

**FLORIDA ENDANGERED AND THREATENED SPECIES  
MANAGEMENT AND CONSERVATION PLAN--FY 2001-2002  
PROGRESS REPORT**

by the

**Florida Fish and Wildlife Conservation Commission**

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

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## PREFACE

This document constitutes the 23rd progress report and update of the Florida Endangered and Threatened Species Management and Conservation Plan as required under Section 5 of the Florida Endangered and Threatened Species Act of 1977 (s. 372.072, F.S.). That section of the Act required the preparation of an initial plan for submission to the 1978 Florida State Legislature, and that a "...revision and update of this overall management and conservation plan...be submitted annually, along with a progress report and budget request."

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

Many persons contributed to preparation of this report. Kipp Frohlich provided information regarding endangered marine species activities; and Scott Ball, Mike Delany, Thomas Eason, Brad Gruver, Paul Hoover, Dave Hudson, Darrell Land, Richard McCann, Joan Berish, Steve Nesbitt, Jennifer Swan, Katherin Haley, Stuart Cumberbatch, Karl Miller, Nancy Douglass, David Cook, Jim Feiertag and Jim Rodgers provided information regarding endangered land wildlife activities that were conducted during FY 2001-2002. Special appreciation is expressed to Ms. Christine Yannett for her assistance with preparation of this report.

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

The first Florida endangered species list consisted of 23 species and was promulgated in 1972. The listing concept was expanded in 1973 to include Threatened species, and again in 1979 to include Species of Special Concern. The state lists are revised as needed and constitute Rules 68A-27.003 (endangered), 68A-27.004 (threatened) and 68A-27.005 (species of special concern) of the Florida Wildlife Code (Title 68A, F.A.C.). There currently are 117 and 60 species listed by the FWC and United States Fish and Wildlife Service (USFWS), respectively (Table 1). A complete listing of all vertebrate species may be accessed at Florida Fish and Wildlife Conservation Commission (FWC) homepage, <http://floridaconservation.org/pubs/endanger.html>. A listing of plants that are protected under the jurisdiction of the Florida Department of Agriculture and Consumer Affairs may be accessed at <http://doacs.state.fl.us/~pi/5B-40.htm>. Additional information regarding federal listings may be accessed at <http://endangered.fws.gov/wildlife.html>.

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

Status Designation	Amphibians/ Reptiles					Total
	Fish	Birds	Mammals	Invertebrates		
<u>FWC</u>						
Endangered	3	8	20	3	40	
Threatened	2	11	4	0	27	
Special Concern	<u>10</u>	<u>13</u>	<u>17</u>	<u>4</u>	<u>50</u>	
<b>Subtotal</b>	<b>15</b>	<b>36</b>	<b>30</b>	<b>7</b>	<b>117</b>	
 <u>USFWS</u> <sup>a</sup>						
Endangered	2	8	19	6	40	
Threatened	<u>1</u>	<u>7</u>	<u>1</u>	<u>4</u>	<u>19</u>	
<b>Subtotal</b>	<b>3</b>	<b>14</b>	<b>20</b>	<b>10</b>	<b>59</b>	

<sup>a</sup> U.S. Fish and Wildlife Service



## **FLORIDA ENDANGERED AND THREATENED TERRESTRIAL WILDLIFE PROGRAMS**

### **COORDINATION<sup>1</sup>**

Endangered species coordination involved overseeing, monitoring, facilitating and otherwise organizing endangered species projects and research; ensuring adherence to all federal and state reporting and documentation requirements and guidelines; implementing or facilitating protection through regulatory measures and permit review; providing or facilitating consultation and technical assistance to private interests and interacting with state and federal agencies, conservation organizations and others regarding a wide range of endangered species matters. Mr. Tom H. Logan was principally responsible for such duties as the Endangered Species Coordinator and Protected Species Section Leader for the Division of Wildlife (DOW).

Funding for coordination was jointly derived from the USFWS via Section 6 of the Federal Endangered Species Act of 1973, the Nongame Wildlife Trust Fund and the Florida Panther Research and Management Trust Fund. Coordination included initiating and/or responding to correspondence dealing with various endangered species issues, processing numerous requests for endangered species information and representation of the FWC at various meetings and conferences. All endangered species activities funded from federal sources were monitored and overseen, and annual reports were prepared to document their progress. Draft recovery plans for various Florida species, Habitat Conservation Plans and Federal listing petitions were reviewed and comments prepared and submitted upon USFWS request. FWC representation on the Florida Panther Interagency Working Group and the U.S. Fish and Wildlife Service's Whooping Crane, Bald Eagle, Florida Scrub-jay and Florida Panther Recovery Teams was maintained. Technical assistance in endangered species matters was provided to a number of state and federal agencies, consulting firms, private individuals and local regulatory authorities.

### **TECHNICAL ASSISTANCE AND PERMITTING**

The DOW's Protected Species Section and the Office of Environmental Services provided federal agencies, other state agencies, consultants and regional and local regulatory authorities with technical assistance in protecting listed species on managed lands and lands slated for development. Such technical assistance was provided as: 1) comments regarding individual species management plans, 2) development of individual species management plans or guidelines and 3) on-site visits to determine species management needs. Information most often provided to the public concerned: 1) life history and general biological information regarding individual species, 2) locality/occurrence data, 3) listing status and 4) solutions to nuisance situations (i.e., education on the species and suggestions for coexisting with the species). Staff of the Protected Species Section provided these types of information through more than 1,500 telephone accounts and hundreds of formal letters. The Bald Eagle Nest Site Data Coordinator responded to 437 public requests for status and location information regarding active bald eagle nesting territories in Florida. Several hundred requests were made monthly of the Eagle Nest Locator web site, <http://wld.fwc.state.fl.us/eagle/eaglenests/>.

A total of 558 wildlife scientific collection, possession and relocation permits and 196 permit amendments were issued this year. A portion of those permits was issued conditioned upon

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<sup>1</sup> Coordination activities involving marine wildlife are discussed in those sections of this report for "MARINE MAMMALS and MARINE TURTLES".

implementation of an approved management plan, which demonstrated that the permitted activities would result in a conservation benefit for the involved species. Other permits required adherence to species management guidelines. Management guidelines are in place for Florida burrowing owls (*Speotyto cunicularia floridana*) in urban areas, ospreys (*Pandion haliaetus*) nesting on man-made structures, gopher tortoises (*Gopherus polyphemus*) on lands slated for development and bald eagles (*Haliaeetus leucocephalus*). Scientific permits were conditioned upon an approved research proposal. The permit review process usually involves coordination between Commission offices, consultations with consultants, other state agencies, federal agencies and regional and local regulatory entities.

The Protected Species Section maintains a website at <http://www.wildflorida.org/permits/default.htm> to provide permit information, guidelines, policies and applications for those interested in applying for wildlife scientific collecting and relocation permits. Staff direct callers to the website as a matter of routine. Several calls were received to inform staff that the site was quite informative.

The Office of Environmental Services issued 173 permits for the incidental taking of gopher tortoises. Developers mitigated the destruction of gopher tortoises and their habitats related to development activities by setting aside 1,075 acres of occupied tortoise habitat, primarily within their developments and/or mitigation parks.

## STATE LISTING PROCESS

The FWC received five petitions in 2001-2002 requesting listing actions.

A petition to reclassify the red-cockaded woodpecker (*Picoides borealis*) from threatened status to species of special concern status was received in July 2001. A final biological status report was completed in December 2001, and the Commission determined in January 2002 that reclassifying the woodpecker was warranted. A draft management plan was under development at the end of the fiscal year. Final action on the reclassification is expected next fiscal year.

A petition to re-evaluate the listing status of the Florida manatee (*Trichechus manatus latirostris*) was received in August 2001. The comment period requesting information on the biological status of the manatee was still open at the end of last fiscal year. Completion of Phase 1 and initiation of Phase 2 is expected next fiscal year.

A petition to reclassify the Panama City crayfish (*Procambarus [Leonticambarus] econfina*) from species of special concern status to threatened status was received in August 2001. A final biological status report was completed and the Commission determined that reclassifying the crayfish was warranted in May 2002. A draft management plan was under development and a comment period requesting conservation recommendations and expected economic and social impacts of implementing the management plan was still open at the end of the fiscal year. Final action on the reclassification is expected next fiscal year.

Petitions to reclassify the gopher tortoise (*Gopherus polyphemus*) from species of special concern status to threatened status and reclassify the northern bobwhite (*Colinus virginianus*) to species of special concern status were received in May and June 2002, respectively. The petitioner later withdrew the northern bobwhite petition. No further actions were taken on these petitions in

2001-2002.

## RESEARCH

Research is a systematic means of generating the scientific information that is necessary to guide conservation of endangered and threatened species, and it is a critical process for addressing the biological and management needs of those resources in a way that affords consistent monitoring and evaluation. Significant research has been conducted on many listed species during the past three decades, and results are leading to a better understanding of the extinction process and clues for how we may alter this process through management actions that may assist in the recovery of some species and preclude further population declines of others. Many of our findings have since been applied toward the design and implementation of recovery actions, and it is our ongoing evaluation of these strategies that could provide the information of most significance for the recovery of other species in Florida. This section describes the progress of ongoing listed species research by the DOW. Annual reports of these activities are available upon request.

### Florida Panther Genetic Restoration and Management

Telemetry data were collected on 42 radio collared Florida panthers (*Puma concolor coryi*) and 3 Texas cougars (*P. c. stanleyana*) in southern Florida during the reporting period. Five radio collared panthers and 3 uncollared panthers died this past year. Male panthers FP96 and FP97 and female panther FP49 died of intraspecific aggression; male panther FP92 and female panther FP105 died of unknown causes. The three uncollared panthers were struck and killed by vehicles. Six new panthers were added to our radio collared population this past capture season. Our current verifiable population count is 80 adult and sub adult panthers and does not include kittens at dens. We documented 14 panther dens during the study period producing a total of 30 neonate kittens (13♀, 17♂). No Texas puma produced litters during the study period. All of these kittens were handled successfully at their dens, permanently marked with subcutaneous transponder chips, and skin biopsies taken. We have radio collared a total of 112 panthers since 1981 and handled 136 neonate kittens at dens since 1992. Apparently, genetic introgression is reducing the occurrence of kinked tails, cowlicks, and cryptorchidism. Preliminary analyses indicate that the likely representation of Texas puma genes is on target with the originally proposed introgression level of 20%.

We deployed Global Positioning System (GPS) radio collars on 4 panthers this past capture season. Two of the GPS collars only store location data on-board the unit and the remaining 2 store data on-board as well as transmit data to a remote receiver at pre-determined times. We are evaluating these units to see how effectively they perform in south Florida environments and to see how this technology may be integrated into our monitoring strategies. This study is scheduled for completion next fiscal year.

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

Finally, we completed a feasibility study on extracting panther DNA from scats and will have a final report prepared this next fiscal year. Preliminary results show that DNA can be extracted from panther scats. We may use scat collections, if quality DNA can be extracted, to complement on-going capture and handling of this endangered species as we monitor the panther population's genetic characteristics.

### Whooping Crane Reintroduction

Twenty-seven whooping cranes were released in 4 cohorts during FY 2001-2002. We recovered 28 mortalities during the year. Initial survival among this year's released birds was good, but the ultimate mortality rate (0.59) was above recent averages. A number of the young birds contracted *infectious bursa disease* (a highly contagious virus), mid way thru the year, which may have been responsible for the greatest proportion of the losses. There were 2 unusual sources of mortality this year; one bird died from stings received from ingested honey bees, and another from a lightening strike. Two other birds among those lost to the project this year were taken into captivity. One was weak and unwilling to fly (possible suffering from bursa disease) and the other had a broken upper bill.

There were 91 whooping cranes alive in the Florida population at the end of the reporting period. The broken bill bird and the bird unwilling to fly were taken to Lowry Park Zoo, Tampa. Another bird died as a consequence of being hit by a golf ball and suffering a broken leg.

There were no unusual dispersals that we knew of this year. Though there are still a number of whooping cranes (12-15) that are unaccounted for. As the number and age of whooping cranes in Florida increase more transmitters will fail and we will continue to have a portion of the population with whereabouts unknown.

Eleven whooping cranes were successfully captured and had radio transmitters replaced this year. Keeping functional transmitters on all the whooping cranes in Florida is becoming a chronic problem because the number of older cranes is increasing while the dependability of the transmitters is decreasing. The highest priority is to keep functional radios on as many of the potential nesting pairs as possible.

Simultaneous molt of wing feathers, resulting in flightlessness, was observed again this year. We are continuing to document which individuals and which age classes exhibit simultaneous molt of flight feathers to attempt to identify a pattern. Flightlessness was perhaps involved in the mortality of some of the older cranes this year.

Normal rainfall patterns did not begin returning until June, leaving marsh levels during the nesting season (January - May) below normal. We documented 7 nests among 6 nesting females (Table 2.), in spite of low rainfall. One female nested twice this year. This was the first time we have had a whooping crane reneest, though sandhill cranes reneest routinely. One pair that initiated nest building in December hatched 2 chicks. One was taken by a bald eagle the day it hatched, but the other survived to fledge on 7 June. This is the first whooping crane to be hatched in the wild by captive reared and released parents.

Table 2. Pairing and Nesting Results for Florida Whooping Cranes 2002 Nesting Season.

Pair (♂/♀)	Est. Location (County)	Laying date	Hatch or Failure Date	Fate/Clutch	Nesting History
800/898	Lake	2/11/02	3/13/02	hatched/2	first time
529/597	Osceola	2/22/02	3/26/02	failed/? <sup>1</sup>	hatched 2000
513/646	Orange	4/06/02	4/23/02	failed/1	failed 2000
471/397	Glades	4/10/02	4/30/02	failed/? <sup>2</sup>	first time
520/505	Osceola	4/18/02	5/08/02	failed/2	failed 2000
588/658	Osceola	4/18/02	5/08/02	failed/? <sup>3</sup>	first time
787/597	Osceola	4/22/02	5/08/02	failed/2	597-renest/ 787-first time

### Bald Eagle Population Monitoring

1,133 active bald eagle (*Haliaeetus leucocephalus*) territories were documented in the 2002 survey year, representing an increase of 2.8% over the number of active territories in 2001. The estimated number of young produced was 1,318. This was close to the number (1,311) estimated last year. The number of young produced per active territory (1.13) and the number of young per successful nest (1.52) were lower than last year, but were equal with the most recent 10-year average. These numbers represent an estimated population of between 3,014 (breeding adults and estimated non breeders) and 4,332 (breeding adults, non breeders and young produced in 2002). The effect of the drought that has been ongoing in Florida since 1998 did not seem to depress statewide nesting effort or production. The drought may have had an affect on local populations that were dependent on lakes that experienced fish kills during the previous summer for food. The technical paper to be written during the period was not completed. Time was spent compiling data, and drafting the manuscript. Analysis is continuing.

### Bald Eagle Seasonal Movements/Habitat Use

Seventy sub-adult bald eagles have been fitted with satellite transmitters since 1997; 41 of

1 A single, partially opened egg (with an embryo near hatching age) was in the water near the nest. It is possible that another egg had been present but was missing at the failed nest site.

2 No remains of eggs were found at the nest after abandonment.

3 One embryo and the fragments from at least 1 egg were found.

We thought another pair, 526/662, had begun incubation but probably hadn't laid eggs.

Wetland water levels were slightly better than in previous years, but the conditions were still poor due to drought. Having 6 of 7 nests fail to hatch is probably associated with declining marsh water levels due to extremely rapid evapo-transpiration rates. Florida cranes breed during the time of year when water levels are typically declining slowly, but late in this breeding season.

these continue transmitting latitude, longitude, and mortality data. This information has expanded our knowledge of area and habitat requirements of Florida's bald eagles by (1) providing locations on migration routes and (2) estimating summer and winter home range sizes and location. Currently, the locations are displayed on the Internet in an Arc View project with appropriate state and/or physiographic region views at <http://wld.fwc.state.fl.us/eagle/eaglestudy/default.htm>. The locations are updated to the project's web page bi-monthly for public access and to facilitate interactions with other state, federal and local land managers. Next year, this information will be summarized in eco-region GIS maps depicting important use areas of Florida bald eagles, both in and outside of Florida. These maps will be made available from a link on the FWC home page and published as a Florida Bald Eagle Atlas.

### Pelican Monitoring

A statewide aerial survey of brown pelicans (*Pelecanus occidentalis carolinensis*) was conducted 23-24 April 2002. Ground checks could not be conducted until July. The number of nesting pairs estimated this year was 9,617 in 40 colonies (Florida Bay and the lower Florida Keys being lumped as 1 site). This is above the average number of nesting pairs statewide (7,871) since the survey began in 1968. A decline of nesting effort reported in recent years (see past progress reports) was less apparent this FY 2001-2002. Nevertheless we should continue to pay close attention to nesting effort and success over the next several years. The nesting effort and production of brown pelicans in Louisiana and Texas continues to increase and may be attracting some of the pelicans produced in Florida to initiate nesting in the north western Gulf of Mexico. Nesting success was measured on 3 Gulf coast and 2 Atlantic coast colonies. A total of 302 nests were inspected and production was estimated to be 1.32 young per productive nest on the Gulf and 1.33 on the Atlantic. This rate was consistent with the nesting effort seen in the last few years. No die-offs of brown pelicans were investigated this year. We should conduct the statewide survey, as scheduled, in 2003.

### Effects of Water Fluctuations on Snail Kite Nesting on Lake Kissimmee.

The final report on the nesting ecology of snail kites (*Rostrhamus sociabilis*) on Lake Kissimmee from February 1987 through August 2001 was completed. The objective of this study was to evaluate the long-term effects of natural and artificial changes in lake water levels, especially as a result of drawdowns for fisheries and habitat management. The number of kite nests with eggs during the pre-drawdown period (mean=30.8 nests/year, median 23 nests) was greater than the post-drawdown period (16.4 nests/year, median 6 nests) indicating that breeding conditions did not recover to pre-drawdown status. There also was a significant difference ( $\chi^2=104.9$ ,  $P<0.001$ ) in the breeding distribution of snail kites among regions before and after the drawdown in 1996. Prior to the drawdown, kites nested most frequently around Bird Island (47.2% averaged over an 8-year period), with intermittent yearly nesting in the Kissimmee Park Cove (10.6%) and other regions. However, kite nesting was more dispersed and fewer kites nested around Bird Island (12.2%) beginning with the post-drawdown 1997- breeding season.

Mean clutch size during the pre-drawdown period ( $2.77\pm 0.50$ ) was similar ( $\chi^2=0.26$ ,  $P=0.88$ ) to the post-drawdown period ( $2.78\pm 0.48$ ). However, pre-drawdown fledging rates ( $0.87\pm 1.00$  fledgling/nest,  $0.31\pm 0.36$  fledgling/egg) were significantly greater ( $\chi^2=13.62$ ,  $P=0.003$ ) than post-drawdown ( $0.49\pm 0.82$  fledgling/nest,  $0.17\pm 0.31$  fledgling/egg) fledging rates. Average annual fledgling production during the pre-drawdown period (27.1 fledglings/year) was greater than the post-drawdown period (7.6 fledglings/year). Mean hatch date during the pre-drawdown period (3

May) was significantly later ( $t$ -test,  $P=0.03$ ) than the post-drawdown period (23 April) and the range of the pre-drawdown period (157 days) was longer than the post-drawdown period (98 days) indicating the breeding season during the latter period was both earlier and of a shorter duration.

There was a shift in use of woody to non-woody nesting substrates by kites from the pre-drawdown period (61.5% non-woody, 38.5% woody) compared to the post-drawdown period (72.2% non-woody, 27.2% woody). There was no significant difference ( $\chi^2=5.82$ ,  $P=0.12$ ) between pre-drawdown ( $0.95\pm 0.94$  fledgling/nest) and post-drawdown ( $0.73\pm 1.05$  fledgling/nest) fledging rates for kites nesting in woody species. However, there was a significant difference ( $\chi^2=13.78$ ,  $P=0.003$ ) between the pre-drawdown ( $0.85\pm 1.03$  fledgling/nest) and post-drawdown ( $0.27\pm 0.57$  fledgling/nest) period fledging rates for kites nesting in non-woody species. The frequency of successful nests ( $\geq 1$  fledgling/nest) during pre-drawdown period (45.3%) was greater than post-drawdown period (29.5%). This difference in fledging success was partially due to higher frequency of nest collapse in cattail during post-drawdown period (20.5%) versus pre-drawdown (15.3%) periods. Only 38 fledglings from 78 nests (0.49 fledgling/nest) were produced during the post-drawdown period. However, if all 14 of the nests that collapsed in non-woody plants had been supported and exhibited the average fledging rate (0.61 fledgling/nest) of the remaining nests, an estimated total of 48 fledglings or an additional 10 fledglings (+26.3%) would have been fledged during the post-drawdown period. Lake levels appeared to have little direct correlation with yearly snail kite nesting success. However, on an individual nest basis, 43 of 77 (59.0%) nests that fledged  $\geq 2$  kites and 7 of 16 (43.8%) nests that fledged 3 kites were initiated at lake levels  $\leq 15.25$  m. During the pre-drawdown period, 33 of 64 (51.6%) nests that fledged  $\geq 2$  kites were initiated at lake levels  $\geq 15.25$  m while 10 of 14 (71.4%) nests that fledged  $\geq 2$  kites were initiated at lake levels  $\geq 15.25$  m during the post-drawdown period.

Snail kite nesting effort (number of nests and fledglings) on Lake Kissimmee was low for two years after the drawdown of 1996 and then increased in the 1999 breeding season ( $n=39$  nests and 7 fledglings). However, only three nests and no fledglings were observed during the 2000 season while only 12 fledglings were fledged from 29 nests in 2001. Low rainfall and near drought conditions may have been a factor in the low fledging rate in 2001. Five years after the drawdown, the reproductive rate and fledgling production of snail kites on Lake Kissimmee has not attained levels similar to the pre-drawdown period. However, the impact of the drawdown on snail kite productivity remains unclear because a direct relationship between snail numbers, habitat quality, and kite productivity has not been demonstrated.

### Black Bear Research and Management

During Calendar year 2001, black bear road kill and nuisance complaints decreased from historic highs set in 2000. One hundred and four bears were killed in collisions with vehicles last year compared to 111 in 2001. Additionally, Commission personnel received 794 calls regarding bears last year compared to 1,136 in 2001.

The Bear Management Section (BMS) and personnel from the Bureau of Wildlife Management in the Northeast Region initiated a pilot Bear Response Agent Program in June. The program utilizes private individuals (Bear Response Agents) to respond to human/bear conflicts in a four county area (Lake, northern Orange, Seminole, and Volusia) in central Florida. The Wildlife Foundation of Florida awarded funding for the pilot program from monies derived from Conserve Wildlife Tag sales.

In response to data management requirements associated with increasing numbers of human interactions with bears, the FWC modernized its black bear database (containing mortalities, nuisance calls, and marked bears) by using the Commission's intranet. Any employee with access to a web browser now can review and summarize the entire database, which contains data back to 1976 and currently holds over 7,300 records. They also can print data sheets, instructions, FAQ's of data protocols, and a chart to estimate weight from chest girth. The near universal access, ease of searching, summarizing and editing data, and decentralized data management greatly enhanced the utility of the database to the Commission.

The BMS finished its second year of fieldwork for the 3-year statewide assessment of road impacts on bear populations. A total of 13,619 hair samples were collected during two field seasons (2001 and 2002) consisting of eight sampling sessions each season. Abundance estimates from the first field season were highest for the Ocala and Osceola study areas (153 and 101 bears, respectively) and were lowest for the St. Johns River, Apalachicola, and Big Cypress study areas (37, 43, and 44 bears, respectively). Additionally, BMS staff worked with other state and federal agency personnel to determine bear range within and surrounding the six core study areas.

BMS staff continued fieldwork on the Ocala Bear Study, which is documenting the habitat use and movements of bears relative to roads in the Ocala National Forest. During the first 3 years of the study staff captured 138 bears (86♀, 52 ♂), collected more than 5,500 locations from 91 radio-collared individuals, and documented 1,596 road crossings along State Road 40. Additionally, 139 individual bears were identified from 1,000 hair samples collected. Preliminary data suggests that the sites at which bear highway mortality occurred did not coincide with locations where bears most frequently crossed the road.

The BMS staff wrote a draft Conservation Strategy for bears in Florida, culminating a 2-year process, which solicited input from 13 stakeholder organizations,. This draft was reviewed at a fourth meeting of the Statewide Bear Working Group and the BMS staff is currently making final edits to the Conservation Strategy.

#### Florida Grasshopper Sparrow Demography and Habitat Availability

The status of the endangered Florida grasshopper sparrow (*Ammodramus savannarum floridanus*) was monitored on Avon Park Air Force Range (APAFR) in Highlands and Polk counties as part of a contractual agreement funded by the Department of Defense. APAFR contains three of the five known populations on protected lands. Three point count survey replications were conducted at 221 marker poles during the March – June 2002 breeding season. The estimated total population on base was 162 birds (50 on Delta Trail/OQ Range, 8 on Bravo Range, and 104 on Echo Range), evincing a continued decrease from 298 birds estimated during 1997. The population on Bravo Range declined from an estimated 43 birds when the population was found in 1997, and is now in danger of extirpation. Point count surveys conducted in a 258 ha experimental habitat improvement area near the Delta Trail/OQ Range population failed to detect Florida grasshopper sparrows. Recent restrictions in access to 19 point count marker poles located on high explosive impact areas on Bravo Range and Echo Range will be problematic in an analysis of population trends. Areas of potential habitat on the installation (1,800 ha total) were searched for Florida grasshopper sparrows, and no additional birds were found.

A spatial analysis of changes in the distribution of Florida grasshopper sparrows on APAFR was conducted to determine possible causes of the decline, at the request of the U.S. Fish and Wildlife Service. Composite contour plots of occurrence were generated from sparrow locations marked on aerial photographs during point count surveys (1996-2001). Sparrow distribution at each of the three locations on base appears to be contracting to core areas away from forested edges and military targets. A supplemental report on changes in distribution and management recommendations was submitted to APAFR and the U.S. Army. Quarterly and annual reports were submitted in compliance with the contractual agreement. An article summarizing Florida grasshopper sparrow recovery efforts was published in the May-June issue of Florida Wildlife, and an article on the effects of prescribed fire on density and reproductive success was published in the July issue of the Journal of Range Management.

### Red-cockaded Woodpecker Population Surveys and Conservation Planning

Red-cockaded woodpecker (*Picoides borealis*, RCW) population surveys continued on 3 wildlife management areas (WMA) in southern Florida – Three Lakes WMA in Osceola County, Babcock Webb WMA in Charlotte County, and J.W. Corbett WMA in Palm Beach County. The scope of work scheduled for FY 2001-2002 included monitoring the number of active clusters, monitoring active clusters for nests, color-banding adults and nestlings, and determining fledging success.

During FY 2001-2002, there were 50 active RCW clusters at Three Lakes WMA. Thirty-five of 50 clusters fledged young, with 57 fledglings produced (1.6 fledglings per nest). The number of active clusters at Three Lakes WMA appeared to be relatively stable since 1999. In contrast, the RCW populations at Babcock Webb WMA and J.W. Corbett WMA declined during FY 2001-2002. During the 2002 nesting season, there were 23 active clusters at Babcock Webb WMA, a decline of 15% since 2000. During the 2002 nesting season, there were 9 active clusters at J.W. Corbett WMA, a decline of 31% since 2000; 3 of the active clusters at J.W. Corbett WMA were occupied by females only, leaving only 6 potential breeding groups on the property.

Color banding continued on all three WMAs, with 81 RCWs banded at Three Lakes WMA (11 adults, 70 nestlings), 50 RCWs banded at Babcock Webb WMA (33 adults, 17 nestlings), and 4 nestling RCWs banded at J.W. Corbett WMA.

During FY 2002-2003, active clusters will be monitored for nests, adults and nestlings will be banded, and fledgling success will be determined on each of the three WMAs. In addition, work will begin to focus on active management to enhance reproductive success and to increase population size. Data from the previous 3 years will be used to prepare an RCW management plan for each WMA. Plans will outline recovery activities for each WMA, including fire and mechanical treatments to improve habitat quality, installing cavity inserts in existing occupied clusters and in recruitment clusters, and translocating RCWs to recruitment clusters.

Statewide conservation planning for the RCW continued throughout FY 2001-2002. A listing process for RCWs was initiated in September 2001 by Commission acceptance of a valid petition for listing action. Commission staff reviewed the status of the red-cockaded woodpecker relative to Florida's listing criteria and summarized the results in a Final Biological Status Report. Based on that report, in January 2002, the Commission determined that listing the species as a candidate for Species of Special Concern designation was warranted and directed staff to develop a

species management plan for consideration. The proposed change in classification will continue the prohibition of direct take except through permit authorized by the executive director or his delegate. In addition, provisions for indirect take under Safe Harbor or an approved Habitat Conservation Plan are proposed.

A draft statewide management plan was completed during FY 2001-2002 and will be made available for public comment and review during FY 2002-2003 and revised accordingly. This management plan will fulfill the requirements of Rule 68A-27.0012, F.A.C. that went into effect June 29, 1999.

#### Effects of Upper Respiratory Tract Disease on Gopher Tortoise Populations

Within the last decade, research has revealed an upper respiratory tract disease (URTD) in wild gopher tortoises in Florida. One causal agent of URTD is a bacterium, *Mycoplasma agassizii*. A blood test has been developed to detect antibodies to this pathogen. In 1998, the Florida Game and Fresh Water Fish Commission (n.k.a. Florida Fish and Wildlife Conservation Commission) initiated a study to investigate the effects of URTD on gopher tortoise populations on public lands; sixty-one tortoises were radio-instrumented on 3 URTD study sites and a control site. Because the current blood test only indicates exposure to mycoplasma, nasal flushes were also taken to detect presence of mycoplasma. All captured tortoises, not just the radio-instrumented animals, were marked, measured, sampled, and evaluated for clinical signs of URTD. During 1998-2001, 208 gopher tortoises were sampled on the 4 study sites. Thirty percent of the 208 tortoises were seropositive (exposed) at some point in their sampling history. Presence of mycoplasma was detected at all 4 study sites, even the "control" site where no tortoises tested seropositive. *Mycoplasma agassizii* was detected at Gold Head Branch State Park, while a genetically distinct mycoplasma was found at Cecil Field Naval Air Station. One or more undescribed mycoplasmas were found at Oldenburg Mitigation Park and Big Shoals Wildlife Management Area (original control site). Radios were removed from tortoises captured during the 2001 sampling season. Six of 15 radio-instrumented tortoises on Cecil Field, and 2 of 15 radio-instrumented tortoises on Oldenburg Mitigation Park, have been found dead since 1998; a third severely symptomatic tortoise on Oldenburg was euthanized and necropsied. The necropsy revealed classic nasal lesions associated with URTD. Data are being analyzed and a final report/manuscript will be prepared.

#### Florida Scrub-jay Translocation Study

The Florida scrub-jay (*Aphelocoma coerulescens*) is endemic to the unique oak scrub habitat of peninsular Florida. It's required habitat naturally occurs on isolated patches of sandy, well-drained soil. Because these sites are highly prized for residential development and agricultural cultivation, habitat loss through development and degradation from fire exclusion have resulted in a rapid decline in the scrub-jay population. Translocation is generally referenced as a potential recovery tool for this species.

A research project was designed to experimentally translocate scrub-jays from a population with virtually no probability of long-term viability to a currently unoccupied area of suitable habitat with potential for long-term management and viability. In February 2002, 4 male and 4 female nonbreeding jays were to be translocated from an area of continually degrading habitat in South Venice, Sarasota County, to the recently restored Balm Boyette West (BBW) tract in Hillsborough County. Although scrub-jays were found in the vicinity of the proposed recipient site, we believed

natural colonization to be unlikely because it is surrounded by continuous habitat over which jays are reluctant to fly. However, on 29 January 2002, while conducting the final site inspection prior to the translocation we observed 2 scrub-jays on the recipient site. We put the translocation on indefinite hold and modified the objectives of this project, to avoid the risk of disrupting the newly established pair.

The objective of the project for 2001-2002 was to document the natural colonization of the recently restored scrub site by Florida scrub-jays. We monitored the established pair of jays on BBW to determine nest success for the 2002 breeding season. Periodic checks were conducted at BBW to watch for additional immigration or emigration throughout the year. The colonizing pair nested successfully and fledged one chick, which has remained with the family unit. No additional migrations were observed. In order to identify where any future immigrants to the BBW are coming from, we will continued surveying the dispersal area and banding unmarked birds. Approximately 40 jays have been banded in a 10-15 mile radius of the BBW site including 5 juveniles from the 2002 breeding season. All known jays within this vicinity, excluding 2 adults and 3 juveniles, whom we have not been able to trap, are now banded. We will continue to monitor these birds to document any additional movement into the restored site.

#### Florida Scrub-Jay Population Monitoring at Cedar Key Scrub State Reserve and Vicinity

Monitoring of the Florida scrub-jay (*Aphelocoma coerulescens*) population in and around Cedar Key Scrub State Reserve in Levy County, Florida, continued during FY 2001-2002. In April 2000, the Commission, in cooperation with the Florida Park Service, initiated a study to assess the status of this scrub-jay population, the northernmost population on Florida's Gulf coast. During the 2002 breeding season, Commission staff color banded 11 Florida scrub-jays (4 adults, 7 fledglings). At the end of FY 2001-2002, the known population consisted of 6 resident family groups, totaling approximately 24 scrub-jays. Staff assisted the Department of Environmental Protection in developing a scrub management plan for Cedar Key Scrub State Reserve during FY 2001-2002.

During FY 2002-2003, Commission staff will continue to work with the Florida Park Service to monitor the number and composition of family groups and to color band adults and fledglings.

#### Flatwoods Salamander Conservation Project

The flatwoods salamander, federally listed as Threatened in 1999, was listed by the State of Florida in 2001 as Species of Special Concern, based on evidence of habitat loss and the estimate of only 38 extant populations in Florida. The flatwoods salamander management plan developed as part of the listing process proposes that 129 self-sustaining populations would need to be located in Florida in order to de-list the species statewide. Actions needed to meet this goal include conducting surveys to confirm the extant populations, conducting surveys to document previously unknown populations, and preparation of population-specific management plans to promote conservation actions that will maintain all known populations.

FY 2001-2002 included the first field season (January – April 2002) for surveying flatwoods salamanders. Commission staff completed surveys on 17 public lands using GIS maps prepared by Florida Natural Areas Inventory (FNAI) on which potential breeding ponds were indicated. Due to drought conditions, many ponds had little or no water and the presence of salamanders could not be assessed by dip netting. These sites were simply evaluated for future surveying in a wetter year.

Flatwoods salamander larvae were found at St. Marks National Wildlife Refuge, in 14 ponds (including 12 previously undocumented ponds) that represented 3 populations, including 1 new population. Extensive surveys were conducted on Point Washington and Pine Log state forests. Ponds at these sites that did have water apparently received it too late to elicit reproduction, although 1 adult was captured in a trap at the known pond on Pine Log State Forest. Adults were also captured at 2 other sites where conditions precluded reproduction this season, Hurlburt Field and Holley OLF.

In collaboration with US Forest Service staff, Commission staff surveyed the known (“extant”) ponds on Apalachicola National Forest (ANF), and confirmed the presence of flatwoods salamander larvae at 10 ponds, representing 2 of 12 previously known populations. An adult was captured at another known pond in a third population where reproduction apparently did not occur this year. Additional surveys by USFS staff also confirmed flatwoods salamander larvae in 12 new ponds representing 8 new populations. Besides St. Marks NWR and ANF, the only other confirmed flatwoods salamander reproduction in Florida in 2002 was documented by an independent researcher, who dip netted larvae on private lands adjoining both ANF and St. Marks NWR.

All Commission-collected data on pond visits, whether dip netting was conducted or not, are entered into a database specially designed by Commission staff. We also solicit all data collected by non-Commission researchers working in Florida in order to keep the database current and comprehensive. Voucher photographs of habitat and animals captured are filed (digital images) or labeled (slides), and appropriate representative images are submitted to the WILDNET image archive. Required reports are being prepared, and all site managers will be provided with survey results for their sites.

A Memorandum of Agreement with the USFWS was prepared and approved; this document clarifies the respective roles the USFWS and the Commission will play in flatwoods salamander conservation activities in Florida. USFWS staff has requested FWC staff assistance to review and finalize a flatwoods salamander federal recovery plan; the schedule for these activities has not yet been provided. The Commission initiated a contract with the USFS to support continued flatwoods salamander surveys on USFS lands, and to elicit assistance in developing management plans and public information materials.

A draft population-specific management plan was prepared for the 1 known population on Pine Log State Forest, and is under review by Commission and DOF staff. Information and materials are being acquired to prepare the plans for other public lands with extant flatwoods salamander populations.

Commission staff coordinated and prepared a multi-state (including Georgia, South Carolina, and Alabama) proposal requesting Safe Harbor grant funds from the USFWS. The proposal was successful and funds were awarded by the USFWS in October 2001. These funds are being used to support survey work on non-federal lands and for development of a potential statewide Safe Harbor program for flatwoods salamanders.

The 2002-2003 survey season is expected to be wetter than last year, at least in the Panhandle, and an ambitious schedule of surveys will be prepared for all public lands where sufficient fall/winter rains occur to stimulate breeding and inundate potential breeding ponds. Sufficient OPS staff to complete this work will be identified and hired, and needed equipment and

supplies will be purchased. We will resurvey ponds ranked as “Potential” in 2002 at which larvae were not confirmed, and will survey target ponds on unsurveyed public lands and on private lands where we are granted access.

Private landowner information is being acquired for the areas within a 2-mile radius of 32 historic records on private land in 13 counties. An educational brochure targeting private landowners who may have flatwoods salamanders on their land will be drafted and distributed. Such a brochure is intended to inform private landowners about appropriate land management activities that would help conserve the species, and it may be useful for gaining permission to conduct surveys on their lands.

### Federally Funded Research

During FY 2001-02, the DOW administered 10 projects for listed species that were supported by federal funding. The Commission maintains a Cooperative Section 6 Agreement (Endangered Species Act of 1973) with the U.S. Department of the Interior’s, Fish & Wildlife Service to facilitate the obligation of federal funds to the state in support of federally listed species.

The funds provided through the Section 6 programs during this period (Table 3) were provided on a cost share basis at a federal:state/local ratio of 3:1. Projects listed as ‘Traditional Section 6’ included a minimum one-fourth state share appropriated from the Nongame Wildlife Trust Fund. One non-traditional Section 6 project under ‘Federal Grants and Aid’ included third party (local) government matching funds. Two other projects were supported by federal safe harbor grants.

During this period the Commission also received funds from the Department of Defense for a Florida grasshopper sparrow study and grants from the US Fish and Wildlife Service for Snowy plover status and the long-term Whooping Crane Reintroduction project.

Table 3. Federally funded projects for listed species administered by the Division of Wildlife during FY 2001-02.

<b>Project</b>	<b>Federal</b>	<b>State/Local</b>	<b>Total</b>
<b><i>Section 6 Projects and Programs</i></b>			
Endangered Species Coordination	\$63,131	\$21,143	\$84,274
Bald Eagle Seasonal Movements/ Habitat Use	\$45,576	\$15,193	\$60,769
Bald Eagle Monitoring	\$23,363	\$7,788	\$31,151
Flatwoods Salamander Safe Harbor	\$115,828	\$55,793	\$171,621
Swallow-tailed Kite Candidate Conservation	\$12,276	\$2,821	\$15,097
RCW Safe Harbor	<u>\$14,000</u>	<u>\$19,507</u>	<u>\$33,507</u>
<b>Sub-total</b>	<b>\$274,174.00</b>	<b>\$122,245.00</b>	<b>\$396,419.00</b>
<b><i>Other Federal Grants &amp; Aid</i></b>			
Snowy plover	\$21,864	\$26,597	\$48,461
Grasshopper Sparrow	\$52,990	\$0	\$52,990
Sebastian Highlands Land Acquisition <sup>1</sup>	\$179,562	\$68,110	\$247,672
Whooping Crane <sup>2</sup>	<u>\$150,000</u>	<u>\$118,316</u>	<u>\$268,316</u>
<b>Sub-total</b>	<b>\$349,028.00</b>	<b>\$148,842.00</b>	<b>\$497,870.00</b>
<b>TOTAL</b>	<b>\$623,202.00</b>	<b>\$271,087.00</b>	<b>\$894,289.00</b>

Contract Sponsored Research

The following **six** studies of listed species were sponsored by the FWC through contracts with state and non-state entities during the reporting period:

1. Dr. Michael Allen, University of Florida completed research on the shoal bass (*Micropterus cataractae*). This newly described species occurs in the Apalachicola, Chattahoochee, and Flint river drainage system and is listed as threatened in Florida because of habitat loss due to dam construction and subsequent limited distribution. This study compared habitat and diets of *M.*

1 Matching funds provided by sub-recipient.

2 The total budget for the whooping crane reestablishment project in FY 2001-2002 was \$270,000. \$150,000 was provided by a 100% grant from the U.S. Fish and Wildlife Service.

*cataractae* and *M. salmoides* (largemouth bass). The shoal bass was more common in shoal habitats especially with rocky substrate. Both very young and adult shoal bass were commonly associated with deeper areas in shoals and shallower areas in pools. Diet content of both bass was similar. The final report is being formatted for publication.

2. Ms. Cathleen NeSmith, Florida Natural Areas Inventory (now FSU), resurveyed selected Atlantic coastal salt marshes of northeast Florida for MacGillivray's seaside sparrow (*Ammodramus maritimus macgillivrayi*) and Worthington's marsh wren (*Cistothorus palustris griseus*). This study, an expansion of earlier work (1975-76 and 1987-88), examined the current distribution and status of these birds by surveying the species' original ranges. The populations of these two birds appear to be stable and possibly expanding in northeast Florida. Additional areas not previously surveyed also found significant populations. The final report is being formatted for publication.

3. HawkWatch International conducted another annual systematic population monitoring on peregrine falcons (*Falco peregrinus*) at Curry Hammock State Park. Mr. Casey Lott reported the highest single season total for peregrine falcons ever reported for North America. The results of this study was submitted as a Technical Report and will be included in later, multi-year analyses which will analyze variation in weather, comparison with other sites, and breeding season studies.

4. A Preliminary Population Viability Assessment for the Gopher Tortoise (*Gopherus polyphemus*) in Florida was prepared by Mr. Philip Miller of the Conservation Breeding Specialist Group, Minnesota. The report was the outcome of a workshop held on the population biology and ecology of the tortoise. Information from the workshop was the basis for the model. The most important parameters for population growth were mortality rates for both juvenile and adult females. Upper Respiratory Tract Disease can have severe consequences for small populations. Overall analyses suggest the gopher tortoise is not imminently threatened with extinction.

5. Drs. Earl McCoy and Henry Mushinsky from the University of South Florida continue to work on the final product for the study "Population Consequences of Upper Respiratory Tract Disease on Gopher Tortoise." This study resurveyed ten populations, collecting blood samples to determine serum levels that can be linked to chronic stress. Stress levels could compromise the animal's ability to recover from URTD. Fecal samples are also being analyzed to measure stress levels in a non-invasive manner.

## **LAW ENFORCEMENT**

Division of Law Enforcement officers continued their statewide enforcement activities to protect specific endangered and threatened species during the year. These special programs consisted of the following:

- 1) Regular patrols of the three Florida panther reduced-speed zones in Collier County (two on State Road 29 and one on US 41),
- 2) Enhanced patrols of the speed zones in all manatee sanctuaries and expanded public outreach efforts statewide with particular emphasis on high mortality areas,
- 3) Regular patrols and close coordination with the Monroe County Sheriff's office in enforcing reduced-speed zones and other special accommodations on behalf of the

Key deer (*Odocoileus virginianus clavium*) in the lower Florida Keys,

- 4) Florida panther enforcement support, which includes officers in the nine-county core of existing and potential panther habitat. The nine counties are Collier, Hendry, Sarasota, Charlotte, Lee, Hardee, Highlands, DeSoto and Glades. The purpose of the program is to provide enhanced targeted law enforcement patrol, intensified landowner coordination, investigation of panther sightings, panther/vehicle collision and depredation reports, assistance in conducting standard field surveys in proposed reintroduction areas, and assistance to the Division of Wildlife for panther research and management,
- 5) Regular patrols in Lee County in the wildlife corridor to reduce vehicle speeds for purposes of panther and prey protection and motorist safety.

## **INFORMATION/EDUCATION**

The Media Relations section of the Office of Informational Services (OIS) issued one statewide and 10 regional news releases on black bears, eight statewide and 30 regional news releases on manatees, one statewide and one regional news release on whooping cranes, two statewide and one regional news release on the Florida panther, three statewide and two regional news releases on sea turtles, one regional news release on Florida sandhill cranes, one statewide and one regional news release on red-cockaded woodpeckers, one statewide news release on crocodiles, one statewide news release on bald eagles, three statewide and nine regional news releases on alligators, and one statewide news release on endangered and threatened species in general.

OIS initiated or responded to 189 news media contacts regarding alligators; 126 regarding black bears; 114 regarding manatees; 25 regarding whooping cranes; 19 regarding sea turtles; 11 regarding sandhill cranes; seven regarding bald eagles; five regarding red cockaded woodpeckers; three each regarding least terns & skimmers and wood storks; two each regarding burrowing owls, Florida panthers, gopher tortoises and Florida scrub-jays; one each regarding brown pelicans and sperm whales; and 17 regarding endangered and threatened species in general.

OIS Media Services staff sent photographs and video footage of alligators, black bears, manatees, sandhill cranes and whooping cranes to seven requestors. The agency's exhibit at the Florida State Fair in Tampa, visited by approximately 425,000, featured exhibits and information on crocodiles, Florida panthers and assorted threatened and endangered bird species.

OIS Conservation Education staff coordinated or participated in 24 wildlife-oriented festivals or events, attended by approximately 20,000 persons. Through these events, staff communicated information about the following endangered or threatened species: American alligator, American crocodile, American oystercatcher, Arctic peregrine falcon, Audubon's crested caracara, bald eagle, black skimmer, bog frog, brown pelican, burrowing owl, Florida black bear, Florida grasshopper sparrow, Florida Key deer, Florida panther, Florida sandhill crane, Florida scrub-jay, gopher frog, gopher tortoise, gray bat, Indiana bat, Key Largo cotton rat, Key Largo wood rat, least tern, limpkin, little blue heron, osprey, Pine Barrens treefrog, piping plover, red rat snake, red-cockaded woodpecker, reddish egret, roseate spoonbill, roseate tern, southeastern American kestrel, southeastern snowy plover, snowy egret, Suwannee cooter, tricolored heron, West Indian manatee,

white ibis, wood stork and whooping crane.

Regional staff partnered with St. Petersburg Audubon Society on a campaign to educate business owners with rooftop least tern colonies and their patrons about the importance of gravel roofs as nesting sites. An educational poster was produced.

Approximately 801 campers at the Everglades Youth Camp attended presentations by the Busch Wildlife Sanctuary, which included information about the following listed species: Florida panther, bald eagle, alligator, crocodile, crested caracara and indigo snake.

Regional staff facilitated or participated in three workshops, involving 50 total participants, related to the Shorebird Sister School Program. Listed species included osprey, Southeastern snowy plover, piping plover, little blue heron, reddish egret, snowy egret, tricolored heron, white ibis, wood stork, brown pelican, American oystercatcher, black skimmer and least tern.

K-12 staff produced and sent an electronic newsletter to 300 subscribers, providing program updates and useful information for workshops or professional development. Species involved in this educational newsletter included Florida panther, Choctawhatchee beach mouse, Perdido Key beach mouse, gray bat, West Indian manatee, Florida black bear, American alligator, whooping crane, red-cockaded woodpecker, gopher tortoise, Atlantic ridley turtle, Atlantic hawksbill turtle, Atlantic green turtle, Atlantic loggerhead turtle, and leatherback turtle.

K-12 staff conducted five workshops attended by 300 K-12 educators, featuring activities on Florida black bear, West Indian manatee, American alligator, Atlantic ridley turtle, Atlantic hawksbill turtle, Atlantic green turtle, Atlantic loggerhead turtle, leatherback turtle, whooping crane, osprey, brown pelican, snail kite, Audubon's crested caracara, black skimmer, least tern, wood stork, bald eagle, white ibis, snowy egret, roseate spoonbill and piping plover.

The Environmental Education Grant Program funded four projects specific to manatees. The projects include an interactive manatee program for 1,710 third graders and 95 adults in Lee County, the installation of 13 kiosks at Lee County boat ramps informing boaters about speed zones and other manatee-related information, a statewide Monofilament Recovery and Recycling program and an evaluation of a manatee education program for boaters in the Tampa Bay area.

Articles and accompanying photographs or illustrations of listed species featured in *Florida Wildlife Magazine* included the Florida panther, Florida black bear, loggerhead sea turtle, Sherman's fox squirrel, sandhill crane, burrowing owl, limpkin, Florida grasshopper sparrow, Florida scrub-jay, whooping crane, wood stork, common snook, red-cockaded woodpecker, West Indian manatee, roseate spoonbill and gopher tortoise. Additional listed species mentioned in articles and conservation updates included the Everglades mink, least tern, osprey, wedge-leaved button snakeroot, snail kite, crested caracara, Bachman's sparrow, reddish egret, bald eagle and right whale. Photo and art collections in the magazine featured the American alligator, Florida panther, snowy egret, bald eagle, wood stork, Florida scrub-jay, American oystercatcher and the loggerhead sea turtle.

## **CRITICAL WILDLIFE AREAS**

Critical Wildlife Areas (CWAs) are established by the FWC to protect wildlife

concentrations from human disturbance during critical nesting, feeding or resting periods (68A-19.005). The areas are defined in establishment orders and are closed to human entry during the period of time established by the order. The 5 FWC regional wildlife diversity conservation biologists are responsible for evaluating potential CWAs, drafting rules for their establishment, modification or deletion, and administering their posting and maintenance each year.

During FY 2001-02 designated sites were monitored by biologists and signs posted seasonally to advise the public of the importance of the CWA. Protection efforts were coordinated with local government, other agencies, organizations and FWC law enforcement personnel. Sixteen of the 21 established CWAs supported varying amounts of nesting, resting or feeding habitat during the year (Table 4). All the active CWAs supported listed species, the most notable of which included: Bird Island (wading birds, oystercatchers and pelican rookeries); ABC Islands (wading birds and pelican rookeries); Fort George Inlet (least terns and black skimmers); St. George Causeway (least terns, oystercatchers and black skimmers); Big Marco Pass (least terns, black skimmers, plovers and wintering shorebirds); and Pelican Shoal (the primary U.S. nesting site for the Caribbean population of roseate terns [*Sterna dougalli*]).

Table 4. Critical Wildlife Areas in Florida in FY 2001-2002.

Region CWA name	County	Closure period	Primary taxa	Status <sup>a</sup>	Managed area
<b>Southwest</b>					
Bird Island	Hillsborough	1 Dec. to 1 Sept.	Hérons, egrets, ibis, pelicans, spoonbills, oystercatchers	9,000 nests	75 acres
Little Estero Island	Lee	1 April to 1 Sept.	Terns, plovers	50 terns nests, 2 snowy plover nests	25 acres
Anclote River Islands*	Pasco/Pinellas	1 Feb. to 1 Sept.	Hérons, egrets pelicans	Inactive <sup>b</sup>	--
Myakka River	Sarasota	1 March to 1 Nov	Wood storks, egrets, herons, anhingas	180 individuals	1 acre
<b>Northwest</b>					
Tyndall	Bay	Year-round	Terns, gulls, skimmers, shorebirds	20-30 snowy plover pairs >15 tern nests, 1 oystercatcher nest	10 acres
Alligator Point	Franklin	1 April to 1 Sept.	Terns, oystercatchers	10 tern nests	145 acres
St. George Causeway	Franklin	1 April to 31 Aug.	Terns, gulls, oystercatchers, skimmers	212 tern nests, 1,466 gull nests, 28 skimmer nests, 600 royal tern nests, 44 sandwich tern nests, 1 oystercatcher nests	32 acres
Gerome's Cave*	Jackson	1 March to 1 Sept.	Bats	Unknown	2 acres
<b>South</b>					
Deerfield Island Park*	Broward	Year-round	Gopher Tortoise	10 individuals	56 acres
ABC Islands	Collier	Year-round	Hérons, egrets, pelicans	892 nests	75 acres
Big Marco Pass*	Collier	Year-round	Terns, black skimmers, plovers, wintering shorebirds	200 nests, 3,000 individuals	11 acres
Caxambas Pass*	Collier	Year-round	Terns, black skimmers, wintering shorebirds	Inactive	1 acre
Rookery Island	Collier	Year-round	Hérons, egrets	205 nests	5 acres
Bill Sadowski*	Dade	Year-round	Shorebirds, herons, egrets (foraging only)	1,000 individuals	700 acres
Pelican Shoal	Monroe	1 April to 1 Sept.	Roseate terns, bridled terns	160 nests	1 acre
<b>Northeast</b>					
Amelia Island	Nassau	1 April to 1 Sept.	Least terns	50 nests	1 acre
Bird Islands*	Duval	1 April to 1 Sept.	Gull-billed terns, black skimmers	200 nests	2 acres
Fort George Inlet*	Duval	1 April to 1 Sept.	Least & royal terns, black skimmers, laughing gulls	5,000 nests	10 acres
Jennings Cave	Marion	15 Feb. to 31 Aug.	Bats	Inactive	1.9 acres
Matanzas Inlet*	St. Johns	1 April to 1 Sept.	Least terns, Wilson's plovers, willets	50 nests	28 acres
Ponce de Leon Inlet	Volusia	1 April to 15 Aug.	Least terns	Inactive	13.7 acres

<sup>a</sup>Estimated peak numbers of individuals and/or successful nests at each site during the closed period in FY 2001-02.

<sup>b</sup>Inactive means the site was not used during FY 2001-02.

\*Indicates sites that may require re-description or merit deletion from the CWA system.

## MARINE MAMMALS AND MARINE TURTLES

The FWC's Florida Marine Research Institute (FMRI) Endangered and Threatened Species Section conducts research on marine mammals and marine turtles and the Office of Environmental Service's Bureau of Protected Species Management conducts management activities relating to these species.

### MANATEE PROGRAM

#### Manatee Mortality and Rescue

A network of researchers and law enforcement agencies was established in 1974 to recover manatee carcasses and provide assistance to injured manatees. This mortality and rescue program now rests largely with the FWC's FMRI. From July 1, 2001 through June 30, 2002, 323 manatee carcasses were documented in Florida. All but 2 of these carcasses were retrieved and necropsied in order to determine causes of death. Human causes accounted for 107 (33%) of these deaths; 97 (30%) of these were watercraft related and 3 (1%) were caused by floodgates or locks. Fifty-three (16%) were perinatal deaths. Eighty-five were too decomposed to determine cause of death. Managers use this information to implement rules and regulations aimed at reducing manatee deaths. FMRI launched an interactive searchable web-based database with manatee mortality information that is now available to anyone with Internet access at <http://www.floridamarine.org>.

During the 33-day period of March 15, 2002 to April 16, 2002 there was an increase in manatee deaths. FMRI collected 35 manatee carcasses from four southwest counties during this time. Brevetoxin from red tide was suspected based on recent locations of red tide blooms (*Karenia brevis*) found in Charlotte, Collier, Lee, and Sarasota counties where the carcasses were recovered, as well as physical evidence collected during necropsy and subsequent toxicology results. As a result a federally appointed advisory panel, The Working Group for Unusual Marine Mammal Mortality Events, declared this an unusual mortality event which means that federal assistance will be provided to study the event.

Staff and cooperators rescued 57 sick or injured manatees statewide under the federal rescue program; 30 of these animals were released. This number includes animals that were treated and released on site as well as animals brought into facilities for treatment. Severely ill or injured manatees were transported to one of three oceanaria participating in the rehabilitation program for treatment. Manatee rescues provide specific information on causes and geographic locations of manatee injuries. The information obtained during manatee rehabilitation, treatment and necropsy assist in reducing manatee mortality.

#### Population Surveys and Monitoring

Statewide aerial surveys are used each year to gather information on manatee distribution, relative abundance and habitat use. Manatees aggregate at natural springs and industrial thermal discharges during the cold weather, making them easier to count. A total of 88 flights were made on 61 days, for manatee distribution, winter counts, calibration studies, and red tide reconnaissance.

One interagency, statewide "synoptic" aerial and ground survey of manatees was conducted in 2002 to meet legislative requirements of conducting an annual manatee census. The count of

1,796 manatees was low, due to sub-optimal weather conditions. Manatees were counted on 16 survey routes (12 aircraft, 4 ground), by 29 biologists from 11 state, federal, and county agencies, and from research labs and universities. The previous record count was 3,276 manatees on January 5-6, 2001. Counts vary depending on weather conditions and manatee response to cold weather.

FMRI, in cooperation with Mote Marine Laboratory, flew intensive aerial surveys this winter to assess the accuracy of aerial counts at the 3 Tampa Bay power plants. Scheduled aerial surveys were delayed due to the heightened security around power plants, following September 11<sup>th</sup>. The accuracy of counts was assessed using simultaneous aerial and ground counts. Time-depth recorders were used for the first time to document the percent of time manatees are at the surface.

A biological status review of the Florida manatee was initiated in response to a petition to re-evaluate the status of the species in Florida. This process involved developing new population models to analyze the population against criteria developed by the State of Florida.

### Behavioral Ecology and Movements

Research on how manatees use the coastal habitats of Florida is essential to understanding what resources are required to sustain a healthy population. By tracking the movements of individual manatees in fresh, brackish, and saltwater habitats, valuable information is obtained about their seasonal and daily movement patterns, migratory behavior, site fidelity, and habitat use.

Radio-tracking of tagged manatees helps assess movement patterns, preferred habitats, migration corridors, behavior and reproduction. Twenty manatees were captured over four days at the TECO power plant in northeastern Tampa Bay in December. Fifteen animals were fitted with flags for a study designed to estimate the percentage of manatees missed during aerial surveys of power plant aggregations. Five of these individuals were fitted with satellite-monitored radio-tags and time-depth recorders (TDRs) and were tracked through the winter to study their movements among and use of industrial warm-water refugia. Water temperature and depth were recorded for these individuals every 30 seconds throughout the winter. Six manatees were captured at Salt Creek, Warm Mineral Springs in January and four were radio-tagged to study their movements, habitat use, and behavior. Three of these individuals had been rehabilitated in oceanaria and released into the area in previous years. Another manatee that had remained tagged since the previous winter was also tracked in the region. An automated VHF receiver/data logger station was set up at the manatee aggregation area between December and March to record attendance patterns of tagged manatees in relation to time of day, tidal state, and water temperature.

FMRI was instrumental in the formation of the inter-agency Manatee Rehabilitation Partnership. This group will monitor rehabilitated animals that are released back into the wild. This year, FMRI took the lead in tracking three animals that were released and assisted with five others. The eight releases is a record for a single season.

FMRI in cooperation with USGS Sirenia Project and Mote Marine Laboratory maintains an image-based, computerized database called the Manatee Individual Photo-Identification System (MIPS) that is used for photo-identification of individual manatees. FMRI maintains the west-central and southwest MIPS catalog which currently consists of approximately 3300 images and 8000 sightings representing 600 manatees. FMRI staff added 15 fully documented animals to the catalog this fiscal year, and they worked intensively on database updates in anticipation of a major upgrade

to the MIPS. These data provide life history information and assist scientists in estimating survival and reproduction rates.

### Human Dimensions

Understanding how humans affect the welfare of manatees is an important element in effective manatee protection. Factors such as pollution and mortality from boat strikes, and changes in habitat are all related to human activities. To make wise decisions with respect to habitat protection, boat speeds, refuge and sanctuary delineation, harassment, and compliance with speed zones, an understanding of human behaviors and motivations is necessary.

Results of a 2000-2001 statewide manatee boater compliance study were analyzed and a final report completed. We recorded 13,936 observations in 864 hours of effort. Compliance with posted speed was highly variable between sites, but averaged 51%, with 14% of the observations recorded as blatant violations.

Grant money was received for several projects including one to explore alternative methods to increase boater compliance within manatee speed zones (i.e., traffic calming alternatives) and another to conduct a study in Miami that explores the motivation behind compliance with manatee speed zones. Field sampling was completed and a telephone survey is being prepared.

### Contracts for Manatee Research

FMRI managed a contract for Mote Marine Laboratory to conduct the following studies: boater compliance studies in Mullock Creek, immunology research, investigations in manatee use of Matlacha Isles, manatee genetics, calibration of aerial surveys at TECO Apollo Bend power plant, behavioral responses to vessel approaches, and manatee rescue and verification. In addition in December 2001, FMRI issues a request for proposals for manatee avoidance technology. Six contractors were selected to develop technology that could alert boaters to the presence of manatees in the area. Many of these studies will be completed by late 2002.

## **RIGHT WHALE PROGRAM**

### North Atlantic Right Whale Program

Another endangered marine mammal of concern to the FWC is the North Atlantic right whale (*Eubalaena glacialis*). Right whales are the rarest of the large whales, and the North Atlantic population numbers about 300 individuals. The coastal waters of Florida and Georgia are the *only* known calving grounds for the species, and were designated as one of three critical habits in 1994. FMRI staff involved with the Right Whale Conservation Project focus on efforts to aid the recovery and protection of the species.

FMRI is instrumental in assisting a recovery plan implementation team whose aim is to help the National Oceanic and Atmospheric Administration (NOAA) Fisheries by providing advice to and support of recovery activities. Presently FMRI staff chair this team and help organize team meetings, agendas, and team correspondence. NOAA Fisheries coordinates the recovery effort, and is currently revising the Recovery Plan last updated in 1991. All activities in the Right Whale Program are grant supported by NOAA Fisheries.

## Population Monitoring

Staff coordinates and conducts aerial surveys off the coastal waters of Florida in an effort to alert vessels to the presence of right whales, monitor calf production, identify unique individuals, and describe whale distribution and habitat. From December 2001 through March 2002, FMRI conducted 29 winter aerial surveys resulting in a total of 18 sightings (5 mother/calf pairs, 3 mother/yearling pairs, one lone adult) of right whales. Data collected from aerial surveys are incorporated into a Geographic Information System (GIS) for mapping and analysis. Staff collaborates with partners - NOAA Fisheries, the Georgia Department of Natural Resources, the University of Rhode Island, the New England Aquarium, and others - to compile and manage aerial survey observations using a GIS. Analyses of these spatial data will help to better define the distribution patterns of right whales in their southeast calving grounds in relation to environmental factors and human activities. Staff is currently comparing whale sightings with bathymetry (water depths) and sea-surface temperatures to gain a better understanding of their habitat. Human activities like ship traffic are also integrated into the GIS to help characterize ship-traffic patterns in areas essential to the survival of these whales. Data on ship-traffic patterns are generated from the mandatory ship reporting (MSR) systems that have been implemented by the federal government to surround the critical habitats of right whales. A NOAA Technical Memo "Ship Traffic Patterns in Right Whale Critical Habitat: Year 1 of the Mandatory Ship Reporting System" was published in January 2002 with several FMRI staff as co-authors. A leading cause of right whale mortality is from collisions with ships. Since the loss of as few as one individual is critical to the recovery of the species, information provided by aerial observers is immediately reported to a federally implemented Early Warning System (EWS) network. Working with the Fleet Area Control and Surveillance Facility at the Naval Air Station in Jacksonville, Florida, the Network disseminates right whale location information to mariners in the waters of Florida and Georgia via the typical marine communication network and a right whale pager network. FMRI researchers continue to coordinate a complex communication network that utilizes alphanumeric pagers to disseminate current right whale sighting information. Using this approach mariners are alerted to the presence of right whales in order to alter course and avoid striking and killing a right whale in the calving grounds.

## **MARINE TURTLE PROGRAM**

### Salvage, Rescue and Necropsy

FMRI staff coordinated the Florida portion of the Sea Turtle Stranding and Salvage Network (STSSN), an 18-state program administered by the National Marine Fisheries Service (NMFS). A total of 1259 dead or debilitated sea turtles were documented in Florida from 1 July 2001-30 June 2002. By species, there were 675 loggerheads (*Caretta caretta*), 352 green turtles (*Chelonia mydas*), 129 Kemp's ridleys (*Lepidochelys kempii*), 26 hawksbills (*Eretmochelys imbricata*), 50 leatherbacks (*Dermochelys coriacea*), 1 olive ridley (*Lepidochelys olivacea*) and an additional 26 sea turtles not identified to species. Staff reviewed, edited, and entered all submitted STSSN reporting forms, responded to or coordinated the response to more than 500 reports of dead or debilitated sea turtles, and conducted gross necropsies on approximately 100 of the carcasses. Staff conducted three workshops to train STSSN participants in standardized data collection methodology. Florida stranding updates were provided weekly to NMFS for incorporation into the Sea Turtle-Shrimp Fishery Management Report. Detailed Florida stranding reports were generated weekly and monthly. Staff presented data at the 22<sup>nd</sup> Annual Symposium on Sea Turtle Biology and

Conservation on red tide as a potential mortality factor for sea turtles and on the trends in 21 years of monitoring sea turtle mortality in Florida.

### Population Monitoring

This long-term monitoring program involves the collection of nesting and habitat information throughout the geographic range of marine turtles in Florida. Approximately 90% of the world's largest loggerhead nesting population occurs in Florida, and the green turtle nesting population is one of regional significance. FMRI assesses nesting abundance and reproductive output by monitoring nesting beaches via a coordinated network of state, federal and volunteer permit holders. FMRI establishes scientifically sound monitoring, designs, provides training, resolves data collection problems, assesses data collection error rates, analyzes data trends, and serves as a clearinghouse for information on marine turtle populations and habitats. Two overlapping monitoring programs are carried out, each with separate objectives.

The Statewide Nesting Beach Survey Program, initiated in 1979, achieves nearly complete coverage of the state's nesting beaches to provide data on total nest numbers, nest geographic distribution, and nesting seasonality for each species. Managers use results to minimize human impacts to turtles and nesting beach habitats, and to identify important areas for land acquisition or enhanced protection. In 2001, 180 survey areas were monitored, comprising 1280 km of beaches. This program documented a total of 69,657 loggerhead nests, 581 green turtle nests, and 935 leatherback nests. FMRI disseminates results of the Statewide Nesting Beach Survey Program through scientific publications, presentations, reports, the Internet, and the CD entitled "Florida Atlas of Marine Resources."

The Index Nesting Beach Survey program, started in 1989, differs from the Statewide Nesting Beach Survey program in collecting more detailed data from a smaller set of index beaches. Surveyors identify each sea turtle track to species, identify the tracks as a nest or abandoned attempt, and locate nests within an approximate half-mile beach zone. Nests and nesting attempts have been monitored for 13 years at 478 index beach zones surveyed daily during each 109-day season, an effort that currently provides over 4 million records in the Index Nesting Beach Database. Annual surveyor training, on-site verification, and consistency of the methods used during the thirteen years of the program and among the 396 km of index beaches make the resulting database a representative and unbiased assessment of sea turtle nesting. The program provides a reliable indication of temporal and spatial trends in Florida sea turtle abundance.

Coastal armoring research data from 2000 were compiled, verified, plotted in Arc View, analyzed and reported. We completed data collection for our 2001 coastal armoring inventory project. We currently have mapped all structures on 200 miles of randomly selected stretches of turtle nesting beach around the State of Florida. These sampling sites were split up into ten 5-mile stretches of beach in each of the four regions of the state (i.e., Northeast, Southeast, Southwest and the Panhandle). In addition to the randomly selected stretches of beach, we have mapped all structures on the 31 Index Nesting Beaches. All data have been entered into Arc View and are currently being analyzed and plotted for publication. We have applied for additional funding to complete this mapping project.

## Biology, Ecology, Life History, Migration

Most research on marine turtles has been conducted on the nesting beach although turtles spend only a small fraction of their lives there. Recovery efforts depend on a broad knowledge of population biology, life history, ecology and migrations. Ongoing projects in the Western Florida Current, Florida Bay, Bermuda, and Panama involve capturing live animals at sea. Studies target four species of marine turtles and several life history stages, and address population structure (including natural sex ratios), growth rates, genetic identity, life history, health, diet, habitat preferences, and migrations.

In 2000, FMRI captured 87 post-hatchling loggerheads during excursions to the Western Gulf Stream off Central Florida. Staff recorded physical oceanographic measurements, turtle behavior, their relationships to floating objects and other organisms, turtle weights and measures, and evidence of ingested plastics and tar. The data help describe the importance of certain oceanographic surface features to young sea turtles and help researchers understand threats to sea turtle survival that occur there. A manuscript entitled, "Ecology of neonate loggerheads inhabiting lines of down welling near a Gulf Stream front" was published by the journal *Marine Biology*.

In June 2002, 98 sea turtles were captured during a sampling session in Florida Bay. All animals were measured, tagged, and released. Twenty-two of the turtles had been previously marked, providing data on residency in Florida Bay. One turtle was closely tracked for a period of 24 hours as part of a larger study to investigate the patterns of habitat use and the behavior of loggerheads in Florida Bay.

As part of a cooperative research project with the government of Bermuda, 110 green turtles were captured in nets, tagged and released during 2001. Over 2500 green turtles have been tagged as part of this project, which has been ongoing since 1968. DNA sequence data have shown that the one-third of the population of immature green turtles that inhabit Bermuda waters are derived from Florida nesting beaches. DNA sequence data analyzed and presented in 2002 showed that hawksbills in Bermuda waters are derived from Cuba, U.S. Virgin Islands, Mexico, and Costa Rica. Captures of flipper-tagged turtles from this project have documented migrations to feeding grounds in Nicaragua, Cuba, Florida, the Dominican Republic, Panama, Venezuela, St. Lucia, and Grenada, showing the need for international cooperation in research and management of this endangered species. In conjunction with field sampling in Bermuda, staff co-taught a short course on the Biology and Conservation of Sea Turtles to ten resource managers and students drawn from Belize, Bermuda, Cuba, Grenada, Nicaragua, and the United States.

Data on sex, size, maturity, and genetic identity were collected from 12 green turtles (*Chelonia mydas*), 5 hawksbills (*Eretmochelys imbricata*) and 1 loggerhead (*Caretta caretta*) captured in nets or on the nesting beach at Zapatilla Cays, Panama. Satellite transmitters were attached to both the male and female of a pair of mating green turtles to study migratory behavior, track movements and identify migratory corridors. Both turtles traveled to the major nesting beach at Tortuguero, Costa Rica, and eventually on to feeding grounds in Nicaragua. Captures of flipper-tagged turtles from this project have documented migrations to feeding grounds in Nicaragua, Costa Rica, Colombia, and Cuba. Genetic studies conducted by staff as part of this project were published in the journal *Animal Conservation* in 2002 showing that 65-70% of the loggerheads in developmental habitat at the study site were derived from South Florida nesting beaches.

## Scientific Consultation with Management and Educational Outreach

The Proceedings of the 20<sup>th</sup> Annual Sea Turtle Symposium (365 pages) compiled by FMRI staff were published in 2002 as a NOAA Technical Memorandum. Staff conducted five training workshops around the state for 260 permit holders who conduct surveys of turtle nesting beaches. FMRI also shared expertise at several training workshops sponsored by other institutions, including U.S. Fish & Wildlife Service's Coastal Ecosystems and Federal Activities Technical Training Symposium, the Third International Workshop on Marine Mammal and Sea Turtles Strandings held in Mexico, the Guanahacabibes Sea Turtle Research and Conservation Workshop in Cuba, and the USFWS/NMFS sponsored Caribbean Hawksbill Protocol meeting in Miami. Staff served on the U.S. delegation to the Second CITES Wider Caribbean Region Hawksbill Turtle Dialogue Meeting in the Cayman Islands 21-23 May. FMRI marine turtle staff served on several additional scientific advisory boards, recovery teams (including the Loggerhead Recovery Team), expert working groups and graduate committees. Staff reviewed numerous research proposals for the Bureau of Protected Species Management. For educational outreach, sea turtle staff gave presentations to school groups at MarineQuest, presented five posters at the Annual Symposium on Sea Turtle Biology and Conservation in Miami, participated in the Great American Teach-in, hosted a 30-minute live broadcast educational program for Project Oceanography (University of Florida), and attended several festivals and expositions around the state to promote sea turtle conservation. In addition, the FMRI website ([www.floridamarine.org/features/category\\_main.asp?id=1289](http://www.floridamarine.org/features/category_main.asp?id=1289)) was updated with new articles, interviews, data, and video footage of research activities and turtle nesting in order to broaden educational outreach and improve efficiency in Florida's sea turtle data distribution. Staff designed, filmed and narrated a 35-minute training video on how to conduct sea turtle nesting surveys that was distributed to 120 permit holders and to several international organizations.

**BUDGETARY NEEDS FOR FLORIDA FISH AND WILDLIFE CONSERVATION  
COMMISSION**

Total budgetary needs of the FWC endangered species programs in FY 2003-2004 will be approximately \$ 15,976,846 million (Table 4). These needs include funding to maintain current programs, in addition to anticipated awards from new federal grants, that are designed to assist development of new recovery programs which include assistance to local governments and private individuals for development of conservation plans, acquisitions and private conservation efforts to benefit listed species.

Table 5. Projected FWC Endangered/Threatened Species Budgetary Needs in FY 2003-2004.

<b>Nongame Wildlife Trust Fund (NGWTF)</b>	<b>\$5,109,601</b>
State	\$311,061
Federal recurring spending authority	\$2,842,290
Federal <i>new</i> spending authority	\$1,956,250
<b>Florida Panther Research &amp; Management Trust Fund (FPRMTF)</b>	<b>\$2,447,460</b>
<b>Save the Manatee Trust Fund (STMTF)</b>	<b>\$4,311,624</b>
<b>Marine Resources Conservation Trust Fund (MRCTF)</b>	<b>\$4,108,161</b>
<b>Total</b>	<b>\$15,976,846</b>