FISCAL YEAR 2004

U.S. FISH AND WILDLIFE SERVICE
FISHERIES RESOURCES

PANAMA CITY FIELD OFFICE
PANAMA CITY, FLORIDA

Organization Code: 41310
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INTRODUCTION

The Bureau of Sport Fisheries and Wildlife established a field office in Panama City, Florida, in 1968. The office was shared by Fishery Research, Fishery Services, and Law Enforcement. The focus of the Fisheries Office was restoration of Gulf of Mexico anadromous fish stocks, especially Gulf strain striped bass. Other program priorities have been developed since the office was established. These currently include: providing technical assistance for the management of fishery resources on Federal lands in Florida and Georgia (1970s); restoration and recovery of Gulf sturgeon (1980s); ecosystem monitoring on Eglin Air Force Base (Eglin) (1999); Partners for Fish and Wildlife (2000); freshwater mussel restoration, recovery, and conservation (2002); Okaloosa darter recovery (2002); and fish passage (2002).

In January 1987, the Fisheries Resources Office (FR) was reorganized as a combined office with Ecological Services (ES) under one Project Leader at the Panama City Field Office (PCFO). Since that date, both programs have benefited by pooling the office's resources to implement the mission of the U.S. Fish and Wildlife Service (USFWS). During FY03, the fisheries staff was reduced as one biologist (Laura Jenkins) began working intermittently. This position, Recreational Fisheries Biologist, was not filled due to budget constraints until FY05. During the summer of FY04, an additional SCEP student was placed in the office to provide technical assistance. Currently, the staff consists of five biologists, two student conservation association interns, one office assistant and other support staff shared with ES (Table 1; Figure 1). PCFO is located at 1601 Balboa Avenue, Panama City, Florida 32405. Contact PCFO by phone at (850) 769–0552 or by fax at (850) 763–2177.

Panama City Fisheries Resources Office Staff during FY 2004

<table>
<thead>
<tr>
<th>Staff Name</th>
<th>Status</th>
<th>Program Lead</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holly Blalock-Herod</td>
<td>FTE</td>
<td>Freshwater Mussel Recovery and Restoration</td>
</tr>
<tr>
<td>Gail Carmody</td>
<td>FTE*</td>
<td>Project Leader</td>
</tr>
<tr>
<td>Jeffrey Herod</td>
<td>4-yr Term</td>
<td>Eglin, Ecosystem Monitoring Using Fishes</td>
</tr>
<tr>
<td>Kelly Huizenga</td>
<td>SCA Intern</td>
<td>Technical Assistance Mussels – Sept. 2003 to current</td>
</tr>
<tr>
<td>Bob Jarvis</td>
<td>FTE*</td>
<td>Biological Technician</td>
</tr>
<tr>
<td>Laura Jenkins</td>
<td>INT**</td>
<td>Striped Bass Restoration</td>
</tr>
<tr>
<td>David LaPlante</td>
<td>SCA Intern</td>
<td>Technical Assistance Eglin – June 2003 to June 2004</td>
</tr>
<tr>
<td>Chris Metcalf</td>
<td>FTE</td>
<td>Partners for Fish and Wildlife</td>
</tr>
<tr>
<td>Frank Parauka</td>
<td>FTE</td>
<td>Gulf Sturgeon Recovery</td>
</tr>
<tr>
<td>Barbara Stanley</td>
<td>FTE</td>
<td>Office Automation Assistant</td>
</tr>
<tr>
<td>Theresa Thom</td>
<td>SCEP</td>
<td>Eglin, Ecosystem Monitoring Using Aquatic Insects</td>
</tr>
</tbody>
</table>

* Indicates FR staff shared with Ecological Services.
** Intermittent
Figure 1. Fish and Wildlife Service, Panama City Field Office staff. Back Row, left to right: Hildreth Cooper (ES), Patty Kelly (ES), Holly Blalock-Herod (FR), Mike Brim (ES), Stan Simpkins (ES), Gail Carmody (ES/FR Project Leader), Chris Metcalf (FR), Frank Parauka (Fr), Barbara Stanley (FR), Jeffrey Herod (FR), Kathy Hoffmaster (ES), Jerry Ziewitz (ES), Bill Lynn (ES), Connie Bowman (Contractor), Mary Mittiga (ES), Jon Hemming (ES), Paul Lang (ES), Denise Hinegardner (ES). Front Row, left to right: Wendy Gierhart (ES), Janet Mizzi (ES – Assistant Project Leader), Lorna Patrick (ES), Laura Jenkins (FR). (Photo taken at Florida State University Ed Ball Marine Laboratory, November 2003).
HIGHLIGHTS FOR FY 2004

1. Completed the second of a 3-year Gulf sturgeon population estimate on the Escambia River, Florida.

2. Completed the first of a 2-year Gulf sturgeon population estimate on the Apalachicola River, Florida.

3. Conducted Gulf sturgeon presence-absence surveys in three other Florida river systems.

4. Documented Gulf sturgeon marine habitat use in the near shore waters of the Gulf of Mexico.

5. Identified environmental threats to Gulf sturgeon spawning habitat in the Choctawhatchee River, Florida.

6. Initiated a study to document Gulf sturgeon spawning with the collection of fertilized eggs in the Yellow River, Florida.

7. Implemented Gulf Striped Bass Restoration Plan by coordinating the 21st Annual Morone Workshop, leading the technical committee, transporting broodfish, and coordinating the stocking on the Apalachicola-Chattahoochee-Flint (ACF) river system.

8. Over 86,000 Phase II Gulf striped bass were marked with sequential coded wire tags and stocked in Lake Seminole and the Apalachicola River. Post-stocking evaluations were conducted at 31 sites.


10. Fishery surveys were conducted on Tyndall Air Force Base and St. Marks and St. Vincent National Wildlife Refuges.

11. Habitat evaluations and population surveys were completed at 153 Okaloosa darter stream sites.

12. Aquatic insect biomonitoring and identification of over 39,000 individual aquatic macroinvertebrates was completed and provided to Eglin Air Force Base.

13. Ten years of fishery data from Okefenokee and Banks Lake National Wildlife Refuges was analyzed with recommendations incorporated into the refuge Comprehensive Conservation Plan.

14. A draft mussel sampling protocol was tested in wadeable streams in northwest Florida and southwest Georgia.
15. Implemented recovery plan and candidate conservation actions for 14 listed and candidate freshwater mussels in the Northeast Gulf Watersheds.

16. Worked with partners in developing the Spring Creek Watershed Partnership in the Flint River basin, Georgia.

17. Multiple stream restoration and watershed management projects were initiated or completed. A total of 6.8 stream miles were restored for stream fishes, along with 56.4 miles of coastline were enhanced for sea turtle lighting. A total of 135 acres of wetlands and 58 acres of understory habitat were restored.

18. Multiple outreach projects were completed to detail aquatic resources conservation needs and opportunities. Participated in National Fishing Week event, BASS ProShops event, several festivals, and school outreach.

**PROGRAMMATIC OPERATIONS**

I. Gulf Sturgeon Recovery

**Gulf Sturgeon Population Survey - Apalachicola River, Florida**

The Gulf Sturgeon Recovery/Management (GSRM) Plan emphasizes that the knowledge of Gulf sturgeon distribution and relative abundance are important components in evaluating the success of recovery and management programs. The first year of a two year Gulf sturgeon population survey was conducted in the Apalachicola River from June 2 to August 10, 2004. The fish were captured above and just below the buoy line at Jim Woodruff Lock and Dam (JWLD) during ten sample periods using six sinking gill nets (8 ft to 12 ft deep; 150 ft long; 3 in to 9 in stretch mesh) set to fish for 90 minutes. All sturgeon captured were weighed and measured (fork length and total length). Each fish was tagged with a Passive Integrated Transponder tag (PIT) injected into the tissue at the base of the dorsal fin, and T-bar anchor tags attached to both pectoral fins.

Ninety-nine fish weighing from 2 - 155 pounds and ranging in total length from 26 - 88 inches were collected in the survey. Sub adults, fish weighing <40 pounds, represented 61% of the sample and large fish (>100 lbs in weight) accounted for 10%. Thirty two percent of the fish had been previously tagged. The population of Gulf sturgeon in the Apalachicola River below JWLD was estimated at 350 fish using the modified Schnabel program (95% Confidence Interval 221-648).

The number of sub-adults represented in the 2004 sample is less (61%) than in 1999 (73%). Two, three and four year old fish were well represented in the 1999 sample and continued as strong year classes in the 2004 sample. Also, the number of large fish collected increased from 4% in 1999 to 10% in 2004. Furthermore, with the large number of potential spawning adult fish (39%) recorded in the 2004 sample, the Gulf sturgeon population would be expected to increase in future years if spawning habitat is available and water flow and temperature are
conducive to natural reproduction. The population estimate of Gulf sturgeon below JWLD was slightly higher (350 fish) than the 1999 estimate (321 fish).

**Recommendations:**

**A. Conduct second year of the Gulf sturgeon population study in the Apalachicola River**

**Gulf Sturgeon Population Survey - Escambia River, Florida**

The second year of a three year Gulf sturgeon population survey was conducted in the Escambia River from October 6 to November 5, 2003, to coincide with the species fall migration from freshwater to the marine environment. Gulf sturgeon were captured from dawn to dusk using four stationary sinking gill nets (8 ft to 20 ft deep; 150 to 250 ft long; 5 in to 14 in stretch mesh) set perpendicular to the river bank, covering about 75% of the river. Fish were also collected by drifting a 200 ft long gill net (12 ft deep; 9 in stretch mesh) upstream of the stationary nets. A houseboat anchored at the netting site provided a base of operations and living quarters for personnel conducting the survey. All sturgeon captured were weighed and measured (fork length and total length). Each fish was tagged with a PIT tag injected into the tissue at the base of the dorsal fin, and T-bar anchor tags attached to both pectoral fins.

One-hundred and seven Gulf sturgeon weighing from 1-158 pounds and measuring from 19-90 inches in total length were collected in the survey. Sub-adults represented 43% of the sample and fish over 100 pounds accounted for 20% of the fish collected. The Gulf sturgeon population estimate for the Escambia River in 2004 was 573 fish using the program NOREMARK with a 95% CI of 402-745. The Gulf sturgeon population estimate for 2003 was reported at 687 fish with a 95% CI of 316-1058, this estimate has been modified to reflect additional data and the correct populations estimate for 2003 is 558 fish with a 95% CI of 83-1033. The Escambia River has more potential sturgeon spawning habitat than all other Florida panhandle river systems combined. It is expected that with the large number of adults in the 2004 sample that natural reproduction would occur in future years and the Gulf sturgeon population would increase significantly.

**Recommendations:**

**A. Conduct third year of the Gulf sturgeon population study in the Escambia River drainage.**
Gulf Sturgeon Investigations in Other River Systems

Gulf sturgeon were collected with sinking and drift gill nets in the Ochlockonee (N=7), Choctawhatchee (N=12), Yellow (N=18) and Brothers (N=59) rivers in Florida during FY 2004. The fish weighed from 1 to 167 pounds and measured up to 85 inches in length. A representative number of fish from five Florida panhandle river systems were equipped with external sonic tags and three fish from two rivers were outfitted with archival pop-off tags in order to monitor marine movement and habitat use (see Gulf sturgeon marine habitat use).

Recommendations:
A. Continue to investigate river systems for the presence of Gulf sturgeon.
B. Describe habitat types that Gulf sturgeon are using.

Gulf Sturgeon Marine Movement and Habitat Use

Priority actions items identified in the GSRM Plan include identification of estuarine and marine habitat use by Gulf sturgeon. It is during the over-wintering period in marine waters than most of the feeding and growth occurs for Gulf sturgeon. Three Gulf sturgeon (Escambia River- N=2, Ochlockonee River-N=1) were equipped with archival pop-up tags that were attached to the base of the dorsal fin with 100-pound monofilament line. The tags record water temperature, depth, and light penetration (to calculate geo-location) and were programmed to release from the fish during the first week in February 2004 and transmit the accumulated data to a satellite. In addition, Gulf sturgeon from five river systems (Ochlockonee- N=11; Apalachicola-N=11;
Yellow-N=15; Escambia-N=17; Choctawhatchee-N=22) were equipped with sonic tags externally attached to the base of the dorsal fin. The tags operated at frequencies of 32 to 40 kHz and had an 18-month battery life.

The pop-off tags prematurely detached from the fish and provided very little information. The tag from the Ochlockonee River fish was recovered by a boater in the river just downstream from the release site. Beach walkers found both Escambia River pop-off tags on the Gulf of Mexico side of the beach west of Pensacola, Florida; one near Gulf Shores, Alabama and the other near Mobile Point, Alabama. Both tags were damaged.

PCFRO and National Marine Fisheries Service biologists conducted telemetry searches from January through March, 2004 for tagged fish from Apalachee Bay, Florida to Horn Island, Mississippi. Much of the tracking was in the Gulf of Mexico and followed the coast staying one mile off shore and stopping every mile to monitor for tagged fish. In addition, a number of telemetry searches were conducted in the Intercoastal Waterway and the bays entering the Gulf.

Sixty-five percent of the fish tagged in the Escambia, Yellow and Choctawhatchee rivers were located. The majority of relocations were in the Gulf of Mexico, from Gulf Breeze, Florida to Mobile Point, Alabama. These fish were located from a half to two miles off shore in 12 to 40 feet of water. A number of fish tagged in the Choctawhatchee River overwintered in Choctawhatchee Bay. These fish were located along the north side of the bay, from 300 to 1000 feet from shore in 3 to 10 feet of water. Substrate at both areas consisted of sand and shell. Two of 11 fish tagged in the Apalachicola River were located in the Gulf of Mexico off Dog Island about a half mile from shore in 15 feet of water. None of the 11 fish tagged in the Ochlockonee River were located in the marine waters. This is a joint project with Eglin Air Force Base, NOAA-Fisheries, and USGS.
Gulf Sturgeon Restoration and Recovery Coordination

The Panama City Fisheries Assistance Office participated in a Gulf Sturgeon Workshop where Federal, state and university researchers presented technical and scientific information regarding current Gulf sturgeon studies. In addition, the workshop stressed the need to address the priority action items identified in the GSRM Plan in order to achieve successful recovery of the species. Additionally, Panama City biologist assisted biologists from Florida Aquatic Preserves, Dept. of Environmental Protection, and US Geological Survey conducting Gulf sturgeon investigations in the Yellow River, FL. Panama City biologist also provided technical assistance relating to Gulf sturgeon recovery to Louisiana Fish, Wildlife and Parks, Georgia Department of Natural Resources, Alabama Division of Wildlife and Fisheries, Florida Fish and Wildlife Conservation Commission, Southern Mississippi University, University of Florida, US Army Corps of Engineers, Eglin Air Force Base and Gulf Coast Research Laboratory.

Gulf Sturgeon Spawning Documentation – Yellow River, Florida

The Gulf Sturgeon Recovery/Management Plan emphasizes that the knowledge of factors affecting the survival rate of Gulf sturgeon are essential for recovery of the species. The Plan stresses that to ensure successful recovery and management of the Gulf sturgeon, life history must be better understood. Several life history studies were initiated or continued in FY04.
A priority task addressed in the Gulf Sturgeon Recovery Management Plan is to identify essential habitats and conduct field investigations to locate important spawning habitats. Panama City Field Office personnel initiated a study in FY04 in the Yellow River Alabama/Florida to document Gulf sturgeon spawning with the collection of fertilized eggs. Fifty egg collection pads were placed across six potential Gulf sturgeon spawning sites during the spring in order to coincide with the species normal spawning period. The eggs pads were inspected every other day for the presence of eggs. Low river conditions limited boat travel and flooded conditions during several periods hampered the project. No eggs were recorded during the study. The project is slated to be conducted again in FY05. The project is important because a dam impounding 10,000 acres is proposed to be constructed on the Yellow River which would block the Gulf sturgeon from the available spawning habitat.

Figure 4. Fish and Wildlife Service volunteer preparing to deploy egg collection pad in the Yellow River.

Gulf Sturgeon Genetic and Parasite Analysis

Partnerships were continued to examine genetic data and parasite fauna. Tissue samples from 46 Gulf sturgeon collected in the Escambia, Choctawhatchee and Ochlockonee Rivers were submitted to University of Southern Mississippi (USM) researchers as part of a study to determine the genetic makeup of Gulf sturgeon in FL, MS, and LA waters. Also, USM researchers accompanied PCFO biologists during a netting survey on the Escambia River and removed external parasites from captured Gulf sturgeon for identification and classification. Reports will be submitted by the researchers upon completion of the study.
Benthic Invertebrate Survey for Gulf Sturgeon Diet Analysis

A study was initiated to collect and analyze benthic macro-invertebrates from six sites off the northern Florida shallow coastal areas where Gulf sturgeon are believed to forage. A priority action item identified in the Gulf Sturgeon Recovery Management Plan is to identify the marine habitat used by Gulf sturgeon. Most of the growth and feeding for the Gulf sturgeon occurs during the winter in the marine environment. Six coastal sites, located off Panama City and Perdido Key, Florida were sampled for benthic invertebrates. Telemetered Gulf sturgeon from three different river systems were located at the sample sites. Twenty-four benthic samples were taken from each site, 12 of which were shallow water (15-20 ft) and 12 were deep water (25-40 ft). The deeper samples yielded richer and denser populations of benthic organisms. Annelids comprised the main group of organisms collected and with the exception of the high density of tube building polychaetes collected at the deep Perdido Key sample, little difference in benthic invertebrate populations was noted between the two study areas. Additional benthic studies of the marine habitat are recommended for FY05.

Environmental Threats to Gulf Sturgeon Spawning Habitat

The GSRM Plan states the need to identify, restore, and protect habitats essential for various life stages of the Gulf sturgeon. Forty miles of the Choctawhatchee River were floated with the purpose of identifying environmental disturbances that may threaten Gulf sturgeon spawning habitat. Threats documented during the survey included: sediment runoff from bridge crossings, boat ramps, dirt roads, uncontrolled range land and pastures, eroded river banks and point and non-point discharges. Efforts will be initiated to solicit government and non-government agencies, groups and individuals to work with landowners to undertake habitat conservation practices and minimize the number of environmental threats to Gulf sturgeon spawning habitat.
Figure 5. Location of habitat threats relative to Gulf sturgeon spawning/resting areas.

Figure 6. High priority threat area showing sediment input from an unpaved road.
II. Striped Bass Restoration

Apalachicola/Chattahoochee/Flint River System Striped Bass Restoration

Gulf of Mexico striped bass restoration activities are guided by the Apalachicola-Chattahoochee-Flint (ACF) River System Restoration and Evaluation Plan that implements the ACF Cooperative Agreement which is a component of the Gulf States Marine Fisheries Commission (GSMFC) Gulf Striped Bass Fishery Management Plan. As part of this partnership restoration effort, PCFO coordinates many activities including: 1) an annual meeting with the cooperating agencies in order to report progress and to discuss stocking goals and future directions, 2) technical coordination and assistance to states, 3) stocking strategies and implementation of the stocking plan, and 4) transportation of broodstock collected by State resource agencies in Florida and Georgia, with fish transportation to the hatchery provided by the PCFO, Welaka NFH (FL) and Warm Springs NFH (GA). PCFO also serves as the lead for the ACF striped bass technical committee, which meets annually to discuss status of plan implementation and consists of at least one member from each participating agency. In FY04 the ACF striped bass technical committee updated and revised the 5 year restoration and evaluation plan. Publication of the plan is expected in December 2004. PCFO is also a member of the GSMFC Anadromous Fish subcommittee. Copies of minutes from the annual *Morone* Meeting or the ACF striped bass technical committee are available at PCFO.

**Recommendations:**

A. **Continue to participate in the annual *Morone* meetings and provide technical assistance.**

B. **Continue to lead the ACF technical committee.**

Hatchery Product Evaluation of Phase II Gulf Striped Bass Stocked in the Apalachicola River, Florida

The Service signed a cooperative agreement in 1987 with the states of Alabama, Florida, and Georgia to restore a self-sustaining stock of striped bass in the ACF river system and to maintain the genetic integrity of the Gulf race striped bass. This agreement was established to restore and protect this depleted nationally significant inter-jurisdictional fishery resource. In FY04/05, 62,834 Phase II fish were stocked in 4 locations in the Apalachicola River below JWLD, and 23,968 Phase II fish were stocked in Lake Seminole. All fish were marked with a coded wire tag. A post stocking evaluation was conducted in October 2004 at thirty one sites with a boat electrofisher to determine survival of stocked fish and success of stocking locations. A total of 11 striped bass, 46 hybrid striped bass, and 34 white bass were collected during 17.9 hours of electrofishing. Of the striped bass caught, only three fish had coded wire tags. Otoliths were removed from all other striped bass in an effort to detect oxytetracycline (OTC) marks applied to striped bass stocked as Phase I’s into Lake Seminole. Electrofishing survey catches equated to catch per unit effort (CPUE) values of 0.6 fish/hr for striped bass, 2.6 fish/hr for hybrid striped bass, and 1.9 fish/hr for white bass. CPUE of coded wire tagged striped bass stocked as Phase II’s was 0.17 fish/hr or 0.14 fish/hr/100,000 stocked. This number is down from 0.39 fish/hr/100,000 stocked in FY03. This study will continue through FY07 to determine the relative contribution of the Phase I, Phase II, and wild fish to the broodstock.
Approximately 11,250 Phase II striped bass were marked with internal anchor tags and stocked in Lake Seminole and 3 locations in the Apalachicola River in FY03. Angler tag returns (N=12) amounted to less than .01% with most fish being caught near the stocking locations. Despite the low number of striped bass tag returns, anglers reported good numbers of untagged striped bass caught of the same size as the tagged fish and in the same general area. Ten percent of the Phase II striped bass stocked in FY06 will be marked with internal anchor tags to evaluate survival, movement and habitat use.

**Recommendations:**

A. Continue fall evaluations of contribution of Phase I, Phase II, and wild striped bass to the broodstock.

B. Conduct a FY05 spring and summer evaluations to compare cost/benefits of evaluation times.

Figure 7. Fall sampling to determine stocking success of Gulf race striped bass in the Apalachicola River. Fish and Wildlife Service and Florida Fish and Wildlife Conservation Commission biologists shown here are identifying, enumerating, and measuring fishes collected.
III. Fishery Assistance on Federal Lands – Department of Defense

Tyndall Air Force Base, Florida

A fishery survey was conducted on Tyndall Air Force Base (AFB) at 3 sites totaling 110 acres. The purpose of the fishery survey was to provide managers information and management practices relating to the aquatic habitat and the fish community. The cursory fishery investigation indicated that all sportfish populations were below average in physical condition. Also, the numbers of quality fish recorded in the survey were low and not indicative of a balanced fish community. Fish habitat was lacking and habitat enhancement programs are suggested to maintain the health and balance of the fishery. Water quality measurements were within the range to maintain a quality fisher. A more comprehensive investigation of the aquatic habitat and fish community on Tyndall AFB is recommended in order to provide base Natural Resource staff a detailed plan to help manage the fishery.
**Eglin Air Force Base, Florida**

Adaptive Management of Recreational Fisheries on Eglin Air Force Base

Recreational fisheries on Eglin AFB are dominated by headwater and mid-reach impoundments which are naturally nutrient poor, acidic, low species richness, and require high levels of structural and biological maintenance. PCFRO approach was to examine the level of need for technical assistance, determining the types of technical assistance, and developing management strategies and waterbody specific component plans that will allow adaptive management of natural communities, lessen disturbance of artificial structures, and integrate management of lentic systems into the current Stream Assessment Program (SAP). During FY04, PCFRO examined Indigo Pond fish stocks, recreational pressure, enforcement needs, stocking requirements, and long-term management needs as a starting point for recreational fisheries technical assistance on Eglin AFB. Eglin has provided a request for assistance in FY05 on 8 out 23 additional ponds following the work accomplished at Indigo Pond in FY2004.

Figure 9. Fish and Wildlife Service biologists and SCA volunteers electrofishing at Indigo Pond.
Aquatic Ecosystem Adaptive Management Plan

Eglin Air Force Base (AFB) is a 465,000 acre reservation that is home to one of the most unique and diverse aquatic faunas in Florida, including the endangered Okaloosa darter. The reservation contains 744 river miles in diverse habitats ranging from nearly pristine to heavily impacted. Study plans examine the incorporation of a stepwise approach using fishes and insects to assess stream condition. Assessments using fishes are developed from peer-reviewed metrics and techniques (e.g., diversity, index of biotic integrity). The 4 indices used for aquatic insects are a diversity index, index of biotic integrity, Florida Index, and EPT Index (referring to the three sensitive orders of insects; Ephemeroptera, Plecoptera, Trichoptera). Quantitative samples of study reaches were evaluated for fishes and aquatic invertebrates. Databases were developed and integrated with Eglin's overall ecosystem management database. Peer review of the annual scope of work was obtained from the Eglin Working Group for Ecological Management. In FY04 aquatic insect and fish surveys were completed. Data analysis is underway with emphasis on integration of data from reach level into watershed and landscape scale. A final report outlining our recommendations for aquatic monitoring at Eglin is due in FY05. It will include calibrated and tested scientific index tools to assess stream health.

Okaloosa Darter Recovery

The vast majority of the range of the endangered Okaloosa darter is on Eglin AFB. At Eglin AFB managers requested a review of stream restoration needs and a discussion was initiated about potential restoration sites, prioritization of tasks, and ground-truthing needs. Active coordination has led to restoration of numerous highly erodible sites and the acknowledgment of the need to restore hydrology and minimize erosion at road crossings.

PCFRO assisted with incorporating landscape variables into a meaningful scale that suggests a ranking of catchments for threat abatement for the Okaloosa darter. Preliminary versions of models, examine the scores and the difference in model outputs when using submodels or an additive process. This technical tool will provide an additional option to Okaloosa darter recovery for setting restoration priorities.

During FY04, a total of 153 site evaluations in Okaloosa darter streams were completed. These evaluations included aspects of crossing structure identification, habitat, and/or Okaloosa darter population surveys and provided habitat descriptions. In cooperation with partners, PCFRO worked to implement key recovery tasks and set priorities for restoration. PCFRO also provided technical assistance for techniques and design alternatives for road crossing structures. Additionally, PCFRO worked with partners to determine the status of the population by seining to collect data about presence of Okaloosa darter on Eglin AFB and areas near the reservation. Information regarding habitat and water chemistry was reported for these sites.
Figure 10. Fish and Wildlife Service biologist and volunteer sampling for Okaloosa darters at Eglin Air Force Base.

Total Maximum Daily Load Development Support

Compliance based sampling of impaired waterbodies was conducted on Eglin AFB in conjunction with Florida Department of Environmental Protection (FDEP). Streams were sampled and water quality samples were sent for analysis by the FDEP central lab in Tallahassee. Data will be used to determine possible impairment and the need for Total Maximum Daily Load Criteria.

Aquatic Insect Biomonitoring

Aquatic insect biomonitoring and identification of over 39,900 individual aquatic macroinvertebrates, representing 416 unique taxa was completed as part of Fisheries Technical Assistance provided to natural resource managers at Eglin AFB.

As part of biological surveys of freshwater streams in the Florida Panhandle, several aquatic insects have been recorded for the first time in the state of Florida. New state records include the gyrinid beetle *Gyrinus marginellus* (Fall), the chironomid *Nanocladius (Plecoteraeolothus) species #5* (Jacobsen), the damselfly *Hetaerina americana* (Fabricius), and a potential new species of snaketail dragonfly, *Ophiogomphus sp*. Other rare species found in Eglin streams include a burrowing mayfly, *Dolania americana* (Edmunds and Traver); armored mayflies, *Baetisca obesa* (Say) and *B. rogersi* (Berner); and the stonefly *Tallaperla cornelia* (Needham and Smith).
IV. Fishery Assistance on Federal Lands – National Wildlife Refuges

St. Vincent National Wildlife Refuge, Florida

PCFRO biologists conducted a cursory fishery survey in Lakes 3 and 4 to determine fish species structure prior to a scheduled stocking of sportfish. Results of the investigation indicated the ponds are currently out of balance and the bluegill will eventually overpopulate the lakes. Largemouth bass were not collected in the sample. A stocking of largemouth bass in FY05 is scheduled to help to maintain the balance of the fishery. Water quality is adequate for maintaining freshwater sportfish. Future fishery investigations are recommended in order to evaluate management decisions.

St. Marks National Wildlife Refuge, Florida

PCFRO biologist conducted a cursory fishery survey in East River Pool (245 ac) and Stoney Bayou I (301 ac) in order to assess the fishery following the stocking of bluegill, redear sunfish, and largemouth bass in 2000-2001. Also, a fishery survey was conducted in Otter Lake (120 ac) and Lake Renfro (20 ac) to determine fish species structure.

The cursory fishery investigation indicated that most sportfish populations were below average in physical condition. Forage was inadequate for maintaining largemouth bass populations in most instances. A parasitic nematode is infecting the largemouth bass in East River Pool and Stoney Bayou I; however, the parasite in not causing any fish mortalities. The infestation is suspected to be contributing to the poor physical condition noted in the largemouth bass population. Water quality in all ponds was adequate for maintaining a healthy sportfish population. A more comprehensive fishery investigation is recommended in order to evaluate the fishery and provide refuge staff a plan to help manage the recreational sport fishery.

Okefenokee and Banks Lake National Wildlife Refuges, Georgia

PCFRO analyzed 10 years of fishery data from Okefenokee NWR and Banks Lake NWR. Results were presented in the form of 2 posters at the Southern Division AFS meeting. Results from the Okefenokee NWR summary were submitted and accepted for publication in the Proceedings of the Annual Conference of Southeastern Fish and Wildlife Agencies (SEAFWA). The purpose of these summaries was to provide fishery management recommendations to the refuge staff based on 10 years of survey data. Management recommendations were used to develop a strawman strategy for management of Banks Lake NWR and incorporated into the Okefenokee NWR Comprehensive Conservation Plan (CCP). The Banks Lake strawman will promote partnerships with the USFWS, GA-DNR, and B.A.S.S. Information was also provided to Okefenokee NWR related to aquatic nuisance vegetation removal and sources of potential funding.
V. Native Freshwater Mussel Recovery and Restoration

**Freshwater Mussel Survey Protocol**

Within the Southeastern Atlantic Slope and Northeastern Gulf Drainages of Alabama, Florida, and Georgia, the Service has identified a need for a standardized mussel survey protocol that can be used across physiographic provinces. The Service (GA ES and PC FRO) and Georgia Department of Transportation (GDOT) worked cooperatively to develop this DRAFT Mussel Sampling Protocol (Protocol) to ensure that it fulfills the dual objectives of the Service and GDOT. Flex funding was received to test the protocol and to develop a field pocket guide and identification and survey workshop. The protocol was tested in wadeable tributaries of the Choctawhatchee, Chattahoochee, Flint, Ochlockonee, and Altamaha river drainages over various stream types, physiographic provinces, habitats, and with different species to determine effectiveness. During FY04, 17 sites were sampled. Additionally, new habitat data sheets and species checklists were added to the protocol. Minimum distance for surveys may be modified based on survey results. The survey data were presented at the Coosa Summit in December 2004. This presentation is available upon request. The pocket guide and workshop will be developed by Columbus State University through a cooperative agreement.

Recovery of Endangered Ochlockonee Moccasinshell - Ochlockonee Basin, Georgia and Florida

The Ochlockonee moccasinshell has not been located in recent years and is feared potentially extinct. Ecological Services flex funding was received to work with partners in the basin to more fully survey the river for the presence of the endangered mussel and to initiate watershed protection strategies to address water quality or geomorphology issues. In FY04, habitat quality assessments were completed at 187 sites within the Ochlockonee basin. A report is in preparation that defines habitat survey methods, existing habitat quality, and recommendations and prioritization of sites for protection or restoration. Ochlockonee mussel surveys were also completed during FY04. A final report detailing mussel distribution is in preparation.

Figure 11. Mussels collected from the Ochlockonee River.
Geographic Information Systems Database for Freshwater Mussel Sampling Sites

During the past two centuries, over 800 unique sites have been sampled for mussels from North Eastern Gulf (NEG) Coastal drainages in Alabama, Georgia, and Florida. These data are available in published and unpublished manuscripts, field notes, and museum records but have not been compiled in one uniform catalogue. In order to initiate freshwater mussel conservation actions in NEG aquatic systems, a consolidated approach was needed to track mussel sampling site locations. A GIS database was established to serve as a host for data from any sites sampled for mussels in NEG rivers to: 1) provide one system to combine records from various reports and published literature; 2) track ongoing survey sites; 3) identify locations of past and present communities that support(ed) federally listed or other species considered imperiled; 4) determine where data gaps exist; and 5) aid in the decision-making process concerning habitat restoration, long-term monitoring, and permitting/consultation issues. The database consists of linked tables that contain locality, collection, and species information, along with a spatial component of these locations. QA/QC procedures are performed by personnel at PC FRO and PC ES. During FY04, PCFO continued to assist in updating the database with historical and new occurrences and is still under construction.

Recovery Planning: Endangered, Threatened, and Imperiled Northeast Gulf Freshwater Mussels

Freshwater mussels are significantly imperiled in the Northeast Gulf watersheds. In FY04 several studies were funded through Fisheries and ES flex funding and agreements were developed to evaluate: status and habitat of the Chipola slabshell; historical and current habitat within the Chattahoochee and Flint Rivers for listed species; status, habitat, and reproductive condition of candidate mussel species; and develop a mussel workshop, poster, field guide and LE pamphlet. These projects are all ongoing with various state and NGO partners. In addition, a recovery plan and candidate conservation actions were implemented by developing grant and co-op agreements for 14 listed and candidate freshwater mussels in the Northeast Gulf Watersheds.

VI. Partners for Fish and Wildlife

Spring Creek Watershed Partnership

The Panama City Fisheries Office and Georgia Ecological Services has partnered with the Northeast Gulf Ecoteam in developing a Spring Creek Watershed Partnership (Partnership) to facilitate conservation action and environmental stewardship for natural environments surrounding areas of Spring Creek, Georgia. On October 8, 2003, a conservation agreement was signed between local, state, and federal governments and non-profit organizations. The Partnership will lead habitat restoration and protection through community development and private landowner participation projects. Threatened and endangered mussel species (i.e., shiny-rayed pocketbook, Gulf moccasinshell, and oval pigtoe) and several imperiled fish species (i.e., spotted bullhead, bluestriped shiner, and striped bass) will benefit.
The Spring Creek watershed is degraded due to erosion and other water quality concerns. As part of the Spring Creek Watershed Partnership, the Service is conducting a basin wide assessment to determine all non-point and point source pollution that may affect Spring Creek. There are several areas of concern including streambank erosion, riparian buffers, agricultural uses, unpaved roads/stream crossings, fish passage, natural springs, and irrigation uses. Initial assessments have focused on stream habitat and streambank erosion. Unpaved road/stream crossing interactions and cattle access have been assessed as well.

**Cofty Streambank Restoration Project.** As part of the Spring Creek Watershed Partnership, several sites have been identified as potential restoration sites to control sedimentation due to streambank erosions. The Cofty site is located along the mainstem of Spring Creek, south of Colquitt, Miller County, Georgia. A streambank restoration project is being proposed to stabilize approximately 250 feet of highly eroding streambank. Past land used practices and loss of riparian vegetation has created extreme bank erosion. The project will consist of sloping back the left bank to about a 3:1 angle, reestablish a bankfull bench, and install bank stability structures using vanes. Two j-hook vanes will be installed using rootwads, logs, and some native rock material as indicated in attached construction specifications. Bioengineering using native shrubs, grasses, and trees will be planted on all exposed soils. Design surveys were completed during FY04, which included detailed land surveying techniques and stream channel geomorphic analyses.
conditions. Section 404 permit application has been submitted and awaiting approval. Project construction should begin sometime in May 2005.

Figure 13. Streambank restoration project, Miller County, Georgia.

*Laurel Bush Springs Restoration Project.* Also as a part of the Spring Creek Watershed Partnership, several restoration sites have been identified to control sedimentation due to development and improper stormwater management. The Laurel Bush Spring site is located along the mainstem of Spring Creek, north of Colquitt, Miller County, Georgia. This project has been impacted by sedimentation from stormwater runoff and lack of agricultural best management practices. The first part of the project consisted of removing almost a hundred cubic yards of sediment from the spring head, which was completed in February 2004. An excavator and front end loader were used to remove the sediment from the spring. The second part of the project will consist of stormwater retention before entering the spring. This will reduce any sediment being conveyed by the stormwater channel directly into the spring head. By reducing sedimentation and flow from the natural spring head, Spring Creek will be enhanced.
Figure 14. Post-project restoration on Laurel Bush Springs project, Miller County, Georgia.

Unpaved Road Interagency Team

The Unpaved Roads Interagency Team (URIT), in Florida, was developed as a collaborative effort among government agencies, NGOs, and other interested parties to expedite the design and implementation of unpaved road-stream crossing projects, programs, and technological tools needed to ensure the recovery and conservation of aquatic and wetland ecosystem water quality and habitat functions in northwest Florida. The goal of this Agreement is threefold: significantly reduce the sedimentation of aquatic and wetland resources associated with unpaved roads and road-stream crossings in northwest Florida; develop cost-effective approaches for managing and maintaining unpaved road-stream crossings; and establish a proactive approach to address aquatic resource issues and concerns. A Conservation Agreement between all active parties was drafted in FY04 and should be signed in FY05. A GIS layer of all unpaved road/stream crossings has been completed. BMP's are in the process of being finalized. A similar effort was initiated for the adjacent Alabama watersheds.

Fluvial Geomorphic Conditions and Regional Curve Development in Florida

Twenty-one stream channels in the Northeast Gulf Ecosystem were surveyed to support restoration projects and long-term monitoring for determination of stream channel stability and health. Many of the sites were surveyed on Eglin AFB to use as baseline stream type conditions for developing aquatic monitoring protocols and to test the overall health of streams. These data
will be used to support additional studies such as large woody debris densities in stream channels, sediment/discharge relationships, and erosional rates curves.

Figure 15. Fluvial geomorphology stream survey on Turtle Creek, Eglin Air Force Base, Florida.

PCFRO led a cooperative study with the Florida Department of Transportation (FDOT) to develop regional curves. These regional curves will assist in predicting bankfull discharge and channel attributes in un-gaged stream reaches and aid in natural channel design for FDOT and Service projects. This study will provide a model for future efforts to analyze streams statewide. By furthering our understanding of regional stream stability, improved guidelines can be developed for designing culverts and bridges to preserve natural bankfull channel dimensions and their associated floodplains and wetlands. All data has been collected for the two study regions, and the final report is due in December 2004.
On-The-Ground Restoration and Monitoring

_Fish Community Analysis Before and After Habitat Restoration in Big Escambia Creek, Florida._ PCFRO provided technical assistance to U.S. Army Corps of Engineers contractors during the restoration of five miles of Big Escambia Creek (BEC). BEC has significantly departed from natural conditions over the past 40 years due to log jams, upstream erosion, and gravel mining. An Army Corps of Engineers Sec. 206 project, at a cost estimate of $7 million dollars, was initiated to restore approximately 2.5 miles of historic natural channel and 2.5 miles of existing channel, along with 1000 acres of bottomland floodplain wetlands. The project is located downstream of Flomaton, Alabama, to its mouth near Century, Florida. The objective for the BEC project is to restore a stable channel that resembles natural channels in the region in terms of plan-view, cross-sectional dimensions, longitudinal profile, and riparian vegetation characteristics. The resulting hypothesis is that accomplishing this habitat objective will increase the productivity and diversity of native fish species populations. The Service has provided extensive design criteria and on-site construction assistance. The project is approximately 65% complete and should be finished by May 2005.
PCFRO has completed an analysis of fish community structure before restoration began fish in order to demonstrate the success of the project. Baseline data from 1998 -2002 was analyzed during FY04. This baseline will be used to establish criteria for monitoring the fish community characteristics before and after restoration activities. The results obtained from the BEC site were compared with a reference site from Little Escambia Creek in order to determine if variations in fish community structure are due to natural phenomenon or restoration activities. A poster presentation was given to SDAFS describing some of the preliminary results. A peer-reviewed publication of known previous collections is in development with Florida Fish and Wildlife Conservation Commission and Alabama Geological Survey.

Restoration on a Tributary to Magnolia Creek. PCFRO is providing technical assistance for design and project construction for the removal of an impoundment structure that alters ecosystem function and blocks fish passage along a tributary to Magnolia Creek, near Freeport, Florida. Existing conditions were surveyed and design criteria were provided for dam removal and placement of a culvert with floodplain drains for continued off-road vehicle traffic. Additionally, PCFRO and Florida Department of Environmental Protection conducted pre-biological monitoring for fish and aquatic insects during FY03. Restoration was completed in January 2004 and post-monitoring was completed in November 2004. This project was initiated
to restore stream habitat and fish passage, an ecosystem priority. The project has resulted in partnership development with local governmental agencies and provides a demonstration of appropriate and successful methods for stream restoration including fluvial geomorphology function and culvert placements with floodplain drains. Approximately 1.5 miles of river was restored.

Figure 18. Existing condition before a dam removal project on an unnamed tributary to Magnolia Creek, Walton County, Florida.
Figure 19. One year post dam removal on the unnamed tributary to Magnolia Creek, Walton County, Florida.
Wrights Creek Restoration Project at Hwy 177A. The Wrights Creek Project at Hwy 177A is located north of Bonifay, Florida, and discharges into the Choctawhatchee River. The Choctawhatchee River provides Critical Habitat for the federally threatened Gulf sturgeon and Wrights Creek supports several species of candidate freshwater mussels. The project consisted of constructing a threshold channel to carry sediment loads and reduce near bank shear stress and bed shear stress. The project design created a stream plug in the existing channel thereby diverting stream flows down the 1,100 feet of historic channel. A new stream bank where the evulsions had occurred was plugged off and stabilized. J-Hook vanes streambed control structures were install to acquire rapid stream stability after construction and maintain overall channel grade. Rootwad structures were also installed to provide bank protection and fish habitat. These structures provided instream habitat, sediment transport, minimize bank shear stress, and velocity dissipation. All exposed surfaces were vegetated with wild seed mixes, temporary seed, erosion control blankets and planted with live stakes and trees.
Wrights Creek Restoration Project at Hwy 79. The Wrights Creek Project at Hwy 79 is located north of Bonifay, Florida, and also discharges into the Choctawhatchee River. The project consisted of stabilizing approximately 200 feet of degraded streambank and riparian area, which has caused some sedimentation into Wrights Creek, and eventually to the Choctawhatchee River. The project design consisted of installing a terraced bulkhead along the entire streambank and placing a j-hook vane to help stabilize the downstream banks. A fence was installed along the bulkhead with a boardwalk. Areas within the riparian area were also fenced off to reduce human vehicular traffic and stabilizing vegetation. All exposed surfaces were vegetated with sod and native trees were planted.
Figure 22. Installation of a log vane on Wrights Creek at Highway 79, Holmes County, Florida.

Clear Creek Restoration Project. The Blackwater River includes Critical Habitat for the threatened Gulf sturgeon. Habitat is degraded in part due to tributary channel instability and poor water quality. Clear Creek is a tributary to the Blackwater River and has provided substantial sediment loading into its lower portions, near Gulf sturgeon habitat. The specific project included stabilizing 45 acres of eroding gully which was an abandoned borrow pit. Historically, an ephemeral channel flowed down the valley and discharged into the main stem of Clear Creek. The stream eroded into an adjacent borrow pit causing mass wasting, stream bank erosion, and hillside slope failure and serious stream degradation. The proposed project will stabilize upslope erosion, in-basin erosion, and stormwater control on Whiting Field Naval Base, an adjacent discharge point into Clear Creek. Berms will be created around the upper portions of the borrow pits, slopes will be reduced in some areas, heavy equipment grading to reduce gully development, and hydroseeding with natural grasses will be planted. Long leaf pine, oaks, and other native ground cover will be planted at the site. Approximately 90% of the project is completed to date.
**Grimsley Tract Understory Restoration.** The Grimsley Tract is focused on multi-use management. The primary objective is to provide responsible conservation stewardship that will restore and enhance native wildlife habitat and aesthetics qualities. PCFRO coordinated the restoration of 58 acres of upland understory habitat by using high school volunteers and landowner help to plant over 30,000 native vegetation plugs (i.e., wire grass, switch grass, and Indian grass) and using prescribed fire. The WHIP program funded the planting of longleaf pine seedlings at 450 trees per acre which also included site preparation by roller chopping, herbicide and prescribed burns. Through a prescribed burning program, the natural fire cycle will be reinstated in the longleaf pine areas.
Technical Assistance

**Blackwater River State Park.** The Blackwater River supports several imperiled aquatic species, and Critical Habitat for the threatened Gulf sturgeon. The river is degraded significantly due to off-site erosion and resulting streambank erosion from channel instability. PCFRO conducted a site visit at Blackwater River State Park, with representatives from FLDEP, to provide technical assistance on stream restoration needs and opportunities inside the park. PCFRO discussed the instability of the stream channel and corrective measures to minimize loss of land/streambank.

**Blackwater River State Forest Restoration and Protection.** Habitat has been degraded in part due to tributary channel instability and poor water quality. PCFRO provided technical assistance for post-monitoring of Riley's Bluff restoration site on Blackwater River State Forest. Data will be used to document success of restoration project and future recommendations for other project sites. Two permanent cross-section transects were established to monitor cross-section of the stream at Reilly's Bluff. Streambank pins and scour chains were installed to monitor projects stability. Photo points were collected along the restored site.
Horsehead Creek Restoration Project. This project is located within the Yellow River Basin, which also supports Critical Habitat for Gulf sturgeon and several candidate mussel species. Reduction in sediment and suspended solids will reduce habitat degradation. The Horsehead Creek project is an extremely unstable site due to stream-side grazing, gully formation, and erosion leading into the creek. NRCS has implemented fencing of cattle and will be providing funding to stabilize gully erosion. The project will consist of creating about 600 feet of new channel by cutting of the existing meander pattern to fit a stable pattern. This would involve excavating a new channel in the floodplain while isolating the existing channel and creating about 1 acre of wetland habitat. The new channel would be at the correct width/depth ratio, channel sinuosity, and slope.

Bohemia Park Stabilization Project. Bohemia Park Stabilization Project is located on the Fish River, Baldwin County, Alabama. The absence of native vegetation, heavy land use, and water runoff has created bank instability within the Park. The recommended alternative is to build a bulkhead wall along the upper portion of the project area to stabilize the high use sections of the park. This will allow access for recreation and reduce streambank instability. At the end of the bulkhead, a j-hook vane would be installed which will direct water away from the bank, thereby reducing streambank erosion. Additional rootwad structures should be placed along the
remainder of the streambank to the wooded edge at the downstream end. All areas that have exposed earth should be planted with native vegetation and erosion control matting should be installed. A water berm should be installed in the upland area to divert any overland runoff away from the streambank. Additionally, a fence should be constructed along the streambank near the backfilled area to the downstream extent. This will minimize human use and protect the restored site.

**Pine Barren Creek Flood Control Project.** The Pensacola Bay watershed includes threatened Gulf sturgeon Critical Habitat and supports several imperiled freshwater mussels. Habitat is degraded in part due to tributary channel instability and poor water quality. The Pine Barren Creek Flood Control Project has been funded under the NRCS PL-566 program to reduce flooding near Atmore, Alabama. PCFRO has provided technical assistance for alternative design criteria and will continue until the project is completed. The existing proposal from NRCS is to channelize Pine Barren Creek to help minimize flooding in Atmore. Alternative suggestions have included wetland creation, dam removal, increase floodplain capacity, and removal of some home sites out of the floodplain. Several entities are involved with the project including the Florida Department of Environmental Protection (DEP), Pensacola and Mobile Army Corps of Engineer, Daphne USFWS, and NRCS.

**Other Technical Assistance for Stream Restoration/Enhancement Projects.** Stream restoration is a focal point for the Fisheries Resource Office and within the Northeast Gulf Ecosystem. Technical assistance is provided to multiple agencies and landowners in the work area. The following is a list of numerous sites where technical assistances was provided during FY04: Shi-Farms, Georgia; Harrington Farms, Georgia; Liza Jackson Park, Florida; Shoal River-Dr. Flynn Property; Tributary to Gulf of Mexico-DEP, Florida; Hidden Springs and Juniper Creek - DEP, Florida; Sawhatchee Creek, Georgia; Pea River, Alabama; Conecuh-Sepulga River, Alabama; and Coastal Dune Lakes, Florida.

**VII. FISH PASSAGE BARRIERS**

Panama City FRO biologists have begun identifying fish passage barriers which inhibit movement of fish and other aquatic species. Fragmentation of rivers, diversion structures and habitat alteration has caused the degradation of aquatic resources including water quality, fish passage, natural sediment transport, and stream bank stabilization. Several potential projects have been identify for removal. Once funding is secured for restoration, a project will be conducted along with monitoring changes in physical, chemical, and biological parameters. A GIS data layer for dam locations has been developed to begin assessing possibilities for removal projects. Several specific projects to assess fish passage were initiated in FY04.

**Okaloosa Darter - Identification of Fish Passage Barriers, Eglin Air Force Base, Florida**

This study was initiated to provide data and assist in the recovery of the Okaloosa darter by conducting and supplying data about road crossing structures and potential fish passage barriers which are perceived threats to Okaloosa darter. This study outlined the process for determining the area of scope, decision for assessments, and implementing recovery actions. There were 153
crossing structure types identified within the Okaloosa darter range. Data collected included GPS position, structure type (box culvert, pipe culvert, bridge, and low water), structure condition, observable degradation at site, along with rapid habitat assessment at 50m segments encompassing 500 m at selected sites. Observable degradation was reported as fish passage barriers, overland sediment pathways, and instream channel alterations. Results were presented at SDAFS in a poster display. Report available upon request.

**Okaloosa Darter - Fish Passage Barrier Removal - Eglin Air Force Base, Florida**

To begin implementing actions defined by the Okaloosa darter road crossing and fish passage assessment and threats study (above) a site was chosen as a demonstration project to remove a fish passage barrier in Okaloosa darter range. Pre-project assessment was completed for aquatic invertebrates, fishes, and fluvial geomorphic conditions. Land surveying techniques were completed for existing conditions along with stream channel design criteria to begin the process of implementation. The project design will be 100% completed by December 2004, with project construction in May 2005. This project will help restore about 5 miles of upstream habitat connectivity for the endangered Okaloosa darter.

Figure 26. Pre-existing conditions on Little Rocky Creek fish passage project, Eglin Air Force Base, Florida.
Oyster Lake Restoration

Oyster Lake is a coastal dune lake that has been isolated from the Gulf of Mexico since 1975. A three chambered box culvert along with two metal culverts prevent tidal flows from entering the Lake. Only freshwater runoff and groundwater seepage entered the western basin causing it to dilute to slightly brackish water. The proposed improvements include the construction of four bridges to re-establish the natural connections that all of the other coastal dune lakes have intact. One of the bridges will be a 30 ft span to replace the box culvert that was constructed without consideration for its long-term impacts. These improvements would re-establish the natural wetland flows and Coastal connections and certainly provide habitat for marine breeding grounds. This project will provide fish passage for several fish species including red drum, flounder, mullet, speckle trout and many other fish. Additionally, it is hoped that oysters will reestablish in the lake. The project will ultimately restore approximately 10 acres of isolated wetlands to the watershed and restore the natural hydrologic connectivity to 26 acres of the coastal dune lake. During FY04 the existing land and geomorphic conditions were surveyed and restoration design development began. These activities were sponsored by Walton County, Florida. A study plan was completed to document project success which will include before and after monitoring of chemical, physical and biological components.

VIII. Quality Assurance / Quality Control: Fish and Wildlife Projects

Good science is one of the top priorities of the FWS. A quality control/quality assurance program was rejuvenated for the Panama City Field Office to include a study plan peer review system. A study plan tracking system was developed to keep personnel informed regarding the status of submitted plans and products and any quality control needs. Biological Assessments, Biological Opinions, study plans, and manuscripts/reports were reviewed and improved with these new procedures. All new and ongoing Fishery Resources and Ecological Resources projects at PCFO are required to have a peer-reviewed study plan on file.

Additionally, technical assistance was provided to Ecological Services Regional Office permitting, and AL and GA ES offices by identifying measures to avoid minimize harm to listed species from proposed activities associated with Sec. 10 permit applications. At least 14 requests for information regarding freshwater mussel location and ecology for Section 7 consultations were filled during FY04. Additionally several study plans, proposals, manuscripts, BAs, BOs, and Section 10 permits were reviewed and comments provided.

OTHER PARTNERSHIPS

Reservoir Operations of the Apalachicola-Chattahoochee-Flint

The Apalachicola River is an important resource to listed, anadromous, and interjurisdictional fishes that are dependent upon a natural flow regime. Policies to enhance reservoir fish spawning were having an adverse effect on riverine fish spawning especially during times of drought. At the request of the Florida Fish and Wildlife Conservation Commission, the Panama
City Field Office facilitated discussions among the three states and the Corps of Engineers to identify ways that operations for reservoir fisheries management did not sacrifice downstream riverine fisheries habitat in the Apalachicola River. Several alternative operating procedures were identified and incorporated into Corps policy. An improved communication network among the agencies was established.

List of Other Partners

Alabama Department of Natural Resources
Choctawhatchee Basin Alliance
Columbus State University
Georgia Natural Heritage
Georgia Department of Natural Resources
Florida Department of Environmental Protection
Florida Fish and Wildlife Conservation Commission
Florida A & M University
Gulf Coastal Plain Ecosystem Partnership
Gulf Coast Research Laboratory
Northwest Florida Water Management District
Science Application International Corporation
University of West Florida
University of Georgia
University of Southern Mississippi
Troy University
University of South Florida
University of Florida
Auburn University
Mote Marine
Jones Ecological Research Center
Northwest Florida Audubon Society
Rivers Alive
Three Rivers Resource Conservation and Development Council
Golden Triangle Resource Conservation and Development Council
Porchband of the Creek Indians
Louisiana Department of Wildlife & Fisheries
Florida Department of Transportation
The Nature Conservancy
Eglin Air Force Base
Tyndall Air Force Base
Choctawhatchee Chapter Audubon Society
National Marine Fisheries Service
U.S. Geological Survey
U.S. Army Corps of Engineers
PUBLIC OUTREACH

Numerous presentations were made to potential and existing partners on the benefits of the Partners for Fish and Wildlife (PFW) Program.

A two-day stream restoration workshop in Milton, Florida was offered by PCFO with the objective to introduce principles of fluvial geomorphology for application in restoring impaired stream channels to the attendees.

Presented information at a FWC Landowner Meeting about the PFW Program and the types of projects, priority areas, and financial and technical assistance opportunities.

Presented information about the PFW Program and opportunities for stream restoration at the Conecuh-Sepulga Partnership meeting.

Funded one outreach video with the Pensacola Bay Watershed Partnership, Resources Rangers Program, on sea grasses and estuaries. This one of seven series videos on natural resources in North Florida. A stream restoration video is planned for next year.

Delivered presentations to the general public on biology and ecology of freshwater mussels in the Ochlockonee River basin.

Presentations were given to the NW Florida Naturalist Society and the Florida Audubon Society about habitats that are necessary to support mussels and actions the general public can undertake to protect mussels and restore their habitats.

Presented mussel ecology and biology program to Cario High School students and demonstrated mussel collecting and habitat assessment.

Coordinated personnel and materials for an Ochlockonee River Cleanup.

Provided Gulf sturgeon information (videos and handouts) to schools and organizations.

Presented Gulf sturgeon information regarding life history, reasons for its decline and recovery efforts to the Panama City Lions Club and Bay Haven Charter School.

Manned aquatic displays and presented seminars at the Bass Pro Shops open house in Destin, Florida about the activities the Service and the PCFO are involved with. Display provided for the Friends of St. Andrew Nature’s Gallery festival.

Participated in the “Kids Fishing Clinic”, a National Fishing Week event at the Panama City Beach Pier and sponsored by the Florida Department of Environmental Protection. Also, we participated in the “Junior Angler’s Pier Fishing Rodeo” held at the Panama City Marina sea wall and sponsored by the Bay Point Women’s Club and the Bay County Boys and Girls Club. Anglers learned about fish habitat, fishing ethics, casting, fishing safety and knot tying. The events attracted almost 500 children, adults, and volunteers.
Figure 27. Children enjoying the “Kid’s Fishing Clinic” at the Panama City Beach Pier.

MEETINGS AND PRESENTATIONS


REPORTS AND PUBLICATIONS


Herod, J.J., H.N. Blalock-Herod, J.D. Williams, and J.M. Pierson. *In review*. Qualitative and quantitative examination of the mussel (Bivalvia: Unionidae) assemblage within an altered reach of the Coosa River below Weiss Spillway Dam, Cherokee County, Alabama. Southeastern Naturalist.


**TRAINING**

Motorboat Operation Certification Course – Karen Popp
ATV Operation – Karen Popp, Bob Jarvis, and Chris Metcalf
Electrofishing Correspondence Course – Bob Jarvis, Frank Parauka, Karen Popp, David LaPlante, Holly Blalock-Herod, Jeff Herod, and Trent Jett
Scientific Excellence Training – Holly Blalock-Herod, Jeff Herod, Frank Parauka Theresa Thom, and Chris Metcalf
CPR/First Aid - Bob Jarvis, Frank Parauka, Gail Carmody, and Karen Popp
Sturgeon Sexing and Spawning Induction Workshop, Staging Maturity – Frank Parauka
Learning ArcGIS 8 – Karen Popp
Stress Management for Women – Barbara Stanley
GSA Expo – Barbara Stanley
Information Technology Security – All
Negotiation Strategies and Techniques Course – Gail Carmody
Criticism and Discipline Skills for Managers – Gail Carmody
Integrated Charge Card Program, Approving Official Training – Gail Carmody
Integrated Charge Card Program, Card Holder Travel Training – Gail Carmody
VOLUNTEER ACTIVITY

During FY04, volunteers donated a grand total of 5,851 hours. Thirty-four volunteers donated 684.75 hours to assist FWS fisheries staff, stationed at Eglin Air Force Base, with geomorphic sampling data collection at 20 sites, totaling over 4 kilometers of streams. Volunteers surveyed over 25 biomonitoring sites, and were introduced to statewide bio-assessment techniques for monitoring stream health. 2 FWS-FR personnel donated 76 hours toward geomorphic surveys. This volunteer effort supports natural resource management for diverse aquatic systems in northwest Florida.

The Panama City Office once again relied on volunteers to assist with the intensive fall migratory surveys for the threatened Gulf sturgeon. Twenty-two volunteers put in 648 hours of netting, tracking, and monitoring Gulf sturgeon in the Escambia River, Florida. In addition, 128 volunteer hours were spent tracking sturgeon, evaluating habitat, and collecting Gulf sturgeon in other river systems.

Three Student Conservation Association (SCA) interns helped our office throughout 2004. The two SCA volunteers at Eglin Air Force Base provided over 2,920 hours of service on biomonitoring, stream geomorphology, stream fish surveys, and monitoring threatened and endangered species, including the Okaloosa darter and Gulf sturgeon. The SCA volunteer in Panama City performed over 1,700 hours of volunteer service, assisting with rare and listed freshwater mussel surveys, collecting and analyzing land use and habitat data along coastal rivers, and monitoring Gulf sturgeon populations.

Three volunteers were awarded for their extraordinary efforts this year, with each performing over 100 hours of volunteer service. One volunteer was awarded "Volunteer of the Month" at Eglin Air Force Base and received special accolades for his efforts with stream geomorphology and biomonitoring, including an interview and photo shoot with the local Eglin Eagle paper.

STATION CYCLICAL MAINTENANCE/CONSTRUCTION

None to report.

PRIMARY ACTIVITIES FOR FY 2005

It is very exciting to see how the Panama City Fisheries program has grown and matured in the past few years so that nearly all aspects of management of fish and their habitats is being addressed in the watersheds of the Florida panhandle. In the coming year, we will continue much of the work described above. We will continue to identify and protect Gulf sturgeon spawning sites in Yellow, Choctawhatchee, and Apalachicola rivers, and Gulf sturgeon populations in the Apalachicola and Escambia rivers will be assessed. On Eglin AFB, we will address fish passage and unpaved road problems and work to restore Mill Creek. In addition, the status and outstanding conservation needs of the endangered Okaloosa darter will be examined. We will be working to complete restoration of Big Escambia Creek and Canoe Creek and
cementing partnerships to improve water and instream habitat quality in the Ochlockonee, Chipola, and Spring Creek River Basins. As in the past, we will continue to work with our state wildlife agency partners on Gulf-race striped bass restoration and stock assessment. Agency partnerships will also be formed to better assess the status and conservation needs of rare fishes in the northeast Gulf portions of Alabama, Florida, and Georgia. Finally, we plan to continue to implement recovery activities for listed and candidate mussels.