Relocation of Panama City-Bay County International Airport (West Bay Site Alternative), Bay County, Florida

Biological Opinion
October 3, 2005

Prepared by:
U.S. Fish and Wildlife Service
1601 Balboa Avenue
Panama City, Florida

RECEIVED
OCT C
JACKSONVIL
US

Panama City – Bay County Airport and Industrial District
SAJ-2001-5264(IP-GAH)
Document F
August 1, 2007

Table of Contents

List of Figures, Tables, and Appendices ____ *ii*
Consultation History ____ *1*
BIOLOGICAL OPINION ____ *3*
DESCRIPTION OF THE PROPOSED ACTION ____ **3**
Conservation Measures ____ 3
Action Area ____ 4
Determination of effects ____ 6
FLATWOODS SALAMANDER ____ *7*
STATUS OF THE SPECIES/CRITICAL HABITAT ____ **7**
Species description ____ 8
Life history ____ 8
Population dynamics ____ 9
Status and distribution ____ 9
ENVIRONMENTAL BASELINE ____ *9*
Status of the species within the action area ____ **9**
EFFECTS OF THE ACTION ____ *16*
Direct effects ____ **16**
Indirect effects ____ **17**
CUMULATIVE EFFECTS ____ *17*
CONCLUSION ____ *26*
INCIDENTAL TAKE STATEMENT ____ *26*
AMOUNT OR EXTENT OF TAKE ____ **27**
EFFECT OF THE TAKE ____ **27**
REASONABLE AND PRUDENT MEASURES ____ **27**
TERMS AND CONDITIONS ____ **28**
CONSERVATION RECOMMENDATIONS ____ *28*
REINITIATION NOTICE ____ *29*
LITERATURE CITED ____ *30*

List of Figures, Tables, and Appendices

Figure 1 – Site Location Map 5
Figure 2 – Surveyed Salamander Ponds 13
Figure 3 – Location of Potential Ponds (Mitigation Site) 15
Figure 4 – Bay County Land Cover Map 18
Figure 5 – Bay County Future Land Use Map 19
Figure 6 – Sector Plan Land Use Map 20

Table 1 – West Bay Site Flatwoods Salamander Potential Breeding Pond Evaluation... 12
Table 2 – Wetland Habitat Based on Sector Planning Area ..21
Table 3 – Wetland Habitat Based on Bay County Future Land Use Map 22
Table 4 – Wetland Habitat Based on Sector Plan Land Use 24

Appendix A - Flatwood Salamander Pond Habitat Evaluation – Proposed Mitigation Parcels 1
Appendix B – Mitigation Synopsis: Panama City-Bay County International Airport Relocation (Draft March, 2005) 1

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Field Office
1601 Balboa Avenue
Panama City, FL 32405-3721

Tel: (850) 769-0552
Fax: (850) 763-2177

October 3, 2005

Ms. Virginia Lane
Federal Aviation Administration
5950 Hazeltine National Drive
Suite 400
Orlando, Florida 32822

Re: FWS Log No. 4-P-06-006
Biological Opinion
Relocation of the Panama City-Bay County International Airport
(West Bay Site Alternative)
Bay County, Florida

Dear Ms. Lane:

This document transmits the Fish and Wildlife Service's (Service) biological opinion (BO) for the Federal Aviation Administration (FAA) proposed action of relocating the Panama City-Bay County International Airport, Bay County, Florida, and its effects on listed species per section 7 of the Endangered Species Act of 1973, as amended (Act), (16 U.S.C. 1531 et seq.). Your August 29, 2005, request for formal consultation was received on August 30, 2005.

This biological opinion is based on information provided in the final biological assessment (BA) which was received on August 30, 2005. A complete administrative record of this consultation is on file in the Service's Panama City, Florida Field Office.

Consultation History

December 21, 2001 through present and continuing - Ongoing consultation has been continuing during preparation of the Panama City-Bay County International Airport Environmental Impact Statement. The US Fish and Wildlife Service (USFWS) provided scoping comments and responded to FAA's Notice of Intent to prepare an Environmental Assessment for the proposed relocation of the Panama City-Bay County International Airport in a letter dated December 21, 2001.

RECEIVED
OCT 06 2005
JACKSONVILLE DISTRICT
USACE

February 6, 2002	Meeting conducted with USFWS to discuss the potential listed species issues on the proposed West Bay Site, the proposed survey methodology, the proposed survey schedule and the results of the spring, summer and fall surveys.
April 23, 2003	A Notice of Intent to prepare the Environmental Impact Statement was published in the *Federal Register*.
November 26, 2004	Notice of Availability of Draft Environmental Impact Statement (EIS) issued in *Federal Register*.
January 27, 2005	The Service provided comments on the Draft EIS. Based on discussions with the Service, it was determined that a biological assessment would be required.
May 23, 2005	The FAA transmitted a draft biological assessment which focused primarily on the flatwoods salamander and eastern indigo snake.
June 20, 2005	The Service provided comments on draft BA. It was determined that additional information was needed for bald eagle, American alligator, Gulf moccasinshell mussel, oval pigtoe mussel, Gulf sturgeon, red cockaded woodpecker, and piping plover.
June 28, 2005	Teleconference with FAA and the Service to discuss draft BA comments.
July 13, 2005	The National Marine Fisheries Service (NMFS) determined that there are no EFH recommendations for conservation measures.
July 21, 2005	Teleconference with FAA, USFWS, and US Army Corps of Engineers to discuss approach for addressing the Service's comments and revisions to the BA. The Service confirmed in an e-mail dated July 29, 2005, the limits of the Action Area as discussed below, the West Bay Sector Plan property as the cumulative impact study area boundary, and the species to be addressed in the revised BA.
July 27, 2005	The FAA submitted a draft habitat suitability analysis for flatwoods salamander to the Service for review and comment.
August 2, 2005	The Service provided comments regarding the draft suitability analysis for flatwoods salamander.
August 5, 2005	The FAA submitted the revised draft BA to the Service.
August 30, 2005	The FAA submitted the final BA to the Service.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The project purpose is to relocate the Panama City-Bay County International Airport (PFN) to meet speculated future aviation needs as identified in the *Draft Environmental Impact Statement (DEIS) for the Proposed Relocation of the Panama City-Bay County International Airport*. The proposed project would relocate aviation facilities of the PFN and its operations to the West Bay Site, in Bay County (**Figure 1**). The project would consist of an airfield and terminal facilities, and include a primary air carrier runway 8,400 feet in length by 150 feet in width and a general aviation crosswind runway 5,000 feet in length by 100 feet wide. This system would be supported by the necessary ancillary facilities including taxiways, terminal area facilities, general aviation facilities, air traffic control and emergency facilities, lighting, and navigation facilities. The project would initially develop 1,378 acres of the 4,037-acre site. The project site is currently rural timberland used for the paper and wood products industry. Approximately 1,929 acres of the entire site are jurisdictional wetlands. The proposed project also includes three (3) additional parcels that would be used as mitigation for the impacts to the West Bay Site. These parcels are also presently rural timberlands and cover an area of 9,718 acres.

Conservation Measures

The Panama City Bay County Airport and Industrial District (Airport Sponsor) has developed a strategy for minimizing the impacts of the relocated airport. The measures will potentially contribute to the protection and recovery of the species under review.

1. Three mitigation parcels will be put under a conservation easement in perpetuity for mitigation of wetland, stream and wildlife impacts on the West Bay Site. These parcels cover an area of 9,718 acres of upland and wetland mosaic. The parcels will be enhanced by management including a more natural hydrologic and fire regime. This management includes thinning the density of timber, planting native species, returning to a more natural, frequent fire regime, exotic species control, hydrologic restoration and long-term conservation management. Hipes et al. (2000) and Palis (1997) recommend growing season fires to restore and maintain the mesic flatwoods habitat that the salamanders require. Within these 9,718 acres, potential salamander breeding ponds have been identified (*Appendix A*). Most of the ponds are presently in poor condition, with habitat quality scores of low to moderate, but should improve as the land recovers from years of intensive silviculture management. A mitigation synopsis has been developed for the parcels by the Airport Sponsor and is included in *Appendix B*.

2. Information concerning potential flatwoods salamander breeding ponds would be shared by the Airport Sponsor with the appropriate agencies that manage and survey salamander populations on public lands as well as the agencies that manage the lands themselves (FWS, FWC and Florida Department of Environmental Protection [FDEP]).

RECEIVED
OCT 06 2005
JACKSONVILLE DISTRICT

Action Area

For purposes of the Endangered Species Act, the action area is defined as all areas affected directly or indirectly by a federal action, including interdependent and interrelated actions and proposed Conservation Measures. Although each potentially affected species will define a separate action area, the most inclusive geographic area is referenced for simplicity.

The Action Area for this analysis includes all the area within the boundaries of the Proposed Action, which includes the 4,000-acre West Bay Site, 37-acre access road, and the 9,718-acre proposed mitigation parcels. See ***Figure 1***.

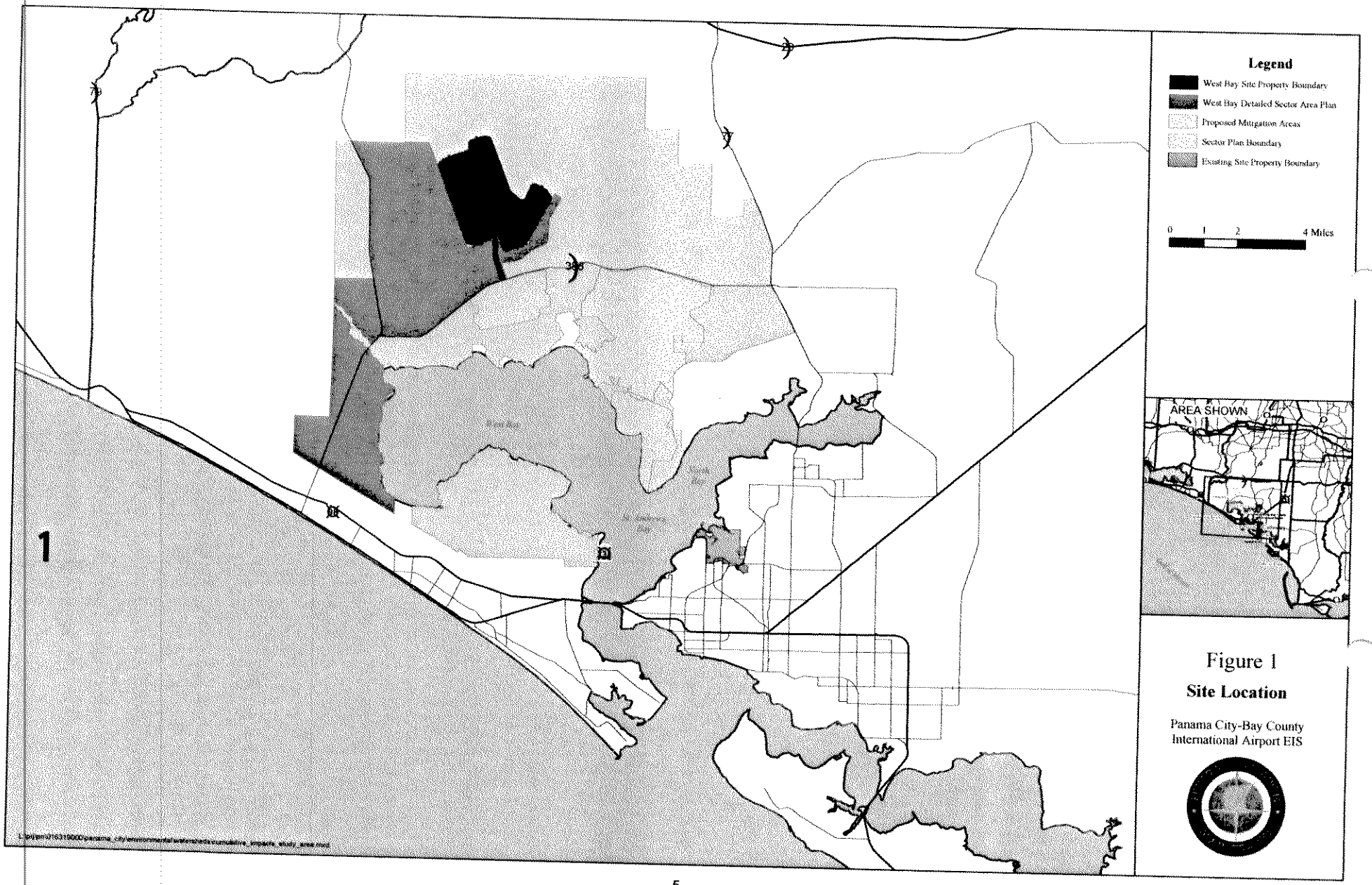


Figure 1
Site Location

Panama City-Bay County
International Airport EIS

Determination of effects

Based upon the low likelihood of direct or indirect impacts on these species as a result of the project, the Service concurs with the following determinations of effects. More detail regarding these species and potential effects of the project is found in the BA.

- **American alligator** (*Alligator mississippiensis*) - No Effect
  Confirmed on-site. American alligators are listed due to the similarity of appearance with the American crocodile. The project is not located within the range of the crocodile.

- **Eastern indigo snakes** (Drymarchon corais couperi) - No Effect
  No Eastern indigo snakes were observed during the field surveys of the West Bay Site or the mitigation parcels, and limited gopher tortoise habitat exists in the Action Area. Occurrences of this species are rare in northwest Florida.

- **Gulf moccasinshell mussel** (*Medionidas penicillatus*) - No Effect
  No Gulf moccansinshell mussels were observed during the field surveys of the West Bay Site and habitat does not exist for this species on the West Bay Site. Habitat could potentially occur downstream but the Action Area is outside the known range of this species.

- **Gulf sturgeon** (*Acipenser oxyrinchus desotoi*) - No Effect
  The designated critical habitat is located outside of the Action Area of the proposed project, and sturgeon are considered to be a transient species in West Bay. Additionally the proposed action would not directly or indirectly impact the West Bay estuary or the coastal rivers.

- **Oval pigtoe mussel** (*Pluerbema pyriforme*) - No Effect
  No oval pigtoe mussels were observed during the field surveys of the West Bay site and no habitat occurs on the West Bay site. Habitat could potentially occur downstream but the Action Area is outside the known range.

- **Piping plover** (*Charadrius melodus*) - No Effect
  The piping plover occurs on the non-breeding grounds from July 15-May 15. The habitats used by non-breeding piping plovers include beaches, mud flats, sand flats, algal flats, and washover passes. No suitable habitat occurs on the proposed airport site, therefore this project would not affect piping plover or any designated critical habitat. Mud and sand flats do occur along the proposed West Bay conservation area during periods of medium to low tide. There has been an incidental report of a piping plover using the area known as Marifarms which occurs within the proposed mitigation area. Protection of habitat adjacent to West Bay within the designated conservation area will have a beneficial impact to the species should they appear.

- **Red-cockaded woodpecker** (*Picoides borealis*) - No Effect
  Florida Natural Areas Inventory data contains a historical occurrence record located directly to the north of the mitigation parcels. No red-cockaded woodpeckers or cavity trees were seen during wildlife surveys in the Action Area. Almost all upland habitats have been converted to

silviculture and it has been determined that habitats were not suitable for the occurrence of the species.

- **Bald eagle** (*Haliaeetus leucocephalus*) - No Effect
  The Florida Fish and Wildlife Conservation Commission (FWC) Eagle Nest data base indicates there is an eagle nest (BA 007) located on Burnt Mill Creek. The data indicated the nest was active as late as 2003. Recent discussions with FWC indicate that the nest was also active in the 2004 and 2005 nesting seasons.

  No bald eagles or eagle nests were observed during the field surveys of the West Bay Site. Bald eagles were observed foraging in the salt marsh habitat of the proposed mitigation parcels by FAA consultants, and the Airport Sponsor's consultant has observed bald eagles flying over the mitigation parcels. No bald eagle nests have been identified on the mitigation parcels.

  The documented nest is located between two of the proposed mitigation parcels. The mitigation parcels are located outside the standard primary and secondary nest protection zones (1,500 feet) as defined in the *Habitat Management Guidelines for the Bald Eagle in the Southeast Region*. The nest is located approximately 2.5 miles from the West Bay Site, and FAA has determined in discussions with other experts that the flights to and from the airport will not create a significant disturbance to nesting activities.

- **Flatwoods salamander** (*Ambystoma cingulatum*) - Likely to Adversely Affect
  Intensive surveys for flatwoods salamanders were not feasible given the size of the action area and the extreme drought that occurred during most of the study period. Potential habitats have been assessed for their quality for both the West Bay Site and the proposed mitigation parcels. Interviews and discussions have resulted in the conclusion that the likelihood of a flatwoods salamander population occurring on the West Bay site is low-to-moderate. No flatwoods salamanders have been collected on site. Since multiple years of breeding pond surveys are required to definitively determine the absence of flatwoods salamanders, and because of the recently re-confirmed presence of flatwoods salamander larvae at nearby Pine Log State Forest, the possibility remains that the ponds on-site could potentially be used by flatwoods salamander. The pond site within Pine Log State Forest is approximately 2 miles from the West Bay Site. The Service concurs with this determination, which is the focus of the remaining analysis in this biological opinion.

FLATWOODS SALAMANDER

STATUS OF THE SPECIES/CRITICAL HABITAT

This section summarizes the biology and ecology of the flatwoods salamander. The Service uses this information to assess whether a Federal action is likely to jeopardize the continued existence of this species. The Environmental Baseline section summarizes information on status and trends of the species specifically within the action area. These summaries provide the foundation for the Service's assessment of the effects of the proposed action, as presented in the Effects of Action section, and to make the Conservation Recommendations listed at the end of this opinion.

The flatwoods salamander (*Ambystoma cingulatum*) is listed as a threatened species under the authority of the Endangered Species Act of 1973, as amended (Act). The flatwoods salamander was designated as threatened in the *Federal Register*, April 1, 1999 (64 FR 15691), and became effective on May 3, 1999. No critical habitat has been designated for this species. Recovery planning is underway, but no recovery plan has been adopted.

Species description

The flatwoods salamander is a slender, small-headed mole salamander that is seldom greater than 5 inches in length. Adult dorsal color ranges from black to chocolate-black with highly variable, fine, light gray lines forming a net-like or cross-banded pattern across the back. Undersurface is plain gray to black with a few creamy or pearl gray blotches or spots. Flatwoods salamander larvae are long and slender, broad-headed and bushy-gilled, with white bellies and striped sides (Ashton, 1992; Palis, 1995). Flatwoods salamanders are known to occur in isolated populations across the lower southeastern Coastal Plain, with the majority of the remaining known populations located in Florida.

Life history

Adult and sub-adult flatwoods salamanders live in underground burrows. Adult flatwoods salamanders move above ground to their wetland breeding sites during rainy weather, in association with cold fronts, from October to December (Palis, 1997). Typical breeding sites are isolated pond cypress *(Taxodium ascendens*), blackgum (*Nyssa sylvatica* var. *biflora*), or slash pine (*Pinus elliottii*) dominated depressions which dry completely on a cyclic basis. They are generally shallow and relatively small, and have a marsh-like appearance with sedges often growing throughout, and wiregrass (*Aristida* sp.), panic grasses (*Panicum* spp.), and other herbaceous species concentrated in the shallow water edges. After breeding, adult flatwoods salamanders leave the pond.

Optimum adult habitat for the flatwoods salamander is an open, mesic (moderate moisture) woodland of longleaf/slash pine (*Pinus palustris/P. elliottii*) flatwoods maintained by frequent fires, with a dominant ground cover of wiregrass (*Aristida spp.*). The ground cover supports a rich herbivorous invertebrate community that serves as a food source for the species (64 FR 15692).

In a study by Ashton (1992), flatwoods salamanders were found greater than 1,859 yards from their breeding pond. However, based on more recent data (Semlitsch, 1998) and additional peer review, the final listing rule recommends a 1,476-feet "buffer" around breeding ponds to protect the majority of a flatwoods salamander population from the adverse effect of certain specified, silvicultural practices. This buffer extends 1,476 feet out from the wetland edge.

Since they may disperse long distances from their breeding ponds to upland sites, desiccation can be a limiting factor. Thus, it is important that areas connecting their wetland and terrestrial habitats are conserved in order to provide cover and appropriate moisture regimes during their migration. High quality habitat for the flatwoods salamander includes a number of isolated wetland breeding sites within a fire maintained landscape of longleaf pine/slash pine flatwoods

having an abundant herbaceous ground cover (Sekerak, 1994). In Florida, Palis (1997) found that 70 percent of the active breeding sites were surrounded by second-growth longleaf or slash pine flatwoods with nearly undisturbed wiregrass ground cover.

Population dynamics

A flatwoods salamander population has been defined as those salamanders using breeding sites within 2 miles of each other, barring an impassable barrier such as a perennial stream (Palis, 1997). Since temporary ponds are not likely permanent fixtures of the landscape due to succession, there would be inevitable extinctions of local populations (Semlitsch, 1998). By maintaining a mosaic of ponds with varying hydrologies, and by providing terrestrial habitats for adult life stages and colonization corridors, some prevention of local population extinction can be achieved. A mosaic of ponds would ensure that appropriate breeding conditions would be achieved under different climate regimes. Colonization corridors would allow movement of salamanders to new breeding sites or previously occupied ones (Semlitsch, 1998).

Fire is needed to maintain the natural pine flatwoods community. The disruption of the natural fire cycle has led to an increase of slash pine on areas previously dominated by longleaf pine, increases in hardwood understory and canopy, and subsequent decreases in herbaceous ground cover (64 FR 15701). Isolated ponds that are surrounded with pine plantations and are protected from fire may become unsuitable breeding sites for the flatwoods salamander. This is a result of canopy closure and the reduction in herbaceous vegetation necessary for egg deposition and larval development (Palis, 1993).

Status and distribution

Historical records for the flatwoods salamanders in its range are limited. Longleaf pine/slash pine flatwoods historically occurred in a broad band across the lower southeastern Coastal Plain. The flatwoods salamander likely occurred in appropriate habitat throughout this area (64 FR 15691). Range-wide surveys in Alabama, Florida, Georgia, and South Carolina have been ongoing since 1990 in an effort to locate new populations. Most surveys were searches for the presence of larvae in the grassy edges of ponds.

The combined data from the surveys completed since 1990 indicate that 59 populations of flatwoods salamanders are known from across the historical range. Most of these occur in Florida (47 populations or 80 percent). Eight populations have been found in Georgia, four in South Carolina, and none have been found in Alabama. Some of these populations are inferred from the capture of a single individual. Slightly more than half the known populations for the flatwoods salamander occur on public land (40 of 59, or 68 percent).

ENVIRONMENTAL BASELINE

Status of the species within the action area

Historical data on flatwoods salamanders in the action area is limited. Most of the area is privately owned and has been intensively managed for silviculture for many years. Little

remains of the natural terrestrial landscape. Almost all uplands and most wetlands were converted to pine plantations with site preparation that included clear cutting, roller chopping, herbicide application, and bedding. In addition, pine flatwoods are not considered wetlands under State of Florida best management practices for silviculture; therefore, this habitat type receives no special consideration when converted and managed for industrial forestry.

There is one documented occurrence of flatwoods salamanders in nearby Washington County in Pine Log State Forest and one recent record in Walton County. The Walton County record is for one individual at one location in Point Washington State Forest. The documented occurrence within the State Forest is approximately 2 miles from the Action Area.

West Bay Site

Listed species surveys were conducted by FAA in November 2001 and February 2003 on the initial 8,000-acre study area, which includes the West Bay Site. During the February 2003 surveys, twenty-two potential breeding ponds were sampled for flatwoods salamander larvae (***Table 1***). Pond locations are illustrated on ***Figure 2***. Only 10 sites are located within the West Bay Site and only 4 sites (D, F, I and W) are located within the initial development phase of the proposed action. Subsequent to the listed species surveys, the Service and John Palis observed an additional pond just south of Pond W. Although this pond was not sampled by the Service or John Palis, it was noted that the habitat appeared to be potentially suitable for flatwoods salamander breeding. During both the November 2001 and February 2003 listed species surveys conducted by FAA, conditions were not suitable (little to no water) within this potential breeding pond to sample. Thus, this pond was not included in the habitat suitability analysis.

Sampling conditions were considered good for most pond sites; however, the survey was conducted towards the end of a severe drought in the area. A total of six hours of dip netting was completed as part of the survey of the twenty-two potential breeding ponds. No flatwoods salamander larvae were found during the surveys; however, larvae of the mole salamander (*Ambystoma talpoideum*) were collected. Additionally, adults were searched for opportunistically during the fall and winter wildlife surveys (November 2001 and February 2003).

The potential habitats on the West Bay Site are not known to support flatwoods salamanders. The potential breeding ponds that are on the site are located in pine plantations presently managed for silviculture. The decline of flatwoods salamander populations in association with silviculture activities has been well documented. The suppression of a routine fire regime results in a dense forested condition that excludes the herbaceous ground cover which is the primary habitat for sub-adult and adult flatwoods salamanders. In addition, silviculture activities include intensive site preparation. Therefore, the lands are not optimally suited for supporting flatwoods salamanders. However, there are recorded occurrences of flatwoods salamander in similar areas where the upland and wetland habitats have been impacted by silviculture.

The surveyed ponds were evaluated after-the-fact utilizing field notes and the habitat suitability method that was developed by HDR, Inc., USFWS, FWC, and FDOT to evaluate potential habitats surrounding the widening of US Highway 98 project. The method uses a scoring system

to evaluate the quality of potential salamander breeding ponds. Scores are developed (1 to 3) for the quality of the pond, the graminaceous ecotone (grassy area surrounding the pond), and the upland around the pond. Scores are only given for the upland if the pond and ecotone scores add up to 3. The total score rates the ponds for their quality and the potential to be used by salamanders as: None, Low, Low-Moderate, Moderate, Moderate-High, and High.

Using the field descriptions completed during the February 2003 listed species surveys, scores were assigned to the potential breeding ponds on the West Bay Site. It was assumed that the upland score correlated to the standard score for pine plantation unless the field notes indicated that conditions were different.

Of the pond sites located within the Action Area, six sites received a score of low, one site a score of low-moderate and three sites a score of moderate. The pond observed by the Service, which is located near Pond W in an area of hydric pine flatwoods, was noted as being dry during field sampling conducted by FAA during fall 2001 and winter 2003 listed surveys. This pond was not included in the analysis, but appeared to be of moderate-high condition according to the Service biologist and contained sufficient water to support breeding activity at the time of the survey by the Service.

Table 1 West Bay Site Flatwoods Salamander Potential Breeding Pond Evaluations [1]

Pond Label	Pond	Ecotone	Upland	Total score (Quality)	Description/Field Notes
A	2	1	1	4 (Low-Mod)	Cypress pond with water depths up to one foot, featuring no aquatic vegetation
B	1	1		Low	Myrtle-leafed holly wetland that had no standing water.
C	1	1		Low	A historic cypress pond that had been logged and burned. The water depth in the pond was up to two feet deep. Vegetation in the pond included: broom sedge, dog fennel, and St. John's wort. Minimal cypress regeneration had occurred and the area had been replanted with slash pine.
*D	1	0		Low	A mixed hardwood and cypress swamp with titi. Described as not suitable flatwoods salamander habitat.
*F	3	1	0	4 (Low-Mod)	Cypress pond surrounded by intensively bedded pine plantation. The pond was described as excellent larval habitat, but the surrounding habitat has been highly disturbed.
G	2	2	0	4 (Low-Mod)	No cypress, sedge dominated ground cover under a slash pine overstory.
H	1	1		Low	Titi dominated shrub swamp with a few scattered cypress. No submerged or emergent aquatic vegetation present within the pond.
*I	1	1		Low	A small titi swamp with a few cypress and sweet bays. The pond was surrounded by newly clearcut pine plantation. There was no wire grass present at the site.
*J	1	1		Low	This cypress dome had recently been clearcut and all of the cypress had been removed.
*K	1	1		Low	This cypress dome had also recently been clearcut and all of the cypress had been removed.
*L	1	1		Low	A deep pond surrounded by mesic to xeric clearcut pine.
M	1	1		Low	A cypress and pine bog that had no water.
N	1	1		Low	A bay, slash pine and cypress drained swamp. A one meter deep ditch drains the swamp. The swamp was dry.
O	1	0		Low	A dense titi thicket with scattered cypress. Little water present.
*P	2	2	1	5 (Mod)	Cypress swamp with St. John's wort fringe. The pond was deep.
*Q	2	2	1	5 (Mod)	A slash pine and cypress swamp with less than 18 inches of water.
*R	1	1		Low	A myrtle-leafed holly wetland that was dry.
S	1	1		Low	A former cypress pond that had been logged. The pond is now titi dominated.
T	1	1		Low	A titi wetland that had very little water.
U	2	2	1	5 (Mod)	A cypress, slash pine, and titi wetland with wiregrass in the littoral zone. Described as good flatwoods salamander habitat.
V	1	1		Low	A cypress, titi, and slash pine seep with one foot of water. No wiregrass was present.
*W	2	2	1.5	5.5 (Mod)	A cypress and black gum swamp described as the best flatwoods salamander habitat that had been observed. There was also titi and myrtle-leafed holly. Mole salamander larvae and eggs were collected in this pond.

Source: Kimley-Horn and Associates, Inc. 2005

[1]Evaluation based on field data collected during listed species surveys conducted in February 2003.

*Pond sites located within Action Area.

Figure 2

Location of Flatwood Salamander Ponds

West Bay Site

Panama City-Bay County International Airport EIS

Proposed Mitigation Parcels

Through field reviews, the Airport Sponsor evaluated 120 wetlands on the mitigation parcels for their likelihood of being suitable flatwoods salamander breeding ponds. The wetland locations are illustrated on ***Figure 3***. These wetlands were also evaluated using the HDR method. Results indicate that there were 50 ponds considered Low, 27 considered Low- Moderate, 6 Moderate, and 37 with no potential. The scores and pond descriptions are attached as *Appendix A*.

The Florida Fish and Wildlife Conservation Commission (FWC) surveys potential habitats on public lands for the presence of flatwoods salamanders. An evaluation of salamander populations indicates that small localized populations are present throughout northwest Florida with one known breeding pond within approximately 2 miles of the project site. Airport Sponsor discussions with FWC biologists as described in the biological assessment indicate that the habitats on the West Bay Site are not optimal to support populations of flatwoods salamanders. These discussions indicate that habitats on the site have been extensively altered for silviculture. FWC comments are based on generalized observations of the Action Area through windshield surveys and local knowledge of the area. Specific sampling of the Action Area has not been conducted by the FWC biologists.

There is no set protocol at this time for providing reasonable assurance that salamanders do not occur at a particular location. However, the consensus among herpetologists is that a reasonable effort would consist of drift fence surveys surrounding a potential breeding pond to be conducted in two consecutive "normal" weather years. There has not been an opportunity to adequately survey for the presence or absence of flatwoods salamanders in any of the potentially suitable habitats. However, based on the remote sensing analysis, site inspections, and the proximity to known locations, the Federal Aviation Administration presumes presence of flatwoods salamanders at four potential locations that were scored as moderate quality. This appears to be a reasonable approach given the size of the project area and the limited timeframe to conduct surveys. Positive results from any future surveys would require re-initiation of section 7 consultation if there is a potential to affect suitable habitat not addressed in the incidental take section of this opinion.

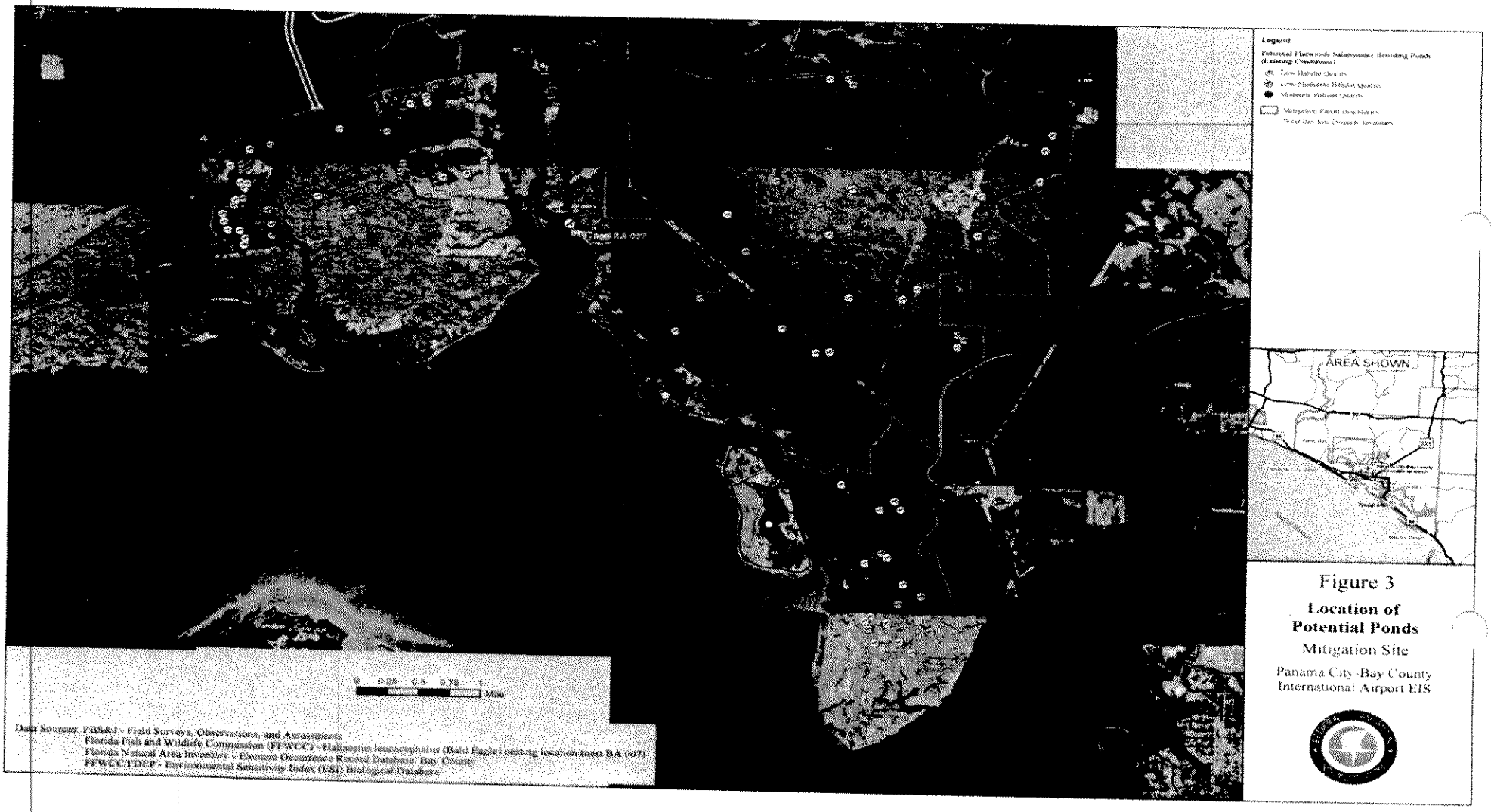


Figure 3

Location of Potential Ponds

Mitigation Site

Panama City-Bay County International Airport EIS

Factors affecting species environment within the action area

West Bay Sector Plan - Bay County officials recently conducted a special planning effort for an area totaling approximately 75,000 acres. This area is the boundary for the Cumulative Impacts Analysis Section of this opinion. The West Bay Sector Plan (Sector Plan) identifies potential development and conservation strategies for the area, and is dependent on relocation of the Panama City/Bay County International Airport. Although the Sector Plan may encourage and accelerate development, it could reduce adverse effects in comparison to existing land use regulations. There are no known flatwoods salamander records within the sector planning area. Potential habitat occurs in a proposed sector conservation area that coincides with the Breakfast Point mitigation bank and in the approximately 30,000 acres identified as the West Bay Preservation Area.

Public Lands - Pine Log State Forest is in proximity to the proposed airport location immediately adjacent to the sector planning area, but not located within the project area. The forest is actively managed in a manner that should improve salamander populations. There is one documented occurrence of flatwoods salamanders in the State Forest approximately 2 miles from the West Bay Site.

EFFECTS OF THE ACTION

The relocation of the Panama City-Bay County International Airport (PFN) is designed to meet projected future aviation needs within the Panama City-Bay County region. It has also been promoted by local officials as a key element in future economic growth for the area. The proposed project would relocate aviation facilities of the PFN and its operations to the West Bay Site. The project would consist of an airfield and terminal facilities, and include a primary air carrier runway 8,400 feet in length by 150 feet in width and a general aviation crosswind runway 5,000 feet in length by 100 feet wide. This system would be supported by the necessary ancillary facilities including taxiways, terminal area facilities, general aviation facilities, air traffic control and emergency facilities, lighting, and navigation facilities. The project would initially develop 1,378 acres of the 4,037-acre site. The project site is currently rural timberland used for the paper and wood products industry. Approximately 1,929 acres of the entire site are jurisdictional wetlands. The proposed project also includes three (3) parcels that would be used as mitigation for wetland impacts at the West Bay Site. These parcels are also presently rural timberlands and cover an area of 9,718 acres.

Direct effects

Effects of the project on salamander habitat are based on two important premises: 1) best available methods were used to identify potential habitat, and 2) presence of salamanders is presumed for these areas although none have been documented. The BA identifies specific direct effects of the project which include development of any potential flatwoods salamander habitats within the 4,037 acres of the West Bay relocation site. The BA identifies ten ponds (D, F, I, J, K, L, P, Q, R and W) that would be lost during the development of the airport parcel. Seven of these ponds were rated as low or low to moderate quality as potential flatwoods salamander habitat. The remaining three ponds were rated as moderate quality. These three

ponds and their associated upland buffer are approximately 475.5 acres in size. If the depressional wetland noted by the Service, but not sampled by FAA due to poor sampling conditions, is included, the four ponds and the associated buffer are a total of 584.3 acres in size.

Potential benefits may be gained on the mitigation parcels where 50 ponds considered Low, 27 considered Low – Moderate, and 6 considered Moderate quality will be enhanced by the more natural management of fire and hydrology. The management of the mitigation parcels may return these lands to a natural flatwoods condition after years of intensive silviculture. Although beneficial effects are encouraged and acknowledged, they are not considered as an offset to direct effects.

Indirect effects

Flatwoods salamanders are thought to be sensitive to soil and groundcover disturbing activities, especially when that disturbance creates an impediment to movement from upland habitat to the ephemeral wetlands they use for breeding and larval development. For this project, however, all of the potential breeding areas on site will be eliminated; therefore movement to and from, and among, wetlands is a moot point. Soil disturbance can also result in potential sedimentation and erosion affecting nearby wetlands habitat. Again, all potential wetland habitat on site eventually will be eliminated. In addition, because most of the perimeter of the project site will be maintained with minimal soil disturbance as "cleared areas" with little construction, the potential for sedimentation and erosion off-site is limited.

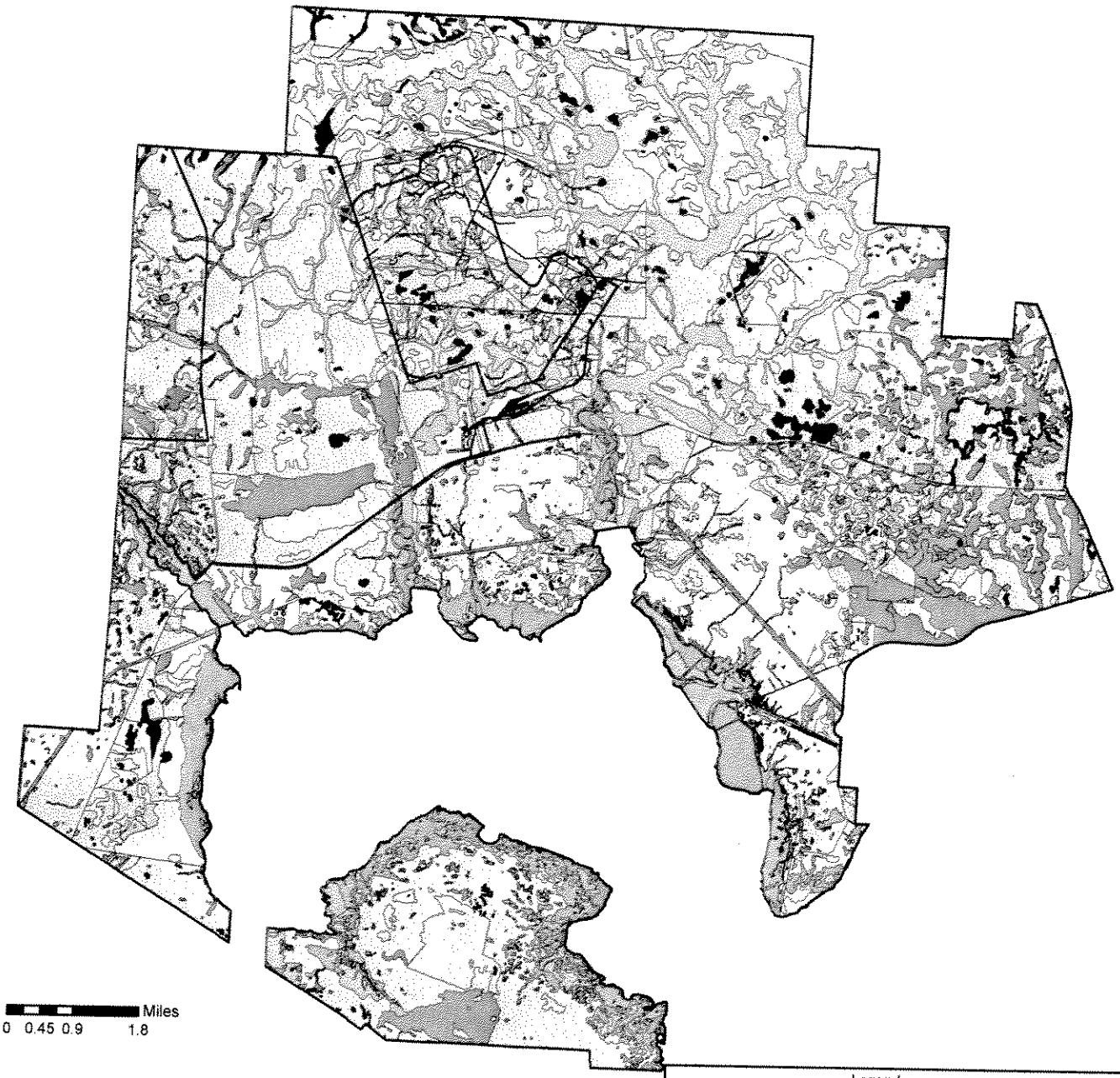
The Florida Department of Environmental Protection identified potential indirect effects to the regional water table which, if realized, could alter the hydrology of surrounding wetlands. This effect is still uncertain and according to the Airport Sponsor, it would be difficult to detect due to the intense monitoring scheme that would be required.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Private development would likely be accelerated outside of the project area. A state/local planning process for potential future development in the region has resulted in the development of the West Bay Area Sector Plan. This boundary is being used to evaluate the cumulative effects of the proposed action. Future Federal actions that are unrelated to the proposed project are not considered in this opinion because they require separate consultation pursuant to section 7 of the Endangered Species Act.

Analysis of Potential Flatwoods Salamander Habitat

The habitats of the Sector Plan area were calculated using GIS analysis. The current land use coverage from the Northwest Water Management District was employed to describe the wetland vegetative cover types within the Sector Plan area (***Figure 4***). Additional habitat information was included for the West Bay Site and the mitigation parcels. These habitats are assumed to be present on the ground currently. *Figure 4* can be compared to Bay County's future land use graphic and the Sector Plan (***Figures 5 and 6***).



1

Notes:
1. Land Use Data from the Northwest Florida Water Management District (NWFWMD) and on-site surveys.
2. Future land use is defined in the Bay County Comprehensive Plan.

Legend

- 1000 Urban
- 1500 Industrial
- 1720 Religious
- 2100 Cropland and Pastures
- 2540 Aquaculture
- 3200 Shrub and Brushland
- 3220 Coastal Shrub
- 4100 Upland Coniferous Forest
- 4230 Oak-Pine-Hickory
- 4270 Live Oak
- 4340 Hardwood-Conifer Mixed
- 4360 Upland Scrub, Pine and Hardwoods
- 4410 Coniferous Plantations
- 4430 Forest Regeneration Areas
- 5000 Water
- 6001 Wet Planted Pine
- 6100 Wetland Hardwood Forest
- 6130 Gum Swamps
- 6140 Tilt Swamps
- 6150 Stream and Lake Swamps
- 6200 Wetland Coniferous Forests
- 6210 Cypress
- 6250 Hydric Pine Flatwoods
- 6251 Hydric Pine Flatwoods
- 6300 Wetland Forested Mix
- 6310 Wetland Shrub
- 6400 Vegetated Non-Forested Wetlands
- 6410 Freshwater Marshes
- 6420 Saltwater Marshes
- 6430 Wet Prairies
- 6440 Emergent Aquatic Vegetation
- 6470 Herbaceous Depression
- 6480 Hillside Seep
- 6510 Tidal Flats
- 6520 Shorelines
- 6560 Tidal Marshes
- 6900 Shrub Wetland
- 7100 Beaches other the Swimming
- 7200 Sand other than Beaches
- 8000 Man-made Infrastructure
- West Bay Area Sector Plan

Figure 4

Bay County Land Cover

Panama City-Bay County International Airport EIS

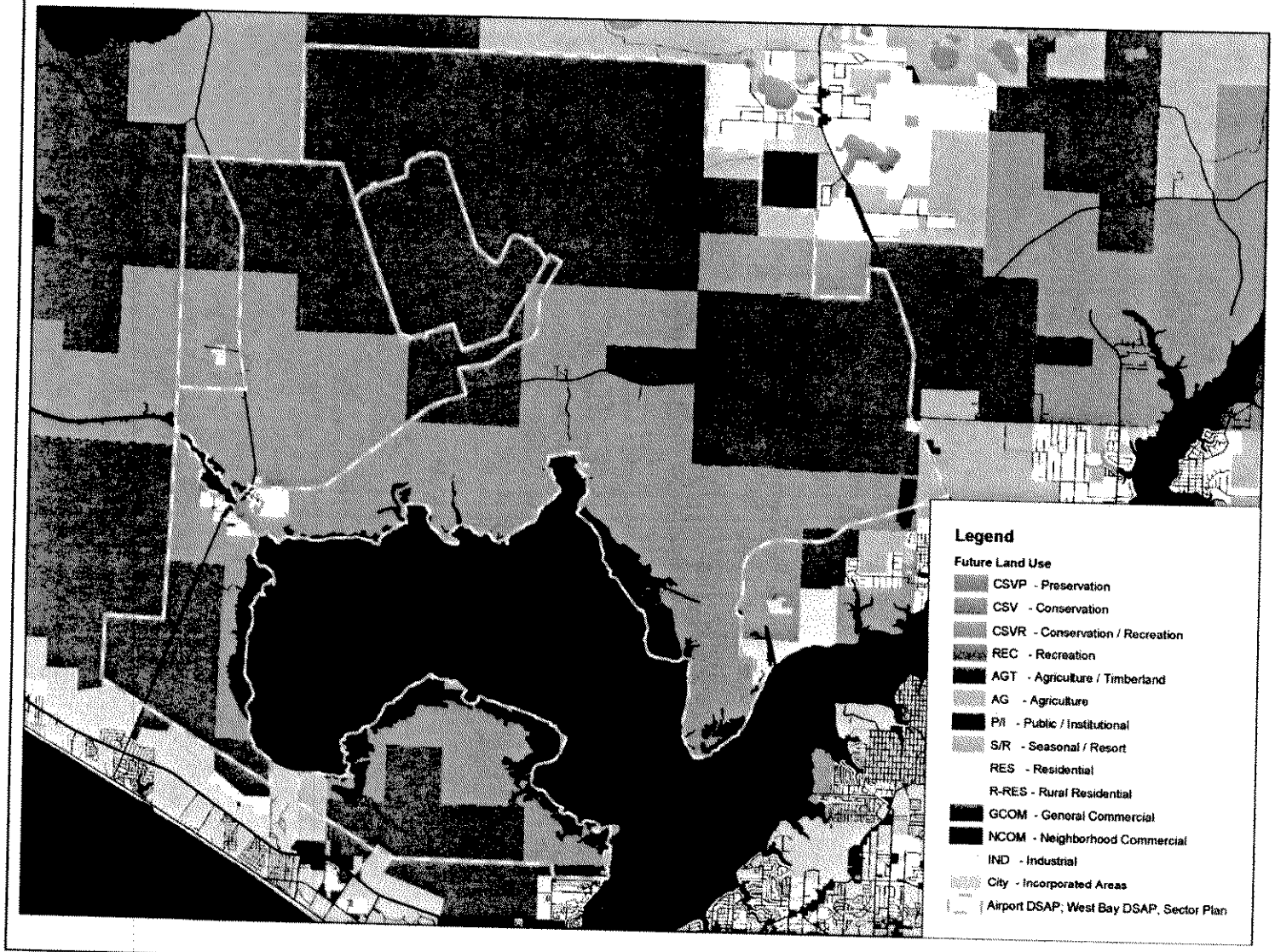


Figure 5

Future Land Use

Panama City-Bay County
International Airport EIS

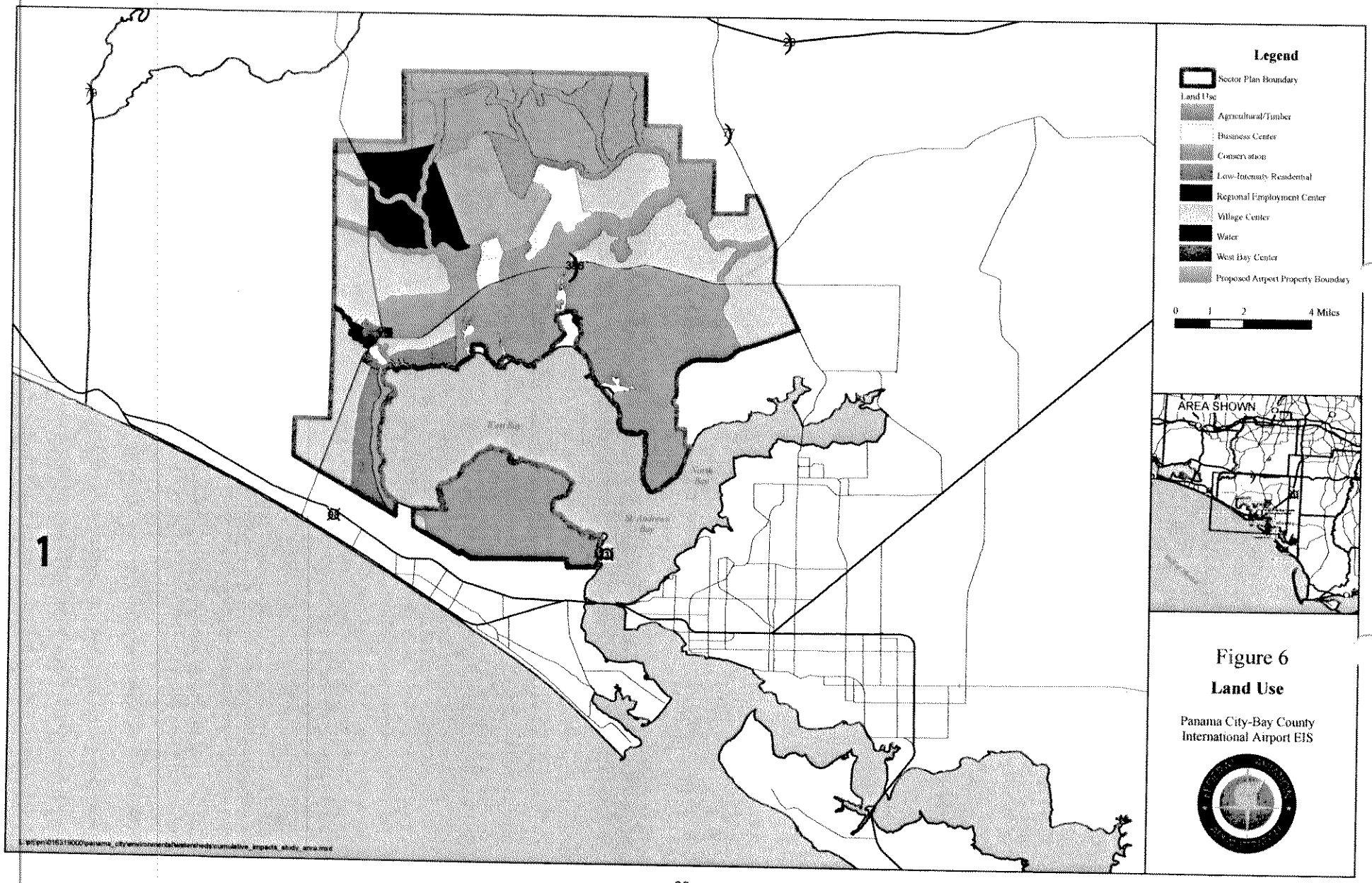


Figure 6

Land Use

Panama City-Bay County International Airport EIS

The Sector Plan area land uses described as wetlands are summarized in ***Table 2***. The potential use of the wetland types by flatwoods salamanders is noted as the FS Potential Association.

These FS Potential Association classifications are different than the breeding pond quality descriptions. Within the Sector Plan area, 33,396 acres are described as wetlands. This summation suggests that there are 1,048 acres that have a "good" potential to support flatwoods salamander reproduction. This analysis over estimates the potential habitat because of the difficulty in estimating appropriate microhabitats for the salamander based on regional geographic analysis (although it is the only way to assess these habitats on such a large regional scale).

Table 2 Wetland Habitats within the Sector Planning Area

FLUCFCS CODE	DESCRIPTION	ACREAGE	FS POTENTIAL ASSOCIATION
6001	Wet Planted Pine	13,409.92	Medium
6100	Wetland Hardwood Forests	3.03	Medium
6130	Gum Swamps	55.05	Medium
6140	Titi Swamps	7,355.53	Poor
6150	Streams and Lake Swamps (Bottomland)	29.84	Poor
6200	Wetland Coniferous Forests	497.75	Medium
6210	Cypress	864.07	Good
6250	Hydric Pine Flatwoods	175.84	Good
6300	Wetland Mixed Forests	6,107.52	Poor
6310	Wetland Scrub	4.91	Poor
6400	Vegetated Non-Forested Wetlands	60.14	Medium
6410	Freshwater Marshes	345.70	Poor
6420	Saltwater Marshes	3,987.99	None
6430	Wet Prairies	2.82	Good
6440	Emergent Aquatic Vegetation	4.22	Poor
6470	Herbaceous Depression	6.01	Good
6480	Hillside Seep	3.66	Poor
6510	Tidal Flats	306.23	None
6520	Shorelines	3.13	None
6900	Shrub wetland	173.07	Medium
	Total Wetlands in Sector Plan Area	33,396.43	

In order to evaluate potential cumulative effects in the study area, two scenarios of future development were utilized. The acreages of wetlands and the predicted future land use of the study area are summarized in ***Table 3***. The predicted land use is based on the existing Future Land Use Map (FLUM) from the Bay County Comprehensive Plan (Updated 5/4/2005) for 2010. The existing FLUM is used because any development projects within the study area which are less than 1,000 acres are not required to adhere to the principles of the Sector Plan. These calculations give insight into which wetland types would be conserved (potentially restored), left in agricultural and silviculture activities, and potentially destroyed by development.

Table 3 Wetland Habitats Based on Bay County Future Land Use Map			
FLUCFCS CODE	DESCRIPTION	ACREAGE	FS POTENTIAL ASSOCIATION
Agriculture			
6001	Wet Planted Pine	81.77	Medium
6140	Titi Swamps	81.16	Poor
6200	Wetland Coniferous Forests	1.57	Medium
6210	Cypress	9.17	Good
6300	Wetland Mixed Forests	111.45	Poor
6310	Wetland Shrub	7.94	Medium
6410	Freshwater Marshes	1.23	Poor
6420	Saltwater Marshes	7.02	None
6510	Tidal Flats	3.90	None
	Total Wetlands	305.21	
Silviculture			
6001	Wet Planted Pine	6,019.39	Medium
6100	Wetland Hardwood Forests	0.15	Medium
6140	Titi Swamps	4,386.58	Poor
6141	Titi-Bay-Pine Swamp	441.06	Poor
6200	Wetland Coniferous Forests	409.17	Medium
6210	Cypress	611.54	Good
6300	Wetland Mixed Forests	2,801.97	Poor
6310	Wetland Shrub	23.29	Medium
6400	Vegetated Non-Forested Wetlands	13.65	Medium
6410	Freshwater Marshes	72.33	Poor
6420	Saltwater Marshes	88.49	None
6510	Tidal Flats	2.10	None
6560	Shorelines	0.53	None
	Total Wetlands	14,870.25	
City			
6200	Wetland Coniferous Forests	0.11	Medium
6300	Wetland Mixed Forests	0.03	Poor
6310	Wetland Shrub	0.69	Medium
6410	Freshwater Marshes	1.02	Poor
6510	Tidal Flats	0.01	None
	Total Wetlands	1.86	
Conservation			
6001	Wet Planted Pine	7,252.37	Medium
6100	Wetland Hardwood Forests	2.54	Medium
6130	Gum Swamps	39.89	
6140	Titi Swamps	1586.61	Poor
6141	Titi-Bay-Pine Swamp	60.33	Poor
6150	Streams and Lake Swamps (Bottomland)	29.86	Poor
6200	Wetland Coniferous Forests	86.11	Medium
6210	Cypress	175.16	Good
6250	Hydric Pine Flatwoods	129.14	Good
6300	Wetland Mixed Forests	3,113.77	Poor
6310	Wetland Shrub	103.48	Poor
6400	Vegetated Non-Forested Wetlands	46.54	Medium
6410	Freshwater Marshes	267.97	Poor
6420	Saltwater Marshes	1,756.12	None
6430	Wet Prairies	2.82	Good
6440	Emergent Aquatic Vegetation	7.05	Poor
6470	Herbaceous Depression	3.58	Medium
6510	Tidal Flats	41.23	None
6520	Shorelines	2.82	None
	Total Wetlands	14,707.39	

Preservation			
6001	Wet Planted Pine	0.23	Medium
6140	Titi Swamps	34.0	Poor
6141	Titi-Bay-Pine Swamp	0.05	Poor
6300	Wetland Mixed Forests	0.11	Poor
6420	Saltwater Marshes	33.71	None
6520	Shorelines	0.50	None
	Total Wetlands	68.60	
General Commercial			
6001	Wet Planted Pine	0.02	Medium
	Total Wetlands	0.02	
Industrial			
6001	Wet Planted Pine	0.13	Medium
6300	Wetland Mixed Forests	0.87	Poor
6410	Freshwater Marshes	0.18	Poor
	Total Wetlands	1.18	
Public Institutional			
6001	Wet Planted Pine	4.97	Medium
6210	Cypress	8.41	Good
6300	Wetland Mixed Forests	7.31	Poor
	Total Wetlands	20.69	
Residential			
6001	Wet Planted Pine	52.14	Medium
	Total Wetlands	52.14	

Source: Kimley-Horn and Associates, Inc. 2005, based on Bay County Future Land Use Geographic Information System (GIS) data.

Future land use data indicates that of the approximately 33,000 acres of wetlands in the study area, 14,775 acres of wetlands would be on conservation lands, which actually allow up to two residential density units per acre depending on the special treatment zone in which they occur. The largest portion, 14,870 acres, would still be managed intensively for silviculture under the FLUM. The potential impacts to wetlands within general commercial, industrial, public institutional and residential land uses (including "conservation") are difficult to predict. However, the majority of those wetland types described as good are projected to be in "conservation" or remain in silviculture according to the existing FLUM. All wetlands in Table 3 would be subject to either state or federal regulatory requirements or both.

The second scenario for evaluating potential future cumulative impacts uses the Sector Plan overlay. The acreages of wetlands and the predicted Sector Plan land use are summarized in ***Table 4.*** These calculations give insight into which wetland types would be conserved (potentially restored), left in agricultural and silviculture activities, and potentially destroyed by development.

Table 4 Wetland Habitats Based on Sector Plan Land Use			
FLUCFCS CODE	**DESCRIPTION**	**ACREAGE**	**FS POTENTIAL ASSOCIATION**
Agriculture/Timber			
6001	Wet Planted Pine	1,121.88	Medium
6140	Titi Swamps	1,278.25	Poor
6141	Titi-Bay-Pine Swamp	38.01	Poor
6200	Wetland Coniferous Forests	99.91	Medium
6210	Cypress	147.30	Good
6300	Wetland Mixed Forests	64.13	Poor
6310	Wetland Shrub	16.98	Medium
6410	Freshwater Marshes	1.08	Poor
6560	Shorelines	0.53	None
	Total Wetlands	2,768.07	
Airport			
6001	Wet Planted Pine	953.01	Medium
6140	Titi Swamps	556.18	Poor
6141	Titi-Bay-Pine Swamp	216.51	Poor
6210	Cypress	59.24	Good
6250	Hydric Pine Flatwoods	46.43	Good
6300	Wetland Mixed Forests	42.17	Poor
6310	Wetland Shrub	1.41	Poor
6410	Freshwater Marshes	2.23	Poor
6470	Herbaceous Depression	2.44	Good
6480	Hillside Seep	2.63	Poor
	Total Wetlands	1,882.25	
Business Center			
6001	Wet Planted Pine	444.61	Medium
6140	Titi Swamps	243.07	Poor
6141	Titi-Bay-Pine Swamp	199.75	Poor
6210	Cypress	36.39	Good
6300	Wetland Mixed Forests	13.78	Poor
6310	Wetland Shrub	1.22	Poor
6400	Vegetated Non-Forested Wetlands	8.93	Poor
6410	Freshwater Marshes	0.60	Poor
6470	Herbaceous Depression	2.92	Good
	Total Wetlands	951.27	
Conservation			
6001	Wet Planted Pine	8,533.02	Medium
6100	Wetland Hardwood Forests	2.54	Medium
6130	Gum Swamps	55.1	Medium
6140	Titi Swamps	3,756.50	Poor
6141	Titi-Bay-Pine Swamp	249.74	Poor
6150	Streams and Lake Swamps (Bottomland)	29.86	None
6200	Wetland Coniferous Forests	229.57	Medium
6210	Cypress	111.687	Good
6250	Hydric Pine Flatwoods	129.55	Good
6300	Wetland Mixed Forests	3,652.28	Poor
6310	Wetland Shrub	0.44	Poor
6400	Vegetated Non-Forested Wetlands	38.29	Poor
6410	Freshwater Marshes	240.70	Poor
6420	Saltwater Marshes	3,598.82	None
6430	Wet Prairies	2.82	Good
6440	Emergent Aquatic Vegetation	4.23	Poor
6470	Herbaceous Depression	0.66	Good
6510	Tidal Flats	292.50	None
6520	Shorelines	3.13	None
6900	Shrub wetland	88.55	Medium

	Total Wetlands	21,058.24	
Low Intensity Residential			
6001	Wet Planted Pine	718.45	Medium
6200	Wetland Coniferous Forests	4.88	Medium
6210	Cypress	73.02	Good
6300	Wetland Mixed Forests	10.08	Poor
6410	Freshwater Marshes	8.31	Poor
6420	Saltwater Marshes	215.81	None
6900	Shrub wetland	0.423	Medium
	Total Wetlands	1,030.97	
Regional Employment Center			
6001	Wet Planted Pine	197.98	Medium
6140	Titi Swamps	232.935	Poor
6141	Titi-Bay-Pine Swamp	14.69	Poor
6200	Wetland Coniferous Forests	3.34	Medium
6210	Cypress	15.71	Good
6300	Wetland Mixed Forests	106.10	Poor
6310	Wetland Shrub	1.85	Poor
6480	Hillside Seep	1.03	None
6900	Shrub wetland	0.412	Medium
	Total Wetlands	574.05	
Roads			
6001	Wet Planted Pine	90.22	Medium
6140	Titi Swamps	8.93	Poor
6200	Wetland Coniferous Forests	7.24	Medium
6210	Cypress	2.57	Good
6300	Wetland Mixed Forests	28.09	Poor
6420	Saltwater Marshes	1.00	None
6900	Shrub wetland	0.34	Medium
	Total Wetlands	138.39	
Village Center			
6001	Wet Planted Pine	1,444.03	Medium
6100	Wetland Hardwood Forests	0.49	Medium
6140	Titi Swamps	567.67	Poor
6200	Wetland Coniferous Forests	152.76	Medium
6210	Cypress	419.60	Good
6300	Wetland Mixed Forests	2,176.65	Poor
6400	Vegetated Non-Forested Wetlands	12.98	Poor
6410	Freshwater Marshes	94.61	Poor
6420	Saltwater Marshes	30.41	None
6900	Shrub wetland	58.39	Medium
	Total Wetlands	4,957.59	
Water			
6300	Wetland Mixed Forests	29.70	Poor
6420	Saltwater Marshes	36.74	None
6510	Tidal Flats	1.18	None
	Total Wetlands	67.62	
West Bay Center			
6001	Wet Planted Pine	2.70	Medium
6300	Wetland Mixed Forests	23.10	Poor
6410	Freshwater Marshes	1.05	Poor
6420	Saltwater Marshes	0.43	None
6900	Shrub wetland	8.92	Medium
	Total Wetlands	36.20	

Source: Kimley-Horn and Associates, Inc. 2005, based on Bay County Sector Plan (GIS) data.

Within the region, large-scale mitigation parcels are proposed for up to 25,066 acres. These would be comprised of the mitigation parcels for the proposed action (9,718 acres),

West Bay to East Walton Regional General Permit conservation units (10,700 acres), and Breakfast Point Mitigation Bank (4,648 acres). These lands would be managed with a much more natural fire regime, thinned timber, and potential restoration of the historic hydrology. This would benefit approximately 25,066 acres of natural habitat, much of which is within the 74,706 acres of the Sector Plan.

The Sector Plan land use data indicates that of the approximately 33,000 acres of wetlands in the study area, approximately 21,000 acres of wetlands would be on conservation lands, which, unlike the existing FLUM, are not allowed any residential density units. The second largest portion of wetlands, 2,768 acres, would still be managed intensively for agriculture/silviculture. The potential impacts to wetlands within the other land use categories are difficult to predict, but it should be helpful that approximately 64 percent of the wetlands will be in conservation if the plan is carried forward. However, these lands include only 243 of the 6048 acres that are considered potential breeding habitats in the sector planning area. Therefore, approximately 75% of the total potential habitat could be subject to future 404 actions outside of this project. The proposed action includes the loss of four potential flatwoods salamander ponds totaling 13.1 acres. This acreage represents approximately 1% of the available 1,048 acres of potential breeding wetlands within the sector planning area.

CONCLUSION

After reviewing the current status of the flatwoods salamander, the environmental baseline for the Panama City-Bay County International Airport (PFN) action area, the effects of the proposed activities, proposed protective, avoidance, and minimization measures, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the flatwoods salamander. Within the project area, eleven wetlands were identified as potential suitable habitat for the flatwoods salamander. No documented breeding habitat for flatwoods salamander will be affected. As conditions of issuing the permit for the project, mitigation lands totaling 9,718 acres will be established to compensate for loss of wetland values. Of the eleven wetlands, only four were considered moderate quality. The combined acreage of the four wetlands and their associated upland buffer totals 584.3 acres. Loss of 584.30 acres of potential habitat will not appreciably reduce the survival and recovery of the flatwoods salamander. No documented breeding pond habitat will be affected. No critical habitat has been designated for the flatwoods salamander; therefore, none would be affected.

There are approximately 160 known flatwoods salamander ponds in Florida with a conservative estimate of 34,720 acres of pond and buffer habitat in the State (average 5-acre pond size plus 1,476-ft. buffer). Therefore, the amount of take could be viewed as 1.68% of the known habitat in the State of Florida. This proportion would be even lower if an analysis of potential habitat, similar to the BA, were done for the entire state.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act and Federal regulation pursuant to Section 4(d) of the Act prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to

include major habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to noticeably disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the Airport Sponsor for the exemption in Section 7(o)(2) to apply. The FAA has a continuing duty to regulate the activity covered by this incidental take statement. If the FAA (1) fails to assume and assure implementation of the terms and conditions, or (2) fail to require the Airport Sponsor to adhere to the terms and conditions of the Incidental Take Statement through enforceable terms, the protective coverage of Section 7(o)(2) may lapse. To monitor the impact of incidental take, the FAA must report the progress of the project and its impacts on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

AMOUNT OR EXTENT OF TAKE

The Service has determined that incidental take of individual flatwoods salamanders is difficult to detect for the following reasons: (1) adult flatwoods salamanders are difficult to locate and observe. (2) Individuals killed during construction would likely be buried under dirt and debris, and/or, (3) losses may be masked by natural fluctuations in numbers of individuals. Although mortality of individuals is difficult to document, the level of take of this species was determined as follows: An estimated 584.3 acres of potential breeding pond and buffer habitat is presumed to be taken by development activities.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the species. The amount of take is for **presumed occupied** habitat and is small when compared to potential habitat that will remain in the mitigation parcels, which will eventually be restored to more suitable habitat and managed in perpetuity. No critical habitat has been designated for the flatwoods salamander; therefore, none will be affected.

REASONABLE AND PRUDENT MEASURES

The Service believes that the following reasonable and prudent measure (RPM) is necessary and appropriate to minimize take of flatwoods salamanders in the action area.

- The mitigation plan will be implemented as defined in the project description.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the FAA and applicant must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The FAA will ensure that the mitigation plan as proposed will be implemented in its entirety and in perpetuity.[1]

2. The FAA will monitor the progress of the action. The monitoring must be sufficient to determine if the amount or extent of take is approached or exceeded, and the reporting must assure that the Service will know when that happens.

CONSERVATION RECOMMENDATIONS FOR FLATWOODS SALAMANDERS

Section 7(a)(1) of the Endangered Species Act (Act) directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We request that the following conservation recommendations be implemented.

1. Develop in cooperation with USFWS a long-term conservation strategy for flatwoods salamanders on lands within the cumulative effects study area.
2. The FAA should continue to monitor and report to the Service and other agencies cumulative effects that result from accelerated development in the study area.
3. The FAA should encourage and financially support continued flatwoods salamander surveys in the area.
4. The FAA should monitor the implementation of the mitigation plan, including the financial assurances to continue management in perpetuity.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

[1]The FAA will ensure that the mitigation measures included in the FEIS for the proposed project are implemented through the issuance of its Record of Decision (ROD). The mitigation measures will become an official part of the ROD thus requiring the Airport Sponsor to comply with Federal grant assurances in order to receive and to continue to receive federal funding for the proposed project. Implementation of mitigation measures included in the FEIS and ROD is a legally binding requirement in order to receive federal funds. Violation of federal grant assurances can result in the FAA withholding federal funds or reimbursement by the Airport Sponsor of federal funds received.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in this biological opinion. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

If you have any questions about this opinion or consultation, please contact staff biologist Hildreth Cooper of our Panama City Field Office at (850) 769-0552, extension 221.

Sincerely yours,

Gail A. Carmody
Project Leader

cc:
USACE, (Panama City, FL) Don Hambrick
USFWS, ES, Jackson, MS (Linda LaClaire)
USFWS, Habitat Conservation/section 7, Atlanta, GA (e-mail copy to Joe Johnston)
FWCC, Tallahassee, FL (Ted Hoehn)
USEPA, Atlanta, GA (Haynes Johnson)
FDEP, Pensacola, FL (Dick Fancher)

LITERATURE CITED

Ashton, R.E., Jr. 1992. Flatwoods salamander (Cope). Pgs. 39-43 *in*: P.E. Moler (ed.). Rare and endangered biota of Florida. Volume III. Amphibians and reptiles, University Press of Florida, Gainesville, Florida.

Palis, J.G. 1993. A status survey of the flatwoods salamander, *Ambystoma cingulatum*, in Florida Natural Areas Inventory, Tallahassee, Florida. 29 pp. plus appendices.

Palis, J.G. 1995. Larval growth, development, and metamorphosis of *Ambystoma cingulatum* on the Gulf Coastal Plain of Florida. Florida Scientist 58:352-358.

Palis, J.G. 1997. Distribution, habitat, and status of the flatwoods salamander (*Ambystoma cingulatum*) in Florida, USA. Herpetological Natural History 5:53-65. to St. Joe Company.

Sekerak, C.M. 1994. Vegetation and aquatic vertebrate and macroinvertebrate assemblages in flatwoods salamander breeding ponds in the Apalachicola National Forest. Unpublished Master's thesis, University of Florida, Gainesville, Florida. 74 pp.

Semlitsch, R.D. 1998. Biological delineation of terrestrial buffer zones for pond-breeding salamanders. Conservation Biology 12:1113-1119.

U.S. Fish and Wildlife Service (USFWS). 1987. Habitat management guidelines for the bald eagle in the southeast region. 9 pp.

Appendix A- Flatwoods Salamander Pond Habitat Evaluation – Proposed Mitigation Parcels

Pond	Code	Pond	Eco	UP	total	Quality	Description/Field Notes
1A-FSBP1	621	1	0.5			low	Pond has open cypress canopy but dense shrub and subcanopy of Lyonia lucida, Ilex myrtifolia, Nyssa biflora, and titi. Ecotone present over about 50% of perimeter, low diversity, no ecotone (all titi) elsewhere. Logging slash pushed into pond.
1A-FSBP2	621	1	1.5			low	Small 621 dome. Dense shrubs in pond, no groundcover. Decent ecotone with Rhynchospora (wiry), Panicum, Andropogon, other sedges, Xyris, Hypericum, red root, young cypress recruits, good cover and diversity. Uplands, young planted pine and andropogon, with a little bit of wiregrass (not much). Sarracenia flava in ecotone. Good cypress recruitment.
1A-S2	630	1	1			low	This is a 614 on map but has cypress, sweetbay, etc. mixed with titi. Potential FSBP but would require restoration. Perimeter is bermed. Need to regrade and burn. Hand clear titi.
1A-S5	621	1	1.5			low	Pond lacks groundcover. Has logging debris covering ground. More open than FSBP4. Salamander obs. in pond - unknown spp.
1A-S8	621	1	1			low	Ecotone shrubby with titi and Lyonia lucida. A few narrow with ok ecotone. Pond has large cypress and open density, but no groundcover. Dense shrub and subcanopy of titi. Bedding or rutting into pond. Hog rooting in ecotone.
1B-FSBP1	630	1	1			low	Formerly flowing?, not now. No special action required.
1C-FSBP1	630	1	1	0	2	low	Burn uplands, allow pond to mature. Pond made up of Cyrilla, Nyssa, Ilex myrtifolia, some slash pine. Titi fringe around pond.
1D-FSBP1	630	1	1.5			low	Ecotone: corkwood, Carex, Lyonia lucida, Cliftonia Pond: >70% crown closure; no tufted or grass species; groundcover is 100% leaf litter/shrubs. No standing water, but shows signs of periodic innundation: watermarks, hummucking, buttressed trunks. Upland: 441/600, no wiregrass, cliftonia subcanopy Is more 630 than 621. Some cypress, but <15%
1D-FSBP2	621	1	1.5			low	Pond has no herbaceous groundcover; leaf litter and hummocked shrubs. Cypress present but patchy. Mostly Cliftonia.Ecotone: Andropogon, hypericum, carex. Upland: 441/600 with cyrilla understory, no wiregrass.
1D-FSBP3	630	1	1.5			low	Pond: very overgrown in shrub layer (I. coriacea, Clethra, Lyonia lucida, Magnolia virginiana), needs a fire. Some cypress towards center but sparse. Ecotone: Area of Andropogon, Rhynchospora, Hypericum; no wiregrass Upland: Planted pine, no wiregrass Overall very poor FSBP, no water.
1E-FSBP1	621	1	0.5			low	Open but no graminaceous cover. Not sure why. Is mixture of 630/621. Cypress healthy here. Lots of Nyssa biflora also. No graminaceous groundcover in ecotone or upland.
1E-FSBP2	640	1	0.5			low	Part 640 (Lyonia lucida, cyrilla) and part 630 (Nyssa biflora, Acer rubrum, button bush). No graminaceous cover, not FSBP habitat. Ecotone is thick and woody.
1E-FSBP3	630	1.5	0.5			low	Change FLUCFCS to 630. Nyssa biflora and Cypress and Magnolia virginiana. Open pond is ephemeral, but lacks graminaceous cover. No Aristida around, but has carex, rhyncospora, mystery ludwigia in some areas, ecotone and upland same as FSBP2 and FSBP1. Pots and turpentine scars found.
1E-FSBP4	613	1	1.5			low	West half is gum swamp, east half is cypress. Pond is ephemeral but lacks graminaceous cover. Ecotone has patches where Andropogon and Rhynchospora spp. Provide some "bunch grasses" habitat but no Aristida. Upland is 441/600.
1E-FSBP5	621	1	0.5			low	Similar to FSBP6 except less peat and lots of Lyonia lucida within pond. Numerous cypress dead. Some recruitment. Fire evidence around.
1E-FSBP6	621	1	0.5			low	Similar to FSBP7 except most cypress are dead and no groundcover. Ecotone overgrown. Lots of slash in wetland. Excessive peat, at least 7". Turpentine evidence.
1G-FSBP1	630	1.5	1			low	Upland: clearcut with small population of wiregrass in southeast corner only. Ecotone: clearcut with small population of wiregrass/pitcher plants in southeast corner only. Pond: 630 with overstory of Magnolia virginiana, Cypress, tupelo, Pop ash. Some standing water despite the drought. Pickerelweed and Panicum rigidulum growing in water. Overstory moderately thick. Has some open areas. No wiregrass.

1G-FSBP3	640	1	1			low	Depressional area where planted pines have died due to wetness. Now comprised of Andropogon virgnianus, mystery Ludwigia, and Panicum scab. Pond: no water, some wiregrass <10%, Ilex myrtifolia, Panicum scab., redroot Ecotone: 441/600 with thick understory of Myrica cerifera, Ilex glabra, Magnolia virginiana, Ilex corrieacea, Upland is clearcut
1I-FSBP3		0.5	0.5			low	441/600 with Cyrilla understory. No potential for FS. Signature on aerial is anomaly.
1I-FSBP4	630	1	1			low	No wiregrass, No cypress. Upland is 441/600. Ecotone is Carex and corkwood. System is very thick and has greater than 70% crown closure with Carex groundcover.
1I-FSBP5	621	1	1			low	Pond 621. Large mature cypress but understory thick with cyrilla and carex clumps. Dry at time of inspection. Ecotone is Cyrilla and Andropogon virginicus. Numerous cypress recruits. Uplands are 441/600 with 12' high slash pine and Cyrilla understory.
2D-FSBP1	621	1	0.5			low	Dense subcanopy of shrubs; dark and no to little ecotone, mostly titi; upland on side toward road sucks, titi jungle; 441 and 441/600 upland witout wiregrass. Possible old firebreak evident along portions of pond edge. Logging slash piled up along margin in places, with dense vine/shrub cover over debris. Needs fire, hand or mechanical thinning of ecotone and remove slash pile and firebreak if large enough, not around entire pond.
2F-FSBP1	621	1.5	1			low	Pond: Nice little cypress pond but not salamander habitat. No herbaceous graminaceous component in pond or ecotone. Made up of Taxodium ascendens, Cyrilla, Lyonia lucida, Itea virginiana Ecotone: Cyrilla, Ilex coriacea, Aronia, Andropogon virginicus, Pinus elliottii Upland: Serenoa repens, bracken, Lyonia lucida, Cyrilla and slash pine
2F-FSBP2	630	1.5	1			low	Same as FSBP3 Except pond is 630 instead of 621. Potential champion Ilex myrtifolia at S2
2F-FSBP4	621	1	1			low	Pond has thick woody cover. No graminaceous component. Is a mixture of 630/621.
2G-FSBP1	621	1.5	1			low	Pond made up of several cypress, Ilex myrtifolia and Cyrilla; canopy closure may be about 70% and some sedges are present Ecotone is overgrown with titi; no water in system but 8" waterline. Uplands cleared to the west side of pond down to ecotone.
2G-HQW2	630	1	1			low	Mixed wetland with Cyrilla, cypress, Ilex myrtifolia and Nyssa biflora. Some sedges and open canopy in some areas. Clethra dominant ground cover. Some Cyrilla large with DBH of 10-12". System dry at this time. Parrot pitcher plants northwest of point within HQW2. Some limited wiregrass on northwestern ecotone, otherwise ecotone is overgrown with Cyrilla.
2G-S1	630	1	0.5			low	Small cypress, Ilex myrtifolia and Nyssa depression. Very shrubby inside with 90-100% canopy closure. Ecotone almost non-exsitent since dominated by titi and Clethra. Needs hand clearing and possible burn.
2K-FSBP1	630	0.5	0.5			low	Pond is Titi/Bay swamp. Very little graminaceous habitat. No uplands. Part of Jackson Titi.
2L-FSBP1	630	1	1			low	Mixed forested wetland with Taxodium ascendens, Magnolia virginiana as canopy and Cyrilla, Acer rubrum, Myrica cerifera as subcanopy. Interior is fairly shruby with no herbaceous ground cover. Ecotone is all titi. Several stumps from old slash pine are present. Stumps at least 30" in diameter
2L-FSBP3	630	1	1			low	Some cypress and bay with lots of Cyrilla and Lyonia lucida. Pond interior is extremely shrubby and dense with no groundcover; ecotone is overgrown with shrubs.
2L-FSBP5	613	1	1.5			low	FSBP 5, 4, and 6 part of same system. FSBP 6 may serve as some ecotone for other two ponds. FSBP 5 is mostly shrubby and made up of Nyssa, Cyrilla, Lyonia lucida, and Myrica cerifera. Some large Magnolia virginiana in system. Little to no groundcover in pond.
2N-FSBP3	621	1	1			low	Shrubby; similar to FSBP2 except more overgrown w/ Cyrilla; more ecotone except some clumps of wiregrass
2O-FSBP1	614	0.5	0.5			low	Is not salamander habitat, is all Cyrilla racemiflora/Cliftonia monophylla
2Q-FSBP1	630	1	1			low	Pond large 630; pop ash, gum, bay; no herbaceous due to shading; Ecotone thick Cliftonia, no wiregrass

2Q-FSBP3	630	0.5	0.5			low	Not suitable; cypress but also a lot of Cliftonia; also has some Nyssa biflora, however has no grass species and is not open enough; it is ephemeral; Ecotone: no grass species all Cliftonia monophylla, Cyrilla; dense upland not present, is surrounded by wetland and powerline which does have some wiregrass but no canopy
2T-FSBP2	630	0.5	0			low	Cypress and maple dominate, pickerelweed and lizardtail groundcover, not much herb grasses, does appear ephemeral; Ecotone is wax myrtle and yaupon, very thick, unsuitable for FS, upland same as ecotone
2W-FSBP1	630	1	1.5			low	Cypress, Nyssa biflora, Magnolia virginiana; canopy is 90% closure; ecotone along powerline is decent but opposite side is very shrubby, adjacent uplands have been clear cut; apparent use of herbicide on pond within powerline easement Ecotone along powerline has Panicum scab., xyris, corkwood
2W-S1	630	1	1			low	Cypress, sweet bay, Nyssa 630 system part of much larger historic system; cypress recruitment, but titi encroachment; lots of logging slash and damage from logging opperations; saw broad winged hawk
3C-FSBP2	641	1	1.5			low	Pond: Nice little open water pond lined with pickerelweed, may have water year round. Ecotone: wide marsh area comprised of pickerelweed, mystery ludwigia, Rhynchospora spp., Juncus effusus, Pluchea. Good diversity. Upland: 441/600 so gets low score, no wiregrass. Site may be too wet for Flatwoods salamanders.
3C-FSBP4	441/600	1	1			low	Same as FSBP6. Obligate species include mystery ludwigia, mermaid weed, Juncus. No wiregrass or cypress. Florida box turtle noted.
3C-FSBP5	626	1	1			low	Nice wet pine savanna despite silviculture. Very thick herbaceous cover throughout. No real pond area, some pockets of standing water with minnows, so probably not ephemeral. Planted pine has died off in center due to being too wet. Good diversity in groundcover, no wiregrass.
3C-FSBP6	441/600	1	1			low	441/600 pines have been thinned due to wetness (mortality). Is savanna like beneath with good groundcover. Too wet for wiregrass. Mostly obligate species. Should be changed from 641 to 441/600.
3E-FSBP6	613	1	1.5			low	Very similar to FSBP4. Larger Nyssa area but more shaded canopy. Also a few large pines in "Pond". Pond was bedded through at some point as was ecotone. Ecotone similar to FSBP4. Possibly narrower. Same species. Possibly some Spartina patens in some of ecotone.
3E-FSBP7	641	1	1.5			low	Probably wet year round, not ephemeral. Also likely connects to road ditch and has fish. Well flooded now to at least 1-2 feet deep. Vegetation in pond and ecotone is Carex spp., corkwood, mystery ludwigia, Pluchea. Also has fish. This is a nice flatwoods pond, but probably not ephmeral, so not a FSBP. Pond margin has Nyssa and planted pine.
3F-FSBP6	641	1	1			low	Logging ruts with standing water. Poor ecotone. Pond species include Rhynchospora, Centella, wiry Rhynchospora, Scattered Nyssa, Panicum virgatum and Juncus.
3F-FSBP7	641	1	1			low	Marsh area dominated by Rhynchospora, Spartina. Logging slash and ruts within pond. No canopy. Presently standing water in pond. Little or no ecotone. Pond goes right to uplands.
3G-FSBP11	641	1	1			low	Pond has no standing water comprised of mystery ludwigia, Nyssa biflora, Juncus effusus, corkwood; Ecotone is the same, no real ecotone. Goes from pond to 441/600. Upland is 441/600 with Nyssa biflora in understory.
3G-FSBP7	641	0.5	0.5			low	Pond is full of Cladium, Juncus, Spartina patens with Nyssa biflora around perimeter. Standing water so not ephemeral.
3G-FSBP8	641	0.5	1			low	Pond is 90% Juncus effusus. Does have some Nyssa biflora. Ecotone has a few clumps of wiregrass under Nyssa biflora. Upland: Pinus elliottii with serenoa repens. Lots of vitus. Very little herbaceous cover. No wiregrass noted.
3G-FSBP9	621	1	1.5			low	Cypress dominated wetland, however many cypress are dead or dying. Not sure why. Seems to have plenty of water. Pond is cypress with sawgrass groundcover. Ecotone is Nyssa biflora, Myrica cerifera, royal fern, some patches of wiregrass and other grasses/sedges. Upland is 441/600 with Ilex vomitoria and glabra. Sparse groundcover.

1A-FSBP3	621	2	1.5	1	4.5	low-moderate	Open canopy, dense groundcover with Rhynchospora, redrood, Xyris, mystery ludwigia, Andropogon, Cliftonia, and corkwood.
1A-FSBP4	621	2	1.5	1	4.5	low-moderate	Interior has rutting and ditching, but doesn't leave pond. Carex, Hypericum, and cypress recruits.
1B-FSBP2	640	2	1	1	4	low-moderate	Shrub bog with titi; ditched and possibly rutted. Could fill. Good groundcover patches, very open.
1B-S1	640	2	1	1	4	low-moderate	Good groundcover and open canopy 640 with 621 fringe and small seedlings within pond. 2 water moccasins and fish present. Potential new Low water crossing and or 441w restoration could affect this site. No vegetation planting needed because cypress recruits. Fire and possible hydrological restoration close to road ditch. And default low water crossing of highwater. Unclear if road ditch is draining site; road bisecting larger wetland.
1D-FSBP4	614	1	2	1	4	low-moderate	Pond actually 614 with wide open ecotone: Hypericum, Lacnanthes, Andropogon, and some sporabolus.
1E-FSBP10	641	2	1.5	1	4.5	low-moderate	Similar to FSBP12 with more mystery ludwigia and Nyssa, Some Myrica cerifera. Ecotone is shrubbier.
1E-FSBP7	621	2	1	1	4	low-moderate	Cypress and tupelo system with open understory and strong sedge groundcover. Many cypress and older slash pine are dead, unsure why. Turpentine and cypress logging evidence noted. Find out why trees are dying.
1G-FSBP2	621	2	1.5	1	4.5	low-moderate	Is a combination of 640/621. Cypress trees present but lots of open areas as well with mystery Ludwigia, corkwood, Pan. Scab., Sagittaria graminea. Pond groundcover thick with Ludwigia. Also some Nyssa, no standing water at time. Ecotone is shrubby with Vaccinium myrsinites, Clethra alnifolia, some limited pockets of Panicum virgatum, Scleria, Wiry Rhyncospora but probably only 30% cover due to Clethra and Nyssa. Some areas open with Panicum ridgidulum and Andropogon virginiana, Wiry Rhyncospora. Upland: 441/600 with Cyrilla understory. Viry little wiregrass.
1I-FSBP1	621	1.5	1.5	1	4	low-moderate	Similar to FSBP2 but his site has more cypress. May have potential?
1I-FSBP2	630	1.5	1.5	1	4	low-moderate	Pond has standing water with some large open areas. Groundcover is mystery ludwigia. 1/3 of area has thick canopy closure of Magnolia virginiana, Nyssa biflora, Ilex spp., but some potential for FS in open areas. Corkwood and mystery ludwigia dominant. Ecotone is Andropogon virginicus, Cliftonia, young pine. Some area of Andropogon virginicus may provide suitable habitat. Selective cut 441/600 to improve "upland" although is 441/600.
1I-FSBP6	630	1.5	1.5	1	4	low-moderate	Upland is 441/600 with young trees, very open. Has decent groundcover but no wiregrass. Ecotone is Rhynchospora, mystery ludgwigia, Carex. Pond is Nyssa biflora, Cyrilla, Magnolia virgniana. Less than 50% crown closure but no herbaceous groundcover.
2D-FSBP2	621	1.5	1.5	1	4	low-moderate	Cypress canopy with somewhat large trees, appropriate crown closure of cypress, but dense midstory/subcanopy of Ilex myrtifolia, black gum, titi, and others. No groundcover in pond. Looks like it's been cleared (gyrotrac?) in past along ecotone, with some good ecotone and groundcover, other areas with logging slash pushed into ecotone, preventing shrub dominance, but no groundcover either. These 2 combined = about 50% of pond margin. The other 50% is somewhat dense titi and Ilex coriacea with no real ecotone. Surrounding upland is 441 with bracken, gallberry, and saw palmetto. Area is relatively high quality (HQW) 621 but low-mod FSBP. Use buffer when thinning around site. Let fire burn in. Hand clear ecotone where shrubs have invaded or invade in future, until fire controls. Some cypress recruits also. Note: shrubs (large) and subcanopy trees seem to be growing on old cypress stumps from past logging. Note: Hog rooting in ecotone observed.
2D-FSBP3	621	1.5	1.5	1.5	4.5	low-moderate	Very similar to FSBP2 in all regards except canopy more open and more light, some scattered groundcover in places within pond. Ecotone and upland similar to FSBP2, except upland has a good bit of wiregrass. Looks like it was cleared over about 75% and logging slash in even layer on ground (not piled up above grade). Also some fire scars on cypress stumps in FSBP3, not seen in 2. This HQ 621 buffer when thinning and do not push slash into pond/ecotone. Same prescription as FSBP2.

2E-HQW2	613	1.5	1.5	1	4	low-moderate	Vegetation similar to HQW1, but canopy closure greater with limited groundcover, some large ruts in ecotone and no wiregrass. Plant adjacent uplands in longleaf.
2F-FSBP3	621	1.5	1.5	1	4	low-moderate	Nice cypress dome but very little graminaceous cover; Pond: open with Taxodium ascendens, Ilex myrtifolia. Is ephemeral Ecotone: Andropogon virginicus, Hypericum chapmanii, Xyris, Rhynchospora spp. And a few patches of Aristida Upland: 441/600 with Cliftonia, no wiregrass.
2J-FSBP1	630	2	1	1	4	low-moderate	Pond is cypress, sweetbay, black gum and Cliftonia; some areas open with many sedges; Ecotone and surrounding upland is very overgrown with Cliftonia. System historically was part of Jackson Titi.
2J-FSBP2	630	1.5	1.5	1	4	low-moderate	Pond mainly cypress, sweetbay, and Cliftonia; some open areas dominated by sedges, but other areas overgrown with shrubs; Plenty of cypress recruitment; Ecotone is somewhat shrubby, but has sedges present; pond was historically part of a much larger system.
2N-FSBP1	621	1.5	2	1	4.5	low-moderate	Cypress pond, mostly shrubby with high crown cover inside with some open areas with sedges; ecotone covers about 75% of pond, also Xyris and Lachnanthes in ecotone; burn adjacent uplands and ecotone
2N-FSBP2	621	1	2	1	4	low-moderate	Similar to FSBP1 except interior has no open areas with little herbaceous cover; burn adjacent ecotone and upland
2O-FSBP2	641	1.5	2	1	4.5	low-moderate	Remove berm; Not much of a pond except in road, which is open and dominated by Xyris spp., Cladium jamaicense and Juncus repens/megacephalus; surrounding ecotone is excellent to the east, including wiregrass, Xyris, Lachnanthes, Pan. scab., Sarracenia flava/psittacina, Rhynchospora spp.; ecotone to the west is more shrubby with some Andropogon; a berm separates the pond from good ecotone.
2U-FSBP1	610	1.5	1.5	1	4	low-moderate	Uplands have been clearcut, with a return of groundcover vegetation, especially Andropogon, some titi encroaching ecotone, but mostly herbaceous with slash present, ecotone made up of Pan. scab, Andropogon and Hypericum; pond is somewhat shrubby and mostly Nyssa, I. myrtifolia, and some larger Magnolia virginiana, Cyrilla also present; canopy closure moslty 80-90%, but one open area supports Pan. scab. and Rhynchospora
3E-FSBP4	613	1.5	1.5	1	4	low-moderate	Similar to FSBP5 but pond has some wax myrtle and yaupon shrubs and small trees; Groundcover in pond and ecotone also seems more "weedy", and also contains lots of Rubus. Pond groundcover has rhynchospora, other sedges, Panicum virgatum. Ecotone narrower but has Panicum virgatum, mystery ludwigia, Rhynchospora, carex, Juncus effusus, Rubus and some maples and pines. Pond possibly a little smaller than FSBP5. Ecotone bedded and planted with poor survival. Standing water in beds. Pond is dry now. A few tallow in ecotone.
3F-FSBP8	641	1.5	1.5	1	4	low-moderate	Logging ruts present. Pond dominated by Rhynchospora and mystery Ludwigia and juncus. Some Nyssa present, including one with 12" DBH. Standing water in ruts. Some herbaceous ecotone present, but not very distinguishable from pond.
3G-FSBP3	630	1.5	1.5	1	4	low-moderate	System is mix of cypress and tupelo with Myrica cerifera understory. Sawgrass ground cover, some tufted grass in ecotone. Ecotone actually holds water while pond is mostly dry. System may be too large for FWS. There are also several dead trees in system.
3G-FSBP4	641	1.5	1.5	1	4	low-moderate	Marsh dominated by Spartina patens, Panicum virgatum, Carex spp. With Nyssa shrubs and Juncus. In other areas, corkwood also present. Standing water in ponds may indicate that system isn't ephemeral and wouldn't be appropriate for FWS. Burning adjacent ecotone would enhance system.
3G-FSBP5	630	1.5	1.5	1	4	low-moderate	System is cypress and tupelo depression, lots of cypress on north ecotone. South ecotone is non-existant. Some sabal palms in pond. Canopy is about 70% closed, and some sawgrass groundcover. Trees are mature. Good high quality system.

3G-FSBP6	613	1.5	1.5	1	4	low-moderate	Pond is low to moderate quality. Overstory of Black gum. High herbaceous vegetation including Juncus, Pluchea, mystery Ludwigia, Panicum virgaturm. No standing water. Ecotone. Good diverse herbaceous. Mesic to hydric. Similar species to pond, but topo higher. More vitus and juncus. 441/600 Diverse herbaceous but no wiregrass. Panicum virgatum, Rhynchospora spp. (3), Andropogon virginicus, Centella Upland. 441, saw palmetto, vitus, bracken fern, wax myrtle. Not much herbaceous cover.
1E-FSBP11	641	2	2	1	5	moderate	Same as FSBP11 but larger with some Pinus elliottii in pond and more Panicum virgatum. Some Acer rubrum as well.
1E-FSBP12	641	2	2	1	5	moderate	Open pond with some Aristida, Panicum virgatum, Panicum scabriuluscum, rhyncospora spp., mystery ludwigia, Pluchea, Juncus marginalis, several small Nyssa, Andropogon virginana. Wiregrass in ecotone and several bays surrounding pond.
1E-FSBP8	641	2	2	1	5	moderate	Similar to FSBP10 but less herbaceous diversity. Some cypress growing, more ludwigia, system is in transition from 641 to 630.
2E-HQW1	613	2.5	1.5	1	5	moderate	Excellent system. Canopy less than 30% closure made up of Nyssa biflora and Ilex myrtifolia. Lots of sedges in groundcover. Pond dry now. Ecotone is patchy, but good in some areas with Lachnanthes, Rhynchospora, Panicum virgatum, and even Aristida. Uplands have been clearcut, but have some wiregrass. Plant longleaf in uplands.
3E-FSBP5	613	2	2	1	5	moderate	Open water area with good groundcover surrounding a small Nyssa depression/pond, about 60' x 40' or maybe a little larger. Pond is ephemerally wet, dry now. Groundcover in pond is rhynchospora and carex. Large herbaceous ecotone around pond with rhynchospora, carex, Panicum scab., Panicum virgatum, etc. Some wax myrtle shrubs and small trees in marshy area, some pines as well. Surrounding ecotone bedded and planted with poor survival. Standing water in beds. Gums in pond are small and dense. Would need thinning. Upland score could be higher. Groundcover dominated at least 50% by Carex spp.
3F-FSBP1	641	2	2	1	5	moderate	Marshy pond with good diversity. Carex, rhynchosporas, Panicum virgatum, Andropogon, Panicum scab., Aristida stricta, mystery Ludwigia, Centella. Little overstory. Some Pinus elliottii, some Ilex vomitoria, Myrica cerifera, Baccharis. Hard to distinguish pond edge from ecotone.
2G-FSBP2	412	0	0	0	0	none	Not a wetland; turkey oak with longleaf recruitment. Most longleaf only a few years old. Cladonia, saw palmetto, and Aristida in ground cover. Sand live oak present as well. Prescribe thinning of oaks, especially sand live oak prior to fire.
2L-FSBP2	640	0	0	0	0	none	Pond not very depressional but dominated by various sedges, Hypericum, mystery Ludwigia, corkwood and has some small Nyssa and Cyrilla; Several small slash pines present and area was originally planted through but had high mortality due to wetness. Difficult to distinguish between ecotone and pond.
2L-FSBP4	625	0	0	0	0	none	Not pond but natural stand of slash pine about 12" dbh; understory is Nyssa and Cyrilla, Some Hypericum. Groundcover is largely Aristida with Andropogon, Lachnocaulon and Xyris. System needs to burn. DO NOT CUT!!
2L-FSBP6	640	0	0	0	0	none	Probably actually serves as ecotone for FSBP4 and 5 (see above). Pond is Hypericum, Nyssa, Cyrilla, Cliftonia, and corkwood with scattered pines. Groundcover is mostly Rhynchospora, Sagittaria, mystery Ludwigia, Xyris, and Andropogon. Most shrubs less than 8' tall.
2Q-FSBP2	441	0	0	0	0	none	Is an upland
2T-FSBP1	640	0	0	0	0	none	Sawgrass transitions into shrub marsh at data point, nice system but not suitable for salamanders. Has small Acer rubrum, Myrica cerifera in subcanopy; groundcover is Sagittaria latifolia, Juncus marginalis, Dichromea, Pluchea odorata, Rhynchospora
3B-FSBP1	641	0	0	0	0	none	is large juncus marsh with Sagittaria latifolia. No cypress, black gum, Ilex myrtifolia or wiregrass. Nice marsh but not FSBP habitat.

3B-FSBP2	441/600	0	0	0	0	none	Small sawgrass marsh within 441/600 opening. Needs fire and thinning in adjacent pine. Ilex vomitoria taking over.
3B-FSBP3	641	0	0	0	0	none	Pond has minnows, so probably not ephemeral. No overstory. Juncus effusus, Sagittaria lat., Spartina patens. Ecotone is Ilex vomitoria, Panicum scab, Centella, with planted pine up to pond edge. Upland is 441/600 with Myrica cerifera. Same as ecotone.
3B-FSBP4	641	0	0	0	0	none	No pond present. Is merely an open area along old logging trail. Has low areas with standing water and Sagittaria latifolia, Sagittaria graminea, corkwood. Note: logging deck in middle of point needs to be removed.
3B-FSBP5	641	0	0	0	0	none	Pond has no cypress, blackgum or Ilex myrtifolia. Has Sagittaria graminea in most wet portions. No wiregrass. Also no overstory. Ecotone is Rhynchospora spp., corkwood, and Pan. scab. Is savanna like. Uplands area 441 and 441/600. 441 areas have Ilex glabra, Serenoa repens and panicum. No wiregrass.
3B-FSBP6	441/600	0	0	0	0	none	Understory of Juncus. More like 441/600. Needs fire. Ilex and Myrica in opening surrounded by Pinus elliottii.
3B-FSBP7	641	0	0	0	0	none	Sawgrass marsh. Not suitable habitat.
3B-FSBP8	641	0	0	0	0	none	Pond - Juncus, Spartina patens thick. Ecotone - Myrica cerifera and Ilex vomitoria, Acer rubrum (no open water) but there is standing water in road adjacent to pond.
3C-FSBP1	641	0	0	0	0	none	Roadside ditch may drain. Need to change border of 641. Logging deck on west side gives illusion of being part of 641. Pond: No real "pond" present, is all 641 with no open water areas. Thick herbaceous cover of Juncus effusus, mystery ludwigia, Scleria spp., Rhynchospora spp., Carex spp., Panicum virgatum, Panicum scab., Very diverse but no wiregrass. No canopy of cypress or blackgum. Ecotone: much the same as pond but less wet. Upland 441/600, spotty patches of sedges and grasses.
3C-FSBP3	441/600	0	0	0	0	none	No pond, but wet savanna which bleeds out into planted pine. Good herbaceous cover: Panicum virgatum, Pluchea, Juncus, mystery Ludwigia, Rhynchospora ssp. Keep out heavy equipment.
3D-FSBP1	641	0	0	0	0	none	sawgrass marsh, no habitat
3D-FSBP2	641	0	0	0	0	none	sawgrass marsh
3D-FSBP3	641	0	0	0	0	none	sawgrass marsh
3D-FSBP4	641	0	0	0	0	none	sawgrass marsh
3D-FSBP5	641	0	0	0	0	none	sawgrass marsh
3E-FSBP1	641	0	0	0	0	none	Mainly Juncus effusus, mystery ludwigia, corkwood, Panicum virgatum. Very wet. Few small Nyssa trees, few Myrica cerifera shrubs/small trees. Partially bedded and planted, pines died. Few small pine recruits. Not sure really a pond or FSBP. Shrubs not bad now, very open. Small elevated island in middle with Nyssa large and small. More marsh-like and more dominated by juncus than previous two sites.
3E-FSBP2	641	0	0	0	0	none	Wet opening in 441/600, bedded through, with Pan. Scab. and corkwood primarily, rhynchospora, with some Andropogon, mystery Ludwigia, and a little Juncus effusus. No real pond, no cypress, a few pines within with poor growth. A little bit of titi and wax myrtle. Not really a FSBP or potential. Area is 641 maybe 643 which could trend towards a 640 shrub perhaps. When surrounding area converted to 626, would blend with that. Needs fire in the future to control pine invasion and shrubs. Shrubs not bad now. Pan. Scab. is by far the dominant species. Standing water in bedding furrows. Depression is irregularlly shaped and has scattered pines.
3E-FSBP3	641	0	0	0	0	none	Wet opening in 441/600 with mystery Ludwigia, Juncus effusus, Panicum virgatum, Panicum scab., and mix of Nyssa and Myrica cerifera as small trees. Area bedded and planted but only a few pines survived. Few pine and maple recruits also. Very little canopy cover. Not sure if really a pond or FSBP candidate. Very dense groundcover. No standing water now, unlike FSBP2. Burn to control shrub and pine invasion in future. Once converted to 625/626 would blend with that. Could qualify as 643 now perhaps?
3F-FSBP2	641	0	0	0	0	none	Very similar to FSBP4. Juncus, Spartina, Cladium. Standing water. North side of

							pond dominated by Cladium and Panicum virgatum, south by Juncus. 1 Tallow found.
3F-FSBP3	641	0	0	0	0	none	Similar to FSBP2 and FSBP4. Juncus dominated with standing water. Nyssa along edges. Some bunch grasses within ecotone. Vitus around edges. Pond not suitable for Flatwoods salamanders.
3F-FSBP4	641	0	0	0	0	none	Pond dominated by juncus and Cladium, some sagittaria, standing water present. No tufted grasses Also some Spartina patens. Not suitable for Flatwoods salamanders.
3F-FSBP5	641	0	0	0	0	none	Very similar to FSBP4. Saw grass on edge, juncus in middle. Not suitable for FWS. Year round water.
3F-FSBP9	641	0	0	0	0	none	Sawgrass marsh with permanent water. Not suitable for FWS. Some Nyssa around edges. Reconnect with marsh in 3G with pipes under road, or hard bottomed LWC.
3G-FSBP1	625	0	0	0	0	none	Area is actually a small natural stand of Slash pine, some large with 15" DBH and 70-80' tall. Some Nyssa mixed in, with Myrica cerifera as well. Juncus, Panicum scab. and Aristida in groundcover. In both FSBP1 and 2 possible bear signs present including scat and torn up logs with ants inside.
3G-FSBP10	8	0	0	0	0	none	No pond. Is a loading deck. Needs removal.
3G-FSBP12	8	0	0	0	0	none	Is not a pond but loading deck. Needs removal.
3G-FSBP2	641	0	0	0	0	none	Not suitable for FSBP since deep year round water and wetland approaching upper size limit. Very nice system though. Marsh dominated by carex with small nyssa, some juncus and Myrica cerifera, mystery Ludwigia. Some tallow is present and should be controlled before spreading.
3H-FSBP1	641	0	0	0	0	none	Sawgrass marsh
3H-FSBP2	641	0	0	0	0	none	Juncus/sawgrass marsh.
3H-FSBP3	641	0	0	0	0	none	Rhynchospora spp., mystery Ludwigia, mermaid weed, Juncus effusus.
3H-FSBP4	641	0	0	0	0	none	Juncus/Spartina/mystery ludwigia. Ditches and/or skidder trail draining the system to the east.

Source: PBS&J, 2005

APPENDIX B

Mitigation Synopsis: Panama City – Bay County International Airport Relocation (Draft March, 2005)

An approximately 10,000 acre mitigation area is proposed as compensation for wetland impacts at the proposed airport relocation site based on the potential 50-year full build-out scenario. The mitigation area is divided into three main parcels: Parcel 1 includes 1,734 acres directly south of CR 388 between Crooked Creek and Burnt Mill Creek and extending southward to the Gulf Power Company power line easement. Parcel 2 includes 6,388 acres directly south of CR 388 to the east of Burnt Mill Creek and extending southward to West Bay and the power plant discharge canal. CR 2300 forms the eastern boundary of the southern portion of Parcel 2. Parcel 3 includes 1,735 acres south of the power plant discharge canal, extending southward to West Bay Point. West Bay also forms the western boundary of Parcel 3. Each parcel has been further divided into management units based on existing landscape features (mainly unpaved forest roads). There are a total of 42 management units in the mitigation area, averaging 200-300 acres in size each.

Habitat types present in the mitigation area are dominated by planted pine wetlands and uplands. Other habitat types include titi wetlands, mixed forested wetlands, cypress wetlands, pine flatwoods, freshwater marsh/shrub wetlands, tidal marsh, and small streams. The main goal of the mitigation plan is to convert planted pine areas back to wet pine flatwoods, wet pine savanna, mesic flatwoods, and sandhill habitats that historically occurred in the area, via restoration and enhancement. Restoration, enhancement and preservation of the other habitat types listed above will also take place. Based on habitat acreages, the planned mitigation activities, and the estimated before and after condition of the various habitat types, a detailed WRAP analysis has been conducted that shows a surplus of mitigation lift relative to functional loss from wetland impacts (including direct and indirect impacts) for each development phase and for full build-out at the airport relocation site through 50 years. All mitigation areas will be placed in Conservation Easements to ensure their long-term protection.

The mitigation plan consists of a series of interrelated plans that address the following major mitigation activities: planted pine thinning; prescribed fire; longleaf pine planting; hydrologic restoration; exotic species control; wildlife management; dump site removal; monitoring; and long-term management.

Thinning

The planted pine thinning plan depicts planted pine stand ages, a thinning schedule, and prescribed thinning densities based on target ecological community types and whether or not longleaf pine will be planted in an area. Planted pine stands in the mitigation areas were planted between 1973 and 1999 (ranging in stand age from 6-32 years old in 2005). Final thinning to a prescribed basal area (BA) will initially take place for all stands that are 25 years old or older. Younger stands will enter mitigation and be thinned to the prescribed basal area as they reach 25 years old. Future wet pine savanna areas will primarily be thinned to a basal area of 20-30 square feet/acre. A few management units or portions of management units will be thinned to 10-20 square feet/acre for comparison/adaptive management purposes. Future pine flatwoods and

sandhill areas that will be planted with longleaf pine will also be thinned to a BA of 20-30. Future wet pine flatwoods that will not be planted with longleaf pine, mainly near West Bay in future coastal slash pine flatwoods, will be thinned to a BA of 40-50. All planted sand pine uplands (future longleaf pine sandhills) will be clear-cut. Natural stands of mixed longleaf and slash pine, and natural stands of coastal slash pine flatwoods will not be thinned under the initial thinning plan. Wetlands dominated by cypress and/or hardwoods will not be harvested or thinned. Also, incidental harvest of individual cypress, hardwood, and cabbage palm trees greater than 6 inches DBH growing in planted pine stands will be minimized during pine thinning operations. Standing dead trees and snags will also be retained whenever possible. The thinning plan includes voluntary 35-foot special management zones (SMZs) around cypress domes, gum ponds, flatwoods marshes, and small depressional mixed forested wetland areas; and 50-foot special management zones (SMZs) adjacent to tidal creeks, tidal marsh, and West Bay to provide additional protection to these areas during thinning operations. Standard SMZs along streams and creeks will also be observed, according to state forestry Best Management Practices (BMPs). Excessive rutting should be avoided by managing thinning operations in wetland areas outside the wet season and around periods when on-site soil moisture conditions are inappropriate. This will include onsite reconnaissance and direction of forestry crews and equipment by supervising foresters and mitigation ecologists. If excessive rutting does unexpectedly occur, thinning operations will be halted and relocated to drier areas until conditions improve, and excessively rutted areas will be rehabilitated.

Prescribed Fire

The prescribed fire plan addresses the use of fire as a restoration and management tool, primarily in pine flatwoods, savanna, and sandhill habitats. Following the thinning of planted pine stands, the prescribed fire plan calls for up to three initial dormant season burns per management unit on a 1-2 year rotation, followed by the implementation of growing season burns on a 3-5 year rotation into perpetuity. The goals of the dormant season burns are to modify and promote fuel characteristics favorable for growing season fire prescriptions while protecting large mature pines and encouraging the expansion of herbaceous ground cover. In addition, the dormant season burns will be aimed at reducing the height and volume of mid-story fuels. The goals of the growing season burns will be to reduce and control woody shrub cover, to promote and maintain natural herbaceous groundcover, and to keep fuel loads low enough to safely burn during the growing season in subsequent years. The roughly 200-300 acre management units described above will comprise the major burn units. In some cases, additional fire lines may be needed to augment the management unit boundaries, but use of such lines will be minimized, especially in wetland areas. Initial early growing season burns may be possible on some management units, and will be used preferentially in place of initial dormant season burns when appropriate. Occasional dormant season burns will also be mixed into the growing season burn rotation. Some variation on the timing of growing season burns will also occur within management units (e.g., an early growing season burn one year followed by a mid or late growing season burn during the next burn rotation, or vice versa, for a particular unit). The mixing of occasional dormant season fires into a growing season fire regime, and the variation of timing on growing season burns will mimic a more natural fire regime and promote more natural plant communities and wildlife habitat. Some use of dormant season fires may also be needed to protect planted longleaf pines once they leave the grass stage and before they reach heights

where fire mortality is less of a concern. Occasional dormant season burns will also promote natural longleaf recruitment and regeneration in the more distant future. Fire will be allowed to burn into non-pine dominated habitats such as cypress domes, flatwoods marshes, salt marshes, etc., when conditions allow and when it would not result in a catastrophic situation.

Planting

The planting plan depicts longleaf pine planting densities based on target ecological community types, soils, and elevation. Longleaf planting will take place after thinning operations and at least one application of prescribed fire have occurred. Containerized longleaf seedlings will be used, and all areas will be hand planted in an irregular pattern (not in rows or on precise spacing intervals). Roughly 1,800 acres of future pine flatwoods that have been thinned will be hand planted at densities of 50 seedlings per acre. Roughly 625 acres of future pine flatwoods and sandhill areas that have been clear-cut will be planted at densities of 100 seedlings per acre. Future wet savannas will have longleaf planted in scattered clusters on small slightly elevated "palmetto islands" identified using historic aerials. These "islands" will be hand planted with 1-5 longleaf seedlings depending on the size of the island. Roughly 2,300 of these "islands" will be planted in savanna areas spanning roughly 2,800 acres.

Hydrologic Restoration

The hydrologic restoration plan includes a number of related activities, including the installation or improvement of low water crossings and culverts, the re-routing of water from major interior ditches to historic flow ways, the restoration of former stream courses, removal of fill from historic floodplains, the reconnection of severed wetland systems, ditch back filling and plugging, and road removal. Each specific hydrologic restoration and road removal area will include survey work (profiles and cross-sections), engineering calculations and design, and the development of construction plans and specifications. Approximately 47 low water crossings are planned to restore more natural hydrologic conditions to streams and flowing wetlands (linear wetlands which typically have flowing surface waters). Overall, approximately 85,500 linear feet of stream and major ditch work is planned (roughly 56% directly related to stream and flowing wetland restoration). This linear estimate does not include enhancements resulting from road and roadside ditch removal, or the upstream and downstream effects of low water crossing installation and associated hydrologic improvements. Roughly 42,000 linear feet of road retirement and removal (upland to wetland restoration) is also planned. An additional 105,000 linear feet of stream and flowing wetland surface waters will be preserved and indirectly enhanced by surrounding mitigation activities and long-term ecosystem management including pine thinning, prescribed burning, installation of low water crossings, road removal, and cessation of timber management activities such as bedding, mechanical site preparation, row planting, and widespread fertilizer and herbicide applications. The extensive pine thinning planned for the site will also provide hydrologic enhancement to wetlands across the entire mitigation area, due to reduced evapotranspiration.

Exotic Control

Invasive exotic plant species of concern have been documented in roughly 30 sites across the mitigation areas. Most of these sites are locations with Chinese tallow. A few locations with cogon grass and camphor tree have also been documented. Chinese tallow is more widespread in Parcel 3, especially along the forest roads and ditches, including additional areas outside the 30 sites mentioned above. Elsewhere, tallow is mainly limited to individual plants found at a few dump sites throughout the mitigation area. Chinese tallow and camphor tree abundance will be reduced and controlled using Triclopyr herbicide (brand names such as Pathfinder and Garlon4 are examples). The trunks of larger seedlings, saplings, and trees will be slashed with a machete or saw and the herbicide applied directly to the slashed area. Herbicide will be directly applied to the foliage of smaller seedlings and saplings. All herbicide applications will be conducted in accordance with standard BMPs. Cogon grass has only been documented in a few limited sites, and these have already been treated by St. Joe Timberlands upon discovery. Cogon grass has also been reported growing along CR 388 on mowed roadsides, therefore, it is assumed that cogon grass has the potential to invade the mitigation areas in the future without regular preventive management. Cogon grass found in the mitigation areas will be treated with Glyphosate herbicide (brand names such as Roundup and Rodeo are examples). Coordination with County road maintenance officials will take place to discuss the proliferation and spread of cogon grass along CR 388. Japanese climbing fern has not been documented on the mitigation site, but one small occurrence (single stem that was removed) been located in one off-site location near the mitigation areas. Any climbing fern discovered on the mitigation site during regular reconnaissance and monitoring will be documented and treated immediately.

Wild (feral) pigs and pig sign (rooting disturbance) have been observed throughout the mitigation areas (all parcels). Rooting was particularly abundant in Parcel 1 in mid-2004. A professional shooting and trapping program will be employed to control hog populations, in coordination with all appropriate agencies and in accordance with pertinent regulations. Regular coordination with recreational hunters will also take place, to encourage hunters to take wild pigs whenever possible (within existing state hunting regulations) and to discourage activities that augment pig populations.

Wildlife Management

Wildlife management on the site will primarily consist of passive habitat enhancement and preservation achieved by thinning; prescribed fire; planting; retention of cypress, hardwoods, cabbage palms, and standing dead trees and snags; hydrologic restoration; road removal; exotic control; protection and enhancement of isolated wetlands and streams; etc. Wild hog management would additionally be considered a direct wildlife enhancement activity since hogs both prey upon and compete with native wildlife. Wildlife species expected to benefit from the mitigation activities described above include: gopher tortoise and various associated species including the Eastern indigo snake, Florida black bear, various wading birds, bald eagle, and flatwoods salamander.

Additional active management techniques that could be utilized would include installation of wood duck boxes in larger cypress, gum, and mixed forested wetland areas; installation of American kestrel and eastern bluebird nesting boxes in pine savanna areas; installation of osprey/bald eagle nesting platforms near the coast; and relocation of offsite gopher tortoises to restored/enhanced upland habitats. Finally, coordination will take place with Gulf Power Company to determine if vegetation plantings or other passive means can be used near the access roads/bridges that cross the power plant discharge canal to enhance wildlife crossings between Mitigation Parcels 2 and 3. See also long-term management, below, for additional future wildlife management opportunities.

Dump Site Removal

Approximately 40 small dump sites have been documented in the mitigation area, particularly along the forest roads and at forest road junctions. Dump materials consist mainly of "white goods" such as washers, dryers, refrigerators, as well as automobile scraps, old tires, construction debris, etc. These dump sites will be removed and properly disposed of at the onset of mitigation activities.

Monitoring

Baseline and post-mitigation implementation monitoring has been proposed. Qualitative baseline monitoring has already been conducted at roughly 200 randomly located field stations in planted pine areas. Another roughly 800 qualitative field stations associated with high quality wetlands, drainage structures, roads, ditches, streams, exotic species, listed species, dump sites, etc. have also been completed. Baseline and post-mitigation quantitative monitoring stations are proposed that would encompass roughly 10-20% of the random qualitative planted pine stations. Quantitative monitoring will entail the use of large fixed field plots (50m x 20m) or transects (100m) and repeated quantitative measures of: (1) canopy and subcanopy tree density, basal area, species composition, and individual tree size (diameter at breast height); (2) woody shrub percent cover, height, and species composition; and (3) groundcover percent cover, species composition, and species richness/diversity. Groundcover parameters will be assessed in a minimum of 10 1-m2 replicate quadrats within each larger field plot/transect. Repeated photo-points will also be recorded at each quantitative station. Peizometers or staff gauges will also be placed at strategic locations to record water table and surface water levels before and after mitigation implementation. Baseline quantitative vegetation monitoring will take place during fall (September-Nov) prior to the onset of mitigation activities across most of the site. Following mitigation implementation, quantitative monitoring is proposed annually for the first 5 years. After this period, monitoring will be staggered every 5 years. In addition to ground-based monitoring, vertical aerial photography will be acquired and photo-interpreted 5 years after the onset of mitigation (in fall), and every 10 years afterward, for comparison with pre-mitigation photography acquired in September 2003 and photo-interpreted to determine ecological community types (using FLUCFCS).

Long-term management

Long-term management of the site will include regular reconnaissance and site security. Site security will include maintenance of locked access gates, signage, and possible use of fencing in some areas, if needed. Conservation Easements will also provide for long-term legal protection of the mitigation area. The major long-term resource management activity will be continued use of prescribed fire, in perpetuity. This will include burning on a 3-5 year rotation, dominated by growing season burns, but allowing for a mix of timing on growing season burns and occasional dormant season burns. As longleaf pine plantings mature over time, some additional selective thinning of slash pine may also be performed periodically, on roughly a 10-year rotation within any particular management unit. Any thinning under long-term management would use passive or low impact methods and not result in severe rutting. Supplemental plantings of longleaf or cypress/mixed hardwoods to augment natural recruitment may also occur in selected areas as needed. Continued monitoring and reconnaissance on the site will also be performed to detect any exotic species problems that may arise over time. It is expected that periodic localized treatment of exotics such as Chinese tallow, cogon grass, and Japanese climbing fern will be performed under long-term management of the site. Sustained management of wild hogs will also continue. Maintenance of hydrologic structures such as low water crossings will take place periodically, as will forest road management activities (including additional potential road retirement and removal sites). Passive and active wildlife enhancement will continue under long-term management. In addition, opportunities will likely exist for enhancement/restoration of wild turkey and quail populations on the site once habitat restoration and enhancement activities are in effect. In the longer term, the mitigation area could also potentially contribute to restoration and management of red-cockaded woodpecker, in coordination with other existing and planned natural resource management areas in the region. Finally, management of passive recreation activities, such as hiking, will be incorporated into long-term management of the mitigation areas.