up to form a new potential breeding group. The other translocated birds paired up with birds on existing territories, became helpers, were solitary, or were not observed after release. Corbett and Dupuis WMAs had their first observed dispersal between the two populations. A female helper moved from Corbett WMA to Dupuis WMA and a Dupuis-released translocated male together formed a potential breeding group on Corbett WMA. The dispersal distance was approximately 15 miles for both birds. Corbett WMA is scheduled to receive six pairs of birds from the Citrus tract of the Withlacoochee River State Forest in Citrus County in the fall of 2010.

Three Lakes, Triple N Ranch, and Bull Creek Wildlife Management Areas in Central Florida – The red-cockaded woodpeckers inhabiting Three Lakes, Triple N Ranch and Bull Creek WMAs are all part of the same metapopulation as determined by the Florida Red-cockaded Woodpecker Management Plan.

On Three Lakes WMA, the FWC has been intensively monitoring the red-cockaded woodpecker population since 2001. The population decreased after the 2004 hurricanes but has finally returned to its pre-hurricane numbers. The number of potential breeding groups on Three Lakes WMA consisted of 47 in 2009 and 50 in 2010. During the 2009 breeding season, 34 of 44 nesting attempts were successful, 48 nestlings were banded and 37 of those banded survived to fledge the nest. FWC installed 22 cavity inserts to augment established clusters. One old and damaged insert was replaced by FWC and 12 inserts were cleaned and maintained. Habitat management activities performed by FWC that enhance red-cockaded woodpecker habitat included prescribed fire on 27,746 acres (11,228 hectares), roller chopping on 1,497 acres (606 hectares), tree thinning on 49 acres (19.9 hectares) and invasive plant control. To protect red-cockaded woodpecker cavity trees during prescribed fires, FWC pre-burned around each tree.

Bull Creek WMA and Triple N Ranch WMA have been actively managed as a single, small, red-cockaded woodpecker population since 2003, and the areas supported eight potential breeding groups in FY 2009-10. This number has been steadily increasing since 2005 when FWC began yearly translocations of birds to the property. This year, three of the seven nesting attempts were successful, eight nestlings were banded, and four of those banded chicks survived to fledge the nest. FWC installed ten cavity inserts to augment existing clusters and to create two new recruitment clusters. One old insert was replaced by FWC and eight inserts were cleaned

and maintained. Six red-cockaded woodpeckers were translocated from Ft. Stewart, Georgia to these Wildlife Management Areas in 2009. Habitat improvements by FWC that aid red-cockaded woodpeckers included prescribed fire on 15,693 acres (6,351 hectares), roller chopping on 1,635 acres (662 hectares) and invasive plant control on 152 acres (62 hectares). To protect red-cockaded woodpecker cavity trees during prescribed fires, FWC pre-burned around each tree.

Big Cypress National Preserve in South Florida – In cooperation with the National Park Service (NPS), FWC biologists designed a plan in 2007 to assist with management and monitoring of red-cockaded woodpeckers at Big Cypress National Preserve (BCNP). Due to limited resources and difficult field conditions, the southern-most population of red-cockaded woodpeckers located on BCNP had never been precisely documented and monitored. Accurate information from this red-cockaded woodpecker population, the largest in South Florida slash pine, would assist in determining population status in reference to recovery goals.

Annual monitoring and management by FWC continued in the fall of 2009 with tree/cavity surveys to determine cluster status and activity. Monitoring continued into the 2010 breeding season with nest monitoring, nestling/adult banding, fledge checks, and roost checks. An FWC biologist was trained and certified to install and maintain artificial cavities and twenty-two artificial cavities were installed in nine cavity-limited clusters. Thirteen adults were banded prior to the 2010 breeding season, and seven new clusters were discovered throughout the year. Thirty-one DNA samples were collected through cheek (buccal) swabs in 25 clusters.

FWC monitored 52 out of 94 clusters for reproduction. This included 37 clusters accessible by ATV and 15 by helicopter. Out of 51 potential breeding groups (one cluster did not have had a potential breeding group in it), 45 attempted nesting with 30 successful nests. Fifty-three chicks made it to banding age (six days) and 42 fledged. Helpers were observed in 11 of the monitored clusters. An additional 42 clusters were surveyed for signs of activity during the breeding season and 27 were found to be active, for a total of 78 active clusters inside the preserve.

FWC will continue to survey BCNP for new cluster locations as well as to augment cavity-limited clusters. Plans to continue genetic sampling in Lostman's Pine sub-population are in place, as well as possibly translocating one to two pairs to the isolated Lostman's Pines sub-population. FWC plans to augment additional cavity-limited clusters and continue to closely monitor clusters for the 2011 breeding season.

Tate's Hell State Forest in Franklin and Liberty Counties – FWC conducts inventory and monitoring projects for red-cockaded woodpeckers on Tate's Hell State Forest. The primary objective is to provide for the long-term perpetuation of red-cockaded woodpeckers, accomplished by searching for unknown red-cockaded woodpecker clusters (colonies), monitoring reproductive success, supervising mechanical treatments in clusters, and determining timber and fire management impacts.

FWC conducted 12 hours of aerial surveys and discovered three new cavity trees and many potential recruitment sites. FWC also established five new recruitment clusters by contracting the installation of 20 artificial cavity inserts and five drilled cavities, in addition to five artificial cavity inserts installed by staff. FWC contracted the mechanical treatment of 78 acres to reduce the hardwood midstory surrounding these new clusters.

From March through June 2010, 47 clusters were monitored for active resin wells. If maintained resin wells occurred on a tree, it was considered active. FWC found 82 active trees in 27 active clusters. The active trees were observed throughout the nesting season to watch for returning adults or listen for chicks calling from the cavity. FWC found 21 nests, and these nests were "peeped" (observed using a special camera designed for use in red-cockaded woodpecker cavities) to confirm the nest and determine the number of eggs or chicks. FWC banded 42 nestlings in 2010 and 41 in 2009, compared to only 46 total birds banded in the previous 14 years. From June through August 2010, FWC performed sunrise checks. During these checks, red-cockaded woodpecker calls were played to keep birds near the cluster until bands could be read. Of the 42 banded chicks, 23 were re-sighted foraging for a fledged rate of 55%.

Apalachicola River Wildlife and Environmental Area in Franklin County – Both natural and artificial red-cockaded woodpecker clusters within the Apalachicola River Wildlife and Environmental Area (ARWEA) were monitored throughout the breeding season. There are currently a total of ten known clusters being monitored. Two additional recruitment clusters were created in the winter of 2009. ARWEA now has three natural and seven artificial red-cockaded woodpecker clusters. Five of the ten clusters showed signs of activity, down one from last year. All five active clusters contained nests; one in the natural clusters and the other four in artificial cavities in recruitment clusters established in March 2005 and January 2008. The nest in the natural clusters produced two fledglings. Nests in the four active recruitment clusters with artificial cavities produced seven fledglings (two nests with two fledglings and one nest with three fledglings). The number of fledglings produced decreased from eleven in 2009 to nine in 2010. All nine chicks were banded by FWC staff. Management activities to enhance red-cockaded woodpecker habitat included roller chopping approximately 409 acres (165.5 hectares) and gyro-tracing (mulching/tree chipping) 489 acres (197.9 hectares) to enhance foraging habitat around the clusters, by reducing woody, midstory growth.

John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area in Palm Beach County – Before translocations began in 2006, red-cockaded woodpeckers were last observed on the John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area (Dupuis) in 1989. The FWC, in conjunction with the South Florida Water Management District and the USFWS, developed a plan to reintroduce red-cockaded woodpeckers to the area. Prior to releasing birds, FWC biologists identified habitat improvement activities critical for reintroduction, which included mechanical clearing of understory, frequent prescribed burning, and installation of artificial nest boxes, and coordinated these activities with the South Florida Water Management District. Since 2006, forty red-cockaded woodpeckers have been captured from public lands in Florida and Georgia and translocated to Dupuis. Of the ten birds released in the fall of 2009, six remained on the area. In 2009, seven active clusters produced two fledglings. In addition, a female bird fledged in 2007 at J.W. Corbett WMA paired with a male on Dupuis. She had travelled approximately 15 miles from her last known location on Corbett to her present location on Dupuis. At the end of the breeding season, 16 birds were observed in the Dupuis population.

FWC will release an additional ten red-cockaded woodpeckers on the area in fall 2010. Additional cavities were installed to bring the total number of cluster locations to 20. During the next breeding season, clusters will continue to be monitored for nests, nestlings will be banded, and fledging success determined. In addition, habitat management activities to reduce midstory height and enhance red-cockaded woodpecker habitat will continue. Restoration of the red-

cockaded woodpecker at Dupuis will provide an important additional population in southeastern Florida as part of the Federal Recovery Plan.

Platt Branch Mitigation Park Wildlife and Environmental Area in Highlands County – Monitoring the Fisheating Creek (part of the Platt Branch Mitigation Park Wildlife and Environmental Area) population of red-cockaded woodpeckers has been conducted by FWC on an intensive level since 2002. Nine active clusters currently comprise the population within Platt Branch Wildlife and Environmental Area and on adjacent private properties, portions of which are protected by conservation easements.

Surveys in FY 2009-10 revealed four potential breeding pairs and five solitary males prior to nesting season. Nesting success was monitored during the spring of 2010, with one pair producing two hatchlings, which is the lowest level for the population on record.

FWC contracted understory mowing of 25 acres (10 hectares) of overgrown red-cockaded woodpecker habitat and completed growing season controlled burns on 345 acres (140 hectares).

Roseate Tern (*Ricardo Zambrano*)

The roseate tern is a State and Federally threatened seabird. After the hurricane season of 2005, the roseate tern's main nesting island, Pelican Shoal Critical Wildlife Area, was submerged under one to two feet of water and is no longer available for roseate terns.

In the spring of 2006, FWC biologists attempted to provide the birds displaced from Pelican Shoal with an alternative nesting area. In cooperation with the National Park Service (NPS), biologists placed plastic tern decoys along with a sound system and speakers broadcasting tern calls on Long Key at Dry Tortugas National Park. These techniques, known as "social attraction," have been used around the world to attract colonially-nesting birds to nesting areas and to restore seabird colonies. These techniques have been successful the last four years. In April of 2010, FWC and NPS biologists again placed social attraction equipment on Long Key at Dry Tortugas National Park. This year, 40 pairs of roseate terns nested at Dry Tortugas National Park. The social attraction equipment and decoys will not be placed at the national park next year in order to test whether the roseate terns return on their own and by doing so have established a permanent colony.

During the nesting season, FWC biologists also surveyed the City of Marathon, Marathon Government Center rooftop colony to conduct nest, egg, juvenile, and adult counts. At one point during the 2010 season, 169 roseate tern nests were counted at this rooftop colony. Based on limited observations, birds in this colony appeared to be abandoning and re-nesting at various intervals, so it was difficult to estimate colony size based on nest counts alone. It was unclear how many pairs were successful in their nesting attempts for this same reason. However, it was clear that the Marathon Government Center colony was larger in 2010 than in 2009. Two other roof colonies in the Florida Keys were found with roseate terns. One, which had seven nests, was located on a Navy barracks building at the Truman Annex complex in Key West. The other site was on a condominium in Marathon that contained at least one nest, although two chicks were found.

A total of 32 chicks were captured, banded, and released at the Dry Tortugas National Park and 132 at the Marathon Government Center.

Everglades Snail Kite (*Missy Juntunen*)

The Everglades snail kite is a State and Federally endangered species. The Everglades and Francis S. Taylor Wildlife Management Area (WMA) in South Florida, consisting of South Florida Water Management District's Water Conservation Areas 2 and 3, is located in Broward and Miami-Dade counties, and is important habitat for the snail kite. In recent years, there has been a significant decline in snail kite nesting attempts and successes. There were no successful nests during the 2007 and 2008 breeding seasons, and one successful nest during the 2009 breeding season. Activity increased during the 2010 breeding season, with 34 nesting attempts resulting in five successful nests.

The Florida Cooperative Fish and Wildlife Research Unit (Unit) has been conducting snail kite monitoring since 1992. This monitoring is designed to provide information about population size, survival, movement, and reproductive success of the snail kite throughout its range in Florida. FWC continued coordination with the Unit to conduct surveys for snail kites in Water Conservation Area 3 in March 2010. Three sampling units were surveyed from airboats using east-west transects approximately 0.5 miles (0.8 kilometers) apart over a three-day period. Thirty-two snail kites were observed and one new nest was found.

In May 2010, the FWC and the Unit placed motion-sensing cameras on a small sample of snail kite nests located in Water Conservation Area 3B. The purpose of this trial effort was to determine the most effective camera model, settings, and mounting configurations for successful nest monitoring. It is expected that monitoring nests with motion sensing cameras will help in understanding the causes of nest failure in the water conservation areas, and provide guidance to land managers regarding how to promote successful nesting within the area. Of the five nests monitored with cameras, two were successful and produced a total of three birds (all of which were banded). The cause of one failed nest was determined to be predation, and the causes for the remaining two failed nests were unknown. The collaborative effort between FWC and the Unit will continue in the future as work towards conservation of the snail kite continues. Historically, Water Conservation Area 3A was the largest and most consistently utilized of the designated critical habitats for the snail kite, and successful nesting within this area will be critical to the long-term success of the species.

Southeastern American Kestrel (*Jennifer Morse, Karl Miller, Steve Daniels, Allan Hallman and Jim Garrison*)

The Southeastern American kestrel is a State threatened non-migratory falcon closely tied to sandhills in the southeastern U.S. This subspecies has undergone a marked range contraction and population decline throughout its range in recent decades. In July 2008, FWC initiated a long-term effort to 1) develop a regional Southeastern American Kestrel conservation partnership within and across agencies by providing standardized data collection protocols to monitor kestrels and establishing a database to manage annual monitoring data on public lands and, 2) establish population targets for Southeastern American kestrels on FWC's Wildlife Management Areas (WMAs) and increase kestrel populations by installing nest boxes.

During FY 2009-10, FWC coordinated kestrel monitoring on 15 properties in north-central Florida managed by four agencies:

- **Managed by FWC**: Bell Ridge Wildlife and Environmental Area (WEA) in Gilchrist County, Camp Blanding WMA in Putnam County, Fort White Mitigation Park WEA in Gilchrist County, Half Moon WMA in Citrus County, Lake Panasoffkee WMA in Sumter County, and Watermelon Pond WEA in Alachua County;
- **Managed by Florida Department of Agriculture and Consumer Services (FDACS)**: Withlacoochee State Forest in Citrus County, Jennings State Forest in Clay County, Twin Rivers State Forest in Madison County, and Indian Lake State Forest in Marion County;
- **Managed by Florida Department of Environmental Protection (FDEP)**: Mike Roess Gold Head Branch State Park in Clay County, Ichetucknee State Park in Columbia & Suwannee counties, Rainbow Springs State Park in Marion County, and Suwannee River State Park in Suwannee County;
- **Managed by the University of Florida**: Ordway-Swisher Biological Station in Putnam County.

A standardized monitoring protocol was designed and distributed to site personnel. Population targets for kestrels were established for each property based on the current amount of sandhill habitat at each site. New nest boxes were installed by FWC and site personnel at several of these properties, including 13 nest boxes at Withlacoochee State Forest, four nest boxes at Bell Ridge WEA, and four nest boxes at Watermelon Pond WEA. Data were collected on nest box occupancy, nesting success, and habitat characteristics, and analyzed to determine habitat requirements for kestrels.

In FY 2009-10, 45 southeastern American kestrel nest boxes were maintained and monitored by FWC on FWC-managed lands in the Southwest Region. Nine of these boxes were installed during FY 2008-09; the remainder were installed the previous fiscal year. FWC-managed lands with kestrel nest boxes are: Chassahowitzka WMA in Hernando County; Hilochee WMA in Lake County; Hilochee WMA-Osprey Unit in Lake County; Lake Wales Ridge WEA in Highlands and Polk counties; KICCO WMA in Polk County; Hickory Hammock WMA in Highlands County; Kissimmee River PUA in Okeechobee County; Crooked Lake WEA in Polk County; and Platt Branch WEA in Highlands and Glades counties. Nest boxes were maintained and monitored by FWC during the spring breeding season. Three nest boxes were used by breeding kestrels. Chassahowitzka WMA had two active boxes and the Lake Wales Ridge WEA had one active box. One box was used by a northern flicker, six by great-crested flycatchers and eleven by eastern screech owls. The remaining 24 boxes were not used. The results of monitoring were reported to FWC's Fish and Wildlife Research Institute for inclusion in a statewide kestrel nest box monitoring program.

During FY 2009-10, 82 boxes were maintained and monitored by FWC staff on FWC-managed lands in the North-central Region.

On Jennings State Forest WMA in Clay and Duval counties, 26 existing boxes were cleaned and maintained in February and March of 2010. FWC staff conducted four visits during nesting season (April – June). No kestrel activity was noted. Other species utilizing boxes on Jennings were flying squirrels, gray squirrels, great-crested flycatchers that laid 12 eggs and hatched nine young, and Southeastern screech owls that laid 11 eggs.

On Camp Blanding WMA in Clay County, 56 nest boxes were cleaned in February 2010 prior to nesting season. Boxes were checked for usage and maintained every two weeks from March through June. Seventeen nest boxes were verified as having been or currently being used by kestrels, and 51 kestrel eggs were identified. Other wildlife utilizing the nest boxes included

screech owls, flying squirrels, blue birds, great-crested flycatchers, starlings, purple martins and gray squirrels.

Whooping Crane (*Marty Folk*)

Non-Migratory Population – The whooping crane is Federally endangered and a State species of special concern. Whooping cranes are no longer being released as non-migratory birds in Florida. Low productivity and high mortality limit the likelihood of achieving a self-sustaining population. However, FWC continues to monitor and study the remaining 22 birds in this flock. Research projects are primarily focused on behaviors of the birds during the breeding season. Biologists are studying behavioral differences between successful and unsuccessful nesting pairs and between whooping cranes and the more successful Florida sandhill cranes. Results from the research are expected to 1) allow a better understanding of the challenges for whooping cranes in Florida, 2) provide knowledge regarding the basic biology of these species, and 3) provide information of value for future reintroductions of whooping cranes.

Eastern Migratory Population – A separate reintroduction of whooping cranes is taking place in the Eastern U.S. These birds breed in Wisconsin and migrate to Florida (and other southeastern states) in the winter. There are 96 birds in this population. Like the non-migratory flock, the migratory flock is encountering reproductive challenges and research is underway to identify the limiting factors. FWC's involvement with this project is primarily an advisory role, with some seasonal field monitoring.

Wood Stork (*James Rodgers and Morgan Wilbur*)

The wood stork was once a common breeding species throughout the southeastern U.S., but declines in the species range and population occurred during the mid 1900s. The U.S. population was listed as Federally endangered in 1984 and is also State listed as endangered.

St. Johns River Water Management District of North and Central Florida – The objective of studying the St. Johns River Water Management District's wood stork population was to gather productivity (reproductive success) data for storks nesting within the district. The data would then be used to determine if the stork population in the U.S. meets criteria for reclassifying the species, and also to determine what types of wetland habitat surrounding each colony were associated with greater productivity. Data collected was compared with the reproductive success of other North and Central Florida stork colonies within and among colonies and years. This project was completed on June 30, 2008. Results may be accessed at http://research.myfwc.com/features/view_article.asp?id=33181.

L. Kirk Edwards Wildlife and Environmental Area in Leon County – Lower Lake Lafayette located within the L. Kirk Edwards WEA is home to a wood stork colony. In an effort to monitor whether the colony is active or inactive from year to year and determine the approximate number of nests, FWC conducts an annual flyover of the colony. The flyover was conducted in late April 2010 from a helicopter at an altitude of approximately 600 feet (183 m) to avoid disturbing the nesting birds. There was an estimated 300 – 350 wood stork nests in the colony, up from an estimated 150 nests in 2009. The colony had been inactive from 2007

through 2008 due to dry conditions, but the colony had contained as many as 300 nests in prior years.

Wading Birds (*Justin Ellenberger, Alex Pries, Justin Davis, Derek Fussell, Morgan Wilbur, Jean McCollom, Pamela Boody, Valerie Sparling and Michael Baranski*)

Guana River Wildlife Management Area in St. Johns County – In FY 2009-10, FWC continued to monitor species richness, spatial distribution, and relative abundance of wading bird species on the 2,400-acre Guana Lake impoundment within Guana River Wildlife Management Area (WMA). Several State and Federally-listed species including limpkin, reddish egret, snowy egret, little blue heron, tricolored heron, white ibis, wood stork, roseate spoonbill, and osprey are known to use Guana Lake either seasonally or throughout the year. Monthly transect surveys quantified these species and other wading birds occurring on the lake. In addition to providing habitat for wading bird species, Guana Lake also provides wintering habitat for migratory waterfowl and foraging habitat for migratory shorebirds during the spring/fall months.

Carter Tract of Econfina Creek Wildlife Management Area in Washington County – Numerous water bodies and associated wetlands present on the Carter Tract of Econfina Creek WMA provide excellent nesting and foraging habitat for the many species of wading birds found in the Florida panhandle, most of which are included on either the Federal or State endangered or threatened lists. One colony has supported nests for various species of colonial-breeding wading birds and was monitored monthly from April through July 2010 to document species use, number of individuals present, number of nests and nest success. Species of special concern found in previous years include the little blue heron and tricolored heron, however, no little blue or tricolored herons were observed nesting during the 2010 surveys. Multiple incidental observations of little blue herons utilizing other water bodies were made during spring 2010. Wood storks were documented throughout the year foraging on area ponds. One wood stork was observed foraging at Green Pond during late summer 2009. The Carter Tract will continue to be surveyed annually for possible wading bird breeding activity, and the existing colony will be monitored monthly during the breeding season (March – July) to document species present, number of birds, and nesting success.

Apalachicola River Wildlife and Environmental Area in Gulf and Franklin Counties – The Apalachicola River Wildlife and Environmental Area (WEA) consists of a matrix of upland, wetland, and riverine habitats that potentially contain several listed species. The numerous wetlands on the Apalachicola River WEA provide habitat for several species of colonial wading birds, including the tricolored heron, little blue heron, snowy egret, white ibis, and wood stork. In order to monitor the relative success of wading bird populations in the area, an annual, aerial survey is conducted in the spring. Aerial transects were flown within the lower Apalachicola River basin on April 26, 2010 and May 24, 2010. There were eight multi-species colonies located, up from five last year. All the colonies had egrets and herons nesting and one colony also had wood storks and anhingas present.

Aucilla Wildlife Management Area in Jefferson and Taylor Counties – Aucilla WMA consists of numerous wetlands that provide habitat for several listed species of colonial wading birds, including little blue heron, snowy egret, tricolored heron, white ibis and wood stork. In

order to monitor the relative success of wading bird populations in the area, an annual, aerial survey is conducted in the spring of each year. Aerial transects were flown in late April 2010 and late May 2010. Transects are 0.5 miles apart and are flown at an altitude of 300-400 feet and an air speed of approximately 40 knots. Of six previously identified wading bird colonies, three were active, down one from last year. No new colonies were found during the aerial survey. Of the six colonies, no more than five have ever been active at the same time. One of the three inactive colonies was identified as a new colony in April 2008 and is located approximately 1.5 miles from a colony that was active for several years until 2008 when it was inactive. It is possible this group of birds moved due to dry conditions. In 2009 and 2010, the old colony was active again and the colony discovered in 2008 was not. The number of nests in two of the colonies increased from 2009. The wading bird colonies typically have a mix of listed species and non-listed species such as yellow-crowned night-herons.

Okaloacoochee Slough Wildlife Management Area in Hendry County – The Okaloacoochee Slough WMA contains numerous small wetlands and a large slough (elongated wetland) that is smaller than, but similar to, the Everglades. A large wading bird roost averaging over 1,000 birds has been monitored on the WMA since 2002. During FY 2009-10, monthly surveys were conducted from November through April at dusk; birds were tallied by species as they came into the roost. White ibis dominated the roost, with little blue herons being the second most abundant species; both are species of special concern. Great egrets and glossy ibis were next most abundant, followed by tricolored herons and snowy egrets. The latter two are also species of special concern. Anhingas and cattle egrets were present in small numbers. Black-crowned night herons left the roost at dusk and limpkins (species of special concern) and American bitterns were often seen or heard in the vicinity of the roost. There were more white ibis and fewer glossy ibis, great egrets and cattle egrets than in previous years.

John C. and Mariana Jones/Hungryland Wildlife and Environmental Area in Martin and Palm Beach Counties – An aerial survey was conducted to identify wading bird rookeries and solitary nesting locations and to document rookery use on the John C. and Mariana Jones/Hungryland WEA. A large multi-species rookery was observed on the WEA, supporting nests for three species of special concern: snowy egret, little blue heron, and white ibis. Three small wading bird rookeries were observed less than 0.3 miles (0.5 kilometers) outside the WEA boundary supporting nests of snowy egret, glossy ibis, black-crowned night heron, great egret, and cattle egret.

John G. and Susan H. Dupuis, Jr. Wildlife and Environmental Area and J.W. Corbett Wildlife Management Area in Palm Beach County – The 2,500 acre marsh on the John G. and Susan H. Dupuis, Jr. WEA provides good habitat for the many species of wading birds in Florida. Monthly roadside surveys have been conducted since 1996 to monitor wading bird use of this area. The most common wading birds observed have been great egrets, great blue herons, and little blue herons. Numerous other wading birds feed on the area, including tricolored herons, snowy egrets, white ibis, and wood storks. The marsh and other wetland areas at Dupuis will continue to be surveyed monthly to document wading bird activity.

J.W. Corbett Wildlife Management Area in Palm Beach County – Aerial wading bird surveys were conducted for active colonies on J.W. Corbett WMA, in which two active colonies

were found during FY 2009-10. One colony contained approximately 15 to 20 nests of little blue heron and tri-colored heron, and the other contained five to ten nests of cattle egret, great egret, and white ibis.

Marsh Birds (*Michael Baranski*)

Marsh bird surveys were conducted on J.W. Corbett Wildlife Management Area in Palm Beach County from April to June 2010. Surveys followed the National Marshbird Monitoring Program Protocol using a call/playback method. Detected species were ranked according to abundance estimates. The survey transect consisted of five designated points and surveys were repeated three times with a two-week interval between sampling periods. The limpkin was the only targeted species observed during survey times (0.20 detections/point). FWC will continue to monitor wading birds and marsh birds in FY 2010-11.

Shorebirds (*Janell Brush and Chris Burney*)

Florida's wildlife habitats are facing unprecedented challenges ranging from climate change to a rapidly expanding human population. The population of Florida's coastal counties is predicted to double from 12.3 million to more than 26 million by 2060. Currently, more than half of Florida beaches are experiencing erosion problems, most of which is due to anthropogenic factors. These problems will be exacerbated in the near future by climate change. The culmination of beach erosion and climate change will require an increase in the management of coastal systems in the form of habitat modifications.

Survival of Florida's vulnerable seabirds and shorebirds (e.g. snowy plover, least tern, roseate tern, black skimmer, American oystercatcher) are dependent on community-based conservation that recognizes both the economic and wildlife values of coastal habitats. This type of conservation cannot be accomplished by any one agency and requires the skills, experience and resources only a broad spectrum of partners can marshal. Realizing this, FWC initiated a conservation approach for shorebirds and seabirds, which relies extensively upon partnership development and support. This project, the Florida Shorebird Partnership Coordination, which began in 2007, is funded through Florida's Wildlife Legacy Initiative (Federal State Wildlife Grants program). FWC staff members helped cultivate numerous local and regional partnerships to improve conservation through cooperative efforts between key agencies, organizations, and individuals involved with the management, monitoring, and stewardship of shorebirds and seabirds. In addition, a statewide partnership network entitled the Florida Shorebird Alliance (FSA) was created to facilitate information exchange between partners, improve coordination statewide, and add more consistency to monitoring and management of Florida's shorebirds and seabirds.

During FY 2009-10, the FSA added several new regional partnerships and expanded its monitoring of important shorebird and seabird sites substantially. The new partnerships include Nature Coast (Taylor to Hernando County) Shorebird Partnership, Collier County Shorebird Partnership, Volusia County Shorebird Partnership, and Lee County Shorebird Partnership. In August 2009, the Florida Shorebird Alliance Website was launched (www.flshorebirdalliance.org). This Website functions as an online resource for information and materials on Florida's shorebirds and seabirds, and as a tool to improve the level of coordination and information sharing between the various regional partnerships. In early 2010, FWC began

developing a new and improved online shorebird/seabird database that will include standardized protocols for monitoring and a section for non-breeding species. Together with continued expansion and development of the FSA network, these changes will enable FWC to assess status and trends for many shorebirds and seabirds in Florida; information that is critical to conservation planning for coastal habitats.

The Effects of Human Induced Habitat Modifications on Shorebirds and Seabirds in Florida – A State Wildlife Grant Funded project was initiated during FY 2009-10 (and will be completed in FY 2011-12) to study the effects of human-induced habitat modifications on shorebirds and seabirds in Florida. In order to evaluate the effects of beach cleaning, food abundance, disturbance, future anthropogenic habitat modifications, and climate change on shorebirds and seabirds, project leaders established standardized statewide monitoring protocols for wintering, migrating, and nesting shorebirds and seabirds. FWC will quantify how prey base, disturbance, beach cleaning, and other site-specific variables (tide, weather, etc.) influence habitat use by shorebirds and seabirds during winter and migration. This project defines habitat use as intra-annual and inter-annual patterns (i.e., residency rates, apparent annual survival rates). Understanding the interrelationship among site variables will allow FWC to define habitat quality for migratory and wintering shorebirds and seabirds in Florida, and provides a better foundation upon which to formulate management recommendations. Project leaders identified 21 study sites statewide as important wintering, migratory, or nesting areas and staff has been sampling them.

Assessing the Importance of Horseshoe Crab Eggs in the Diets of Migrating Red Knots During Refueling Stops on Selected Florida Beaches – The red knot is a large sandpiper that is known for its long-distance migrations and large flocks. The red knots consist of at least six subspecies worldwide, representing both long-distance and short-distance migrants. In the Americas two subspecies exist, *Calidris canutus roselaari* and *Calidris canutus rufa*. The *rufa* subspecies is subdivided into three distinct over-wintering populations found in southern South America (Tierra del Fuego), Brazil, and the southeastern U.S.. The bulk of the *rufa* population winters in Tierra del Fuego (approximately 14,000 – 16,000 individuals). Smaller groups are found in Brazil (approximately 3,000) and the U.S. (approximately 2,000 in Florida).

Available data suggest that the red knot sub-species *rufa* is declining in Florida. This information prompted FWC to support research designed to determine the status of the species within the state and factors that could be managed to curb further declines such as availability of horseshoe crab eggs, which are a part of the natural diet of migrating red knots. Local assessment starts with examining the link between habitat quality and survival rates of the species throughout its annual cycle. This relationship, and thus subsequent management options, may be complicated by the range of migratory strategies exhibited by segments of the *rufa* sub-species. Widespread decline increases the vulnerability of local populations because it fractures demographic and genetic connections among segments of the *rufa* population.

This State Wildlife Grant funded project was initiated in July 2007 and will continue through June 2011. The project objectives are to: 1) determine the diet of red knots in Florida and assess whether horseshoe crab eggs constitute an important part of their diet, 2) measure body condition of red knots over the winter and into the migratory period and compare this to other red knot populations and 3) analyze intra-annual residency and habitat use patterns to better understand how red knots utilize Florida's beaches. The project is designed to quantify how

horseshoe crab eggs influence habitat use and body condition of wintering and migrating red knots in Florida. Understanding the interrelationship among these parameters helps to define habitat quality for migratory shorebirds in Florida, and provides a better foundation upon which to formulate management recommendations. This project will provide an opportunity to gain insight into migratory shorebird ecology and conservation at larger geographic scales by comparing study results with similar studies conducted in other areas of the U.S. Study areas are focused in the Cedar Key and Tampa Bay areas. In order to achieve these goals FWC has captured and marked birds, taken blood samples for plasma metabolite analysis, conducted shorebird surveys, re-sighted banded individuals, monitored foraging activities, and sampled invertebrates along beaches within FWC's study areas. FWC has worked closely with land managers and other partners including University of Florida, North Carolina State University, Florida State Parks, Pinellas County, National Wildlife Refuges and New Jersey Division of Fish and Wildlife. Project leaders are currently working on the final data analyses, reports, and manuscripts.

Gopher Frogs (*Kevin Enge, Sharon Hester, Randy Havens, Brent Howze and Gabriel Miller*)

The gopher frog is a species of special concern in Florida. It is an "explosive breeder" (all or most of the population congregates to breed during a short period of time) that travels from burrows in surrounding uplands (sometimes from more than a mile away) to temporary wetlands lacking predatory fish during heavy rainfall events. Breeding often occurs from October through April, after tropical storms, hurricanes, or winter cold fronts, but breeding may occur any month of the year. Tadpoles remain in ponds for three to seven months before transforming and leaving ponds in search of burrows in which to live. Ponds on public lands were sampled for gopher frog tadpoles as part of two State Wildlife Grant projects: Statewide Survey for the Striped Newt and Survey of Winter-breeding Amphibian Species in the Peninsula. The first grant began on July 1, 2009 and the second grant on January 1, 2010. The gopher frog is one of five targeted amphibian species for the winter-breeding amphibian grant. The results of FY 2009-10 surveys of 29 public lands appear below (**Table 3**). Gopher frogs were found in 13 known ponds and 50 new ponds. Gopher frogs were already known to be present on five of the twelve public lands where FWC surveys failed to find them, and FWC surveys recorded the first gopher frog from Conner Preserve in Pasco County.

Table 3. Public land surveys for gopher frogs**.**

Public Land	**No. Known Ponds**	**No. New Ponds**
Apalachicola National Forest	4	0
Caravelle Ranch Wildlife Management Area (WMA)	0	0
Chassahowitzka WMA	0	7
Chuluota Wilderness Area	0	0
Conner Preserve	0	1
Dunns Creek State Park	0	1
Etoniah Creek State Forest	2	1
Faver-Dykes State Park	0	1
Fort White Mitigation Park Wildlife and Environmental Area (WEA)	0	1

Geneva Wilderness Area	0	0
Goethe State Forest	0	1
Green Swamp West	0	0
Guana River WMA	0	0
Halfmoon WMA	0	1
Halpata Tastanaki Preserve	0	7
Hilochee WMA	0	0
Jennings State Forest	0	0
Lake Louisa State Park	0	0
Lake Panasoffkee WMA	0	1
Lake Proctor Wilderness Area	0	0
Little Big Econ State Forest	0	0
Marjorie Harris Carr Cross Florida Greenway	0	2
Ocala National Forest	4	18
Rock Springs Run State Reserve	1	4
Ross Prairie State Forest	0	2
San Felasco Hammock Preserve State Park	0	0
Seminole State Forest	1	2
Starkey Wilderness Park	1	0
Welaka State Forest	0	0
Total	**13**	**50**

FWC conducted a comprehensive survey in cooperation with Florida Natural Areas Inventory during FY 2009-10 to determine the suite of reptile and amphibian species that use the five management units of the Big Bend WMA in Taylor and Dixie counties. Survey protocols included use of 38 drift fence arrays within 14 unique habitat types. The gopher frog was observed multiple times, but was not captured.

Florida Bog Frog and Okaloosa Darter (*Barbara Almario and Stuart Cumberbatch*)

The Florida bog frog is a State species of special concern that is only found in western Florida in shallow ponds or creeks. The Okaloosa darter is a State and Federally endangered species that is only found in the Choctawhatchee Bay drainage in northwest Florida, where it inhabits sand runs in clear creeks.

Nongame Wildlife Grant – Dr. James Austin, University of Florida, completed a genetic study supported by the Nongame Wildlife Grant Program on Florida bog frogs and Okaloosa darters during FY 2009-10. Status of these important focal species was determined by examining genetic factors and populations in several drainages in northwest Florida. The study examined patterns of hybridization between the Florida bog frog and the bronze frog, defined the range-wide genetic structure of the Florida bog frog and the Okaloosa darter, and examined the population structures and connectivity between drainages.

Results of the genetic work indicate there is hybridization between the frog species, but no determination was made on the effects of this hybridization for the long-term persistence of the Florida bog frog. Data suggest Florida bog frogs and Okaloosa darters underwent significant

genetic events about the same time more than 10,000 years ago. The genetic differences between populations of both the Florida bog frog and the Okaloosa darter make a strong case for using caution when planning future translocation or stream restoration efforts.

Yellow River and Escribano Point Wildlife Management Areas in Santa Rosa and Okaloosa Counties – FWC began call surveys for the Florida bog frog on the recently acquired Yellow River and Escribano Point Wildlife Management Areas (WMA) during FY 2009-10. FWC surveyed ten points distributed along three creeks in Yellow River WMA and six points in Escribano Point WMA in May, June, and July. Survey protocols were similar to those used by the U.S. Geological Survey's North American Amphibian Monitoring Program. FWC documented bog frogs at one survey point in May of 2010 on Yellow River WMA. No bog frogs were documented on Escribano Point WMA during FY 2009-10.

Eastern Indigo Snake (*Kevin Enge*)

The Eastern indigo snake is a State and Federally threatened species that once occurred throughout Florida but has experienced significant population declines in some areas, particularly the Panhandle and heavily populated areas. Sightings of indigo snakes have been reported by a variety of sources since 2000 and more than150 conservation or other public lands now have credible records of indigo snakes. There have been no confirmed sightings of indigo snakes from the panhandle since 1999, although there have been reports from two conservation lands and one private land. The first indigo snake seen since 1998 was on a small, privately owned key in the Florida Keys. This sighting was confirmed by a photograph. FWC collaborated on a food habits study using literature records, road-killed and museum specimens and field observations. Forty-eight different species were eaten by Eastern indigos, consisting of mostly frogs and toads, juvenile gopher tortoises (the most common prey species), snakes, and rodents. The State Wildlife Grant final report on the genetics of indigo snakes in Florida and Georgia was submitted. Analysis of mitochondrial DNA indicates the existence of two distinct genetic lineages that generally correspond to historical biogeography and sea level changes in Peninsular Florida. The Atlantic clade extends from southeastern Georgia, south to Alachua County (east of the Brooksville Ridge), east to Putnam County, and southeast to Brevard and Osceola counties. The Gulf clade occurs from Okaloosa County in the western Panhandle, southeast to extreme western Alachua County (on or west of the Brooksville Ridge), and south at least as far as Everglades National Park.

Flatwoods Salamander (*Kevin Enge, Bill Turner, Fred Robinette, Barbara Almario and Kim Sash*)

Flatwoods Salamander Taxonomic Change and Endangered Species Act Designation by U.S. Fish and Wildlife Service – The U.S. Fish and Wildlife Service (USFWS) officially sub-divided the flatwoods salamander into two species in 2009. Flatwoods salamanders in the population west of the Apalachicola River are now reticulated flatwoods salamanders (State species of special concern and Federally endangered) and populations to the east are now frosted flatwoods salamanders (State species of special concern and Federally threatened). While the frosted flatwoods salamander will remain threatened, the USFWS designated the reticulated

flatwoods salamander as endangered. This taxonomic change has been widely accepted by the scientific community.

Dipnet Surveys for Flatwoods Salamander Larvae – The frosted flatwoods salamander is a State and Federally threatened species. Habitat loss, intensive forestry practices, insufficient fire, and droughts have contributed to the decline of this species. On January 1, 2010, a three-year State Wildlife Grant project entitled "Survey of Winter-breeding Amphibian Species in the Peninsula" began, and the frosted flatwoods salamander is one of the five targeted species. Dipnet surveys for larvae were unsuccessful at three historic sites where the species' larvae have historically been found: Hatchet Creek Tract of Newnans Lake Conservation Area (Alachua County), Raiford WMA (Bradford County), and Osceola National Forest (Baker County). There were three known breeding ponds in Osceola National Forest, but the last salamander larva was found there in 1996. On March 31 2010, FWC helped survey for the species at St. Marks National Wildlife Refuge (Wakulla County) and the adjacent Flint Rock WMA (Wakulla County), which contain more than 50 known breeding ponds. Larvae were found only in swales in pine flatwoods between two known breeding ponds, but the sampling date was late in the season and most larvae had probably already transformed and left the ponds. Tail clips were taken from 15 larvae for genetic analysis.

Aucilla Wildlife Management Area in Jefferson and Taylor Counties – Aucilla WMA contains thousands of small, isolated wetlands. Historically, these ephemeral (short-lived) wetlands were fire-maintained, natural communities with fire frequencies that varied according to the periods of time during which the sites were wet. The edges of these wetlands had a higher fire frequency than the interior. These ephemeral wetlands were critical breeding habitat for the frosted flatwoods salamander. Past land management practices have severely degraded ephemeral wetlands across the WMA. Disturbances include rutting from logging activity, deposition of logging debris (i.e. windrows and push piles), and fire suppression. In an effort to restore ephemeral wetlands, FWC has attempted to burn them when conditions are favorable with mixed results.

Pine Log and Point Washington Wildlife Management Areas in Bay, Washington and Walton Counties – Staff sampled potential breeding ponds on Point Washington State Forest and Pine Log State Forest from November 2009 to April 2010, in an effort to reconfirm the two known breeding sites and document any new breeding populations. These two WMAs received enough rainfall during the FY 2009-10 breeding season to inundate most of the potential breeding ponds, allowing for the first major dip-netting effort on either WMA in three years. Ponds were mapped and ranked as "highly likely," "potential," "unlikely," or "unsuitable," based primarily on a suitable hydroperiod (holding enough water to support amphibian larvae for at least three months) and the presence of wiregrass or other grasses at the edge of the pond.

Survey methods used in FY 2009-10 included drift fences set parallel to the edges of ponds, as well as sampling the ponds with dip nets and/or minnow traps. Drift fences were deployed on 18 ponds classified as "highly likely" or "potential" flatwoods salamander habitat: 12 fences were set up on ten ponds on Point Washington and six fences were used on four ponds on Pine Log. Traps were set ahead of rain fronts, for a total of 210 fence-nights on Point Washington and 52 fence-nights on Pine Log.

Small, shallow ponds were sampled with minnow traps or dip-netted throughout the pond. Larger ponds were dip-netted near edges and in any areas where grass grew in the water. Using dip nets, staff and volunteers spent over 111 hours sampling 67 ponds on Point Washington, and over 59 hours sampling 25 ponds on Pine Log. The highest priority ponds were re-sampled in late March and April where water levels allowed. Minnow traps were used in four small "highly likely" ponds on Pine Log, with a total of 50-75 traps set for three to five nights in each pond. All amphibian and reptile species captured were recorded. No flatwoods salamanders were captured.

The recent taxonomic change has elevated the conservation priority of these salamanders and highlights the need for more active management to avoid extinction. In 2009, the species received critical habitat designation by USFWS. FWC continued to work with the Florida Department of Agriculture and Consumer Services (FDACS) to improve potential breeding pond habitat through prescribed fire, mowing, thinning, and chopping. The Management Plan for the Flatwoods Salamander on Point Washington State Forest was developed by FWC in 2005, and FWC has also provided recommendations for mitigation (mowing, burning, or a combination of both) on the eastern section of Point Washington State Forest. These recommendations continue to be employed. Habitat improvement (thinning canopy cover to stimulate herbaceous growth) at a previously confirmed breeding pond on Pine Log WMA was completed in the summer of 2009.

Blackwater Wildlife Management Area in Okaloosa and Santa Rosa Counties – FWC has surveyed for reticulated flatwoods salamanders within Blackwater WMA over the past several years. As of April 2010, there were no confirmed flatwoods salamander breeding ponds. A three-year sampling protocol designed to survey and monitor 118 pond sites throughout the WMA was implemented in early 2007. Priority ponds (known to be good breeding sites) are sampled annually, while potential breeding sites are sampled on a three-year cycle. Additionally, FWC located and sampled two new ponds, which were added to the potential breeding site sampling rotation.

Property containing a known flatwoods salamander breeding site and managed as the Yellow River WMA was incorporated in the Blackwater River State Forest in 2008. This pond is sampled by FWC twice a year. In 2009, FWC located two more potential flatwoods salamander breeding ponds on Yellow River WMA. These ponds are also sampled twice annually. FWC documented locations of several other ponds that should be sampled after surrounding habitat is improved. In April 2010, FWC worked with FDACS and USFWS to remove undesirable woody species from the known flatwoods salamander breeding pond. FWC will continue to work with FDACS to manage and improve habitat around all potential flatwoods salamander breeding ponds.

Apalachicola River Wildlife and Environmental Area in Franklin County – Surveys of ponds are conducted to determine the existence of flatwoods salamanders on Apalachicola River Wildlife and Environmental Area (ARWEA). The pond surveys conducted in January 2010 were a follow-up and continuation of previous monitoring efforts initiated in 2002-2003. Area staff locates ponds that may be suitable for flatwoods salamanders and dipnets for larvae and adult salamanders. To date, no flatwoods salamanders, larvae or adults, have been found on the ARWEA, although confirmed breeding populations have been located on Apalachicola National Forest. The closest known breeding pond on Apalachicola National Forest according to the U.S.

Forest Service, is approximately 1.3 miles (2.1 kilometers) from a previously ranked potential breeding pond on the Bloody Bluff portion of the ARWEA. Habitat management activities on the ARWEA included prescribed fire, mechanical treatments (i.e. mowing, gyro-tracing and roller chopping in the adjacent uplands), and restoring historic hydrologic function and water flow patterns. Ephemeral pond restoration efforts began in spring 2010 and will continue thru 2011 on 54 potential flatwoods salamander breeding ponds.

American Crocodile (*Lindsey Hord*)

The American crocodile is currently a State and Federally threatened species. Documented nests have increased from 20 in 1975, when it was Federally listed as endangered, to more than 170 in 2009. Crocodile occurrences have been documented as far north as Indian River Shores (Indian River County) on the east coast and Ellenton (Manatee County) on the west coast.

With the increasing crocodile population (estimated between 1,500 and 2,000 non-hatchlings), a commensurate increase in crocodile-human conflicts has been documented. FWC manages these conflicts under a plan developed in May 2005, including FWC and crocodile experts from USFWS, National Park Service (NPS), and the University of Florida. The plan provides guidance for dealing with all crocodile-human interactions and promotes public safety while recognizing the conservation needs of a listed species. FWC received just over 100 complaints regarding the American crocodile in FY 2009-10. Most of these complaints were resolved through telephone calls and site visits. Seven animals were captured. Of these, one was male, five were female, and one was undetermined. The male was 4.25 feet (1.3 meters) in length. The females averaged 7.23 feet (2.2 meters) in length, with the largest one being 8.67 feet (2.64 meters) in length. Of the captured animals, four were relocated to one of the five relocation areas: Rookery Bay National Estuarine Research Reserve, J.N. “Ding” Darling National Wildlife Refuge, Everglades National Park, Matheson Hammock County Park, or Crocodile Lake National Wildlife Refuge. Two were released at or near their capture location.

FWC was involved in the recovery of three American crocodile carcasses in FY 2009-10. Two were discovered dead in a canal (one was too decomposed to measure and the other was a 9 foot [2.74 meter] female). The third recovered carcass was the result of a road kill and was a 5.2 foot (1.58 meter) animal of undetermined sex.

While FWC was not directly involved in the assessment, the American crocodile suffered an unprecedented mortality event due to a historic period of cold weather that occurred during January 2010. Unofficial reports from University of Florida researchers and staff of the Everglades National Park place the total number of documented dead American crocodiles at approximately 150 animals.

Alligator Snapping Turtle (*Travis Thomas and Kim Sash*)

The alligator snapping turtle is a species of special concern in Florida. It is the largest freshwater turtle species in North America and can be found in the Suwannee River drainage west through the Florida Panhandle. Newly established FWC turtle regulations now prohibit the harvest of this species in Florida and possession of a pet alligator snapping turtle requires an FWC permit. FWC trapped for turtles in the Suwannee, Ochlockonee, and Apalachicola river drainages this year. On a single day, six traps in the Santa Fe River, part of the Suwannee River

drainage, captured three turtles weighing 48, 104, and 120 pounds, respectively. Bite-force measurements were taken on these three specimens. The largest turtle had a bite force of greater than 900 pounds per square inch, the highest measurement for any turtle species. When the bone structure of both skulls and shells of turtles from the Suwannee River drainage were compared with turtles from other drainages, differences were discovered. These physical differences, along with preexisting genetic data, suggest that alligator snapping turtles from the Suwannee drainage may represent a new species.

Alligator Snapping Turtle Population Survey on the Apalachicola River Wildlife and Environmental Area – Trapping and biological data collection continued on the Apalachicola River Wildlife and Environmental Area (ARWEA) for the second consecutive year. In a little over two weeks of trapping last year, five turtles were captured. Basic biological data (shell length, weight, sex, and overall condition of the animal) were recorded and the turtles were marked and released. In three weeks of trapping this year, six more turtles were marked and released. The largest turtle trapped weighed 80 pounds (36.3 kilograms) and the smallest was 9.5 pounds (4.3 kilograms). Three of the six turtles captured were males and three were females. Trapping was conducted in the same locations as in 2008, but no turtles were recaptured from prior years. All turtles appeared healthy, but two turtles caught in 2009 had only three legs. In both cases the injuries appeared to be old. In neither case did the turtles seem hindered by the missing limb.

Gopher Tortoise (*Deborah Burr, Joan Berish, Shane Belson, Jennifer Myers, Paul Scharine, Justin Davis, Barbara Almario, Fred Robinette, Scotland Talley, Allan Hallman and Tera Meeks*)

Management – The gopher tortoise is a State threatened species. The Gopher Tortoise Management Plan was approved in September 2007 and can be accessed at http://myfwc.com/docs/WildlifeHabitats/GT_Mgmt_Plan.pdf . The overarching conservation goal of the management plan is to restore and maintain secure, viable populations of gopher tortoises throughout the species' current range in Florida by addressing habitat loss. Specific objectives include increasing the amount of protected habitat; conducting appropriate vegetation management to maintain gopher tortoise habitat (e.g. prescribed burning); restocking tortoises to protected, managed, suitable habitats where densities are low; and decreasing tortoise mortality on lands proposed for development. Each objective provides benchmarks and measurements against which progress toward the plan's goal can be assessed. A suite of conservation actions is proposed for the plan's first five-year cycle. The extensive conservation actions outlined in the plan fall under the following broad categories: permitting, local government coordination, law enforcement, habitat preservation and management, population and disease management, landowner incentives, monitoring and research, and public awareness.

Originally approved in April 2008, the Gopher Tortoise Permitting Guidelines of FY 2009-10 were revised based on stakeholder and staff input and approved by FWC's Commission in June 2010. The guidelines, which can be accessed at http://myfwc.com/WILDLIFEHABITATS/GopherTortoise_BreakingNews.htm, include new permit options: the Burrow and Structure Safety permit, a Research Recipient Site permit, and the Disturbed Site permit. The FWC will continue to work with stakeholders to discuss new challenges and to work towards possible solutions throughout the implementation of the Gopher

Tortoise Management Plan. The continued participation of stakeholders is important to the long-term conservation of this species.

The FWC's online gopher tortoise permitting system continues to improve in customer service. A greater number of permits can now be acquired online by the public. In addition to reducing the use of paper, the new online permitting system has enhanced communication between permit applicants and FWC by sending notices and requests for additional information online. Expedited review and issuance of gopher tortoise permits can be attributed to the system, with some permits issued in as little as a few days.

The gopher tortoise recipient site permit program (a program in which landowners may use their lands to receive gopher tortoises from other sites) now accounts for approximately 7,000 acres of private land that have been protected through conservation easements and are currently being restocked with, and managed for, gopher tortoises. Thirteen recipient sites with a capacity for 12,576 tortoises have been permitted. Twenty-two additional permit applications with potential capacity for more than 12,000 tortoises are currently under review. To date, 6,365 tortoises have been relocated through this program.

During FY 2009-10, FWC continued to coordinate with an interagency working group to develop guidelines for land managers to use when considering restocking tortoises onto public conservation lands where populations have been depleted.

FWC also continues to work closely with public and non-profit organizations to identify and provide incentives for gopher tortoise conservation on private lands. In addition, FWC continues to use Geographic Information Systems (GIS) to help identify areas and determine acreages of potential tortoise habitat throughout Florida.

Through the combined coordination of public and non-government organizations and the utilization of contracted vendors, over 30,000 acres of gopher tortoise habitat was managed through prescribed fire and other methods on public and private lands during FY 2009-10. FWC provided $120,000 in funding for gopher tortoise habitat management activities on more than 700 acres under local government ownership.

In addition to providing habitat management funding to local governments, FWC works with local government representatives to develop internal processes, ordinances, and codes pertaining to gopher tortoise habitat, and helps to identify potential gopher tortoise recipient sites. In February 2010, after years of collaboration between FWC and County staff, Volusia County Board of County Commissioners approved the first gopher tortoise conservation ordinance of its type. Additionally, a revised inter-local agreement with FWC and Hillsborough County was signed which will provide on-the-ground assistance to verify that gopher tortoises permits are issued according to FWC permitting guidelines. All of these efforts are critical to the success of FWC's Gopher Tortoise Management Plan and the overall conservation goal for Florida.

To enhance the protection and conservation of gopher tortoises and gopher tortoise habitat statewide, FWC is developing a training workshop and field manual for FWC Law Enforcement Officers. These tools will help FWC officers address wildlife complaints related to gopher tortoises in an effective and consistent manner statewide.

Wildlife Management Area and Wildlife and Environmental Area Activities – Approximately 89 acres of gopher tortoise habitat at the Carter Creek tract of the Lake Wales Ridge Wildlife and Environmental Area (LWRWEA) in Highlands County were mechanically treated by a contractor through funding from a State Wildlife Grant. Chainsaws were used to fell

select hardwood trees greater than five inches in diameter. Hardwoods three to five inches in diameter were girdled and treated with herbicide. This action opened the canopy and improved the suitability of this area for use by gopher tortoises. The treated acreage will be managed by prescribed burning during FY 2010-11 to maximize the effectiveness of the mechanical treatment.

During FY 2009-10, Apalachee Wildlife Management Area (WMA) in Jackson County received funding through the Florida State Wildlife Grants Program and FWC gopher tortoise mitigation funds to support restoration of approximately 400 acres of sandhill communities on the WMA. These management activities consist primarily of hardwood reduction through herbicide and mechanical methods, and administering prescribed burning. To determine the response of gopher tortoises to this management, FWC completed a baseline burrow survey prior to initiating management activities. Using the Gopher Tortoise Management Plan protocol recommended for assessing population densities, FWC estimated there were 1.16 tortoises per acre within sandhill communities on the area. Additional surveys will be conducted following restoration that will allow FWC to determine the response of gopher tortoises to this land management activity.

Gopher tortoise surveys and monitoring continued during May-July 2010 on the Carter Tract of Econfina Creek WMA in Washington County. The 2,200 acre tract contains approximately 1,200 acres of sandhill uplands. The monitoring protocol is in keeping with that established for Point Washington WMA. For logistical and accounting purposes, gopher tortoise burrows on the area were grouped into five clusters. The 2010 surveys yielded 378 total burrows, with 96 (25%) classified as active or possibly active. This is a 10% increase in the number of active or possibly active burrows compared to 2009 surveys. Habitat improvement activities implemented in 2007 continue, including prescribed burning, scrub oak reduction, herbicide application, removal of sand pine and slash pine plantations, and planting of longleaf pine and wiregrass. These activities focus on retaining the open overstory and herbaceous understory that are indicative of the longleaf-wiregrass ecosystem, and will allow for future expansion of gopher tortoise populations on the Carter Tract. Surveys will continue to be conducted annually on the area between May and October. Future work will provide comparative data on tortoise population trends within the Carter Tract following land management and mitigation strategies.

FWC continued a multi-year comprehensive burrow survey of the gopher tortoise population, designed to evaluate the entire 200,000 acres (80,937 hectares) of Blackwater WMA in Okaloosa and Santa Rosa counties. The purpose of the survey is to provide Florida Department of Agriculture and Consumer Services (FDACS), the lead land manager on the area, with habitat improvement recommendations. Burrow activity was defined by FDACS so that habitat improvement recommendations could be more easily translated into management actions. As of August 2010, FWC has surveyed three management units and found over 2,000 burrows. FWC also worked with The Nature Conservancy to procure funding from the Multi-State Sandhills Ecological Restoration Project for gopher tortoise surveys on the Hutton Unit of Blackwater WMA. As of July 2010, FWC has surveyed more than 1,500 acres of suitable gopher tortoise habitat in that area.

FWC has surveyed, monitored, and assessed the status of the gopher tortoise on Point Washington WMA in Walton County annually since 1993 and on Pine Log WMA in Bay and Washington counties since 2004. Aerial photos are used to identify suitable gopher tortoise habitat, primarily sandhill areas, which were divided into clusters for management purposes.

Point Washington's sandhill habitat is grouped into 33 clusters and scheduled for sampling on a three-year rotational schedule such that approximately 1/3 of the area is surveyed each year. Pine Log is grouped into 14 clusters and the entire area is surveyed annually. These sandhill clusters are systematically searched for gopher tortoise burrows by staff each summer, on foot or using all-terrain vehicles. Burrows are classified as active, possibly active, inactive, or abandoned. An inactive burrow may be used later but is not currently being used, and an abandoned burrow will not be used again. Using burrow widths, the burrows are further grouped into size categories. Burrow locations are recorded using Global Positioning System (GPS) units, and the data points are downloaded into a Geographic Information System (GIS). Data collected each year provide information used to determine population trends and demography of the gopher tortoise populations within the WMAs. The results of the 2009 summer survey showed slightly lower numbers of active burrows on both WMAs, compared to the previous year. Preliminary data from the 2010 survey suggests that the activity level has increased on Pine Log and remained steady on the eastern third of Point Washington.

Working in cooperation with FDACS, the lead management agency, habitat improvements are being prescribed and implemented on Pine Log and Point Washington WMA. Prescribed fire continues to be the preferred management tool, although herbicide has been effective in controlling encroaching scrub oaks on sandhill habitat where prescribed fire is impractical or ineffective. As recommended by FWC, FDACS' Division of Forestry has removed the majority of sand pine plantings from Pine Log WMA in Bay and Washington counties, and replanted several of the resulting clearcuts in longleaf pine with re-growth of herbaceous groundcover. These areas are well on their way to becoming suitable habitat for gopher tortoises

FWC conducted a survey of gopher tortoise burrows on the Spring Creek Unit of the Big Bend WMA in Taylor County prior to initiating habitat restoration activities funded in part by the State Wildlife Grant program. Matching funds are provided by the FWC. Surveys conducted on a 350 acre (142 hectare) sandhill restoration area within the Spring Creek Unit resulted in an estimate of 0.31 tortoises per acre in the project area. This estimate indicates that the current population is less than the population density observed on sandhill habitat in good condition and will provide a baseline for assessing population response to habitat enhancement in the future.

Activities to enhance habitat for gopher tortoises on Jennings State Forest WMA in Clay and Duval counties consisted of three projects contracted out to private vendors. The first project involved treating 125 acres (51 hectares) of sandhill habitat. All turkey oaks greater than four inches in diameter at breast height were mechanically cut down and immediately treated with herbicide in order to stimulate regeneration of ground cover plant species and restore wiregrass. The second and third projects involved treating 164 acres (66 hectares) of sandhill habitat by removing all sand pine trees in the designated area to within three inches of ground level in order to stimulate regeneration of ground cover plant species and restore wiregrass. A gopher tortoise survey was conducted on a183-acre (74 hectares) area that has been surveyed on a five-year rotational basis since FDACS' Division of Forestry acquired the property in 1990. The survey yielded 830 burrows, of which 651 were active or inactive (78%), and 179 (22%) were abandoned. The estimated gopher tortoise population is 400 in Jennings State Forest WMA, an increase of 48% over the 2005 population estimate of 271.

Mitigation Park Program – The FWC Mitigation Park Program began as a pilot initiative in 1988. It was developed with the primary goal of improving the biological effectiveness of listed species habitat protection efforts required for new land developments by State and Federal regulations. The program increases the biological value of mitigation by consolidating habitat protection areas into larger tracts, implementing listed species habitat management plans, and providing for permanent management by endowing each facility with a dedicated funding source. Primary management emphasis at mitigation parks is gopher tortoise habitat enhancement and restoration. To date, 14 mitigation parks totaling 15,320 acres (6,200 hectares) have been established in Duval, Clay, Hamilton, Gilchrist, Lafayette, Alachua, Hernando, Orange, Osceola, Polk, Hillsborough, Manatee, Highlands and Lee counties.

In North Florida during FY 2009-10, growing season controlled burns were used to maintain and enhance 375 acres (152 hectares) at Suwannee Ridge WEA in Hamilton County and 304 acres (123 hectares) at Fort White WEA in Gilchrist County. At Watermelon Pond WEA in Alachua County, 430 acres (174 hectares) and 37 acres (15 hectares) were burned in the growing and dormant seasons, respectively, and 142 acres (57 hectares) of hardwoods in fire-suppressed sandhills were controlled. A gopher tortoise survey completed at Fort White WEA resulted in an estimated population density of 1.32 tortoises per acre, which is consistent with previous surveys for the site.

In Central Florida, 720 acres (291 hectares) of tortoise habitat were treated with growing season controlled burns at Split Oak Forest WEA in Orange and Osceola counties. At Crooked Lake WEA, 150 acres (61 hectares) of saw palmetto were mowed in mesic flatwoods, 454 acres (184 hectares) received growing season controlled burns, and 200 acres (81 hectares) of exotic plants were treated with herbicides. Perry Oldenburg WEA in Hernando County received 78 acres (32 hectares) of growing season controlled burns, 85 acres (35 hectares) of hardwood reduction, and the planting of wiregrass on 85 acres (35 hectares) of sandhills. Gopher tortoise management at Janet Butterfield Brooks Preserve WEA in Hernando County included the establishment of 1.7 miles (2.7 kilometer) of firelines and treatment of one acre (0.4 hectare) of cogongrass. At Bullfrog Creek WEA in Hillsborough County, 115 acres (47 hectares) of gopher tortoise habitat were enhanced using growing season controlled burns.

In south-central Florida, growing season controlled burns were completed on 129 acres (52 hectares) of scrubby and mesic flatwoods at Hickey Creek WEA in Lee County. Additional tortoise habitat was enhanced by the mowing of 120 acres (49 hectares) of overgrown scrubby flatwoods. At Platt Branch WEA in Highlands County, 70 acres (28 hectares) of uplands were mechanically treated to improve habitat structure. Controlled burns were completed on 345 acres (140 hectares) during the growing season and 98 acres (40 hectares) during the dormant season. In addition, mature oaks were removed from 30 acres (12 hectares) of overgrown scrub to promote herbaceous growth in the understory.

Research – The gopher tortoise has declined throughout Florida, primarily due to conversion of upland habitats for a variety of human uses. As tortoises are displaced by land development in peninsular Florida, there is a strong temptation to relocate those tortoises to areas of the Panhandle with suitable habitat but which currently support few, if any, tortoises. This raises a number of concerns regarding genetic disruption of resident tortoise populations. An early genetic assessment of tortoise populations in Florida identified three genetic groups: Panhandle, Brooksville Ridge, and Peninsula (other than Brooksville Ridge). A later study using more sophisticated genetic tools identified additional genetic subdivisions within Peninsula

populations, but included only one sample from the Panhandle. During 2008-2010, data gathered by FWC on the genetics of Panhandle tortoise populations was combined with previously published data to provide a more complete picture of the genetic structure of Florida gopher tortoise populations.

The objectives of the genetics study were to assess the genetic diversity of gopher tortoises in the Panhandle to determine if they are genetically structured into distinct populations or if they form a single genetic population, and to compare the genetics of Panhandle populations with those in the Peninsula based on previous research. Blood samples from 69 gopher tortoises were collected in 2008-2009; tissue samples were also taken from three tortoises killed on highways. Analyses conducted by Dr. Colleen Sinclair-Winters of Towson University indicated minimal genetic diversity among six Panhandle populations and suggested that gene flow has occurred among these populations. However, when Panhandle samples were compared with those from an earlier study of Peninsula tortoises, genetic partitioning was evident between Panhandle and Peninsula populations. Based on study findings, relocating tortoises within the Panhandle should not raise significant genetic concerns (e.g., tortoises from Tallahassee developments could preferably go to an approved research recipient area in nearby Apalachicola National Forest, or could be accommodated at other Panhandle recipient sites that are approved over time). The Apalachicola River does not appear to have been a major barrier for gene flow; however, there are indications of genetic differentiation among populations east and west of the Suwannee Basin. Even though such relocations have occurred in the past, efforts should be made to minimize future relocations across the Suwannee River drainage.

Although a number of short-term studies have been conducted on gopher tortoises during the last several decades, information regarding long-term population changes and habitat use is lacking. Because the gopher tortoise is a slow-growing species estimated to live 40-60 years, short-term studies provide only a snapshot of the changes in any particular tortoise population. Additionally, the ways in which gopher tortoises distribute their burrows across a landscape over time, and how they respond to changes in their habitat, are poorly understood. To help fill this information gap, a follow-up study was conducted in a pine plantation near Cross Creek. Mark-recapture surveys were conducted on this site during the 1980s and a follow-up survey was undertaken in 1992. Gopher tortoise burrows were located during spring 2009 and tortoises were captured in bucket traps or wire traps during May through July. Unseasonably heavy rains during May flooded portions of the study site and made trapping tortoises a challenge. Fifty-two tortoises were captured on the study site, seventeen of which (33%) had been previously marked, including a male that had been initially marked as a mature adult in 1982. Most (88%) marked individuals were in the same approximate location as during earlier surveys, despite the forestry-related habitat changes over time. This follow-up survey indicated that viable and robust gopher tortoise populations can persist on sites undergoing intensive forestry, and further substantiated tortoise use of berms, ecotones (habitat edges), and better-drained soils.

Barbour's Map Turtle (*Kim Sash*)

The Apalachicola River Wildlife and Environmental Area (ARWEA) in Gulf and Franklin counties is within the Apalachicola River basin. This bio-diverse area is home to the Barbour's map turtle, an endemic species. The Barbour's map turtle is listed as a species of special concern because of its limited range and vulnerability to habitat modifications and other human disturbances. Through annual surveys, FWC continues to monitor the population and

assess threats facing the species. Approximately 52 miles (83.6 kilometers) of river were surveyed in late summer, including areas of the Apalachicola, Brothers, St. Marks, East and Chipola Rivers. Surveys were conducted September 8–10, 2009 and 559 turtles were recorded.

Marine Turtles (*Robbin Trindell, Anne Meylan, Allen Foley, Blair Witherington and Beth Brost*)

FWC continues to work with stakeholders throughout Florida to implement the State's responsibilities under the Marine Turtle Protection Act [Florida Statute §379.2431 (1)] and the USFWS Recovery Plans for five species of marine turtle: the loggerhead (State and Federally threatened) and the green, leatherback, hawksbill and Kemp's ridley (all State and Federally endangered).

Management Activities – During FY 2009-10, FWC worked closely with the Federal government, State regulatory agencies, volunteer conservation groups, and local governments on the protection of marine turtles and their critical nesting beaches, developmental habitat, and foraging habitat along Florida's coast. FWC continues to provide expertise for requests to conduct human activities that could impact marine turtles and their nesting and foraging habitats. Public education concerning marine turtle biology and important conservation issues such as turtle-friendly lighting, threats from marine debris, and the importance of protecting nesting beaches continues to be the major focus of FWC's educational efforts. FWC's Marine Turtle Management program is supported fully by proceeds from the sale of the marine turtle license plate and voluntary donations.

During FY 2009-10, FWC participated in two catastrophic events that impacted sea turtles in the Florida Panhandle and the Atlantic coast, the January 2010 cold stun event and the April 2010 Deepwater Horizon oil spill. During the January cold stun event, FWC retrieved turtles from St. Joseph Bay in Gulf County, transported them to Gulf World in Panama City for rehabilitation, and then assisted in the release of the turtles. Staff was integral in processing, transporting, and releasing the turtles retrieved from peninsular Florida, including Mosquito Lagoon and other areas along the Atlantic Coast. During the Deepwater Horizon oil spill, staff participated in Technical Working Groups for Natural Resource Damage Assessment planning, and in actual response and rehabilitation activities.

Environmental Commenting – During FY 2009-10, FWC reviewed approximately 309 project requests and provided approximately 114 final comment letters to the Florida Department of Environmental Protection's (FDEP) District Offices, FDEP's Bureau of Beaches and Coastal Systems, the Water Management Districts, and the State Clearing House. Projects reviewed included Coastal Construction Control Line applications, Environmental Resource Permit applications, and Joint Coastal Permit applications. FWC participated in over 100 meetings with local governments, other State and Federal agencies, and stakeholders on these projects and on other issues involving marine turtles. FWC initiated or participated in more than 64 conference calls on specific projects and marine turtle conservation issues as well as participating in development of two Habitat Conservation Plans (HCP); the Walton County HCP and the statewide beaches HCP (in cooperation with the FDEP). FWC conducted more than 64 site inspections as part of environmental commenting responsibilities, including lighting inspections conducted at the invitation of local governments and property owners. FWC also participated in one administrative hearing and was subpoenaed as a witness for two additional hearings.

No rule making activity occurred during this period.

FWC reviewed and approved approximately 189 applications for conservation activities with marine turtles, including nesting beach surveys, stranding and salvage work, research, public turtle walks, rehabilitation at captive facilities, and educational displays. FWC also made presentations at four Index Nesting Beach Survey/Statewide Nesting Beach Survey training workshops statewide.

FWC authorizes captive facilities to hold marine turtles for rehabilitation (14), for educational display (17), or for research (two). FWC staff coordinated transfer and release of marine turtles during rehabilitation, supervised public marine turtle releases and conducted four facility inspections.

Currently FWC is administering three grants, including $416,000 from the USFWS for Walton County's Habitat Conservation Plan; $25,000 from the National Marine Fisheries Service for medical supplies for rehabilitation facilities; and $87,000 from the FDEP Coastal Zone Management Program for improvements in coastal armoring designs to minimize impacts to marine turtles and their nesting habitat. All requirements of a grant from the National Fish and Wildlife Foundation to create the sea turtle lighting trailer and the shield loan program were completed. The National Fish and Wildlife Foundation grant allowed FWC to work directly on sea turtle conservation with property owners by providing bulbs and shields in the communities in sea turtle habitat. FWC is assisting the Florida Fish and Wildlife Foundation with another project funded by the National Fish and Wildlife Foundation, at approximately $450,000, to assist two local governments with lighting improvements along sea turtle nesting beaches. Grant management includes oversight of contracts to local governments and vendors as necessary.

FWC was invited to participate as an expert for the USFWS and the Army Corps of Engineer's Team on the Programmatic Biological Opinion for beach restoration. FWC served on the following teams, working groups, and committees: Archie Carr Sea Turtle Refuge Working Group, FWC's Coastal Wildlife Conservation Initiative, FWC's Wildlife Friendly Designation, FWC's Climate Change Team and the Marine Turtle Grants Committee.

For more information on the FWC's Marine Turtle Protection Program, visit http://www.myfwc.com/WILDLIFEHABITATS/SeaTurtle_index.htm

Research – FWC coordinated the Florida portion of the Sea Turtle Stranding and Salvage Network, an 18-state program administered by the National Oceanic and Atmospheric Agency (NOAA)-Fisheries. The Network is responsible for gathering data on dead, sick, or injured (i.e., stranded) sea turtles. Documentation of stranded sea turtles provides information on mortality levels and is an important component of monitoring the status of sea turtle populations. Mortality factors for sea turtles are also identified and monitored through the work of the Network.

A total of 1,738 dead or debilitated sea turtles were documented; of those 863 were green turtles, 638 loggerheads, 87 Kemp's ridley, 71 hawksbills, 11 leatherbacks, and an additional 68 sea turtles not identified by species. In addition, 4,594 cold-stunned sea turtles (4,372 green turtles, 93 loggerheads, 72 Kemp's ridleys, and 57 hawksbills) were documented during January 2010. All reported cold-stunned sea turtles were responded to during FY 2009-10. FWC responded to or coordinated the response to approximately 1,000 reports of dead or debilitated sea turtles (not counting cold-stunned sea turtles), transported 108 sick or injured sea turtles (not counting cold-stunned sea turtles) to rehabilitation facilities, and conducted necropsies on 91 carcasses. Florida sea turtle stranding data were regularly uploaded to the Network on-line

database for use by various National Marine Fisheries Service and FWC law enforcement and protected species personnel. FWC also continually worked to identify and characterize any unusual sea turtle mortality events as soon as possible. In response to the Deepwater Horizon oil spill, FWC rescued oiled sea turtles at sea from three Gulf of Mexico ports and helped get these turtles to rehabilitation facilities.

The population-monitoring program involves collection of nesting and habitat information throughout the geographic range of marine turtles in Florida. Approximately 90% of the world's largest loggerhead nesting population occurs in Florida, and the green turtle and leatherback nesting populations are of regional significance, meaning they also nest in the state but it is not a big nesting area for these species. FWC assesses nesting abundance and reproductive output by coordinating a network of State, Federal and volunteer permit holders who monitor sea turtle reproduction on Florida's beaches. FWC establishes scientifically sound monitoring designs, provides training, resolves data collection problems, assesses data collection error rates, analyzes data trends, and serves as a clearinghouse for information on marine turtle populations and habitats. Two overlapping monitoring programs, the Statewide Nesting Beach Survey Program, initiated in 1979, and the Index Nesting Beach Survey Program, started in 1989, have different 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 2009, 203 survey areas were monitored, comprising 823 miles (1,324 kilometers) of beaches. Statewide, the program documented 52,374 loggerhead nests, 4,462 green turtle nests, 1,747 leatherback nests, three hawksbill nests, and eight Kemp's ridley nests.

The Index Nesting Beach Survey Program collects more detailed data from a smaller set of index beaches. Surveyors identify each sea turtle track by species, identify the tracks as a nest or abandoned attempt, and locate nests within an approximate half-mile beach zone. Nests and nesting attempts have been monitored for 20 years at 478 index beach zones surveyed daily during each 109-day nesting season (May – August), an effort that currently provides nearly six million records in the Index Nesting Beach Survey Program database total. Annual surveys of training, on-site verification, and consistency of the methods used during the 21 years of the program and among the 246 miles (396 kilometers) of index beaches, make the resulting database a representative assessment of sea turtle nesting. The program provides a reliable way to detect changes in the abundance of Florida sea turtles. In 2009, the program documented trends in nesting for loggerheads (declining), green turtles (increasing), and leatherbacks (increasing).

Most research on marine turtles is conducted on the nesting beach although turtles spend only a small fraction of their lives there. Conservation efforts depend on a broad knowledge of population biology, life history, ecology, and migrations. Ongoing projects in the Western Florida Current, the eastern Gulf of Mexico, Florida Bay, and the Key West National Wildlife Refuge involve capturing live animals at sea. Studies target four species of marine turtles and several life history stages, and address population structure (including gender ratios), growth rates, genetic identity (nesting population to which turtles belong), life history, health, diet, habitat preferences, and migrations. FWC research on the first few months of a sea turtle's life is

critical to understanding and managing threats to sea turtles as they leave Florida waters and circulate throughout the North Atlantic.

FWC studies the abundance, distribution, behavior, and diet of recent hatchlings and small juvenile sea turtles in open-ocean habitat off Florida's coasts. These juvenile turtles live in surface waters and later occupy a pelagic stage (occupy deep ocean water) in sea turtle development that precedes a time when as larger immature and adult sea turtles, they will live primarily along the bottom of more shallow, coastal areas. Study objectives are to measure relationships between open-ocean habitat and pelagic turtle abundance, and to measure threats unique to this habitat such as mortality and morbidity from plastics and tar ingestion. FWC records physical oceanographic measurements, turtle behavior, their relationships to floating objects and other organisms, turtle weights and measures, and evidence of ingested plastics and tar. Thirteen sampling trips were conducted during FY 2009-10. This effort continues a study in which approximately 528 miles (850 kilometers) of search transects were sampled between 2004 and 2010. On these search transects, a total of 567 turtles were observed: 355 loggerheads, 105 green turtles, 98 Kemp's ridley, and nine hawksbills. Survey locations included Gulf of Mexico waters offshore from Pensacola, Apalachicola, and Sarasota, and Atlantic waters offshore from Sebastian Inlet. Additional benthic-stage sea turtles recorded during this effort included 136 loggerheads, four green turtles, two Kemp's ridley, and two hawksbills between 2005 and 2010. Dead neonate sea turtles were recovered following storm events on Atlantic beaches. Of these, 181 loggerheads and 93 green turtles were necropsied and examined for their gut contents. A high proportion, approximately 92%, of these young turtles had ingested plastics or tar.

FWC served on several scientific advisory committees and governing boards during FY 2009-10, including the Carr Refuge Working Group, the National Academies/National Research Council Committee to Review Sea Turtle Population Assessment Methods, USFWS International Working Group for the Conservation of the Northwest Atlantic Loggerhead Populations, university graduate committees, and the International Union for the Conservation of Nature's Marine Turtle Specialist Group. FWC reviewed all research-related proposals submitted for consideration by the small grants program of the Florida Sea Turtle License Plate.

For more information on the Marine Turtle Research Program, visit the following Web site at http://research.myfwc.com/features/category_main.asp?id=1289.

Smalltooth Sawfish (*Phil Stevens and Gregg Poulakis*)

The smalltooth sawfish is a Federally endangered species that was once common in the coastal and estuarine waters of the southeastern U.S., but during the 20th century it became rare throughout its North American range. Smalltooth sawfish used to be found in the U.S. along the entire gulf coast, around Florida, and up to North Carolina, but they are currently found only in Florida from Charlotte Harbor in Charlotte County to the Florida Keys in Monroe County. This decline is attributed to two main factors: 1) bycatch in commercial and recreational fishing, and 2) life history parameters that include late maturity and production of small numbers of young.

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

In November 2004, FWC staff initiated long-term monitoring specifically designed to collect data on the life history, biology, and ecology of the smalltooth sawfish. During FY 2009-10, two complimentary sampling methods were used in the Charlotte Harbor estuarine system, located on the southwest Gulf Coast of Florida. Monthly, randomized sampling and monthly directed sampling that targeted smalltooth sawfish was conducted in the Caloosahatchee River in Lee County and in the Peace River in Charlotte County using a multi-gear approach (*e.g.*, gill nets, seines).

Fourteen smalltooth sawfish were captured and released. A variety of data were collected on all sawfish (*e.g.*, lengths, rostral tooth counts), and each new animal was tagged and released. Total lengths ranged from about 2.5 to 5 feet (797–1620 millimeters); all of these sawfish were immature. Captured sawfish were tagged with a colored tag embossed with the FWC tagging hotline phone number, a PIT (Passive Integrated Transponder) tag (similar to what is used for dogs and cats), and an acoustic tag, and were released at the site of capture. PIT tags remain with the sawfish for life, and the PIT tag reader can be carried by researchers to detect recaptures. The acoustic tags are used by researchers to track sawfish movements using hydrophones (underwater listening devices). Data obtained will help define activity space, home range, and the abiotic (non-living chemical and physical factors in the environment) preferences of this species. This is a collaborative effort between the FWC and other scientists.

FWC is a member of Smalltooth Sawfish Recovery and Implementation Teams. These groups include members with Federal, State, academic, and non-profit affiliations and were assembled by the National Marine Fisheries Service to develop and implement the Recovery Plan for this species. Sampling data are provided to the team as needed.

Information received via awareness efforts and research is compiled and archived as part of the National Sawfish Encounter Database. This database has been used by the Smalltooth Sawfish Recovery and Implementation Teams in a variety of ways, including proposal of critical habitat for the species. When citizens provide information on sawfish, FWC takes the opportunity to inform responders about the smalltooth sawfish and the FWC's role in its protection.

Atlantic, Shortnose and Gulf Sturgeon (*Jeffrey Wilcox and Stuart Cumberbatch*)

Atlantic Sturgeon Activities – The Atlantic sturgeon is a State-listed species of special concern. The St. Mary's River once supported a thriving commercial fishery for Atlantic sturgeon. However, there have been few reports of sturgeon being seen or caught in the river in the past 50 years, until this winter. FWC has been collaborating with multiple agencies to survey the river and develop a fishery restoration plan to return Atlantic sturgeon to the system. FWC, in coordination with Florida Department of Environmental Protection (FDEP), the Georgia Environmental Protection Department, the U.S. Environmental Protection Agency, the St. Johns River Water Management District, and the St. Marys Fisheries Restoration Committee continues to compile all agencies' water quality, flows and levels, point source discharges, reports of limestone outcroppings for spawning, and toxicity studies to attempt to characterize the entire length of the St. Mary's River.

FWC has continued collaboration with the Georgia Department of Natural Resources, U.S. Fish and Wildlife Service (USFWS), the St. Johns River Water Management District, and National Oceanic and Atmospheric Agency's National Marine Fisheries Service, as a primary member of the St. Marys Fisheries Restoration Committee. FWC, in coordination with the St.

Marys Fisheries Restoration Committee, drafted the St. Mary's River Fishery Management Plan (management plan) for Atlantic sturgeon. The management plan was based on the initial assumption that shortnose and Atlantic sturgeons no longer occurred in this system. The management plan included adaptive management options should the assumption of extirpation (ceasing to exist) be incorrect.

Staff represented FWC on the Atlantic States Marine Fisheries Commission Sturgeon Technical Committee.

The National Marine Fisheries Service funded a study at the University of Georgia to conduct a two-year estuarine/riverine survey to confirm the presence of shortnose and Atlantic sturgeons in the St. Mary's River. This study was initiated in FY 2008-09. In year two of the study, the University of Georgia collected one shortnose sturgeon within the St. Mary's River. Additionally, 21 Atlantic sturgeon were collected in the St. Mary's estuary during this winter. The Army Corps of Engineers were conducting dredging maintenance of the 45 foot deep (Trident Submarine) main channel, and was simultaneously contracting chase-trawling for sea-turtles. Their chase-trawler incidentally caught, measured, and released 21 juvenile Atlantic sturgeon. Funding is currently being sought to tag and monitor the movements of the juvenile Atlantic sturgeon population in the St. Mary's estuary next winter.

Gulf Sturgeon Activities – The Gulf sturgeon is listed as Federally threatened and a State species of special concern. Between November 13, 2000 and January 1, 2001, 46 tagged Gulf sturgeon were released into six separate habitat types in both reaches of the Hillsborough River at the head of Tampa Bay. During FY 2008-09, one of those tagged and released Gulf sturgeon's severely decayed carcass was recovered, but tag recovery and identification was not possible. It is presumed that by this time, all radio tags have reached the end of their battery life and are no longer transmitting, so only incidental live-capture or reported mortalities will reveal the future fate of the remaining released fish.

FWC continues to monitor the proposed Wiregrass Reservoir Initiative in Dothan, Alabama, due to the potential water quality impacts of damming the Little Choctawhatchee River prior to its entering the Choctawhatchee River. The Choctawhatchee River is a Federally-designated critical habitat for Gulf sturgeon and is critically important to the few remaining alligator gar in Florida.

Nongame Wildlife Grant – Dr. William Pine, of the University of Florida, completed his three-year study to reconstruct the historical population size of Gulf sturgeon in Florida during FY 2009-10. Using 20 years of sampling data, along with historical landings from the late 19th and early 20th century, the study sought to address whether declines in the Gulf Sturgeon population were caused by impacts to recruitment due to alteration of essential habitat, or from intensive harvesting. To help answer these questions population models were developed, using information from commercial landings and data from previously conducted studies, to assess the trends of the Suwannee River and Apalachicola River populations of Gulf Sturgeon, the two rivers that likely supported the largest fisheries.

Results from review of the historical data indicate there was a severe reduction in the number of Gulf sturgeon during an intense period of commercial harvest, and that a small, sustainable fishery followed. Take of Gulf sturgeon was prohibited in 1984.

The population models developed to estimate abundance, recruitment, and mortality in the Apalachicola and Suwannee rivers illustrate population increases for both rivers after the

closure through the mid-1990s. Thereafter the trends differ for the model structures where some showed population decreases and some showed increases. These differences are attributed to low recapture rates and sparse data. Researchers suggest a combination of life history characteristics, behavior, and variations in sampling programs contribute to uncertainty and highlight why assessing Gulf sturgeon populations is difficult. The researchers concluded this uncertainty could lead to divergent management policies for the Gulf sturgeon.

Shortnose Sturgeon Activities – The shortnose sturgeon is a Federal and State Listed endangered species. The Florida Department of Agriculture and Consumer Services' (FDACS) Sturgeon Production Working Group reports the current and future status of sturgeon aquaculture in Florida (for all sturgeon species). Several non-native species continue to be cultured, per FDACS Best Management Practices. The working group urged FDACS to pursue a second attempt at getting a legal exemption to the National Marine Fisheries "zero culture for meat or caviar" policy on shortnose sturgeon. The National Marine Fisheries Service is the lead agency on the endangered shortnose sturgeon and their position is that culture in Florida would increase the likelihood of poaching in other states to sustain such a market for roe and meat; therefore, they denied the exemption. The Working Group believes that the best sturgeon species (both biologically and economically) to culture in Florida, considering the state's environmental constraints, will be the shortnose sturgeon, should FDACS pursue and obtain an exemption.

Other Imperiled Fish (*John R. Knight, Jeffrey Wilcox and Kate Harriger*)

Federal Wallop-Breaux Sport Fish Restoration Program – FWC conducted research funded through the Federal Wallop-Breaux Sport Fish Restoration Program during FY 2009-10 to monitor the status and trends of Florida's riverine sport fish populations and associated fish communities. While imperiled fishes were not specifically targeted during sampling, collections and/or observations of imperiled species were made. All information gathered is critical for developing proper conservation and management strategies to protect Florida's sport fish populations and associated communities. Aside from research to monitor sport fish species such as the shoal and Suwannee bass, there is no species-specific research to determine the status and trends of imperiled fishes in Florida.

Blackmouth Shiner – State-listed as endangered in Florida, the blackmouth shiner was not encountered during FY 2009-10. Sampling was conducted within the known range of the species in the Blackwater and Yellow River watersheds of Florida. This species is difficult to monitor and warrants an alternative monitoring strategy to properly assess the population status and trend of the species. Known locations of blackmouth shiners have not been recently sampled and no new blackmouth shiner populations have been discovered since 2003.

Bluenose Shiner – State-listed as a species of special concern, the bluenose shiner was collected from multiple locations during FY 2009-10, including two locations in the Yellow River and 30 locations in Holmes Creek, a tributary to the Choctawhatchee River. Factors that contributed to this observed localized abundance are unknown, since the species was only occasionally encountered in previous sampling. Sampling techniques used for Florida's River Monitoring project appear to be sufficient for collecting the species, and it is anticipated that a population status and trend assessment may be possible in the future.

Saltmarsh Topminnow – State-listed as a species of special concern, the saltmarsh topminnow is only known to occur in the Escambia watershed in northwest Florida. The species was not collected by FWC during FY 2009-10. Euryhaline species (species that tolerate varying levels of salinity), such as saltmarsh topminnows, are rarely encountered in freshwater habitats. Sampling was conducted in the vicinity of the species' known range, although no individuals were encountered. Additional research is needed to properly assess the status of the species in Florida.

Shoal Bass – State listed as a species of special concern, the shoal bass is only known to occur in the Apalachicola River watershed in northwest Florida. The species was collected from the Chipola River (a tributary to the Apalachicola) during the previous year. Currently, FWC is continuing work to determine age, growth, and exploitation rates for the species, as well as developing a population assessment. Six-hundred and forty-seven fish were collected and released as part of this research. An estimated 1,256 shoal bass were caught by anglers from February to November 2009 and 25% of these fish were harvested. Shoal bass populations from the Chipola River appear locally abundant and secure, although fragmented from its source population (in Georgia and Alabama) due to Woodruff Dam. The dam represents a barrier to gene flow, making this species susceptible to catastrophic events since no other significant population exists in Florida.

Suwannee Bass – State-listed as a species of special concern, the Suwannee bass is known to occur in the Ochlockonee, Wakulla, and Suwannee River watersheds in north-central Florida. This species was collected from the Withlacoochee River during the previous year (a tributary to the Suwannee River). Research is currently being conducted to investigate age, growth, and catch rates for the species from this river. A total of 47 individuals were collected from 24 locations on the Withlacoochee River, and one individual was collected from the Ochlockonee River during sampling. Suwannee bass appear to be locally abundant and secure in the Suwannee River watershed, but rare in the Ochlockonee River. Monitoring is needed due to the species' highly endemic nature, making this species susceptible to catastrophic events.

Crystal Darter – State-listed as threatened, the crystal darter is only known to occur in the upper section of the Escambia River system near Century, Florida. A single crystal darter was collected from this area during FY 2009-10, and it represents the first record of the species in Florida since 2004, despite extensive sampling being conducted. The status and population trend of the species is currently unknown, warranting a need for an alternative monitoring strategy for the species.

Harlequin Darter – State-listed as a species of special concern, the harlequin darter is only known to occur in the Escambia River watershed. While restricted in range, the species is regularly collected from both tributaries and mainstream Escambia River when suitable habitats (submerged woody debris) are present. Recent sampling indicates that the species is distributed throughout the Escambia River watershed. Five individuals were collected from four sites in mainstream Escambia River, and one individual was collected from Big Escambia Creek (a tributary) during FY 2009-10. Due to this species' endemic nature, additional long-term monitoring is needed to determine population trends.

Tessellated Darter – State-listed as a species of special concern, tessellated darters are only known to occur in the Ocklawaha River watershed (a tributary to the St. Johns River) in north-central Florida. Sampling conducted from this river did not yield any individuals. The species has not been collected in Florida since 2004, therefore the population status and trend of tessellated darters is unknown. Additional long-term monitoring is needed to properly assess the status of the species.

Commenting – FWC provided comment on numerous developments of regional impact, environmental resource permits, and joint coastal permit applications (housing developments, highway and bridges, beach renourishment, power plants, dredge and fill activities, dam removal, etc.) impacting State-listed species. Many of the proposed activities had the potential to negatively affect State-listed fishes by increased sediment loading, water quality degradation, habitat alteration, and/or direct lethal take. FWC commented on activities involving: Atlantic sturgeon, bluenose shiner, saltmarsh topminnow, Gulf sturgeon, Okaloosa darter, Southern tessellated darter, mangrove rivulus, and smalltooth sawfish.

Miami Blue Butterfly (*Ricardo Zambrano and David Cook*)

The Miami blue butterfly is a State endangered species. The butterfly was formerly found from Hillsborough County to the Dry Tortugas on the Gulf Coast and from Merritt Island to the Florida Keys on the Atlantic Coast. Currently, it is only found at two sites in extreme South Florida.

FWC has partnered with several government agencies, nongovernmental organizations, and the University of Florida (UF) to protect and conserve this species. FWC has coordinated closely with UF, the National Park Service, and the Florida Department of Environmental Protection (FDEP) for captive propagation and reintroduction efforts. FWC, through the State Wildlife Grants program, funded UF to conduct Miami blue butterfly population surveys and to examine their genetic diversity at the Key West National Wildlife Refuge (Refuge). FWC assisted in the fieldwork for this study.

FWC has a representative on the Florida Coordinating Council on Mosquito Control and on the Council's Imperiled Species Subcommittee. One of the main objectives of the Subcommittee has been to resolve issues and concerns between Mosquito Control districts and the release of Miami blue butterflies.

During FY 2009-10, FWC updated and revised the 2003 Miami Blue Butterfly Management Plan and included input from the public and Miami blue stakeholders. The revised plan was approved by the Commission in June 2010. The conservation goal of the management plan is "to secure multiple viable self-sustaining wild metapopulations of Miami blues throughout all or parts of its historic range so that it no longer requires listing." Achievement of this goal relies on safeguarding the known populations and using captive propagation, reintroduction, and translocation to establish additional populations. The revised Miami Blue Butterfly Management Plan can be accessed at http://www.myfwc.com/WILDLIFEHABITATS/imperiledSpp_plans.htm.

Unfortunately, the status of the Miami blue appears to have declined since the revised management plan was drafted. In 2009, the butterfly was only known from Bahia Honda State Park and from the Marquesas Islands in the Refuge. Although small and subject to annual and

seasonal fluctuations, the Bahia Honda metapopulation seemed relatively stable and had provided the butterflies used to start and maintain the highly successful captive breeding population at UF. No Miami blue has been reported at Bahia Honda, however, since March 2010. The cause of their disappearance is unknown, but extreme weather compounded by nonnative green iguanas feeding on their food plant (nickerbean) have been implicated. In coordination with FDEP, FWC staff is supporting the ongoing trapping and removal of iguanas, replanting and managing nickerbean, fencing off sensitive areas from public access to reduce disturbance, and regular monitoring for Miami blues at Bahia Honda, actions that will continue into 2011. In addition, the captive breeding population at the University of Florida was severely impacted by unseasonably cold weather in spring 2010 and, without Bahia Honda butterflies available to replenish the genetic stock, it died out.

There is better news from the Refuge. Surveys by FWC and UF in summer 2010 not only confirmed the Miami blues metapopulation in the Marquesas, but also a second metapopulation on Boca Grande, where the butterfly had not been reported since 2008. During FY 2010-11, FWC will support U.S. Fish and Wildlife Service efforts to conduct a comprehensive survey on the Refuge and consider the feasibility of establishing a new captive Miami blue population. Surveys for Miami blues elsewhere in the historic range will continue. Implementation of the revised management plan, particularly those actions involving research to determine successful reintroduction techniques that were planned for 2010, must be postponed.

Black Creek Crayfish (*Paul Moler*)

The Black Creek crayfish is a State species of special concern. Black Creek crayfish have previously been recorded only from the Black Creek drainage in Clay and Duval counties, the Julington Creek drainage in Duval County, and Rileys Creek in Duval County. The next major drainage south of Black Creek is the Etoniah Creek – Rice Creek system, which enters the St. John's River in Palatka, Florida. A survey during FY 2009-10 documented the occurrence of Black Creek crayfish in headwater streams of Etoniah Creek in Putnam County.

Panama City Crayfish (*David Cook and John Himes*)

The Panama City crayfish is a State species of special concern. The historic range of the Panama City crayfish is restricted to 51 square miles of the Bay County peninsula that includes Panama City and Lynn Haven. Urbanization and the alteration of natural wetlands (e.g., pine flatwoods prone to seasonal flooding) have eliminated this crayfish from most of the western and central parts of its range. The species is now most commonly found in disturbed wetlands and roadside ditches that are vulnerable to continued habitat degradation. In accordance with the listing process (68A-27.0012 F.A.C.), a draft management plan for the Panama City crayfish was submitted to FWC Commissioners for consideration at its June 2007 meeting in Melbourne. At its December 2007 meeting, Commissioners directed FWC to suspend further listing action on the Panama City crayfish until the listing process has been revised. Therefore, completion and approval of the draft Panama City Crayfish Management Plan is pending. The draft is available at http://myfwc.com/docs/WildlifeHabitats/Revised_Draft_PCC_Plan.pdf.

Highlights of the draft management plan include: (1) conservation objectives and strategies that, if achieved, will cause the Panama City crayfish to no longer meet the criteria for listing; (2) the inclusion of best management practices (BMPs) developed through considerable

stakeholder input that enable road maintenance, development, silviculture, and other activities to proceed without the need for an incidental take permit if BMPs are followed; (3) a rule establishing a no-cost permit for crayfish recreational harvest that will enable FWC to collect information on the possible impact of this activity on the species; and (4) an implementation strategy and schedule.

FWC addressed questions involving developments and other activities with possible impact to the Panama City crayfish, and made site visits to evaluate potential crayfish presence or habitat. In particular, FWC reviewed a number of Environmental Resource Permit applications. FWC consulted with the Florida Department of Environmental Protection (FDEP), to whom the applications had been submitted, and with environmental consultants to provide guidance on proposed development projects and to prevent unauthorized taking of Panama City crayfish. Additional consultation and guidance was provided to Panama City and Bay County officials as needed. In conjunction with U.S. Fish and Wildlife Service and Biological Research Associates, FWC also evaluated a number of sites as possible conservation easements within the range of the Panama City crayfish, three of which were determined to provide suitable habitat. Arrangements are currently underway to relocate Panama City crayfish to these sites in an effort to increase the species' area of occupancy. Funding for restoring habitat for Panama City crayfish at some of these sites has been obtained from an Aquatic Habitat Restoration and Enhancement (a section in the Division of Habitat and Species Conservation at FWC) grant. This work will begin in FY 2010-11. In conjunction with the U.S. Fish and Wildlife Service and ECO Consulting Group, LLC, FWC is currently working to establish a mitigation bank to serve as an additional site to relocate Panama City crayfish.

Finalization of a Candidate Conservation Agreement with Assurances between FWC, the U.S. Fish and Wildlife Service, and the St. Joe Company is presently on hold due to the downturn in the economy. If approved and implemented, this incentive-based conservation agreement will establish a nearly 2,000-acre "Panama City Crayfish Conservation Area" in the eastern part of the Panama City crayfish range, and guide habitat restoration and management activities that will enhance the long-term survival of the species.

Freshwater Mussels (*Gary Warren*)

The southeastern U.S. is the center of freshwater mussel biodiversity in North America. Florida inland waters are inhabited by over 60 species of freshwater mussels. Seven of these Florida species are Federally-listed as endangered or threatened (**Table 4**). These species were listed because they are extremely rare, their distributions are limited to small areas, and their preferred habitats are threatened. Primary threats to the continued existence of listed mussels in Florida include impoundment of streams, channelization, sedimentation and destabilization of stream banks and bottoms. Contaminants such as pesticides, heavy metals, and acid mine drainage have also contributed to the decline of Florida mussel species. The distributions of six of the seven listed mussel species are restricted to streams in the Florida panhandle. The lone species occurring east of the Ochlockonee River basin is the oval pigtoe, which is distributed as far east and south as the Santa Fe River in the Suwannee River watershed. An additional six Florida mussel species were designated as candidates for listing by the U.S. Fish and Wildlife Service in 2009.

Table 4. Florida freshwater mussel species Federally-listed as endangered or threatened.

Common Name	Scientific Name	Federal Status
fat three-ridge	*Amblema neislerii*	Endangered
Chipola slabshell	*Elliptio chipolaensis*	Threatened
purple bankclimber	*Elliptoideus sloatianus*	Threatened
shinyrayed pocketbook	*Hamiota subangulata*	Endangered
Gulf moccasinshell	*Medionidus penicillatus*	Endangered
Ochlockonee moccasinshell	*Medionidus simpsonianus*	Endangered
oval pigtoe	*Pleurobema pyriforme*	Endangered

In 2007, FWC's Freshwater Invertebrate Resource Assessment Unit implemented the Freshwater Mussels of Florida project, which was funded by the Florida State Wildlife Grant program. The overall goal of the project was to produce a book describing all Florida mussel species and detailing their distributions, abundances, and ecology. One of the primary project objectives, however, was to document current distributions of listed mussel species in Florida and adjacent watersheds in Alabama and Georgia. Comparisons of this data with historical records could then be used to ascertain trajectories in listed mussel distribution and abundance. During FY 2009-10, over 100 sites were sampled statewide for mussels using both quantitative and qualitative methods. Taxonomic composition, abundance, and location data from these sites were compiled into a database. Historical data on listed mussel distributions was obtained from records maintained by the authors of the *Freshwater Mussels of Florida*, and from visits to the collections of several museums including: the Florida Museum of Natural History (University of Florida), the Smithsonian Institution (Washington, D.C.), the Museum of Comparative Zoology (Harvard University), the Philadelphia Academy of Natural Sciences, and the University of Michigan Museum of Zoology. Type-specimens of listed Florida mussels were examined during these museum visits. Also during FY 2009-10, electronic records of listed unionid mussels (a family of freshwater mussels) from Florida and connected watersheds in Alabama and Georgia were obtained from the Carnegie Museum of Natural History (Pittsburgh, Pennsylvania), the Florida Museum of Natural History, the Illinois Natural History Survey, the Museum of Comparative Zoology (Harvard), the Ohio State University Museum, the Smithsonian Institution, and the University of Michigan Museum of Zoology. Each record was georeferenced and entered into a database. All records were then visually confirmed on hard copy county road or topographic maps or electronic maps. A total of over 9,000 records from Florida were georeferenced and entered into the distribution database during FY 2009-10 using this method. Once all records are verified they will be plotted on Florida stream base maps (using GIS) to depict the distribution of Florida mussels. These distribution maps will appear in the *Freshwater Mussels of Florida*. A preliminary map illustrating the Florida distribution of the Endangered Gulf moccasinshell is presented in **Figure 1.** The *Freshwater Mussels of Florida* is scheduled to be completed in 2011.

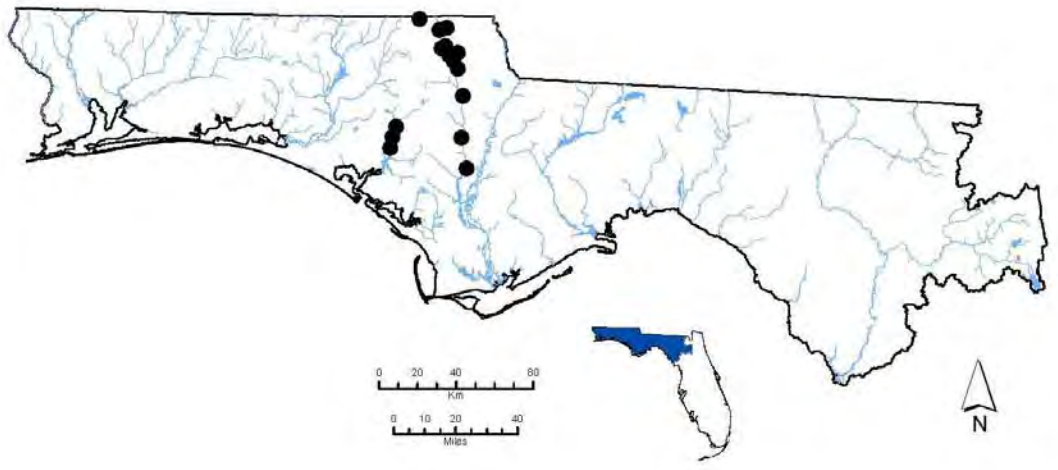

Figure 1. Distribution of the Gulf moccasinshell, a Federally endangered species in Florida.

Also in conjunction with the Florida Freshwater Mussel project, the Freshwater Invertebrate Resource Assessment Unit took scanning electron micrographs of the larvae of listed mussel species. These photos will be used to document the structure of larvae and to construct keys for their identification. The resulting keys will be useful for taxonomic identification of larvae on fish hosts, and thus provide specific identification of those fish species that serve as hosts for the larvae of listed mussel species. Identification of the fish species will provide insight into the distribution of listed mussel species.

In an effort to educate the public regarding the existence and locations of listed mussel species in the Florida panhandle, FWC produced signage that was deployed at boat ramps and parks along the Ochlockonee and Apalachicola Rivers. These rivers are inhabited by six of the seven Federally listed mussel species in Florida. The signs contained photographs of listed mussel species (primarily the purple bankclimber) and encouraged citizens not to disturb mussel beds.

Habitat Modeling (*Beth Stys*)

In FY 2009-10, FWC released the final version of the report "Wildlife Habitat Conservation Needs in Florida: Updated Recommendations for Strategic Habitat Conservation Areas." This project is a re-analysis of the 1994 report "Closing the Gaps in Florida's Wildlife Habitat Conservation System," using a new suite of species, updated and more recent datasets, and improved analytical techniques, including population-viability analyses. Significant changes to Florida's ecosystems have occurred subsequent to the 1994 analysis.

For effective land management and planning to continue, a reassessment of the level of protection that Florida's managed lands provide our biological resources was necessary. FWC selected 62 wildlife species for analysis. Fifty-four of the species were analyzed individually, and eight species of wading birds as a group. This project was limited to terrestrial vertebrate

wildlife, so only their needs were directly addressed. However, the identification and protection of Strategic Habitat Conservation Area lands should protect other wildlife and plant species. The 62 species selected represent "focal" species. The selection process used several ecological concepts that describe the species-ecosystem relationship (e.g., community indicators, keystone species, and umbrella species). Twenty-one of the selected species were Federally-listed as endangered or threatened and 46 of the species were State-listed (Species of Special Concern, Threatened, or Endangered).

The final report, data and associated metadata can be accessed at http://research.myfwc.com/features/view_article.asp?id=29815.

Wildlife Conservation Prioritization and Recovery (*Dan Sullivan*)

FWC is taking a pro-active, science-based approach to evaluating management needs of imperiled species on FWC managed lands. FWC is implementing this approach through the Wildlife Conservation Prioritization and Recovery Program. This program integrates geospatial analytical techniques to model potential habitat with conservation planning and population viability analysis results. Using this information, FWC determines where species conservation can be affected on each wildlife management area (WMA) and wildlife and environmental area (WEA). Staff integrates the outcome of the landscape level assessment with area-specific and expert knowledge to produce a Species Management Strategy. Strategies are particular to each WMA/WEA and outline the role of the area in wildlife conservation. Each strategy contains measurable objectives for managing priority species and their habitat, a list of actions necessary to achieve these objectives, and monitoring to verify progress towards meeting the objectives.

During FY 2009-10, FWC completed five workshops covering ten WMAs. The areas covered by a workshop include: Guana River WMA in St. Johns County; Fort White WEA in Gilchrist County; Suwannee Ridge WEA in Hamilton County; Branan Field WEA in Clay and Duval counties; Bell Ridge Longleaf WEA in Gilchrist County; L. Kirk Edwards WEA in Leon County; Hilochee WMA in Lake and Polk counties; Spirit of the Wild WMA in Hendry County; Okaloacoochee Slough WMA in Collier and Hendry counties; and Dinner Island Ranch WMA in Hendry County. FWC finalized Strategies for the Chassahowitzka WMA in Hernando County, Apalachicola River WEA in Franklin and Gulf counties, Box-R WMA in Franklin County, Fort White WEA in Gilchrist County and Suwannee Ridge WEA in Hamilton County. Strategies for Branan Field WEA in Clay and Duval counties, Bell Ridge Longleaf WEA in Gilchrist County, L. Kirk Edwards WEA in Leon County, Hilochee WMA in Lake and Polk counties, Spirit of the Wild WMA in Hendry County, Okaloacoochee Slough WMA in Collier and Hendry counties and Dinner Island Ranch WMA in Hendry County have been initiated and will be completed during FY 2010-11.

The Program will continue to assess the changing needs of wildlife at the statewide level. FWC plans to update strategies on a regular basis in conjunction with required updates to an area's management plan.

Coordination and Assistance (*Brad Gruver, Erin Leone, Richard Kiltie, Kristin Rogers, Terry Gilbert and Joseph Walsh*)

Coordination – Listed species coordination included overseeing, monitoring, facilitating and otherwise organizing activities associated with listed species. It also included ensuring

adherence to Federal and State reporting and documentation requirements and guidelines; implementing or facilitating protection through coordination of assistance, regulatory measures, and permit review; providing or facilitating consultation and assistance to private interests; and interacting with State and Federal agencies, conservation organizations, and others regarding a wide range of listed species matters. Funding for coordination was jointly derived from the U.S. Fish and Wildlife Service (through Section 6 of the Federal Endangered Species Act of 1973, known as the Section 6 Cooperative Agreement), the Nongame Wildlife Trust Fund, and the Florida Panther Research and Management Trust Fund.

Assistance on listed species was provided to State and Federal agencies, environmental-related consulting firms, private individuals, and local regulatory authorities. Assistance was provided through telephone calls, e-mails, written correspondence, and agency commenting. The Section 6 Cooperative Agreement was administered, including preparing emergency handling reports, preparing and executing Section 6 grants, and developing the Cooperative Agreement renewal packet.

The Imperiled Species Website, http://www.myfwc.com/WILDLIFEHABITATS/imperiledSpp_index.htm, was maintained. Information was added, updated, or removed as necessary. The site includes, among other things, copies of previous legislative reports, the current lists of imperiled wildlife, information on listed species permits, and listed species management plans.

Internal Project Support – FWC provided statistical and data management support for numerous projects focused on threatened and endangered species and species of special concern. FWC contributed to: population trend analysis, monitoring, or assessment of American alligators, bald eagles, Florida scrub-jays, Southeastern American kestrels, wood storks, piping plovers, roseate terns, striped newts, frosted flatwoods salamanders, gopher tortoises, beach mice, and Florida panthers; habitat selection of Florida panthers and Suwannee bass; movement patterns of juvenile American alligators; American alligator cannibalism rates; gopher tortoise respiratory disease incidence; veterinary sample tracking for Florida panthers; DNA sequencing of Florida mussels; whooping crane reproduction; and loggerhead turtle nesting trends.

Reviews and Assistance for Transportation Projects – FWC performed a total of 106 reviews of highway projects in support of the Florida Department of Transportation's Efficient Transportation Decision Making Process during FY 2009-10. Each review included a biological assessment of the direct and indirect effects of the transportation project on imperiled bird, mammal, amphibian, and reptile species and their habitats. Recommendations were provided to the Florida Department of Transportation's seven Districts and the Turnpike Enterprise on methods to avoid, minimize, or mitigate these effects on listed species. Recommendations were related to road design issues, locations and design of Florida black bear and Florida panther wildlife underpasses, wildlife species occurrence information and field survey methodologies, wetland and upland habitat restoration strategies and techniques, and suitability evaluations of a moderate number of land parcels for mitigation through public land acquisition. This assistance was designed to reduce the adverse effects of specific highway projects on listed fish and wildlife species.

Land Use Planning Activities – FWC provided 104 written assistance letters for public and private land and water use planning activities that had the potential to impact imperiled

wildlife species and their habitats. The types of projects reviewed and commented on included Developments of Regional Impact, County Comprehensive Plan Evaluation and Appraisal Reports, proposed amendments and Sector Plans, regional visioning projects, various large-scale State and Federal permit applications, environmental assessments, and environmental impact statements. The content of consultations was based on established best management practices, species management guidelines, and GIS analysis.

Critical Wildlife Areas (*Terry J. Doonan*)

Critical Wildlife Areas (CWAs) are established by the FWC under rule 68A-14.001 of the Florida Administrative Code, to protect concentrations of listed and other important wildlife species from human disturbance during critical periods of their life cycles, such as nesting or maternity seasons. For each CWA, the boundaries and periods of time when portions of the area may be posted as closed to entry by people are defined in the CWA establishment order. FWC's regional species conservation biologists are responsible for evaluating needs for potential CWAs, producing or revising establishment orders, and coordinating necessary management and monitoring activities for the wildlife populations using those areas each year. Management and monitoring activities are conducted with the participation of FWC law enforcement personnel and multiple partners including other State and Federal agencies, local governments, and nongovernmental organizations.

Managed areas within CWA boundaries are usually defined with posts and signs (posted) to identify the area, increase public awareness, and reduce disturbance to the fragile wildlife resources that are present there. During FY 2009-10, all active CWAs were posted with appropriate signage as necessary.

Active CWAs were monitored in FY 2009-10 by FWC biologists and staff of management partners. Monitoring protocols varied among sites, depending on the species present, but usually involved either direct counts or estimates of adults, nests, or young. Protection and monitoring efforts for listed species of shorebirds and seabirds at some CWAs have been improved through the work of partnership networks. FWC provides species expertise, technical assistance, and available management and educational materials when partnering with other groups in these efforts.

Seventeen of the 20 established CWAs supported populations of important wildlife species during FY 2009-10 (**Table 5**). Almost all the active CWAs supported listed species, the most notable of which included: Alafia Bank in Hillsborough County (several wading bird species, American oystercatchers, and brown pelicans); ABC Islands in Collier County (several wading bird species and brown pelicans); St. George Causeway in Franklin County (least terns); Big Marco Pass in Collier County (least terns, black skimmers, snowy plovers, and wintering piping plovers); Bird Islands in Duval County (least terns and black skimmers); Myakka River in Sarasota County (wood storks), and Gerome's Cave in Jackson County (southeastern myotis bats). Pelican Shoal in Monroe County had been the main nesting site in the U.S. for roseate terns, but was unavailable for nesting again this year, as in prior years, because of severe erosion from hurricanes in the past (**Table 5**). Results show that CWA management is important for effective conservation of many species and so this project is expected to be an ongoing priority for FWC.

Table 5. Critical wildlife areas (CWAs) that were established statewide in Florida in FY 2009-10, with relevant information about each.

FWC Region CWA name	County	Closure period	Primary taxa	Status[a]	Area within the established CWA boundary
Southwest					
Alafia Bank	Hillsborough	1 Dec. to 1 Sept.	Herons, egrets, ibis, brown pelicans, roseate spoonbills, American oystercatchers, cormorants, willets	8,000 nests total	75 acres (30 hectares)
Little Estero Island	Lee	1 April to 1 Sept.	Least terns, Wilson's plovers, snowy plovers	~50 nests total	25 ac (10 ha)
Anclote River Islands	Pasco/ Pinellas	1 Feb. to 1 Sept.	Herons, egrets, brown pelicans	Inactive[b]	5 ac (2 ha)
Myakka River	Sarasota	1 March to 1 Nov.	Wood storks, egrets, herons, anhingas	~175 nests total	1 ac (0.4 ha)
North Central					
Amelia Island	Nassau	1 April to 1 Sept.	Least terns, Wilson's plovers	~200, 8 nests	10 ac (4 ha)
Bird Islands	Duval	1 April to 1 Sept.	Black skimmers, gull-billed terns, least terns, American oystercatchers	37, 7, 25, 1 nests	6 ac (2.4 ha)
Fort George Inlet	Duval	1 April to 1 Sept.	Royal terns, black skimmers, Wilson's plovers, laughing gulls	~500, ~20, 2, >3,000 nests	10 ac (4 ha)
Northwest					
Tyndall	Bay	Year-round	Least terns, black skimmers, snowy plovers, Wilson's plovers, American oystercatchers, piping plovers[c]	52, 0, 50, 17, 2, 0, 1 nests	10 ac (4 ha)
Alligator Point	Franklin	1 April to 1 Sept.	Snowy plovers	2 nests	145 ac (59 ha)
St. George Causeway	Franklin	1 April to 31 Aug.	Least terns, laughing gulls, Caspian terns, gull-billed terns, royal terns, American oystercatchers, black skimmers	86, 2500, 113, 5, 957 0, 73 nests	32 ac (13 ha)
Gerome's Cave	Jackson	1 March to 1 Sept.	Southeastern myotis bats	~2,000 individuals	2 ac (0.8 ha)
South					
Deerfield Island Park	Broward	Year-round	Gopher tortoise	7 individuals	56 ac (23 ha)
ABC Islands	Collier	Year-round	Herons, egrets	~325 nests total	75 ac (30 ha)
Big Marco Pass	Collier	Year-round	Least terns, black skimmers, snowy plovers, Wilson's plovers, wintering shorebirds[c]	130 tern, 451 skimmer, 2 Wilson's plover nests	60 ac (24 ha)
Caxambas Pass	Collier	1 April to 1 Sept.	Least terns, black skimmers, Wilson's plovers, wintering shorebirds[c]	67 tern, 112 skimmer, 4 Wilson's plover nests	1 ac (0.4 ha)
Rookery Island	Collier	Year-round	Herons, egrets, brown pelicans	Inactive	5 ac (2 ha)
Bill Sadowski	Dade	Year-round	Shorebirds, herons, & egrets (foraging); great blue herons	~1,000 individuals; 5 great blue heron nests	700 ac (283 ha)
Pelican Shoal	Monroe	1 April to 1 Sept.	Roseate terns, bridled terns	Inactive - not emergent now	1 ac (0.4 ha)
Northeast					
Jennings Cave	Marion	15 Feb. to 31 Aug.	Southeastern myotis bats	Inactive	1.9 ac (0.8 ha)
Matanzas Inlet	St. Johns	1 April to 1 Sept.	Least terns, Wilson's plovers, willets	256, 4, 0 nests	28 ac (11 ha)

[a]Counts or estimates of peak numbers of individuals and/or successful nests at each site during the closed period in FY 2009-2010.
[b]Inactive means the site was either not used, or not available for use, by wildlife during FY 2009-2010.
[c]Monitoring to count or estimate numbers of wintering shorebirds was not conducted.

Florida's Incentive-Based Conservation Programs (*Chris C. Wynn*)

FWC has been overseeing the Landowner Assistance Program (LAP), in cooperation with the U.S. Fish and Wildlife Service (USFWS), since October 2003. Florida's LAP is a vital, natural resource-driven tool used to promote stewardship on private lands while also playing a fundamental role in the conservation of imperiled species. Florida's LAP is a voluntary cost-share program designed to provide wildlife-related assistance with land-use planning and habitat management to private landowners as well as financial support to those interested in improving habitat conditions on their property for the benefit of listed species. The Program's focal area approach ensures that Federally-funded dollars are being distributed in the most efficient and equitable manner on properties with the greatest potential benefits for listed species.

During FY 2009-10, FWC's LAP provided assistance to 678 landowners. Many of the landowners also received financial assistance though State or Federal cost-share or easement programs such as FARM Bill Conservation Programs. LAP staff worked in cooperation with the U.S. Department of Agriculture's Natural Resources Conservation Service, U.S. Fish and Wildlife Service, the Florida Department of Agriculture and Consumer Services' Division of Forestry, the University of Florida's Institute of Food and Agriculture Sciences, Florida Natural Areas Inventory, and various conservation organizations, to assist Florida's private landowners. While private landowners represent the majority assisted by LAP staff, public conservation land managers including the U.S. Department of Defense, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture's Forest Service received assistance with management plan development or updates for their conservation lands.

For more information, please visit the LAP Website at http://www.myfwc.com/CONSERVATION/ConservationYou_LAP_index.htm.

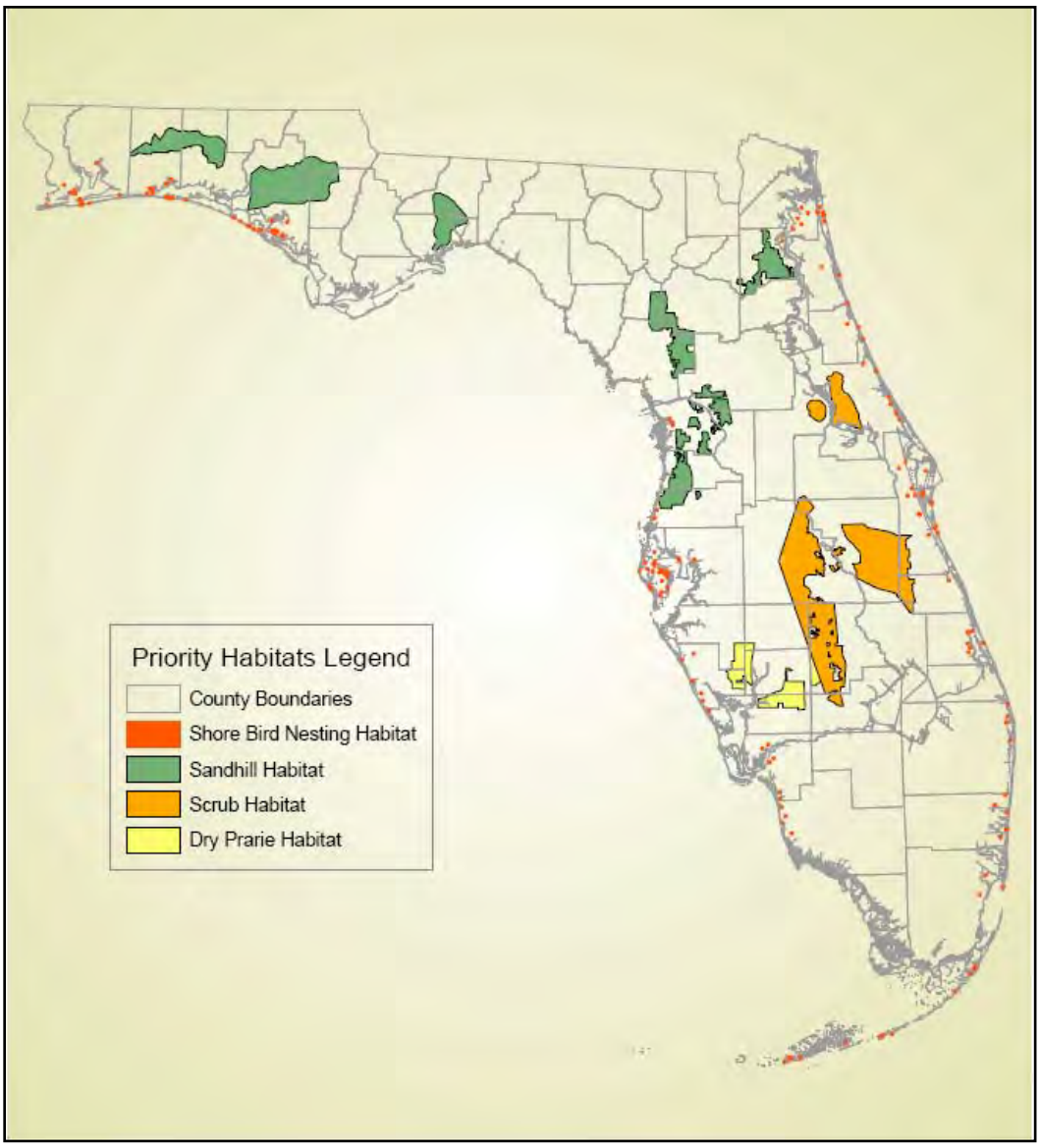

Figure 2. Landowner Assistance Program Focal Areas

Law Enforcement (*Captain Rob Beaton and Lt. Colonel Mike Wiwi*)

FWC's Division of Law Enforcement continued statewide enforcement activities to protect specific endangered and threatened species during FY 2009-10. These activities included:

- Regular patrols of the Florida panther reduced-speed zones in Lee and Collier counties to protect panther and prey species, and provide public safety.
- Regular patrols in Monroe County as part of a multi-agency task force enforcing the Key deer speed zone on Big Pine Key.
- Patrol efforts targeting coastal nesting areas of marine turtles, to reduce nest destruction and unlawful egg removal or theft.

- Patrol efforts directed toward the enforcement of specific gear requirements (i.e. Turtle Excluder Device) to protect sea turtles from becoming entrapped in shrimp trawl nets.
- Patrol efforts targeting coastal nesting areas of protected shore birds to reduce nest disturbance, nest destruction, and incidental take.
- Investigations by the Internet Crimes Unit targeting the unlawful sale and possession of protected species on the internet.
- Enhanced statewide enforcement efforts directed towards utilizing radar and the Manatee Cam surveillance technology to ensure compliance with boat speed zones and to prevent manatee vessel strikes and manatee harassment. More than 65,000 water patrol hours were dedicated to manatee enforcement, resulting in 1,591 citations, and nearly 5,000 warnings.

The Division of Law Enforcement issued 32 additional citations separate from manatee citations, involving endangered species, threatened species, and species of special concern. The majority of these were for illegal take or possession of gopher tortoises.

The Division of Law Enforcement continues to work with other governmental agencies and citizen groups to work through issues concerning the Florida panther in southwest Florida. Law Enforcement also worked closely with FWC biologists on increasing public awareness of black bear, gopher tortoises, Perdido Key beach mice, sea turtles, and other species.

Permitting and Assistance (*Angela T. Williams*)

FWC provided Federal agencies, other State agencies, environmental consultants, and regional and local regulatory authorities with technical assistance and guidance regarding protected and listed fish, bird, and land dwelling species on managed lands and lands slated for development. Many of these entities, in addition to researchers, landowners, and educational facilities, utilized this technical assistance and guidance when applying for scientific collecting, captive possession, nest removal, wildlife relocation, and incidental take permits for protected and listed species.

Technical assistance for developers, environmental consultants, and regulatory agencies usually consisted of any combination of the following mechanisms: (1) comments on species management plans submitted for review; (2) development of individual species management plans or guidelines; and (3) on-site visits to determine species management needs. Generally, the public was provided information regarding protected or listed species such as (1) life history and other biological information, (2) locality and occurrence data, (3) listing status, and (4) solutions to nuisance situations (i.e., education on the species behavior and habitat requirements and suggestions for coexisting with the species).

Permits to handle or impact protected and listed species throughout the state are issued in accordance with Rules 68A-5, 68A-9, 68A-12, 68A-16, 68A-25 and 68A-27 of the Florida Administrative Code. Some permits required permit holders to carry out an approved site or species-specific management plan. Others required permit holders to follow FWC species guidelines, policies, or management plans for the Florida burrowing owl, osprey, gopher tortoise, bald eagle, flatwoods salamander, peregrine falcon, red-cockaded woodpecker, and Miami blue butterfly. Scientific permits were generally 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.

An estimated 575 protected and listed species scientific collection, captive possession, wildlife relocation, nest removal, disturbance and incidental take permits (and permit amendments) were issued during FY 2009-10.

Overall, FWC provided science-based and regulatory guidance to ensure that permitted activities would result in a net conservation benefit for the involved species. Additional information (including guidelines, policies, and applications) is available at http://myfwc.com/License/Permits_ProtectedWildlife.htm. An online permit system was launched for scientific collecting, migratory bird nest relocation, and non-resident falconry permits, and it can be accessed at http://myfwc.com/License/Permits_ProtectedWildlife.htm.

Coastal Wildlife Conservation Initiative *(Laura DiGruttolo)*

Many species of wildlife are dependent on coastal ecosystems, including 17 State or Federally listed species and more than 100 Species of Greatest Conservation Need. These species have been identified as needing protection, but they do not necessarily meet the criteria for being listed. Coastal habitats are among those identified in Florida's Wildlife Action Plan as having the highest relative threats statewide. Habitat loss and degradation due to development, and commercial and recreational activities have led to declining wildlife populations and few remaining healthy, natural coastal ecosystems. The Coastal Wildlife Conservation Initiative (CWCI) is an FWC-led, multi-agency (Florida Department of Environmental Protection, Florida Department of Community Affairs, and the University of Florida Institute of Food and Agriculture Services) strategy that began in May 2007. The goal of the CWCI is to initiate a statewide, cooperative process to provide for greater consistency and coordination in protecting coastal wildlife populations, conserving and managing coastal ecosystems, and achieving balance between these efforts and human use of coastal areas. The CWCI's comprehensive approach focuses on wildlife and their habitat needs as well as socioeconomic issues. Through this interactive process, agencies can improve coordination on coastal issues, address emerging issues, and work towards greater consistency statewide in the conservation of wildlife.

A full-time Coordinator, hired in February 2010 with State Wildlife Grant funding, is responsible for creating the partnership network, developing and implementing the framework for a standing team and working groups, and coordinating actions between these groups and FWC teams in addressing coastal issues. In May 2010, a Conserve Wildlife Tag grant was awarded by the Wildlife Foundation of Florida for implementing the CWCI and developing the partnership network. Engaging potential partners and stakeholders at the local level is an important component in achieving a cohesive partnership. To begin this process, a statewide series of regional informational forums was initiated in 2010 and will continue through 2011. Following each forum, efforts are made to assemble working groups in the region to focus on wildlife, habitat, and human interests in coastal areas. A campaign on the importance of wrack to beach habitats includes public education, an agency position statement and minimization guidelines on beach raking, and formation of partnerships with other government agencies. A similar effort to address disturbance of wildlife on the beach is under way. Team members and the Coordinator participate in other working groups and teams within and outside of FWC to lend technical expertise and to strategize on how the CWCI and its partnership may assist with achievement of goals focusing on coastal conservation issues.

FWC's Response to the Deepwater Horizon Oil Spill (*Tom Ostertag*)

FWC worked with DEP, county governments, water management districts, and several Federal agencies in the following areas during the State of Florida's emergency response to the BP Deepwater Horizon oil spill: reconnaissance, scientific support, Natural Resources Damage Assessment (NRDA) sampling, and wildlife response.

FWC staff were on duty at Joint Incident Command posts in Mobile, Alabama, and the Florida Peninsula Command Post in Miami, which also oversaw operations for the remaining Sectors in Florida: St. Petersburg, Key West, and Miami. Additionally, FWC staff were deployed to the Emergency Operations Center in Tallahassee, as well as County Emergency Operations Centers throughout the panhandle. Hundreds of FWC staff worked behind the scenes to coordinate all activities and communications regarding wildlife issues.

FWC was actively involved in reconnaissance efforts. Staff members were deployed on FWC aircraft and offshore on FWC vessels to monitor Florida's shoreline for the presence of oil and to provide information that allowed emergency management officials to make informed, timely decisions regarding response, mitigation, and recovery. FWC staff developed wildlife management plans for Sector Command Centers. Staff also developed wildlife-related guidance for night-time cleaning crews. FWC staff participated in the Natural Resource Damage Assessment, which included pre- and post-spill impact conditions from an ecological and economic standpoint. This process was science- based and provided supporting data needed for long-term remediation, as well for future litigation. FWC staff provided guidance to Tri-State, BPs wildlife rescue and rehabilitation contractor, on how to develop and review wildlife protocols. These protocols were established to address issues such as risks associated with wildlife translocation, proper translocation sites to prevent re-oiling, monitoring of both oil and non-oil related wildlife mortality, and oiled wildlife response planning.

CITIZENS AWARENESS PROGRAM

Compiled by Pat Behnke. Information contributed by Bonnie Abellera, Pat Behnke, Kelly Broderick, Deborah Burr, Wendy Dial, Laura DiGruttolo, Craig Faulhaber, Gabriella Ferraro, Marty Folk, Lori Haynes, Mark Kiser, Mark Lotz, Anne Morrow, Gary Morse, Lindsay Nester, Katie Purcell, Wendy Quigley, Adrienne Ruhl, David Telesco, Kent Whittington, Robbin Trindell and Kristin Wood.

Introduction – Section 379.2291(5), F.S. requires FWC to provide a revised and updated plan for management and conservation of endangered and threatened species, including a description of relevant educational programs.

Though FWC has no formal education program, staff often provides information to educate the public. FWC conducts citizen awareness programs throughout the agency to fulfill the Statute requirement. The following summarizes these efforts for listed species from July 1, 2009, to June 30, 2010.

Media Relations – Statewide news releases reach more than 200 Florida newspapers and approximately 400 broadcast media, national wire services, magazines, newsletters, freelance writers and stakeholders. During FY 2009-10, the FWC issued 54 statewide news releases on these subjects regarding listed species:

- The unusually long cold spell in the winter of 2010 generated news releases on the safety and recovery of both manatees and sea turtles.
- By May, focus shifted to efforts to rescue imperiled species from the impacts of the Deepwater Horizon oil spill.
- Statewide efforts to inform the public on ways to live safely in areas inhabited by Florida black bears and Florida panthers.
- News releases helped inform the public about input needed and meetings being held regarding new rules being developed for the way Florida manages and lists imperiled species in Florida.
- FWC regional staff distributed press releases and media advisories on listed species, including Florida panther and Florida black bear, specific to both species' habitats.
- News releases on the Florida manatee provided the public with important information on the location of manatees and boating speed zone laws to protect the endangered species.

In addition to statewide and regional news releases, staff responded to nearly 1,000 media inquiries about these subjects regarding listed species:

- Manatee inquiries accounted for nearly half of all those recorded. The annual synoptic survey for manatees counted a record number of these mammals in early 2010.
- The FWC rescued and released many sea turtles and manatees during the cold snap, which brought substantial media attention. Many of these contacts with the media resulted in interviews on radio and television networks – locally, statewide, nationally, and internationally.
- During the oil spill event and recovery, the sea turtle nest relocation project was a joint effort with Federal, regional, and State entities, but the FWC was the lead in managing media inquiries and events.

- Across the state, the FWC held news briefings and media events regarding listed species. The FWC's panther team played an integral role in an episode of National Geographic Wild's television series, "Swamp Men." The episode follows the panther team as they recover a dead Florida panther from the Big Cypress Seminole Indian Reservation.

Information Requests – The FWC Knowledge Base public service system ("Ask FWC") handles most of the routine listed species questions that come into the agency. This service provides individuals with an automatic response to their questions and a link to the FWC imperiled species pages http://www.myfwc.com/WILDLIFEHABITATS/imperiledSpp_index.htm if people want more information. Nearly 300 questions were answered through Ask FWC about manatees, Florida panthers, sea turtles, and Florida black bears. In addition, the questions on these species received nearly 4,000 hits on the website. The most popular information requests topics were:

- Manatee speed zones;
- What to do if a sea turtle is hooked during fishing;
- What to do when encountering a bear that looks as if it might attack; and
- The location of panthers in Florida.

School-based Programs and Presentations – The FWC reached approximately 3,000 students from kindergarten through college with presentations and programs on listed species during FY 2009-10 on the following subjects:

- Research staff interacted with more than 900 students in K-12 schools with manatee presentations.
- Right whale researchers made presentations at two elementary schools and one college.
- Panther researchers educated 150 students.
- During one event at an elementary school, bear researchers made presentations to 550 students.
- Manatee researchers made presentations to more than 1,000 students across the state.
- Presentations were made to students at the University of Florida and Florida State University covering a wide range of topics.
- Chinsegut Nature Center hosted six groups from elementary schools for its Citizens of the Sandhill presentation, and more than 300 students walked the educational gopher tortoise trail, learning about the keystone species as they went.
- FWC's Project WILD schools coordinator for Pine Jog Elementary presented ten different Project WILD and/or Florida black bear activities to each grade from kindergarten to 5th grade, reaching approximately 750 students.
- Alligator management made presentations on the American alligator at two schools – one for a science fair and one to 30 students.
- FWC responded to 61 requests for educational materials concerning sea turtles and provided copies of educational brochures, posters, rack cards, and other information.
- FWC also conducted educational presentations concerning marine turtles, lights, and other impacts to schools and meetings of local conservation groups, home owners associations, and other interested groups.

Educator Learning Kits – FWC has curriculum kits targeting teachers of middle to high-school-age students to teach them about manatees and sea turtles. The kits provide lesson plans and activities, bones and biofacts, and books, videos, slideshows, and computer activities. Efforts are under way to redesign the curriculum kits.

FWC Websites – The FWC Website (MyFWC.com) contains many pages about specific listed species such as manatee, sea turtles, Florida panther, gopher tortoise, American crocodile, American alligator, Florida black bear, North Atlantic right whale, and listed fish. News releases often direct the public to the Website for further information.

- The FWC hosts PantherNet at MyFWC.com/PANTHER, where teachers, students, and the public can get comprehensive information about the Florida panther. A section of PantherNet called *Field Notes* contains periodic entries by FWC panther biologists on panther births, deaths, capture activities, and other material of interest. Brochures, activities, and annual reports are also posted and available for download.
- Public education efforts on the American alligator include the website MyFWC.com/CONSERVATION, where visitors can download living-with-wildlife information such as the "Living with Alligators" brochure and PowerPoint presentation. Educational products related to American crocodiles are at the same site, along with the "Living with Crocodiles" brochure.
- *Wildlife 2060*: *What's at stake for Florida* is a website at MyFWC.com/wildlife2060 that addresses the potential future impacts of Florida's continued human growth and development, and promotes understanding of what this means for Florida's fish and wildlife. Species discussed are Florida scrub-jay, Florida panther, Florida black bear, sea turtles, manatee, corals, gopher tortoise, burrowing owl, and wood stork.
- FWC began a new initiative in 2009 with the introduction of the Coastal Wildlife Conservation Initiative (CWCI). The initiatives' website provides a description of the effort to conserve coastal habitats that are home to listed species such as shorebirds, sea turtles, and beach mice. The website at MyFWC.com/CONSERVATION/CWCI_index.htm provides information, publications and frequently asked questions about coastal habitat.
- The Manatee Mortality Database Web search (http://research.myfwc.com/manatees/) provides Internet users a way to search for data on manatee mortalities in Florida. The summary report allows users to search manatee mortality data by Florida county, probable cause of death, and month and year, while the individual report allows users the same options, and it also provides more detailed information including sex, size and region in which the death occurred. Web visitors can subscribe to receive a notification e-mail when the database has been updated or new or updated tables have been posted. During FY 2009-10, 1,021 people subscribed to this service.
- Significant media attention was created as a result of information provided on the Web by manatee researchers regarding manatee deaths during the winter of 2009-2010.
- During FY 2009-10, FWC used several social media tools, including Facebook (http://www.facebook.com/MyFWC) and Twitter (http://twitter.com/MyFWC), to further FWC missions. Facebook provides users with the ability to indicate that they "like" a posting, as well as the option to comment directly. Postings to the FWC

Facebook site included information about wood storks, manatees, and sea turtles. Posts to the FWC Twitter site included items related to manatees and sea turtles.

Community Meetings and Presentations – FWC gave more than 100 presentations on listed species to various audiences, including internal presentations, community groups, homeowners groups, local law enforcement personnel, State park staff, conservation groups, college classes, K-12 students, clubs, and camps. Species discussed included manatee, Florida black bear, Florida panther, American alligator, sea turtles, indigo snake, whooping crane, kestrel, listed shorebirds, and gopher tortoise. Thousands of people were reached through these presentations, which help spread public awareness on the conservation of listed species.

- FWC gave a presentation about the management and status of red-cockaded woodpeckers in Big Cypress National Preserve to the Everglades Foundation in August 2009, the Big Cypress National Preserve Research Symposium in September 2009, and the annual Big Cypress Interpretive Meeting in October 2009.
- FWC made American alligator presentations to Cub Scouts, The National Wild Turkey Federation, Ducks Unlimited Green Wing, the public at the Emeralda Marsh, and to Trout Lake Nature Center in Eustis.
- FWC gave a presentation to the Florida Department of Environmental Protection in Tallahassee on the Coastal Wildlife Conservation Initiative. The presentation provided an overview of the Coastal Wildlife Conservation Initiative as a multi-agency approach to addressing coastal issues that impact wildlife.
    - The first of a statewide series of regional informational meetings on the Coastal Wildlife Conservation Initiative began in Port Charlotte. The purpose of the meeting was to provide an overview of the initiative and begin development of a cooperative process to provide greater consistency and coordination in protecting coastal wildlife populations, conserving and managing coastal ecosystems, and achieving balance between these efforts and ecologically sound, responsible human use of coastal areas.
- Sea turtle programs were held at two Brevard County libraries and represented all species of sea turtles. Materials were given to approximately 150 participants. In addition, a sea turtle display was set up at another Brevard County library with 2,000-plus patrons. The educational items filled a medium-size display case for one month.
- Two presentations on gopher tortoises were coordinated by FWC at two Brevard County libraries. The FWC assisted with promotion of the event and provided educational materials, such as booklets, posters, and display items.
- Two “Look Out Below” displays on sea turtles, manatees, and right whales were put up at two different Brevard County libraries. More than 6,000 patrons viewed the educational displays over several months.
- The Bear Management and Research Program employed an extensive informational effort to help people learn about bears. Programs provided information on bear ecology and natural history as well as suggestions for successfully living in bear country.
    - The Bear Management program participated in 45 public presentations, meetings, and events to offer more than 6,800 people information about bears and ways to minimize conflicts.
    - A grant from the Wildlife Foundation of Florida, using Conserve Wildlife license plate funds, was used to hire an information specialist for 12 months during FY 2009-

10. By placing one person in the Florida Panhandle, the FWC was able to speak directly with more than 7,800 members of the public and almost 100 local government personnel about how to reduce bear conflicts.
    - In addition, thousands more residents were taught about bears through radio, television, newspaper, and billboard messages.
- FWC closed out the "Wild Treasures of Brevard County – the imperiled species discovery series" program, and collected evaluations from staff and presenters. This program was awarded first place in the 2009 Association of Conservation Information Awards Outreach and Education category. Volunteers and FWC provided presentations and set up displays at the county's libraries. This network opportunity opened up communication between local groups, library education coordinators, and government groups, which brought an important educational service on listed species to the community.
- Scrub-jay project staff presented information on Florida scrub-jay conservation for the West Pasco Audubon Society, with approximately 20 people in attendance. FWC also presented a poster at the Southeast Partners in Flight meeting to highlight successful partnerships for scrub-jay conservation.
- FWC's panther team conducted informational efforts throughout the year. A door-to-door information campaign, which distributed 2,000 information packets on living safely in panther country, was initiated during FY 2009-10 after a series of depredations (panthers preying on domestic livestock pets) occurred in a semi-rural portion of Collier County.
- FWC presentations on whooping cranes included the Marion County Audubon Society on January 28, 2010, and the Leesburg Rotary Club on March 9, 2010. Twenty-five people were reached at each presentation.
- A presentation was given to Collier County law enforcement officers on nesting shorebirds, with special emphasis on least terns.
- FWC's Chinsegut Nature Center hosted four presentations to 119 attendees about crested caracara, American alligator, Florida frogs, gopher tortoises, and the Southeastern American kestrel.
- Manatee research staff conducted more than 20 community activities in FY 2009-10, in addition to coordinating displays on manatees and sea turtles at a Satellite Beach library and providing a manatee skeleton for an educational display at the Environmental Learning Center in Wabasso in Indian River County. These activities included presentations at State parks and marine centers, civic organizations, and summer camps. More than 700 participants were reached through these efforts.
- Manatee research staff conducted more than 40 hours of informative talks at the Satellite Beach manatee aggregation site during the cold snap in January and February 2010. FWC spoke with more than 500 people while performing their research. They also handed out more than 75 manatee activity books.
- Right whale researchers made four presentations, reaching 130 members of the following community organizations: Nordic Tug Owners Association, Amelia Island Sailing Club, South Anastasia Community Association, and Nassau County Sierra Club. In addition, right whale staff contributed articles on right whales to the St. Johns County "Share the

Beach" e-newsletter (five editions, circulated to 300 citizens each) and the Right Whale News, a publication targeting the right whale research and management community.

- Sea turtle research staff presented to more than 60 attendees as part of the Clearwater Marine Aquarium speaker series (Pinellas County) and to more than 30 youth and adults from SCUBAnauts International in Tarpon Springs in Pinellas County.
- Black bear research biologists participated in three events where information about their research on Florida black bears was presented. Information was provided to seven members of the Spruce Creek Environmental Club in Volusia County, 40 members of the Florida Chapter of the Wildlife Society in Leon County, and 50 members of the Halifax River Audubon in Volusia County (this presentation also covered coyote information).
- An avian biologist shared information on Southeastern American kestrels to about 125 people of varying ages from the Hernando Audubon Society.

Workshops and Training – Manatees, panthers, gopher tortoises, right whales, alligators, and sea turtles were the subject of numerous workshops and training sessions.

- In FY 2009-10, FWC staff presented the Gopher Tortoise Management Plan and Permitting Guidelines at more than 20 workshops hosted by public and private organizations.
  - The workshops emphasized incentives for private landowners and the new permitting requirements. These presentations resulted in additional landowners being interested in helping with gopher tortoise conservation.
  - Presentations have been made at workshops hosted by the FWC's Landowner Assistance Program, Longleaf Alliance, American Forest Foundation, North Florida Prescribed Fire Council, Southeastern Partners for Amphibian and Reptile Conservation, Florida Chamber of Commerce's Annual Environmental Permitting Summer School, the Annual Symposium on the Conservation and Biology of Tortoises and Freshwater Turtles, and the annual meeting of the Gopher Tortoise Council.
- As a continuation of the FY 2008-09 local government workshop information initiative, FWC organized seven additional local government workshops in Florida counties. During FY 2009-10, FWC conducted 15 county workshops.
  - More than 500 representatives of local governments and other interested entities attended these. The workshops have fostered new partnerships at the local level, assisted in establishing recipient sites on publicly owned conservation lands, provided information on management and regulations, and opened lines of communication between FWC and local governments in Florida.
- Manatee staff attended the Collier County Task Force meeting and the Collier County Alliance meeting. Staff shared information about manatee deaths during the winter of 2010 with internal and external law enforcement staff through four meetings, presenting to a total of 195 officers on the east coast of Florida.
- In addition, manatee staff provided 200 manatee brochures to the Satellite Beach Police Department to help address manatee harassment issues at aggregation sites in the area.
- Manatee research staff participated in seven law enforcement training activities in FY 2009-10. Manatee staff provided a presentation to 25 officers undergoing training and another seven new recruits in the FWC Law Enforcement.

- South Region staff conducted two Law Enforcement Marine Mammal Coordination Workshops – one in Jacksonville, for approximately 50 participants from local, State and Federal law enforcement agencies, State and national parks, beach patrols and nonprofit organizations; and one in Melbourne for approximately 25 participants. Species covered included manatees and right whales.
- Manatee researchers presented at the marine mammal stranding workshop for Northeast Region law enforcement staff, reaching approximately 50 individuals with information on dolphins, right whales, and manatees. Staff also facilitated two manatee rescue-in-water training activities with 70 local and State law enforcement officers.
- Manatee staff provided two days of on-the-water manatee rescue training for approximately 20 Jacksonville Zoo volunteers.
- Staff provided a PowerPoint presentation and on-the-water training for 15 Jacksonville University students in helping monitor manatees at the JEA District II outfall in the St. Johns River in Jacksonville.
- Additional manatee-related trainings included the Florida Marine Mammal Stranding Network Prescott Training in Lee County for 20 people; Manatee Park volunteer training for 35 people; U.S. Army Corps of Engineers Lock Volunteer training, covering manatee biology and photo-identification data collection for eight lock volunteers and biologists; training for 25 docents and employees at the TECO Manatee Viewing Center; and manatee cold stress awareness training for 15 Reliant Energy staff in Port St. John.
- FWC made a presentation to foresters from Plum Creek Timber Company in Lake Butler (Union County) on gopher tortoises and silviculture, a branch of forestry dealing with the development and care of forests.
- Right whale researchers participated in the Right Whale Southeastern U.S. Recovery Plan Implementation Team meeting and 59 participants attended.
- Right whale staff presented to 50 local government and local business members at the St. Augustine Rotary Club.
- Right whale staff held three workshops. Two of the workshops provided whale disentanglement training for law enforcement and U.S. Coast Guard members, with 50 attending each event.
- Researchers presented the right whale awareness module for 65 law enforcement officers as part of a Marine Unit Interagency Coordination Workshop.
- Sea turtle research staff conducted 12 sea turtle stranding and salvage training workshops with a total of 366 participants. These workshops took place in Collier, Duval, Hillsborough, Levy, Manatee, Monroe, Palm Beach, Pinellas, Sarasota, and St. Johns counties. In addition, researchers conducted six training workshops for 843 attendees on surveying sea turtle nesting sites on beaches.
- Sea turtle staff hosted the 2010 Marine Turtle Permit Holder Workshop in Tallahassee for over 300 Marine Turtle Permit Holders, volunteers, local governments, and State and Federal agency staff. This two-day event included approximately 15 presentations by agency management and research staff, conservation organizations, and local governments, as well as summaries of Marine Turtle Grant projects.
- At the request of local governments, FWC participated in six public workshops about sea turtles hosted in the Panhandle and southeast Florida.

- Through a Marine Turtle Lighting course, which was developed jointly with the U.S. Fish and Wildlife Service, FWC was able to provide information on sea turtles and lights to a variety of entities across peninsular and Panhandle Florida. Workshops were presented to an audience of 152 individuals. Participants included local governments, code enforcement entities, private property owners, State agency staff, marine turtle permit holders, lighting consultants, insurance companies, and interested citizens. These workshops were hosted by different organizations around the state, and included demonstration of the Sea Turtle Lighting Trailer.
- FWC and volunteer facilitators provided 67 one-day Project WILD, Aquatic WILD, Growing Up WILD, Flying WILD, Schoolyard Wildlife, and Florida Black Bear workshops to 1,629 educators statewide. The Chinsegut Nature Center hosted three educator workshops during FY 2009-10; Project WILD/Aquatic WILD for 11 people, Flying WILD for 14, and Black Bear Workshop for 13.
- Educational materials to train docents and employees at the Columbus Zoo in Ohio were provided by the FWC. The zoo has four juvenile manatees in its manatee-viewing facility.
- FWC American alligator scientists enlisted the help of ten members of the University of Florida's Wildlife Society to give presentations around Gainesville once a year and train students on alligator biology, ecology and handling.

Fairs, Festivals and Special Events

- According to State Fair Authority marketing surveys, 80% of fair-goers visit the FWC exhibit at the State Fair in Tampa. Statistics for 2009 show that 283,000 fair patrons visited FWC's exhibit, which included a live Florida black bear and Florida panther. Static displays with information about nesting shorebirds and manatees were prominently featured. The agency took this opportunity to educate the public about living with wildlife, the species' histories and to promote buying FWC license tags, which fund programs for targeted species.
- In FY 2009-10, FWC helped organize the first annual Florida Scrub-jay Festival to celebrate and raise awareness about the Florida scrub-jay, which is the only bird that occurs exclusively in Florida. The festival took place at Lyonia Preserve in Volusia County and included guided walks, presentations, exhibitors, children's activities and live entertainment. More than 1,000 people attended. The festival was a cooperative partnership effort led by the Education and Outreach Committee of the Northeast Florida Scrub Working Group, which includes staff from FWC, the Department of Environmental Protection, Volusia County, the U.S. Fish and Wildlife Service and the Florida Scrub-Jay Consortium.
- FWC bear management staff partnered with the Umatilla, Florida Chamber of Commerce, the U.S. Forest Service, the Wildlife Foundation of Florida, Defenders of Wildlife, Lake County, and private business sponsors to present the 11th Annual Florida Black Bear Festival. An estimated 6,000 attendees received valuable information on successfully living with black bears, the activities of FWC bear staff, and the results of bear research through talks, displays, children's activities, and field trips. Research biologists provided field trips for 250 attendees.

- The FWC participated in the 2nd annual Forgotten Coast Black Bear Festival in Carrabelle. The event educated an estimated 500 attendees, and the FWC has agreed to take a more active role in the next festival, scheduled for November 2010.
- MarineQuest is an annual open house of the FWC's Fish and Wildlife Research Institute in St. Petersburg. Since the first event was held in 1995, MarineQuest has evolved into a three-day event that welcomes thousands.
  - The first two days accommodate students in grades 4th – 8th who are invited to participate in "School Daze," a special version of MarineQuest available to schools by registration only. Students tour lab stations managed by Fish and Wildlife Research Institute scientists. Exhibits with hands-on displays and activities draw students into the world of marine science and the fascinating things that Fish and Wildlife Research Institute scientists discover. The third day, a Saturday, is open to the general public. MarineQuest 2010 hosted 1,378 students, chaperones, and teachers during the School Daze program and more than 4,000 visitors during the general open house.
  - Indoor and outdoor displays discussed several listed species, including the Florida manatee, North Atlantic right whale, sea turtles, alligators, and panthers.
  - Displays featured hands-on activities as well as printed materials and information, and staff biologists were on hand to answer questions. Several displays featured artifacts including manatee bones, turtle shells, and a full-sized mounted panther.
  - Three public talks were presented to more than 200 people as part of the MarineQuest auditorium program on alligators, panthers, and cold-weather impacts on Florida's fish and wildlife.
- Manatee research staff participated in eight festivals and special events held throughout the state including the Pride Festival in St. Augustine, with 1,000 attendees; the U.S. Geological Survey's Open House in Pinellas County; and the Crystal River Manatee Festival, with 3,500 attendees.
- Other events included booths at the Earth Day and Endangered Species Event at the Jacksonville Zoo, Charlotte Harbor Nature Festival, Bioblitz at Biscayne National Park in Miami-Dade County, and the U.S. Coast Guard Open House in Fort Pierce. Attendance at these events ranged from 25 to several thousand.
- Research staff attended seven events where they presented information on right whales. They reached approximately 11,000 people at the following events: a Sea Turtle Festival in St. Johns County, the Endangered Species Day and the Earth Day Celebration at Jacksonville Zoo, the Ancient City Pride Festival, the Wild Amelia Nature Festival, an Earth Day event at the Harbor Branch Oceanographic Institute, and the inaugural Right Whale Festival in Jacksonville Beach.
- Sea turtle research staff shared information about their research to hundreds of people by hosting booths at three festivals: World Animal Festival at the Jacksonville Zoo, Earth Day festival at Jacksonville Zoo, and Sea Turtle Day at Gumbo Limbo Nature Center in Boca Raton.
- Chinsegut Nature Center, an educational center just north of Brooksville that is operated by FWC, hosted several events during FY 2009-10:

  - The first was the annual April Bird and Wildlife Festival, which included two off-site burrowing owl field trips and one swallow-tailed kite talk. Festival attendance was 390 for the one-day and one-evening event.
  - The Reptile and Amphibian Festival in October included two gopher tortoise hikes, gopher tortoise burrow-cam talks, two alligator talks, and a live reptile and amphibian exhibit that included approximately 50 species of herps found in Florida, including the gopher frog and alligator snapping turtle. Additionally the Alligator Management Section and the Gopher Tortoise Council had an exhibit at the festival attended by 550-650 people.
- The Florida Legislature established the third Saturday in March as Save the Florida Panther Day.
  - In recognition of Florida's official mammal, Governor Charlie Crist declared March 20, 2010, as "Save the Florida Panther Day" and the Collier County Board of Commissioners declared March 14-20, 2010, as "Save the Florida Panther Week." A week-long series of events culminated at the Florida Panther National Wildlife Refuge.
  - FWC gave two presentations at the refuge, discussing panther life history and demonstrating panther capture techniques with tools and equipment used in the field. Approximately 120 people attended the two talks.
- FWC launched a promotional event at the Florida Capitol during the 2010 Legislative session. Listed species' displays on the manatee, sea turtle, panther, and gopher tortoise reached 500-plus participants.
- At the Earth Day at the Capitol event, FWC displayed information on manatees, sea turtles, panthers, Florida black bears and right whales, reaching more than 500 students, teachers, and parents.
- FWC also participated in an Earth Day event at Busch Wildlife Center in Jupiter. A live juvenile alligator was on display at the FWC table and literature was handed out to dozens of people about Florida's listed species.
- FWC's law enforcement staff set up a display table and trailer at the South Florida Fair. Information on manatees and alligators was presented and literature was distributed on listed species. Over a two-week period, hundreds of people stopped by the table and interacted with FWC staff. Approximately 545,000 people attended the fair.
- FWC's West Palm Beach office hosted a Disabled Mentoring Day in 2009. Approximately 40 young people with disabilities learned from FWC about managing fish and wildlife. Live species on display included the American alligator, Florida manatee, crested caracara, and burrowing owl. Local media covered the event.
- Each October, FWC sets up an interactive wildlife exhibit at the Munson Heritage Festival located within the Blackwater River State Forest in Okaloosa County. Audiences learn about wildlife and how habitat management protects the red-cockaded woodpecker, the gopher tortoise, and other rare species found in the area. A popular display is the Florida black bear exhibit, where people learn the life history of the black bear and ways to reduce human-bear conflicts. FWC sets up similar displays for the annual Beaches to Woodlands tour-Coastal Encounters Festival and the annual Forestry Conclave and Lumberjack Festival held at Pensacola Junior College, Milton campus.

Publications, Signs and Exhibits

- FWC's *Florida Wildlife* magazine contained six feature stories on the following listed species: the American alligator, gopher tortoise, Florida manatee, Miami blue butterfly, sea turtles, and snowy egret.
  - An additional 17 feature stories included information about listed species, including the Florida black bear, limpkin, tricolored heron, black skimmer, red-cockaded woodpecker, Florida scrub-jay, and snowy egret.
  - The magazine included another 37 short articles featuring Audubon's crested caracara, Florida panther, Everglades's snail kite, wood stork, Atlantic sturgeon, piping plover, Key deer, and the imperiled species list/listing process.
  - The magazine, published six times per year, distributes 20,000 magazines per issue for a total of 120,000 single copies each year.
  - Ten thousand copies per issue (60,000 per year) are sent to doctor's offices across the state, where multiple individuals read one magazine.
- FWC increased direct accessibility to information about bear conflict resolution. FWC created bear safety-guide binders for local governments, normally only available on the Internet, and made 11,000 pieces of literature readily available at more than 500 public-office and private-business locations.
- Gopher Tortoise Management Plan staff created new brochures and fact sheets to describe the biology of the gopher tortoise, conservation measures of the management plan, regulations, and permitting options for landowners.
  - More than 17,000 of the publications have been distributed to individuals, counties, developers, and schools in Florida.
  - In FY 2009-10, a newly created Spanish version of the "Living with Gopher Tortoises" brochure was distributed to more than 500 nonprofit, educational and governmental organizations in Florida.
  - Staff also created "Got Gophers, Get Permits" poster for distribution to planning councils as well as county and city building and permitting departments. In FY 2009-10, 88 posters were distributed.
  - All of the informational publications on the gopher tortoise are available for download at MyFWC.com/GopherTortoise.
  - The FWC also collaborated with the American Forest Foundation on the development and distribution of the booklet *The Pine Ecosystem Conservation Handbook for the Gopher Tortoise in Florida*. This handbook is part of an initiative of the American Forest Foundation's Center for Conservation Solutions that brings together conservation partners and family forest owners to conserve and create forest habitat for the gopher tortoise and other declining wildlife of the southern pine forest.
- The Coastal Wildlife Conservation Initiative (CWCI) produced a one-page flyer about its program and the need for conserving coastal habitat. The flyer has been included in agenda packets for informational meetings and sent with e-mails announcing the meetings. It is available for download at MyFWC.com/CONSERVATION/CWCI_index.htm.
- The Great Florida Birding Trail's *Kite Tales* Fall 2009 newsletter featured articles on the biology, conservation, and ethical wildlife viewing techniques for the North Atlantic right

whale and the snail kite. The newsletter is sent to 4,000 subscribers (electronic and hard copies) and is available at http://floridabirdingtrail.com/index.php/newsletter/issues/.

- An annual report available on PantherNet (http://www.floridapanthernet.org/images/field_notes/FWC_Panther_Annual_Report_2009_2010.pdf) summarizes how the FWC manages human-panther interactions.
  - The FWC panther team provided editorial reviews and contributed photographs to the Army Corps of Engineers for their publication *Trails and Tails: the endangered Florida panther of Picayune Strand and Southwest Florida.* This publication is one facet of the Army Corp's informational program to highlight the Picayune Strand Restoration Project, which is part of the Comprehensive Everglades Restoration Project.
  - An article in *Defenders* magazine (Fall 2009) titled "Heartbreak Highway" chronicles the impact of roads and development on the Florida panther.
  - In *Gulfshore Life* magazine (May 2010), an article titled "I, Panther" reveals a glimpse into the life of a Florida panther by highlighting significant events throughout a female panther's life. The story was created by combining real life events from several panthers.
- FWC's wildlife management areas (WMA) and wildlife and environmental areas (WEA) updated and created signs that contain information about listed species.
  - An interpretive sign was installed at Lake Wales Ridge WEA in Highlands County with a photo and information on the gopher tortoise. The sign's content emphasizes the gopher tortoise's role in creating habitat for hundreds of other species.
  - An interpretive sign on the sand skink was installed at Lake Wales Ridge WEA in Highlands County during FY 2009-10. The sign, with photos and information helps visitors identify rare scrub fauna and provide information on their fascinating natural history. This area also installed two interpretive signs on the Florida scrub-jay. The signs provides photos and information on the importance of the scrub-jay to the scrub ecosystem. The signs also let visitors know that if they spot a scrub-jay wearing a leg band, that particular bird is part of a scientific study.
  - The Beau Turner Youth Conservation Center in Jefferson County displays a new interpretive sign on Sherman's fox squirrels. The sign helps identify the species and provides information on the fox squirrel's natural history within the longleaf pine community, stressing the importance of their role in pine seed germination.
- Right whale researchers erected two 3X4-foot right whale boater awareness signs at State park facilities in Flagler County.
- Avian researchers posted signs designating bird nesting areas near Lanark Reef in Franklin County. Gull-billed terns, brown pelicans, and American oystercatchers nest in this area. The signs were posted at a boat ramp, a kayak ramp, and a boat club in Lanark Village. Reports of disturbance to nesting birds decreased, as knowledge of conservation and the importance of nesting sites increased.
- The Sea Stats series of brochures provide information on some of FWC's areas of marine life research. Each brochure is four pages in length and provides information on age and growth, distribution, migration, feeding habits and more. Staff distributed 1,684 copies of the Sea Turtles Sea Stats and 1,108 copies of the Right Whales Sea Stats. In addition, these products are available for downloading at http://research.myfwc.com.

Other Research and Information

- The Save the Manatee Trust Fund receives money from sales of manatee specialty license plates and decals, boat registration fees, and voluntary donations. It is the primary funding source for the State's manatee-related research and conservation management activities. Florida law [section 370.12(4)(b), F. S.] requires that each year, by December 1, the FWC must provide a report to the Florida Legislature on expenditures from the Save the Manatee Trust Fund. This report provides brief summaries of accomplishments and descriptions of research projects and conservation and enforcement activities. The trust fund report is available at http://www.myfwc.com/About/About_legislative.htm in PDF format.
- Each year, FWC produces a summary of its programs.
  - The FY 2009-10 FWC Science Programs document provides an overview of the fish and wildlife research institute's major programs. It is intended to enhance understanding of the scope and purpose of the technical information produced.
  - Also highlighted in the FY 2009-10 Science Programs document are several articles discussing current research projects around the state, which included "Identifying Florida Manatees Using DNA Fingerprinting," "Saving Entangled Right Whales," "Assessing Gopher Tortoise Populations" and "Reconnecting Isolated Black Bear Populations."
  - The Science Programs document is available as a PDF at http://research.myfwc.com/education/view_article.asp?id=19241.
- FWC scientists published their work through a variety of outlets. Their contributions have appeared in various scientific journals or as publications of the Fish and Wildlife Research Institute. These publications and reprint issues are exchanged with libraries throughout the world. While supplies last, FWC sends single copies of the publications in print, at no cost, to individuals who request them. Many publications are also made available for download from FWC's website. Listed species featured in scientific publications during FY 2009-10 include the American kestrel, beach mouse, Florida black bear, gopher tortoise, Gulf sturgeon, manatee, Florida panther, Hawksbill sea turtle, and indigo snake.
- The Community Relations office produces a print media feature called "Featured Creature," reaching approximately 280,000 readers in key areas such as Jacksonville Beach, the Tampa Bay area, and Kissimmee. This year, one "Featured Creature" highlighted the gopher tortoise. "Featured Creature" is sent quarterly to approximately 150 weekly newspapers. In addition, the editors have access to a "Featured Creature" section of the website that contains all the articles and photographs for individual downloading at MyFWC.com/NEWSROOM/News_FeaturedCreature.htm. Other "Featured Creatures" on imperiled species available for download include sea turtle, Florida black bear, and Florida panther.
- FWC created a colorful decal featuring a photograph of a juvenile green sea turtle in the open water. This decal, number 19 of a series, was distributed to local tax collectors offices across Florida. Funds from the sale of this decal support FWC's marine turtle program.

Video, Photography, Radio

- The second season of *Operation Wild* premiered in November on the Planet Green network, featuring the Florida Fish and Wildlife Conservation Commission (FWC). While the show follows the daily activities of FWC officers, from responding to boating accidents to searching for missing people in the woods, to assisting and relocating wildlife, other parts of the FWC are spotlighted as well. FWC employees' commitment to and love for the job are key themes in *Operation Wild* episodes. The show also highlights FWC officers' encounters with threatened and endangered wildlife, including the American crocodile, Florida panther and key deer. Several episodes also feature rescues of threatened and endangered species, such as the Kemp's ridley sea turtle, sperm whale and manatee. The *Operation Wild* website http://planetgreen.discovery.com/tv/operation-wild/ has more information about the FWC as well as a schedule for the show.
- The FWC's Great Florida Birding Trail was featured on Birding Adventures TV in fall 2009 and spring 2010. The episodes featured listed species, include piping plovers at J.N. "Ding" Darling National Wildlife Refuge; Florida scrub-jays and gopher tortoises at Seminole State Forest; snowy plovers, brown pelicans, roseate spoonbills, American alligators, and wood storks at Corkscrew Swamp Sanctuary and Little Estero Island Critical Wildlife Area; snail kites at Wakodahatchee Wetlands and Loxahatchee National Wildlife Refuge; Florida scrub-jays at Juno Dunes Natural Area and Jupiter Ridge Natural Area; and loggerhead turtles at Gumbo Limbo Nature Center. According to Birding Adventures TV, viewership of the show for fall 2009 reached between 350,000 and 700,000 households.
- FWC produced an educational DVD titled "Living with Florida Black Bears" for distribution to local governments, schools, and homeowners in areas where residents may interact with bears.
  - The 14-minute video provides facts and advice on how to avoid conflicts with bears. Five thousand copies were produced of the DVD. FWC sent 2,500 copies to regional offices for public distribution in summer 2010.
  - FWC purchased 1,000 copies of a 60-minute video on general black bear ecology and management containing the 14-minute, Florida-specific video as a separate segment within the DVD. These DVDs will be distributed to teachers and other educators.
  - FWC developed an instructional DVD on how to construct an electric fence. Electric fencing is an extremely effective and cost-effective way to keep bears away from outdoor attractants such as bee yards and dumpsters, but many in the public hesitate to use this method. In response to this need, staff created the DVD and a companion set of instructions to walk people, step-by-step, through building an electric fence. The DVD was created in summer 2010 and will be available to the public in fall 2010.
- FWC created a video on wildlife-resistant trash containers that was sent as a video news release twice: March and May 2010. The video was sent to 300 media outlets in Florida and was broadcast in major media markets in southwest, Central, and northwest Florida.
- Specialty License Plate promotional video featuring Jack Hanna was made by FWC in FY 2009-10. This advertising commercial was shot and edited to promote Florida's conservation specialty license plates. The FWC plates featured in the commercial

included Florida black bear, Florida panther, manatee, and sea turtle. The commercial was aired on eight of the nine cable networks in Florida a total of 22,859 times.

Volunteer opportunities – Volunteers play an important role in FWC's research programs. During FY 2009-10, 62 regular service volunteers (RSV) contributed 6,852.5 hours to listed species-related projects, while 78 occasional service volunteers (OSV) contributed 1,475.5 hours:

- Alligator research: 9 RSVs for 159 hours and 44 OSVs for 52 hours.
- Black bear research: 15 RSVs for 1,646 hours and 12 OSVs for 120 hours.
- Crayfish research: 2 RSVs for 518.5 hours.
- Beach mouse, Key Largo woodrat, Key Largo cotton mouse research: 7 OSVs for 157.75 hours.
- Marine mammal research: 33 RSVs for 429 hours and 1 OSVs for 185.5 hours.
- Sea turtle research: 3 RSVs for 12 hours and 14 OSVs for 960 hours.

APPENDIX A. LISTED WILDLIFE SPECIES IN FLORIDA AS OF JUNE 30, 2010

Common Name	Scientific Name	Status
FISH		
Atlantic sturgeon (Gulf sturgeon)	*Acipenser oxyrinchus* (*Acipenser oxyrinchus desotoi*)	SSC (1)
blackmouth shiner	*Notropis melanostomus*	E
bluenose shiner	*Pteronotropis welaka*	SSC (1,2)
crystal darter	*Crystallaria asprella*	T
harlequin darter	*Etheostoma histrio*	SSC (1)
key blenny	*Starksia starcki*	SSC (1)
key silverside	*Menidia conchorum*	T
Lake Eustis pupfish	*Cyprinodon variegatus hubbsi*	SSC (1)
Okaloosa darter	*Etheostoma okalossae*	E
rivulus (mangrove rivulus)	*Rivulus marmoratus*	SSC (1)
saltmarsh topminnow	*Fundulus jenkinsi*	SSC (1)
shortnose sturgeon	*Acipenser brevirostrum*	E
shoal bass	*Micropterus cataractae*	SSC (1,2)
Suwannee bass	*Micropterus notius*	SSC (1)
Southern tessellated darter (tessellated johnny darter)	*Etheostoma olmstedi maculaticeps*	SSC (1)
AMPHIBIANS		
flatwoods salamander	*Ambystoma cingulatum*	SSC
Florida bog frog	*Rana okaloosae*	SSC (2)
Georgia blind salamander	*Haideotriton wallacei*	SSC (1,2)
gopher frog	*Rana capito*	SSC
pine barrens treefrog	*Hyla andersonii*	SSC (1)
REPTILES		
alligator snapping turtle	*Macroclemys temminckii*	SSC (1)
American alligator	*Alligator mississippiensis*	SSC (1,3)
American crocodile	*Crocodylus acutus*	E
Atlantic salt marsh water snake (Atlantic salt marsh snake)	*Nerodia clarkii taeniata*	T
Barbour's map turtle	*Graptemys barbouri*	SSC (1,2)
bluetail mole skink	*Eumeces egregius lividus*	T
Eastern indigo snake	*Drymarchon corais couperi*	T
Florida brown snake	*Storeria dekayi victa*	T1
Florida Key mole skink	*Eumeces egregius egregius*	SSC (1)

APPENDIX A. Continued

Common Name	Scientific Name	Status
Florida pine snake	*Pituophis melanoleucus mugitus*	SSC (2)
Florida ribbon snake	*Thamnophis sauritus sackeni*	T[1]
gopher tortoise	*Gopherus polyphemus*	T
green seaturtle (green sea turtle)	*Chelonia mydas*	E
hawksbill seaturtle (hawksbill sea turtle)	*Eretmochelys imbricata*	E
Kemp's ridley seaturtle (Kemp's ridley sea turtle)	*Lepidochelys kempii*	E
leatherback seaturtle (leatherback sea turtle)	*Dermochelys coriacea*	E
loggerhead seaturtle (loggerhead sea turtle)	*Caretta caretta*	T
key ringneck snake	*Diadophis punctatus acricus*	T
red rat snake	*Elaphe guttata*	SSC[1] (1)
rim rock crowned snake	*Tantilla oolitica*	T
sand skink	*Neoseps reynoldsi*	T
short-tailed snake	*Stilosoma extenuatum*	T
striped mud turtle	*Kinosternon baurii*	E[1]
Suwannee cooter	*Pseudemys concinna suwanniensis*	SSC (1,2)
BIRDS		
American oystercatcher	*Haematopus palliates*	SSC (1,2)
Bachman's warbler	*Vermivora bachmanii*	E
black skimmer	*Rynchops niger*	SSC (1)
brown pelican	*Pelecanus occidentalis*	SSC (1)
burrowing owl (Florida burrowing owl)	*Athene cunicularia* (*Athene cunicularia floridana*)	SSC (1)
Cape Sable seaside sparrow	*Ammodramus maritimus mirabilis*	E
crested caracara (Audubon's crested caracara)	*Caracara cheriway* (*Polyborus plancus audubonii*)	T
Florida grasshopper sparrow	*Ammodramus savannarum floridanus*	E
Florida sandhill crane	*Grus canadensis pratensis*	T
Florida scrub-jay	*Aphelocoma coerulescens*	T
ivory-billed woodpecker	*Campephilus principalis*	E
Kirtland's warbler	*Dendroica kirtlandii*	E
least tern	*Sterna antillarum*	T

APPENDIX A. Continued

Common Name	Scientific Name	Status
limpkin	*Aramus guarauna*	SSC (1)
little blue heron	*Egretta caerulea*	SSC (1,4)
Marian's marsh wren	*Cistothorus palustris marianae*	SSC (1)
osprey	*Pandion haliaetus*	SSC[2] (1,2)
piping plover	*Charadrius melodus*	T
red-cockaded woodpecker	*Picoides borealis*	SSC
reddish egret	*Egretta rufescens*	SSC (1,4)
roseate spoonbill	*Platalea ajaja*	SSC (1,4)
roseate tern	*Sterna dougalli* (*Sterna dougallii dougallii*)	T
Scott's seaside sparrow	*Ammodramus maritimus peninsulae*	SSC (1)
snail kite (Everglades snail kite)	*Rostrhamus sociabilis plumbeus*	E
snowy egret	*Egretta thula*	SSC (1)
snowy plover (Cuban snowy plover)	*Charadrius alexandrinus*	T
Southeastern American kestrel	*Falco sparverius paulus*	T
tricolored heron	*Egretta tricolor*	SSC (1,4)
Wakulla seaside sparrow	*Ammodramus maritimus juncicolus*	SSC (1)
white-crowned pigeon	*Columba leucocephala*	T
white ibis	*Eudocimus albus*	SSC (2)
whooping crane	*Grus americana*	SSC (5)
wood stork	*Mycteria americana*	E
Worthington's marsh wren	*Cistothorus palustris griseus*	SSC (1)
MAMMALS		
Anastasia Island beach mouse	*Peromyscus polionotus phasma*	E
Big Cypress fox squirrel	*Sciurus niger avicennia*	T
Choctawhatchee beach mouse	*Peromyscus polionotus allophrys*	E
Eastern chipmunk	*Tamias striatus*	SSC (1)
Everglades mink	*Mustela vison evergladensis*	T
fin whale (finback whale)	*Balaenoptera physalus*	E
Florida black bear	*Ursus americanus floridanus*	T3
Florida manatee (West Indian manatee)	*Trichechus manatus latirostris (Trichechus manatus)*	E

APPENDIX A. Continued

Common Name	Scientific Name	Status
Florida mastiff bat	*Eumops glaucinus floridanus*	E
Florida mouse	*Podomys floridanus*	SSC (1)
Florida panther	*Puma concolor coryi* (*Puma* [*=Felis*] *concolor coryi*)	E
Florida saltmarsh vole (Florida salt marsh vole)	*Microtus pennsylvanicus dukecampbelli*	E
gray bat	*Myotis grisescens*	E
Homosassa shrew	*Sorex longirostris eionis*	SSC (2)
humpback whale	*Megaptera novaeangliae*	E
Indiana bat	*Myotis sodalist*	E
key deer	*Odocoileus virginianus clavium*	E
Key Largo Cotton Mouse	*Peromyscus gossypinus allapaticola*	E
Key Largo woodrat	*Neotoma floridana smalli*	E
Lower Keys marsh rabbit	*Sylvilagus palustris hefneri*	E
North Atlantic right whale (right whale)	*Eubalaena glacialis* (*Balaena glacialis* [*incl. australis*])	E
Perdido Key beach mouse	*Peromyscus polionotus trissyllepsis*	E
Sanibel Island rice rat	*Oryzomys palustris sanibeli*	SSC (1,2)
sei whale	*Balaenoptera borealis*	E
Sherman's fox squirrel	*Sciurus niger shermani*	SSC (1,2)
Sherman's short-tailed shrew	*Blarina carolonensis [=brevicauda] shermani*	SSC (2)
silver rice rat (rice rat, lower FL Keys)	*Oryzomys argentatus* (*Oryzomys palustris natator*)	E
Southeastern beach mouse	*Peromyscus polionotus niveiventris*	T
sperm whale	*Physeter macrocephalus*	E
St. Andrews beach mouse	*Peromyscus polionotus peninsularis*	E
INVERTEBRATES		
CORALS		
pillar coral	*Dendrogyra cylindrus*	E

APPENDIX A. Continued

Common Name	Scientific Name	Status
CRUSTACEANS		
black creek crayfish	*Procambarus pictus*	SSC (1)
Panama City crayfish (Econfina crayfish)	*Procambarus econfinae*	SSC (1)
Sims Sink crayfish (Santa Fe cave crayfish)	*Procambarus erythrops*	SSC (1)
INSECTS		
Miami blue butterfly	*Cyclargus* [*=Hermiargus*] *thomasi bethunebakeri*	E
Schaus swallowtail butterfly	*Heraclides aristodemus ponceanus*	E
MOLLUSKS		
Florida tree snail	*Liguus fasciatus*	SSC (1)
Stock Island tree snail	*Orthalicus reses* *Orthalicus reses* [*not incl. nesodryas*]	E

APPENDIX A. Continued

KEY TO ABBREVIATIONS AND NOTATIONS

LIST ABBREVIATIONS

E = Endangered
T = Threatened
SSC = Species of Special Concern

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

(1) has a significant vulnerability to habitat modification, environmental alteration, human disturbance, or human exploitation which, in the foreseeable future, may result in its becoming a threatened species unless appropriate protective or management techniques are initiated or maintained;
(2) may already meet certain criteria for designation as a threatened species but for which conclusive data are limited or lacking;
(3) may occupy such an unusually vital or essential ecological niche that should it decline significantly in numbers or distribution other species would be adversely affected to a significant degree;
(4) has not sufficiently recovered from past population depletion; and
(5) occurs as a population either intentionally introduced or being experimentally managed to attain specific objectives, and the species of special concern prohibitions in Rule 68A-27.0012, F.A.C., shall not apply to species so designated, provided that the intentional killing, attempting to kill, possession or sale of such species is prohibited.

(FWC)

[1] Lower keys population only.

[2] Monroe County population only.

[3] Other than those found in Baker and Columbia counties or in Apalachicola National Forest.

APPENDIX B. LIST OF ACRONYMS USED IN THIS REPORT

Term	Acronym
Apalachicola River Wildlife and Environmental Area	ARWEA
Big Cypress National Preserve	BCNP
Coastal Wildlife Conservation Initiative	CWCI
Code of Federal Regulations	CFR
Critical Wildlife Area	CWA
Deoxyribonucleic acid	DNA
Florida Department of Environmental Protection	FDEP
Florida Division of Agriculture and Consumer Services	FDACS
Florida Fish and Wildlife Conservation Commission	FWC
Fiscal Year	FY
Geographic Information System	GIS
Global Positioning System	GPS
Habitat Conservation Plan	HCP
Landowner Assistance Program	LAP
Lake Wales Ridge State Forest	LWRSF
Lake Wales Ridge Wildlife and Environmental Area	LWRWEA
Manatee Protection Plans	MPP
National Oceanic and Atmospheric Agency's Marine Fisheries Service	NOAA-Fisheries
National Park Service	NPS
Passive Integrated Transponder	PIT
Salt Lake Wildlife Management Area	SLWMA
Statewide Nesting Beach Survey Program	SNBS
Species of special concern	SSC
Technical Advisory Group	TAG
The Nature Conservancy	TNC
University of Florida	UF
U.S. Fish and Wildlife Service	USFWS
U.S. Geological Survey	USGS
Very High Frequency	VHF
Wildlife and Environmental Area	WEA
Wildlife Management Area	WMA

APPENDIX C. FWC PUBLICATIONS DURING FY 2009-10.

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APPENDIX C. Continued

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APPENDIX C. Continued

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APPENDIX C. Continued

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APPENDIX D. COMMON AND SCIENTIFIC NAMES OF NON-LISTED SPECIES MENTIONED BY COMMON NAME IN THIS REPORT.

Common Name	**Scientific Name**
FISH	
Alligator gar	*Atractosteus spatula*
Smalltooth sawfish	*Pristis pectinata*
AMPHIBIANS	
Striped newt	*Notophthalmus perstriatus*
REPTILES	
None	
BIRDS	
Bald eagle	*Haliaeetus leucocephalus*
Cattle egret	*Bubulcus ibis*
Eastern screech owl	*Otus asio*
Glossy ibis	*Plegadis falcinellus*
Great blue heron	*Ardea herodias*
Great-crested flycatcher	*Myiarchus crinitus*
Great egret	*Ardea alba*
Northern flicker	*Colaptes auratus*
Peregrine falcon	*Falco peregrinus*
Purple martins	*Progne subis*
Red knot	*Calidris canutus*
Yellow-crowned night-herons	*Nyctanassa violacea*
MAMMALS	
Flying squirrel	*Glaucomys volans*
Gray squirrel	*Sciurus carlinensis*
Old-field mouse	*Peromyscus polionotus*
Puma	*Puma concolor stanleyana*
Southeastern myotis bat	*Myotis austroriparius*
INVERTEBRATES	
Horseshoe crab	*Limulus polyphemus*

APPENDIX D. Continued

Common Name	**Scientific Name**
PLANTS	
Cabbage palm	*Sabal palmetto*
Oak trees	*Quercus* spp.
Saw palmetto	*Serenoa repens*
Wiregrass	*Aristida stricta*

APPENDIX E. GLOSSARY OF TERMS

DEFINITIONS

Abiotic – The non-living chemical and physical factors in the environment.

Artificial start – A partial cavity created by drilling an entrance tunnel into the tree and then wallowing out a fist sized cavity at the back of that tunnel.

Benthic – An organism that lives on or in sea or lake bottoms.

Berm – A mound or wall of earth or sand.

Cavity – A hollow or hole occupied by an organism.

Cavity insert – A premade box with a cavity built into it that is used to mimic natural cavities.

Clade – A group of living organisms, including all descendants that share specific genetic traits of a common ancestor.

Cluster – The aggregation of cavity trees previously and currently used and defended by a group of woodpeckers.

Commission – The seven member board of FWC that meet five times each year to hear staff reports, consider rule proposals and conduct other Commission business.

Colonial-breeding – Breeding between individuals of the same species that occupy the same colony.

Colony – A distinguishable localized population within a species.

Depredation event - When domestic livestock or pets are preyed upon by a panther.

Ecotone – A transitional zone between two communities containing the characteristic species of each.

Endangered species – As designated by the Commission, a species, subspecies, or isolated population of a species or subspecies which is so few or depleted in number or so restricted in range or habitat due to any man-made or natural factors that it is in imminent danger of extinction, or extirpation from Florida.

Endemic – Restricted or peculiar to a certain area or region.

Ephemeral – Lasting a very short time.

Euryhaline – Describes organisms that tolerate varying levels of salinity.

APPENDIX E. Continued

Explosive breeder – All or most of the population congregates to breed during a short period of time.

Extirpation – Cease to exist.

Fledge – To raise a young bird until it is capable of flight.

Fledged – To leave the nest.

Fledgling – A young bird that has recently developed flight feathers and is capable of flight.

Gene flow – In population genetics, gene flow is the movement of genes from one population to another.

Genetic Introgression – Adding new genes to a population.

Genetic partitioning – Genetic partitioning results when gene flow between populations is restricted or prevented, resulting in the two populations becoming genetically distinct over time through mutation or genetic drift.

Geographic Information System (GIS) – Captures, stores, analyzes, manages, and presents data that is linked to a location.

Habitat – A natural environment where a species lives and grows.

Hydroperiod – The cyclical changes in the amount or stage of water in a wet habitat.

Hydrophone – Used for determining short-term, fine-scale movements and to listen for acoustic tags at moored stations.

Intraspecific – Occurring within a species or involving members of one species.

Life History – All of the changes experienced by a species, from its birth to its death.

Listed species – Species designated as endangered, threatened, or species of special concern are collectively referred to as listed species.

Morbidity – A disease or the incidence of disease within a population.

Necropsy – The examination of a body after death.

Nestling – A young bird that has not abandoned the nest.

APPENDIX E. Continued

Pelagic – An organism that lives in deep ocean water.

Productivity – The ability to produce; fertility.

Recruitment – The addition of individuals into a breeding population through reproduction and/or immigration and attainment of breeding position.

Recruitment cluster – A cluster of artificial cavities in suitable nesting habitat, located close to existing clusters.

Resin well – A wound in a pine tree's cambium, created and maintained by red-cockaded woodpeckers for the purpose of resin production. These wells are maintained to keep sap flowing out of the tree, and prevents snakes from climbing the trees and ultimately from eating birds that are in the cavity. By maintaining resin wells, the birds keep the tree from forming a scab over the well.

Rookery – A colony of breeding animals.

Roosts – A place where species such as bats, and often multiple individuals sleep or reside.

Safe haven – an area of water [established by §379.2431(2)(o) Florida Statute] that manatees may rest, feed, reproduce, give birth, or nurse in while remaining undisturbed by human activity.

Species of special concern – As designated by the Commission, a species, subspecies, or isolated population of a species or subspecies which is facing a moderate risk of extinction, or extirpation from Florida, in the future.

Stock identity – Identification of a group of marine mammals of the same species in a common spatial arrangement that interbred when mature ….in order to identify management procedures at a local level.

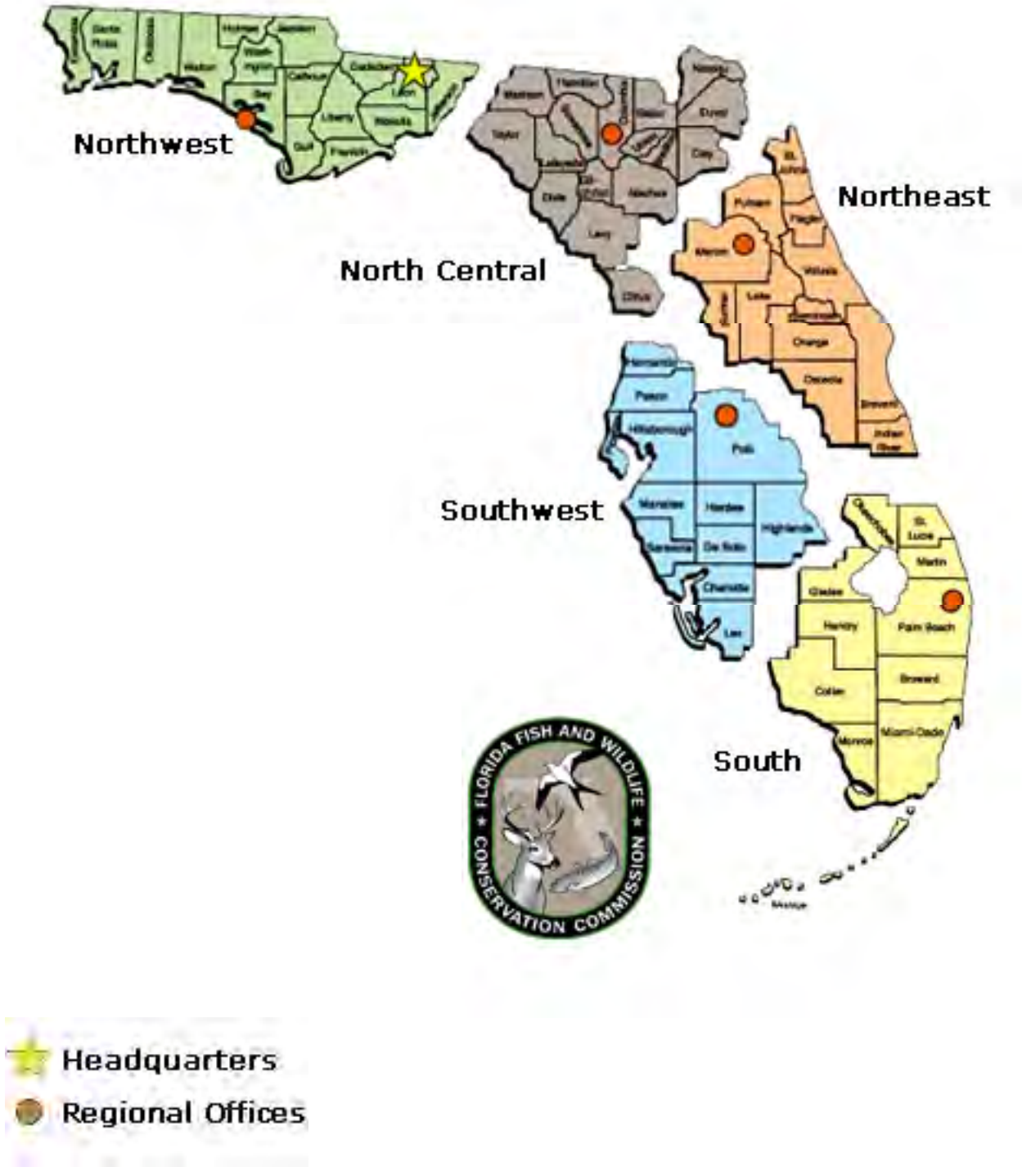
Telemetry – Recording of information about a species and transmitting it to an observer

Threatened species – As designated by the Commission, a species, subspecies, or isolated population of a species or subspecies which is facing a very high risk of extinction, or extirpation from Florida, in the future.

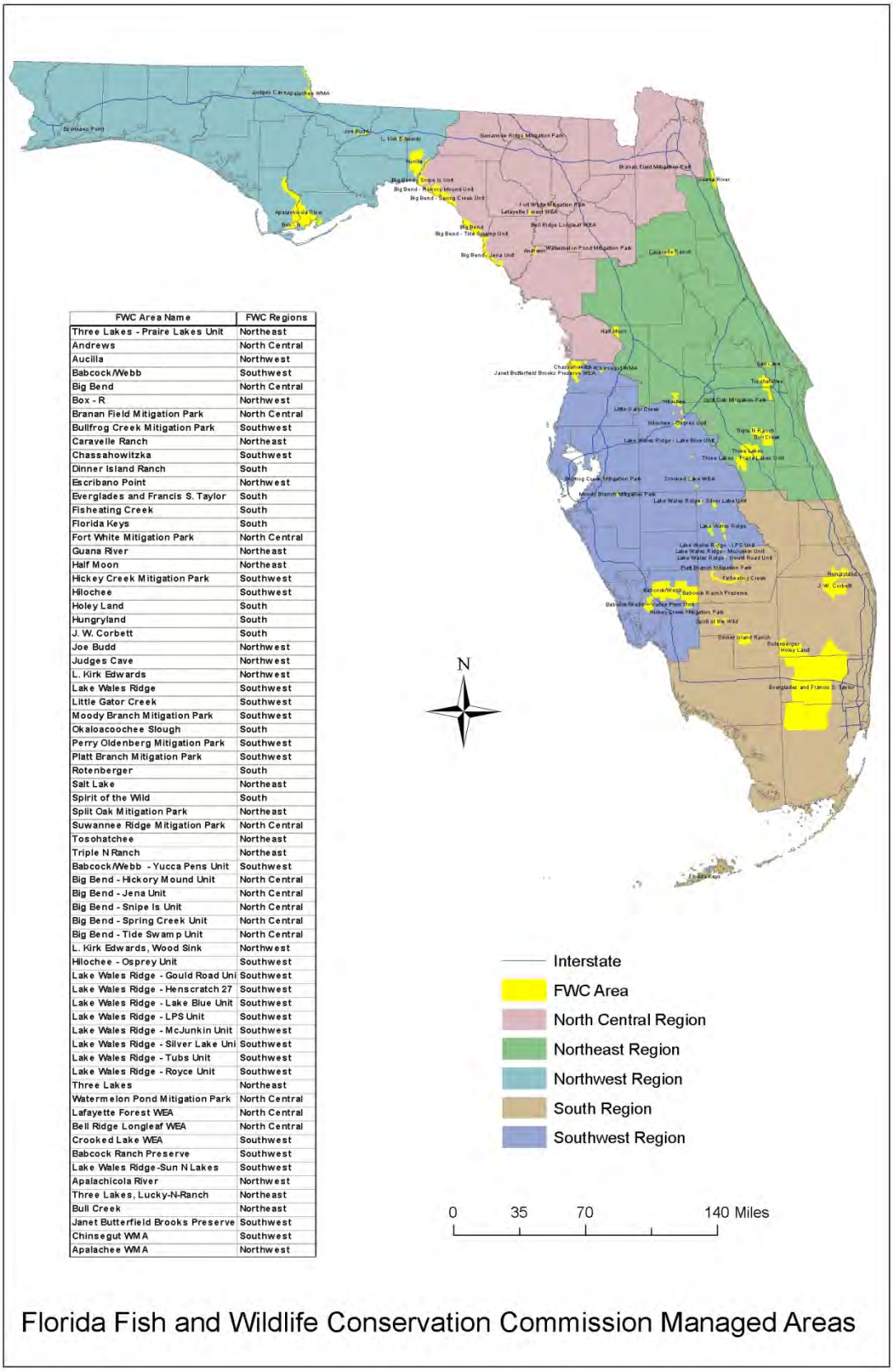
Transect – A path along which one records and counts occurrences of species, vegetation, and other relevant factors of a study.

Translocation – Capture, transport, and release or introduction or reintroduction of wildlife.

APPENDIX F. MAP OF FWC'S REGIONS



APPENDIX G. MAP OF FWC'S MANAGED AREAS



FWC Area Name	FWC Regions
Three Lakes - Praire Lakes Unit	Northeast
Andrews	North Central
Aucilla	Northwest
Babcock/Webb	Southwest
Big Bend	North Central
Box - R	Northwest
Branan Field Mitigation Park	North Central
Bullfrog Creek Mitigation Park	Southwest
Caravelle Ranch	Northeast
Chassahowitzka	Southwest
Dinner Island Ranch	South
Escribano Point	Northwest
Everglades and Francis S. Taylor	South
Fisheating Creek	South
Florida Keys	South
Fort White Mitigation Park	North Central
Guana River	Northeast
Half Moon	Northeast
Hickey Creek Mitigation Park	Southwest
Hilochee	Southwest
Holey Land	South
Hungryland	South
J. W. Corbett	South
Joe Budd	Northwest
Judges Cave	Northwest
L. Kirk Edwards	Northwest
Lake Wales Ridge	Southwest
Little Gator Creek	Southwest
Moody Branch Mitigation Park	Southwest
Okaloacoochee Slough	South
Perry Oldenberg Mitigation Park	Southwest
Platt Branch Mitigation Park	Southwest
Rotenberger	South
Salt Lake	Northeast
Spirit of the Wild	South
Split Oak Mitigation Park	Northeast
Suwannee Ridge Mitigation Park	North Central
Tosohatchee	Northeast
Triple N Ranch	Northeast
Babcock/Webb - Yucca Pens Unit	Southwest
Big Bend - Hickory Mound Unit	North Central
Big Bend - Jena Unit	North Central
Big Bend - Snipe Is Unit	North Central
Big Bend - Spring Creek Unit	North Central
Big Bend - Tide Swamp Unit	North Central
L. Kirk Edwards, Wood Sink	Northwest
Hilochee - Osprey Unit	Southwest
Lake Wales Ridge - Gould Road Uni	Southwest
Lake Wales Ridge - Henscratch 27	Southwest
Lake Wales Ridge - Lake Blue Unit	Southwest
Lake Wales Ridge - LPS Unit	Southwest
Lake Wales Ridge - McJunkin Unit	Southwest
Lake Wales Ridge - Silver Lake Uni	Southwest
Lake Wales Ridge - Tubs Unit	Southwest
Lake Wales Ridge - Royce Unit	Southwest
Three Lakes	Northeast
Watermelon Pond Mitigation Park	North Central
Lafayette Forest WEA	North Central
Bell Ridge Longleaf WEA	North Central
Crooked Lake WEA	Southwest
Babcock Ranch Preserve	Southwest
Lake Wales Ridge-Sun N Lakes	Southwest
Apalachicola River	Northwest
Three Lakes, Lucky-N-Ranch	Northeast
Bull Creek	Northeast
Janet Butterfield Brooks Preserve	Southwest
Chinsegut WMA	Southwest
Apalachee WMA	Northwest