EXHIBIT 21

United States Department of the Interior

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

IN REPLY REFER TO:

Tel: (850) 769-0552
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May 19, 2009

Colonel Paul L. Grosskruger, District Engineer
Department of the Army
Jacksonville District, Corps of Engineers
Panama City Regulatory Office
475 Harrison Avenue, Suite 202
Panama City, Florida 32401-2731

Attn: Don Hambrick

Re: FWS Log No. 4-P-04-054
Reissued Biological Opinion Letter
West Bay to East Walton Counties, FL
Regional General Permit SAJ-86
SAJ-2004-01861

Dear Colonel Grosskruger:

This letter addresses the reinitiation of consultation for the U.S. Army Corps of Engineers (Corps) RGP SAJ-86 and responds to the Corps April 15 and April 28, 2009 letters. This correspondence is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

The original biological opinion (BO) for this project was transmitted to the Corps on May 19, 2004 and revised on March 3, 2005. The RGP SAJ-86 was issued by the Corps on June 30, 2004. Since that time, the western population of flatwoods salamander (reticulated flatwoods salamander *Ambystoma bishopi*) has been recognized as a new and separate endangered species. The bald eagle (*Haliaeetus leucocephalus*) was delisted (August 8, 2007), and the telephus spurge (*Euphorbia telephioides*) *RGP-86 Telephus Spurge Pre-Application Evaluation* form has been updated.

The *RGP-86 Flatwoods Salamander Pre-Application Evaluation* and *RGP-86 Telephus Spurge Pre-Application Evaluation* are still required in order to make a determination of impact within and minimize potential take of these species in the action area. If the pre-application evaluation process indicates suitable habitat for flatwoods salamanders within a proposed project area, the Corps is required to re-initiate consultation with the Service.

Our review of the effects of the action indicate the effects to flatwoods salamanders remain the same as those described in the original BO; however, the western population (*Ambystoma bishopi*) has been designated as a distinct species within the action area. No critical habitat is within the boundaries of the RGP. There are no changes to the Terms and Conditions to minimize the potential for incidental take of the reticulated flatwoods salamander. Implementation of these Terms and Conditions are non-discretionary in order to be exempt from the prohibitions of section 9 of the Act. The extent of take to date is 24.83 acres. Therefore 85.15 acres remain under the provisions of the Incidental Take Statement.

Since delisting, the Act no longer protects the bald eagle. However, the MBTA and BGPA do.

- Technical Assistance: The RGP conditions regarding the bald eagle should be revised to read: "if a bald eagle's nest occurs within 660 feet of a project, the applicant should follow the Service's May 2007 National Bald Eagle Management Guidelines. The applicant should also contact the Florida Fish and Wildlife Conservation Commission (FWC) for recommendations relative to Florida's Bald Eagle Management Plan and Permitting Guidelines."

The telephus spurge (*Euphorbia telephioides*) *RGP-86 Telephus Spurge Pre-Application Evaluation* form has been updated to reflect the following:

- BO Appendix III, Step 3: See www.plantatlas.usf.edu, www.fws.gov/panamacity/species/plants.html for photo reference collections.
- BO Appendix III, Step 3: Ideal survey months are May through August.

According to the Act, Terms and Conditions are not applicable to plants; therefore, actions that avoid and minimize take for plants are listed only in the Conservation Measures section of the BO for the telephus spurge. Additionally, the telephus spurge March 3, 2005 Revised BO included Conservation Recommendations, item number 1, which should be updated by the addition of the following paragraph:

- It is well accepted that there is no exact number below which plant populations are lost or above which they are safe (Matthies et al. 2004; Menges 1990); that is studies have demonstrated variation among the number of plants necessary for a population to survive risks of extinction. As a general rule, authors suggest an effective population size of 50-500 to maintain sufficient genetic variation for adaptation to environmental changes (i.e., viable population). In order to maintain a viable population with an effective size, each population should have between 357 and 3,571 individuals. Studies on 379 populations of eight threatened species in northern Germany demonstrated that very small populations face a considerable risk of extinction, while the risk for populations with more than 1,000 individuals was very small (Matthies et al. 2004). Therefore, in order to consider an experimental translocated population as having the potential for recovery, we recommend a minimum population size of at least 1,000 individuals.

Colonel Grosskruger

The Service continues to concur with the determination in the Biological Assessment (BA) of "not likely to adversely affect" for red-cockaded woodpecker (*Picoides borealis*), manatee (*Trichechus manatus latirostris*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*) (including its critical habitat), eastern indigo snake (*Drymarchon couperi*), and Godfrey's butterwort (*Pinguicula ionantha*). This concurrence is based upon implementation of the avoidance and minimization measures identified in the final BA and supplemental information provided on December 22, 2003. No additional information that is pertinent to our conclusion has been collected since that time. If these protective, avoidance and minimization measures as identified in your plan or the Terms and Conditions in the BO cannot be implemented, re-initiation of consultation may be required. Additional information on re-initiation of consultation is provided in the Re-initiation Notice within the BO.

After reviewing the current status of the Service's revised BO, the environmental baseline for the action area, the effects and cumulative effects of the RGP SAJ-86, the Corps' information on implementation of the Terms and Conditions to date, and information on file, it is the Service's biological opinion that the Corps RGP SAJ-86 is not likely to jeopardize the continued existence of the species addressed in the Service's revised BO, and it is not likely to destroy or adversely modify designated critical habitat.

This concludes RGP SAJ-86 BO reissuance consultation. If you have any questions about this RGP SAJ-86 BO consultation, please contact staff ecologist Ted Martin of our Panama City Field Office at (850) 769-0552, extension 239.

Sincerely,

Janet Mizzi
Deputy Field Supervisor

Enclosures:
Revised Appendix II, RGP-86 Flatwoods Salamander Pre-Application Evaluation
Revised Appendix II RGP-86 Potential Flatwoods Salamander Pond Description Data Sheet
Revised Appendix III, RGP-86 Telephus Spurge Pre-Application Evaluation

References:
Menges, E. 1990. Population viability analysis for an endangered plant. Conservation Biology. 4: 52-62.
Matthies, D., I. Bräuer, W. Maibom, and T. Tscharntke. 2004. Population size and the risk of local extinction: empirical evidence from rare plants.

cc:
St. Joe Company, WaterSound, FL (Thomas Estes)
USFWS, Atlanta, GA (ARD-ES)
USFWS, ES, Jackson, MS (Linda LaClaire)
USFWS, Habitat Conservation/section 7, Atlanta, GA (e-mail copy to Joe Johnston)
NMFS, Habitat Conservation, Panama City, FL (Mark Thompson)
NWFWMD, Havana, FL (Ron Bartel)
FWC, Office of Environmental Services, Tallahassee, FL (Ted Hoehn)
COE, Jacksonville, FL (Osvaldo Collazo)
USEPA, Atlanta, GA (Cecelia Harper)
FDEP, Pensacola, FL (Larry O'Donnell)

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March 3, 2005

Colonel Robert Carpenter, District Engineer
U.S. Army Corps of Engineers
Jacksonville District Office
475 Harrison Avenue, Suite 202
Panama City, Florida 32401

Attn: Don Hambrick

Re: FWS Log No. 4-P-04-054
Revised Biological Opinion
Regional General Permit 86 (RGP-86)
West Bay to East Walton Counties, Florida

Dear Colonel Carpenter:

Enclosed is the Fish and Wildlife Service's (Service) revised biological opinion (BO) for the U.S. Army Corps of Engineers (Corps) Regional General Permit 86 (RGP-86). This opinion is provided in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq*.).

The original BO for this project was transmitted to the Corps on May 19, 2004. RGP-86 was issued by the Corps on June 30, 2004. Since that time, we have received new information regarding actions that may affect listed species in a manner not considered in the original opinion. Specifically, a newly proposed construction project would impact the listed plant telephus spurge *(Euphorbia telephioides)*, and a new location for the plant has been documented within the RGP boundary. The original BO determined that RGP-86 may affect, but was not likely to adversely affect telephus spurge based on the stipulation that all impacts to known plant locations would be avoided. The new information reveals a more realistic scenario in that permit authorizations under RGP-86 will likely result in adverse effects to telephus spurge. The Service has determined in the revised biological opinion analysis that the permit would not jeopardize the continued existence of this species.

The analysis of impacts to flatwoods salamanders remains the same as the original BO with one minor modification to the salamander "checklist" as noted. There are no other changes to the Terms and Conditions to minimize the potential for incidental take of the flatwoods salamander. Implementation of these Terms and Conditions are non-discretionary in order to be exempt from

the prohibitions of Section 9 of the Act. According to the Act, Terms and Conditions are not applicable to plants; therefore, actions that avoid and minimize take are listed only in the Conservation Measures section of the BO for the telephus spurge.

The Service continues to concur with the previous determination in the Biological Assessment (BA) of "not likely to adversely affect" for red-cockaded woodpecker, bald eagle, manatee, Gulf sturgeon (including its critical habitat), eastern indigo snake, and Godfrey's butterwort. This concurrence is based upon implementation of the avoidance and minimization measures identified in the final BA and supplemental information provided on December 22, 2003. We have included the avoidance and minimization measures in the Conservation Measures section of the BO. If these protective, avoidance, and minimization measures as identified in your plan or the Terms and Conditions cannot be implemented, re-initiation of consultation may be required. Additional information on re-initiation is provided in the Re-initiation Notice of the biological opinion.

We have also provided Conservation Recommendations for each species that are actions that could be taken by the Corps to further the recovery of federally listed species and to help conserve other species that occur within the RGP area. While they are voluntary actions, we feel that many of the recommendations we have provided will help the Corps meet their responsibilities under Section 7(a)(1) of the Act and will also serve to improve future consultations under the RGP-86.

The following findings and recommendations constitute the report of the Department of the Interior. This concludes formal consultation. 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

Gail A. Carmody
Project Leader

Enclosure:
Revised Biological Opinion

cc:
St. Joe Company, Jacksonville, FL (Dave Tillis)
USFWS, Atlanta, GA (ARD-ES)
USFWS, ES, Jackson, MS (Linda LaClaire)
USFWS, Habitat Conservation/section 7, Atlanta, GA (e-mail copy to Joe Johnston)
NMFS, Protected Species, St. Petersburg, FL
NMFS, Habitat Conservation, Panama City, FL (Mark Thompson)
NWFWMD, Havana, FL (Ron Bartel)
FWC, Office of Environmental Services, Tallahassee, FL (Rick McCann)
FWC, Non-game Program, Tallahassee, FL (Thomas Eason)
COE, Jacksonville, FL (Osvaldo Collazo))
USEPA, Atlanta, GA (Haynes Johnson)
FDEP, Pensacola, FL (Dick Fancher)

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U.S. Army Corps of Engineers
Regional General Permit 86
West Bay to East Walton Counties, Florida

Revised Biological Opinion
March 3, 2005

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

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INTRODUCTION

This document transmits the Fish and Wildlife Service's (Service) revised biological opinion (BO) for the U.S. Army Corps of Engineers (Corps) issuance of Regional General Permit (RGP-86). RGP-86 authorizes certain dredge and fill activities in non-navigable waters of the U.S. which are located in three large watersheds, including the Lake Powell watershed and various drainage basins of the Choctawhatchee Bay and West Bay watersheds within southeastern Walton County and southwestern Bay County, Florida. This opinion is in accordance with Section 7 of the Endangered Species Act of 1973, as amended (Act), (16 U.S.C. 1531 *et seq*.).

This biological opinion is based on information provided in the December 22, 2003, Biological Assessment (BA) and draft permit advertised on August 29, 2003. A complete administrative record of this consultation is on file in the Service's Panama City, Florida Field Office.

CONSULTATION HISTORY

May 1999	An interagency group met to review cumulative impacts to wetlands in the project area. The focus was primarily on specific projects being proposed by the St. Joe Company in the vicinity of Panama City Beach.
May 1999 through October 2001	The interagency group continued to meet with varying representatives of agencies, applicants, and consultants involved in development projects in the area. The group addressed ways to improve coordination and review of specific projects and approaches to evaluating cumulative impacts. On April 20, 2001, the group met at Disney Wilderness Preserve to learn more about the mitigation approach used by the Orlando Airport Authority and others.
October 2001	The Service presented a potential landscape approach of addressing build-out of the area and assessing impact and conservation needs to the group. The study area at that time was the southwestern quadrant of West Bay.
Winter 2002	The interagency group further explored regulatory mechanisms for assessing cumulative impacts and implementing a comprehensive conservation plan for the watersheds of southern West Bay, Lake Powell, and southeastern Choctawhatchee Bay.

Winter 2002 to present	The interagency teams continue to meet regularly to develop the "West Bay to East Walton Regional General Permit" (RGP-86) and the State equivalent regulatory mechanism, an "Ecosystem Management Agreement."
July 16, 2003	The interagency team discussed the consultation requirements. The consultant requested that the Service identify the species that should be addressed in the project analysis. The Service noted that this is the purpose of the BA, which should be prepared in conjunction with the Federal action agency, the Corps of Engineers. Species lists for the counties would be provided by the Service.
August 1, 2003	The Service provided a species list only for Walton County since a current list for Bay County was provided in 2001 before the project area was expanded.
August 22, 2003	All parties teleconferenced to discuss the BA.
August 26, 2003	The consultant provided a draft species list and proposed determinations of effects.
August 29, 2003	The Corps issues a public notice for RGP-86.
September 24, 2003	The Service participated in a Corps public workshop to discuss RGP-86.
September 29 – October 3, 2003	The St. Joe Company enlisted consulting herpetologist, John Palis, to evaluate potential flatwoods salamander habitat within the project area.
October 23, 2003	The Service provided written concurrence of the species lists used in the BA.
October 30, 2003	A draft BA was transmitted by the consultant to the Corps and to the Service.
November 13-14, 2003	The interagency team provided verbal comments on the BA.

December 4 and 9, 2003	The Service assisted the consultant and John Palis with field evaluations of potential flatwoods salamander habitat.
December 11, 2003	Another draft BA was transmitted to the Service.
December 16-17, 2003	The interagency team met to discuss the BA and other items related to RGP-86.
December 22, 2003	The consultant transmitted the final BA to the Service.
December 23, 2003	In a letter to the Service, the Corps concurs with the findings of the BA and requests initiation of formal consultation.
December 24, 2003	The Service transmitted an electronic copy of the draft BO to the Corps with copies as requested to WilsonMiller and the St. Joe Company.
January 12, 2004	The Service participated in a public workshop regarding DEP's Ecosystem Management Agreement.
January 27, 2004	WilsonMiller provided comments on the draft BO to the Service and to the Corps.
January 30, 2004	A revised draft of the BO was transmitted to the Corps.
February 5, 2004	At the request of the agencies, WilsonMiller provided a "salamander checklist" as an addition to the BA.
February 25, 2004	The Service and Corps met to discuss suggested revisions to the BO.
March 18, 2004	The Service faxed a memorandum to the Corps and WilsonMiller regarding telephus spurge conservation.
April 21, 2004	WilsonMiller conducted a survey for telephus spurge north of Highway 98.

April 30, 2004	WilsonMiller provided details of the telephus spurge survey and a memorandum describing revised Conservation Measures.
May 6, 2004	The Corps concurred with the Service that the additional information was sufficient to proceed with the final biological opinion.
May 19, 2004	The final BO was delivered to the Corps.
May 27, 2004	The Service and other agencies received preliminary materials describing the North Glades Development project.
June 9, 2004	The first RGP pre-application meeting and site visit to a newly documented telephus spurge location. The Service advised the North Glades applicant that more information would be needed regarding telephus spurge locations, impacts, and conservation.
June 18, 2004	The Service received a copy of a draft dredge and fill permit application for "North Glades Development." The packet included an evaluation of telephus spurge for the project.
June 30, 2004	RGP-86 was issued by the Corps.
July 28, 2004	An interagency meeting was convened to discuss pending projects for authorization under RGP-86, including North Glades and potential re-initiation for telephus spurge effects. The applicant was advised that additional information would be needed.
July 28, 2004	The Service received an e-mail from the Corps requesting re-initiation for the North Glades project.
August 3, 2004	The Service transmitted a draft list of additional information to the North Glades consultant and to the Corps.
August 10, 2004	The Service advised the North Glades consultant that the list of additional information should be considered final.

August 11, 2004	The Service and the consultant conducted a teleconference to discuss the technical details of the analysis.
September 9, 2004	The Service attended an interagency pre-application meeting for the Waterfall project within the RGP boundary. The meeting illustrated the need to modify the flatwoods salamander checklist for clarification. (Appendix 1)
October 18, 2004	The Service sent a reminder to the North Glades applicant that the consultation information has not been received.
October 29, 2004	The Service received via e-mail from the consultant the information necessary to proceed with consultation.
November 3, 2004	The Service proposed to the interagency group a modification to the flatwoods salamander checklist as suggested at the September 9, 2004, meeting regarding the Waterfall project.
December 2, 2004	The Service attended an interagency "RGP Team" meeting and clarified the consultation process. There was also discussion about the availability of "negative" survey data for the telephus spurge.
December 23, 2004	The Service again requested the "negative" survey data from the St. Joe Company.
December 29, 2004	The Service requested from the St. Joe Company additional telephus spurge survey information related to plants documented south of the Breakfast Point Mitigation Bank.
January 5, 2005	The consultant for the St. Joe Company responded with three documents that clarified survey information for the telephus spurge.
February 25, 2005	The Corps concurred with the draft BO which was delivered on February 11, 2005.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Regional General Permit #86 (RGP-86) was cooperatively developed by several State and Federal agencies to address the cumulative effects of existing and anticipated development pressures within a fast growing region of the Florida panhandle. A public notice for the permit was published on August 29, 2003. The area addressed by the permit is approximately 47,480 acres in southwest Bay County and southeast Walton County (Figure 1, page 8). Approximately 90 percent of the property is presently in silviculture (forestry) management and is owned by the St. Joe Company. However, as recent trends near the coastline indicate, forestry is giving way to more lucrative residential and commercial development. In addition, just outside the RGP area is the location for a proposed new regional airport, which is undergoing separate review by the Federal Aviation Administration (FAA).

Wetland regulatory agencies have been inundated with permit applications in the area, particularly along U.S. Highway 98 and in the vicinity of Lake Powell. These agencies, along with other Federal and State natural resource agencies, have recognized the need to develop an ecosystem approach to reviewing these permits and assessing the adequacy of mitigation sequencing. RGP-86 provides a mechanism for addressing the cumulative effects of many potential dredge and fill permits by influencing the extent and intensity of development across the landscape. It is accompanied by a State regulatory mechanism, which is known as an Ecosystem Management Agreement (EMA) and is administered by the Florida Department of Environmental Protection (FDEP).

RGP-86 does not directly control development in the area, but it provides an incentive for landowners to participate in the watershed plan that was developed by the agencies. Landowners may continue to submit applications for routine individual permits; however, it is recognized that agency review will require more time and may not be favorable unless ecosystem benefits similar to the principles of RGP-86 can be achieved. The basic principles of RGP-86 are that a maximum 20 percent of a watershed's low quality wetlands can be impacted; these wetland impacts must be fully compensated within the larger watershed; less than one percent of high quality wetlands will be impacted and fully compensated; the Lake Powell watershed wetland functions will not be diminished by any amount; large areas of wetlands and uplands (Conservation Units) will be set aside from future development; and compensatory mitigation will be consolidated in two large mitigation banks.

One recently proposed construction project within the RGP boundary is the cause for Section 7 re-initiation. This project, known as North Glades, will be constructed within the only previously known location of a federally listed plant, telephus spurge (*Euphorbia telephioides)* within the RGP boundary. The permit applicant has indicated that impacts to some of the plants cannot be avoided. In addition, a new location for the plant has been recently discovered nearby on other property owned by the applicant. This information will be discussed in more detail in the telephus spurge section of the BO.

Conservation Measures

The interagency working group developed the following Conservation Measures that will be incorporated within RGP-86. These measures will further the recovery of the species under review.

1. A maximum of 20 percent of low quality wetlands on a project site or within a watershed sub-basin can be impacted. Impacts will be compensated in a mitigation bank, on site, or within identified Conservation Units. The interagency team defined low quality wetlands as those planted for pine silviculture and ditches.

2. Impacts to high quality wetlands (wetlands not in silviculture) will be limited to necessary, minimized road crossings. Total fill of high quality wetlands in the entire 47,480-acre project area cannot exceed 125 acres.

3. Avoidance of impacts to wetlands could assist in the recovery of the flatwoods salamander, indigo snake, bald eagle, and Godfrey's butterwort, if these areas are managed appropriately.

4. Restoration and management of two mitigation banks will secure for conservation two large, strategically placed parcels totaling approximately 7,700 acres. These banks are currently used for industrial forestry, and without RGP-86 could be partially converted to development sites in the future. The mitigation banks could assist in the recovery of the flatwoods salamander, red-cockaded woodpecker, indigo snake, bald eagle, Godfrey's butterwort, telephus spurge, Gulf sturgeon, and manatee.

5. Approximately 10,665 acres of uplands and wetlands (27 percent of the project area) will be designated as Conservation Units (CU's). These areas will be removed from development potential and industrial forestry practices. They will eventually be restored in amounts relative to parcel sizes of future development projects. The interagency working group developed specific prescriptions for wildlife management that focus on listed species. The CU's include significant amounts of uplands, which do not normally receive direct attention in wetland regulatory programs. The CU's could eventually assist in the recovery of the flatwoods salamander, red-cockaded woodpecker, indigo snake, bald eagle, Godfrey's butterwort, telephus spurge, Gulf sturgeon, and manatee.

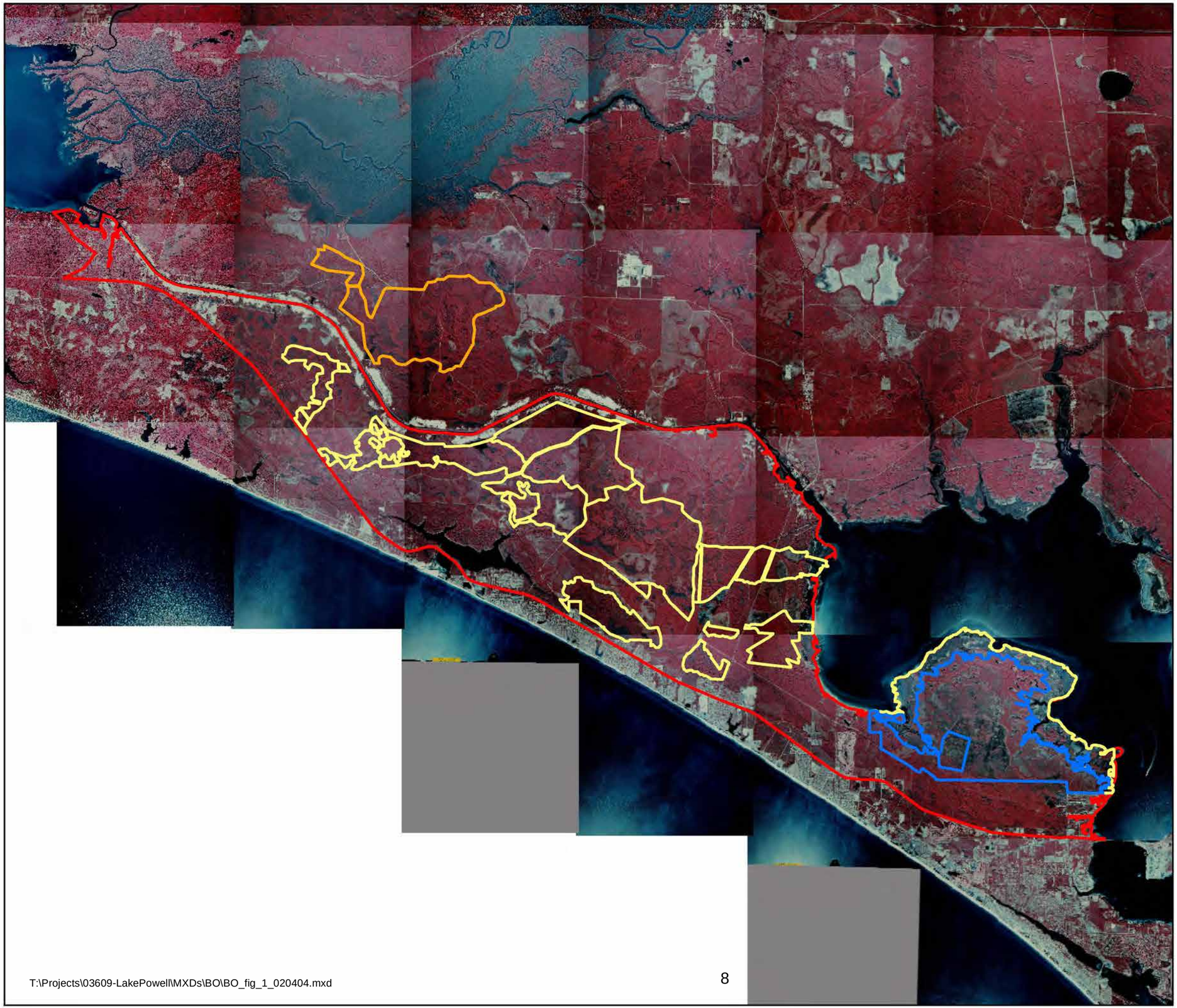

Figure 1

RGP Boundary Biological Opinion

West Bay to East Walton RGP

Legend

- Conservation Units
- Project Area (Including Tidal Soils)
- Devil's Swamp Mitigation Bank
- Breakfast Point Mitigation Bank

Disclaimer:
This exhibit was prepared utilizing GIS data provided by various sources that may include but not limited to federal, state, district and local agencies. Data provided by other sources are not warranted by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey, or for zoning verification.

Map Date:
02/04/04

0 0.5 1 2 3 4 Miles

WilsonMiller
New Directions In Planning, Design & Engineering

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6. In general, low quality wetlands provide somewhat of a buffer to high quality wetlands in the project area. For specific projects, buffers to high quality wetlands will be comprised of uplands and/or low quality wetlands, and will be on average not less than 50 feet with a minimum of 30 feet in some locations. The buffers will remain in a natural condition with no application of fertilizers and herbicides. Providing buffers where they are not currently required could assist in the recovery of the flatwoods salamander, red-cockaded woodpecker, indigo snake, bald eagle, Godfrey's butterwort, telephus spurge, Gulf sturgeon, and manatee.

7. A sub-basin watershed approach to wetlands avoidance is a priority over the larger watershed approach. Protection of sub-basins should provide better protection of water quality and quantity functions. This could assist in the recovery of species such as Gulf sturgeon and manatees, which may occur in receiving water bodies.

8. Environmental Resource Permitting (ERP) stormwater attenuation standards will be applied to all development projects. This is a higher standard than currently exists in the Northwest District of the Florida Department of Environmental Protection (FDEP). The increased protection could assist in the recovery of species such as Gulf sturgeon and manatees, which may occur in receiving water bodies.

9. Corps jurisdictional determinations (JD) will be applied to all development projects. The Corps JD is generally more encompassing than the FDEP method.

10. No fill in wetlands will be allowed for septic tanks or drainfields.

11. *Habitat Management Guidelines for the Bald Eagles in the Southeast Region* (USFWS, 1987) will be applied to all development sites, mitigation banks, and CU's.

12. Road construction at WaterSound North, a proposed project under RGP-86, will include wildlife crossings as identified in the project plans dated January 30, 2004.

13. The North Glades applicant has conducted additional surveys for telephus spurge within the RGP-86 Conservation Units (CU) in Bay County, Florida, and within the Breakfast Point mitigation bank (BPMB) (Appendix I). As a result, one new population of telephus spurge containing over 200 plants was located in the Breakfast Point mitigation area and adjacent lands to the south that have no conservation designation. The portion of the population within the BPMB will be managed and monitored in conjunction with the existing management requirements within the RGP-86 permit. [US. Fish and Wildlife Service (USFWS) recovery plan tasks 1.33, 3.1, 3.2, 3.3].

14. The North Glades applicant has agreed to place 2.33 acres (containing approximately 6,825 plants) of 6.43 acres (containing approximately 17,250 plants) of the telephus spurge population of the North Glades development parcel into a conservation easement to protect and manage into perpetuity. The applicant has provided a monitoring plan for the North Glades conservation easement area to assess success of restoration activities (Appendix II). [USFWS recovery plan tasks 3.1, 3.2, 3.3].

15. The North Glades applicant has agreed to transfer 500 plants of telephus spurge to an as yet undetermined location within the BPMB. These plants would otherwise be destroyed by the proposed development plan. The applicant will set up 5 monitoring plots with 100 plants transplanted within each plot. Each plot will be quantitatively monitored for 5 years to assess their overall survival and viability (ERC, 2004). [USFWS recovery plan task 5.0].

16. All proposed project sites within the RGP will be surveyed for presence or absence of telephus spurge according to the survey protocol (Appendix III).

Action area

For purposes of the Endangered Species Act, 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 is generally described as the proposed boundary of the RGP, including the mitigation banks. Receiving waters under consideration for aquatic or water-dependent species are West Bay, Lake Powell, the intracoastal waterway, and extreme southeast Choctawhatchee Bay. Adjacent wetlands and uplands were considered where development or conservation actions could potentially affect non-aquatic species.

Determination of effects

Based on the proposed protective, avoidance, and minimization measures and the analysis provided in the BA, 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.

-Piping plover (*Charadrius melodus*) – No Effect

- Only one historical record occurs near the project. The site is not within listed critical habitat for the species. There are no direct effects to the site, and indirect effects would be difficult to measure.

-Sea turtles – No Effect

- Beachfront habitat is located near the project site at Lake Powell inlet, but not within the RGP boundary. Almost all beachfront that is not presently developed at Lake Powell is within Camp Helen State Recreation Area. Based on the project description and location, the Service concurs with the determination that no effects to sea turtles will occur as a result of the proposed action.

-Wood storks (*Mycteria americana*) – No Effect

- No documented occurrences in vicinity.

-American alligator (*Alligator mississippiensis*) – No Effect

- Alligators were listed due to similarity of appearance with crocodiles; however, the project is not located within the range of the crocodile.

-Eastern indigo snake (Drymarchon corais couperi) - No Effect

- No documented occurrences in the vicinity.

-Plants (federally listed) – Six federally listed plant species were considered in the BA. These were selected from the Service's lists of plants that have the potential to occur in Bay and Walton counties. Additional plant surveys were conducted, although they were limited considering the size of the project area and the timeframe for RGP development. No federally listed plant species were observed within the project area during the initial surveys that were conducted as part of this project; however, subsequent surveys verified and expanded known locations of one plant, telephus spurge, in the project area.

1. Cooley's meadow rue (*Thalictrum cooleyi*) – No Effect
   - Only one known population of Cooley's meadow rue occurs in Florida, and it appears that suitable soils may not be present in the project area. This species does not tolerate disturbance, and most impacts of the permit would be in areas that are highly disturbed.

2. Crystal Lake nailwort (*Paronychia chartacea* ssp. *minima)* – No Effect
   - There are no recorded observations of this species within the project area; there is no suitable habitat (sandhill upland lakes and karst ponds); and the known species range is well northeast of the project area.

3. Florida skullcap (*Scutellaria floridana*) – No Effect
   - There are no recorded observations of this species within the project area. The only known record in Bay County occurs approximately 17 miles from the project, and all other records in its range are in counties even farther to the east. This species does not tolerate disturbance, and most impacts of the permit would be in areas that are highly disturbed.

4. White birds-in-a-nest (*Macbridea alba*) – No Effect
   - Within the project area, potentially suitable habitat for white birds-in-a-nest may be present in cleared or recently planted areas, in roadside ditches, or along the edges of pine plantations. However, this species has not been observed in the project area, and the nearest observations are in eastern Bay County in the vicinity of Sandy Creek and East Bay, approximately 17 miles from the project site.

5. Godfrey's butterwort (*Pinguicula ionantha*) – May Affect, Not Likely to Adversely Affect
    - There are no recorded observations of this species within the project area, but there are records in the vicinity to the southeast of the project. Suitable habitat may be present in small pockets within pine plantations that could be affected by the developments within the project area. The species could also be found in herbaceous ecotones of the more high quality wetlands that will be protected. Beneficial effects of the project include the following: protection of high quality wetlands and high quality ecotone habitat that may be adjacent to them; establishment of buffers around preserved wetlands; and protection of uplands and wetlands within conservation units and two mitigation banks. Without RGP-86, most of the suitable habitat would continue to be negatively affected by intense silviculture.

6. Telephus spurge (*Euphorbia telephioides*) - Likely to Adversely Affect
    - The Service concurs with the determination for this species.

-Manatees (*Trichechus manatus latirostris*) – May Affect, Not Likely to Adversely Affect

- There are few documented records of occurrence in the action area. The species is considered transitory in this area.

- Project could indirectly affect seagrass through hydrologic alterations and increased sediment, nutrient, and chemical loading. However, effects are expected to be of a scale that will not measurably alter the system's ecological balance due to the expanse of the receiving waterbody. Conservation Measures address water quality issues to the extent currently practicable by adopting ERP stormwater criteria.

- Note that the manatee key also leads to a May Affect, Not Likely to Adversely Affect determination, even though the project is not located in Section 10 waters. This determination is based on the fact that the potential indirect effects related to water quality are insignificant in consideration of the large geographic area covered by RGP-86, including extensive shoreline areas.

-Gulf sturgeon (*Acipenser oxyrinchus desotoi*) – May Affect, Not Likely to Adversely Affect

- The project could indirectly affect Gulf sturgeon habitat due to increased stormwater associated with development. The Service received concurrence from National Marine Fisheries Service (NMFS) that we should be the lead agency in this case because potential impacts are related to water quality (Bolton, August 2003). NMFS would be the lead agency only if there were proposed direct impacts to sturgeon habitat. There are few documented records of species occurrences in West Bay, where the species is transitory. Critical habitat is located near the action area in Choctawhatchee Bay; however, only a small portion of the Choctawhatchee Bay watershed occurs in the action area. Indirect

effects are expected to be of a scale that will not measurably alter the system's ecological balance due to the expanse of the receiving waterbody and the Conservation Measures provided that address water quality issues to the extent currently practicable. These measures are described in the BA. Furthermore, the influence of these hydrologic alterations and increased sediment, nutrient, and chemical loadings would be minor in comparison to large influence of nutrient and sediment inputs currently stemming from the Choctawhatchee River. However, if measurable impacts on any of the primary constituent elements essential for the conservation of the Gulf sturgeon are documented, re-initiation of consultation with the Service should occur. The primary constituent elements are those habitat components that support feeding, resting, sheltering, reproduction, migration, and physical features necessary for maintaining the natural processes that support these habitat components. Relevant to this project, any impacts that alter the abundance of prey items, disrupt aggregation areas, decrease water quality, or increase sediment quality would potentially affect the Gulf sturgeon. The added stormwater provisions of RGP-86 minimize adverse effects.

-Red-cockaded woodpeckers (*Picoides boralis*) – May Affect, Not Likely to Adversely Affect

- The action area has been surveyed on numerous occasions. No active cavities were recorded, including an evaluation of two historical cavity trees within the action area. Almost all upland habitats have been converted to silviculture, and most remaining unplanted wetlands are cypress/bayhead communities with dense shrub and mid-story layers. Wildlife surveys for projects will be conducted as they come into the planning stages. If active cavities are found, the landowner will notify the Corps, which will re-initiate consultation with the Service. Additional information on re-initiation is provided in the Re-initiation Notice of this BO.

-Bald eagles (Haliaeetus leicocephalus) – May Affect, Not Likely to Adversely Affect

- One documented bald eagle nest is located in the action area. The nest is located within the proposed Breakfast Point mitigation bank. The management plan for the bank incorporates the *Habitat Management Guidelines for the Bald Eagles in the Southeast Region* (USFWS, 1987). Other areas have been surveyed, but will be surveyed again when each proposed large project goes into the planning stages. If new nests are found, the *Habitat Management Guidelines for Bald Eagles* will be incorporated into the project. If the guidelines cannot be implemented, initiation of consultation for the bald eagle may be required.

-Flatwoods salamander (*Ambystoma cingulatum*) – Likely to Adversely Affect

- The Service concurs with the determination for this species.

Based on the information provided in the project BA and supplemental information, and with the implementation of the protective, avoidance, and minimization measures, we concur that

RGP-86 would likely adversely affect telephus spurge and flatwoods salamanders. These two species will be addressed further in the 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 clearcutting, 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 are no documented occurrences of flatwoods salamanders in Bay County and only one recent record in Walton County. The Walton County record is for one individual at one location in Point Washington State Forest, which is adjacent to the RGP-86 boundary but separated to a great extent by a four-lane highway. One large parcel of the State Forest bisects the RGP area at the western end, and other parcels are adjacent to the RGP boundary north of the highway in that vicinity. The known record for the flatwoods salamander at the State Forest is located south of the four-lane highway. Further field investigations were recommended for the RGP area due to the proximity to the known location and the absence of surveys across this vast expanse of private lands in the project area. There is also one other known occurrence approximately seven miles north of the project area in Pine Log State Forest in Washington County.

The St. Joe Company (St. Joe) owns the majority of lands in the action area. St. Joe has received assistance from the Service in recent years in an effort to develop a habitat suitability model for flatwoods salamanders. Such a model would provide useful information for salamander management and recovery, particularly in the Florida panhandle where St. Joe has much of its lands. Unusually dry conditions in recent years delayed progress on the model, but a fair amount of background data collection was conducted in the project area. The area also has been visited on several occasions by one of the foremost flatwoods salamander experts, John Palis. Mr. Palis was first contracted by St. Joe to visit the project area on March 8, 2000. This cursory visit identified potential habitat and that “flatwoods salamanders may occur at this site” (Palis, 2000). Subsequent field inspections were conducted by John Palis in the action area related to the habitat model and to Camp Creek Golf Course Phase II.

Mr. Palis was again contracted to evaluate potential flatwoods salamander habitat specifically in the RGP area. Details of his survey methods are described in the biological assessment. Approximately 300 potential sites were initially selected using aerial photography and GIS data. These sites were throughout the RGP area, not just on St. Joe Company lands (Figure 2, page 18). Upon further review of high resolution photography, historical photography, and soils maps, Palis selected 83 of the 300 sites "that merited a field visit to determine their potential as flatwoods salamander habitat" (WilsonMiller, 2003) (Figure 3, page 19). A team including Palis, the applicant, and consultants for the applicant inspected these sites, and any others that were noted in the field. Each site that was deemed to have at least a "small potential" for suitable habitat was re-visited by Palis. The final analysis concluded that only nine wetlands appeared to be suitable habitat (Figure 4, page 20).

There is no set protocol at this time for providing reasonable assurance that salamanders do <u>not</u> 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 due to a recent drought. However, based on the remote sensing analysis, site inspections, and the proximity to at least two known locations, the Corps and the St. Joe Company have agreed to presume presence of flatwoods salamanders at the nine potential locations. This appears to be a reasonable approach given the size of the project area and the limited time frame 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.

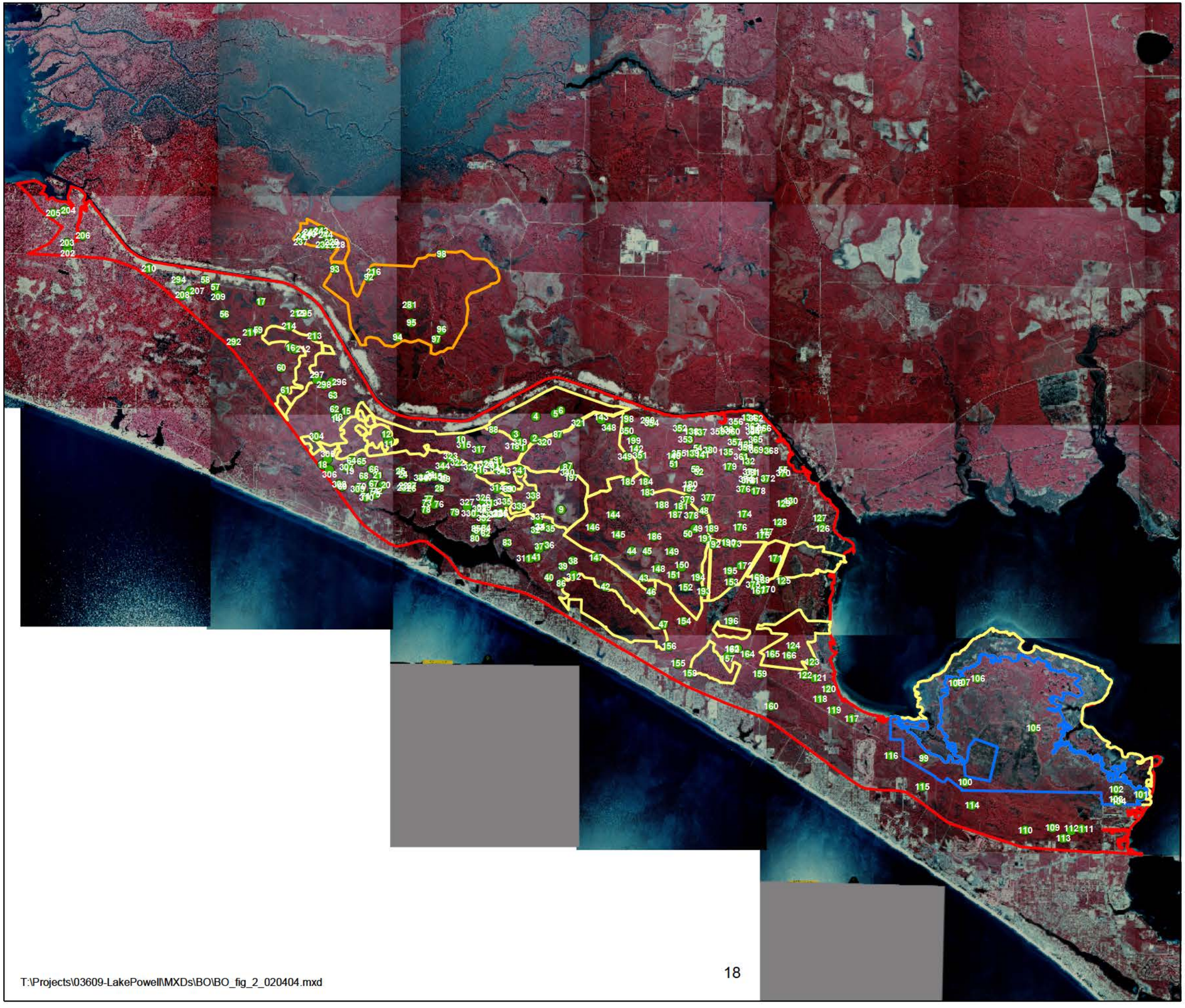

Figure 2

300+ Sites Selected for Analysis Biological Opinion

West Bay to East Walton RGP

Legend

- Conservation Units
- RGP Area (Including Tidal Soils)
- Devil's Swamp Mitigation Bank
- Breakfast Point Mitigation Bank
- Ponds Reviewed Prior to Field Surveys for Potential Flatwoods Salamander Habitat

203 Pond Identification Number

Disclaimer:
This exhibit was prepared utilizing GIS data provided by various sources that may include but not limited to federal, state, district and local agencies. Data provided by other sources are not warranted by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey, or for zoning verification.

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02/04/04

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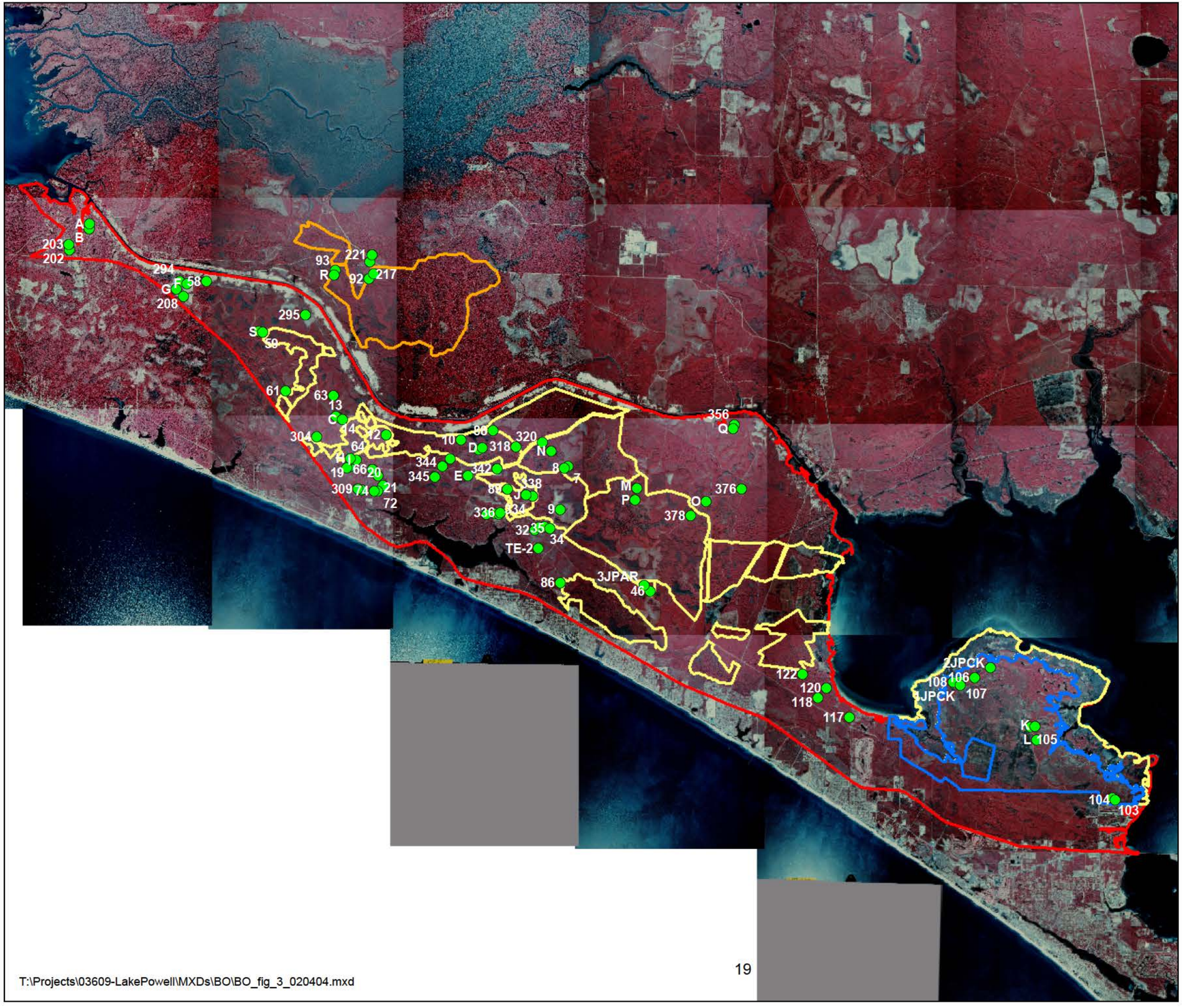

Figure 3

83 Sites Selected from 300+

West Bay to East Walton RGP

Legend

- Conservation Units
- RGP Area (Including Tidal Soils)
- Devil's Swamp Mitigation Bank
- Breakfast Point Mitigation Bank

- Ponds Surveyed for Potential Flatwoods Salamander Habitat

203 Pond Identification

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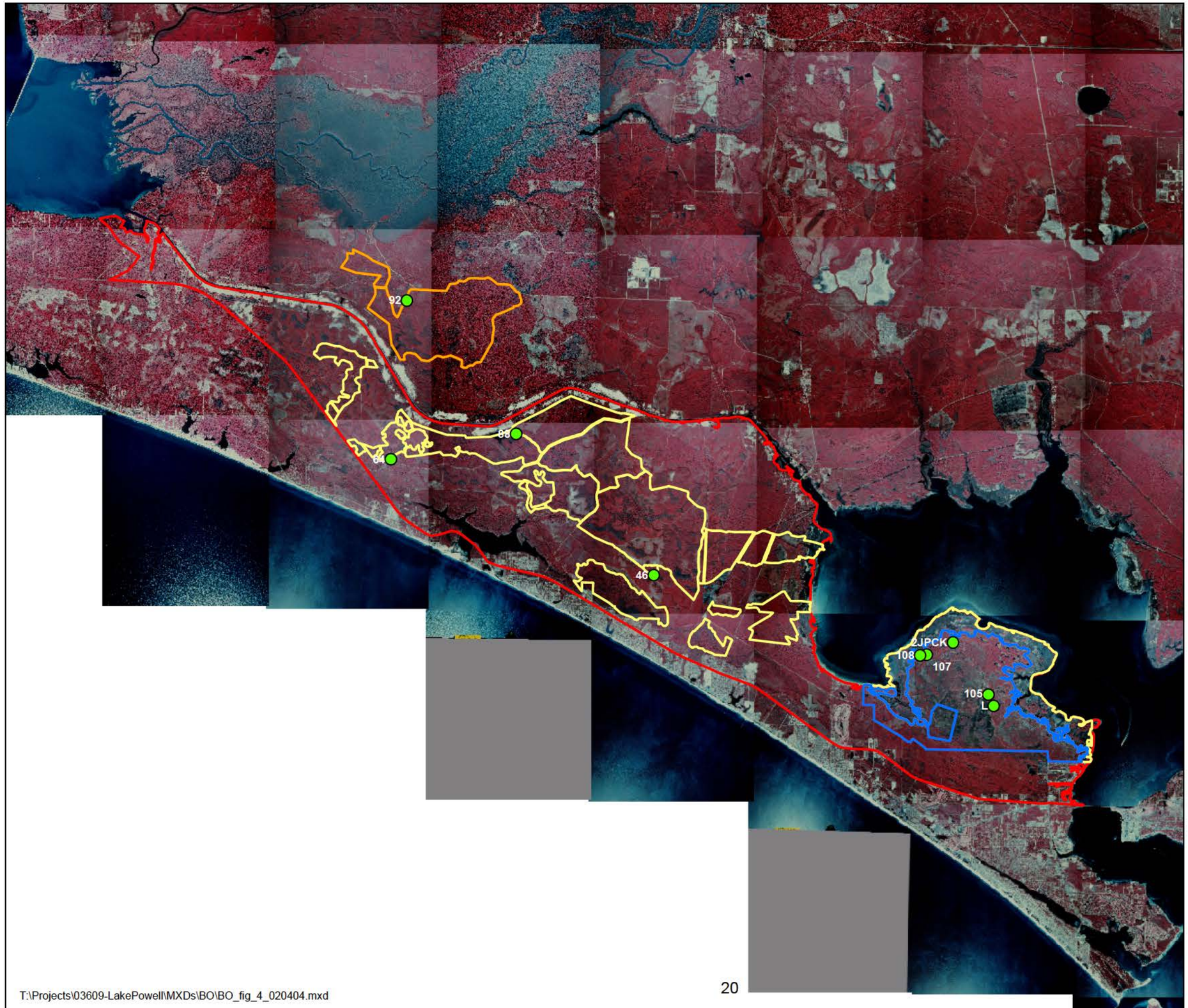

Figure 4

Nine Potential Salamander Locations

West Bay to East Walton RGP

Legend

- Conservation Units
- GP Area (Including Tidal Soils)
- Devils Swamp
- Breakfast Point

- Ponds Considered Potential Habitat Based on Field Survey Results

46 Pond Identification

Disclaimer:
This exhibit was prepared utilizing GIS data provided by various sources that may include but not limited to federal, state, district and local agencies. Data provided by other sources are not warranted by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey, or for zoning verification.

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Factors affecting species environment within the action area

West Bay Sector Plan - Bay County officials recently conducted a special planning effort for a portion of the RGP and additional adjacent areas totaling approximately 75,000 acres. The "West Bay Sector Plan" identifies potential development and conservation strategies for the area, and is predicated on re-location 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. It is likely that other habitat could be found in the approximately 30,000 acres identified as the West Bay Preservation Area.

Camp Creek Golf Course, Medallist, and Highway 98 - These three projects are within the RGP boundary. Each project required Corps permits and formal consultations for flatwoods salamanders. Similar to the approach agreed upon for the RGP, each project area was presumed to have salamanders based on the presence of suitable habitat and the proximity to known locations. The amount of presumed take from these three projects totals 606 acres of buffer habitat. There was no direct take of breeding pond habitat.

Public Lands - Point Washington State Forest occurs within the RGP boundary. There is one known location of a flatwoods salamander breeding pond in the forest, but it is a considerable distance from any potential development that could occur in the RGP. The forest is actively managed in a manner that should improve salamander populations. Pine Log State Forest is in proximity to the RGP boundary, but not located within the project area. As with Point Washington, there is one documented occurrence of flatwoods salamanders, and the forest is managed to improve habitat for the species. The Northwest Florida Water Management District (WMD) also owns large parcels adjacent to the project area. There are no known occurrences of flatwoods salamanders on WMD land, but there is good potential that active management will improve habitat. The RGP conservation units blend with the State forest and WMD lands to provide an opportunity for habitat improvement and connectivity across a large area of Bay and Walton counties.

EFFECTS OF THE ACTION

RGP-86 is designed to manage the cumulative effects of numerous potential Section 404 dredge and fill permits. The RGP guides development to specific areas allowing no more than 20 percent of low quality silviculture wetlands to be impacted within each sub-watershed in the RGP area. More than 99 percent of high quality, unplanted wetlands will remain. Two mitigation banks of 7,700 acres will compensate for the loss of wetland functional values to both low and high quality wetlands. Conservation units of 13,200 acres will be removed from development potential as a condition of the permit, but will be encumbered by conservation easements concurrently as future development projects receive permit authorization. The conservation units and mitigation banks establish large, contiguous blocks of manageable lands, wildlife corridors, and provide for reduction of potential stormwater and hydrological impacts. 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.

Direct effects

The BA identifies specific direct effects of the project to include development projects within two potential habitats identified as Ponds 64 and 46. Pond 64 is the only potential breeding habitat that is not located within a conservation unit or one of the two mitigation banks. Pond 46 was added to a conservation unit following its discovery and evaluation; however, some of the surrounding buffer habitat of Pond 46 falls outside the conservation unit and is therefore subject to future development plans. All other identified suitable habitat, including buffers, is located either within a conservation unit or a mitigation bank. Direct effects could occur in other locations if suitable habitat is discovered at a later time; however, this situation would constitute new information that would trigger re-initiation of consultation.

The BA describes the method by which John Palis and the consultants quantified the amount of suitable habitat that could be affected at Ponds 64 and 46. This is based on a draft project design for a residential/golf course development adjacent to Pond 64 and presumed future development within suitable buffer habitat of Pond 46 that is outside the conservation unit. The BA indicates that approximately 57 acres of fair to fairly good buffer habitat will be affected at Pond 64. Approximately 53.6 acres of potential buffer habitat will be affected at Pond 46.

Management of the conservation units and the mitigation banks should ultimately benefit flatwoods salamander habitat. The conservation units will be managed according to *Principles for Forest and Wildlife Management for Conservation Units Within the Regional General Permit Area* that is part of RGP-86. The banks will be managed according to their mitigation banking instruments. The ultimate goal in both conservation units and banks is to restore the habitat to historical natural condition.

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. Soil disturbance can also result in potential sedimentation and erosion affecting nearby wetlands habitat. However, construction that could occur within proximity to suitable habitat is limited by the boundaries of the conservation units and mitigation banks and by the proposed buffers. In addition, a proposed road near Pond 64 has been re-designed to include underpasses for reptiles, amphibians, and small mammals. This would maintain a connection between the pond and an area to the north that will be placed in a conservation easement within the development and which connects to a large conservation unit.

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. 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.

RGP-86 was specifically designed through 3 years of interagency coordination to address cumulative effects that could be expected from increased development pressure in the area. The Service has evaluated numerous development projects in the area in recent years, and has conducted formal consultation for flatwoods salamanders for three of these projects. The general permit provides a more coordinated ecosystem approach for implementation of the current dredge and fill program in the area. The cooperation of the largest landowner in the area has been instrumental in the process. Additional evaluation of flatwoods salamander habitat will occur on a project-by-project basis using the procedures described in Appendix IV.

CONCLUSION

After reviewing the current status of the flatwoods salamander, the environmental baseline for the RGP-86 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 RGP project area, nine wetlands were identified as potential suitable habitat for the flatwoods salamander. No known breeding habitat for flatwoods salamander will be affected. As conditions of issuing the permit for the project, mitigation banks totaling 7,692 acres will be established to compensate for loss of wetland values and conservation units totaling 13,200 acres will be removed from development potential. Seven of the nine potential flatwoods salamander ponds are located completely within a conservation unit or mitigation bank. Of the two ponds not included, only one is completely outside a conservation unit or mitigation bank. The combined acreage of affected buffer habitat in both ponds totals 110.6 acres. This acreage, which has been established as the amount of take for the affected potentially occupied habitat, is

very small when compared to the amount of suitable upland and wetland habitat (18,357 acres) that will be restored and managed in perpetuity within the conservation units and mitigation banks. Loss of 110.6 acres of potential suitable habitat will not appreciably reduce the survival and recovery of the flatwoods salamander. No potential breeding pond habitat will be affected. Less than 2.4 percent of the buffer habitat surrounding these ponds will be taken. The RGP project area will allow for protection and expansion of populations if any are eventually located at the site. The existing and future land uses without the RGP (silviculture and haphazard development) would be more of a threat to recovery of the species than issuance of the permit. No critical habitat has been designated for the flatwoods salamander; therefore, none would be affected.

There are approximately 160 ponds in Florida with a conservative estimate of 376,000 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 0.0003 of the amount of known habitat in the State of Florida. As a reminder, it should be pointed out that all effects are for habitat that is **presumed** to support flatwoods salamanders, and that a majority of the buffer habitat around the two affected ponds will remain and be improved.

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 Corps of Engineers for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and assure implementation of the Terms and Conditions, or (2) fails to require applicants 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. In order to monitor the impact of incidental take, the Corps 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. Individuals killed during construction would likely be buried under dirt and debris, and/or, (2) 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 110.6 acres of potential buffer habitat is presumed to be taken by development activities allowed under RGP-86.

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 conservation units and mitigation banks, both of which will eventually be restored to more suitable habitat and managed in perpetuity. The amount of take is also for buffer habitat only; no take is given for potential breeding ponds themselves. No critical habitat has been designated for the flatwoods salamander; therefore none will be affected.

Reasonable and prudent measures

The Service believes the following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize take of flatwoods salamanders.

1. All applicants for development projects will receive information about flatwoods salamander habitat.

2. Future development proposals will include a verification that the ponds on the site have been evaluated for their suitability as flatwoods salamander breeding ponds, as described in the Terms and Conditions.

3. Future owners of the conservation units will receive information about the flatwoods salamander Conservation Measures of RGP-86.

Terms and conditions

In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the Corps and applicants for RGP-86 must comply with the following Terms and Conditions, which implement the reasonable and prudent measures, described above. These Terms and Conditions are non-discretionary.

1. The Conservation Measures as described in the BA and in the proposed action section of this BO will be implemented.

2. The 5-year review and renewal process will provide an evaluation of salamander effects and conservation.

3. As part of the pre-application process for RGP-86, project sites will be assessed using the *Flatwoods Salamander Pre-Application Evaluation* (Appendix IV). This requirement is addressed in Special Condition 19.a (8) of the permit.

4. As Special Condition 13.d of RGP-86, sale or transfer of conservation units requires that a copy of RGP-86 and this biological opinion be provided to the new owner.

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. The following conservation recommendations will be implemented if possible:

1. The Corps recognizes that a joint effort is underway to develop a predictive model to determine habitat suitability for flatwoods salamander. The research to develop the model has been ongoing for 2 years and requires another year for completion. To the extent it is available for use, the Corps and the St. Joe Company should apply the model to the project area.

2. The Corps and the St. Joe Company should participate in conservation planning for telephus spurge in the RGP action area.

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.

TELEPHUS SPURGE

STATUS OF THE SPECIES/CRITICAL HABITAT

This section summarizes the biology and ecology of telephus spurge. The Service uses this information to assess whether a Federal action is likely to jeopardize the continued existence of the species. The Environmental Baseline summarizes information on status and trends of the species specifically within the action area. These summaries provide a 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.

Telephus spurge was listed as a threatened species under the authority of the Endangered Species Act of 1973, as amended (Act). The telephus spurge was designated as threatened in the Federal Register, May 8, 1992 (57 FR 19813-19819) and became effective on June 8, 1992. No critical habitat has been designated for this species. This species is endemic to Bay, Franklin, and Gulf counties, Florida. It is threatened by habitat degradation due to conversion of habitat to pine plantations with accompanying mechanical destruction and eventual shading, as well as real estate development within its habitat. Use of herbicides within powerline right-of-ways may also adversely affect telephus spurge. A recovery plan was approved on June 22, 1994 (USFWS 1994).

Species description

Telephus spurge is a perennial herb with a stout storage root and numerous, erect stems to 1 foot tall. Stems and leaves are smooth and fleshy with milky sap. The leaves are alternate, 1-2 inches long, without leaf stalks, obovate to oblanceolate, usually over 1 cm wide at the widest part, with maroon midribs and margins. The species flowers from April through July with flowers that are reddish-green cyanthia (cup-like structures). It produces one female flower and several male flowers on short stalks, surrounded by 4-5 minute, petal-like glands. The fruit is a 3-lobed capsule. Naturally occurring telephus spurge is found in a variety of habitat types including pine savannas and wet prairies to sandhills, scrubby and mesic flatwoods, and coastal scrub on low sand ridges within 4 miles of the Gulf of Mexico (Chafin 2000, WilsonMiller 2004). Biologists from Florida Natural Areas Inventory (FNAI) and WilsonMiller have documented populations of telephus spurge persisting under powerlines, pine plantations, and remnant pine flatwoods and coastal scrub (WilsonMiller 2004). Botanists at Historic Bok Sanctuary have had minimal success with greenhouse propagation by transplanting individual plants (Cheryl Peterson, personal communication, September 21, 2004).

Status and distribution

When the USFWS listed telephus spurge, there were 22 known locations of this species. Since listing, the number of known extant telephus spurge locations increased from 22 to approximately 42 known locations due to additional survey work (Moranz, et.al., 2001; ERC 2004). However, several locations may now be extirpated.

There are currently 41 occurrences of telephus spurge documented in the Florida Natural Areas Inventory database (Sept 2004). Thirty sites (FNAI 1, 3, 4, 6, 10-19, 23-25, 27-34, 36-39, 41) are concentrated in a 28 square mile area east and south of the town of Port St. Joe in Gulf County; however, FNAI 1, 10, and 17 are believed to be extirpated. Outside the main concentration area, three sites (FNAI 7, 8, and 9) are found 40 miles west in Bay County. FNAI 9 is believed extirpated also. Two sites (FNAI 26, 35) were documented 20 miles east in Franklin County but are both now believed extirpated due to development. Six sites (FNAI 2, 5, 20, 21, 22, 40) were scattered to the east of the main concentration, but FNAI 2 is now believed to be extirpated. Twelve occurrences (FNAI 3, 18, 24, 25, 28, 29, 30, 31, 32, 33, 36, and 41) within the main area of concentration are protected on the St. Joseph State Buffer Preserve

(SJBP). The SJBP sites range mostly from 3-30 in plant numbers with a few ranging from 30-100 and one with numbers in the 1000's. The remaining sites are on private lands with most having from 0-50 plants, a few having 50-300 plants, and 4 sites having plant numbers in the 1000's. Plant numbers from most sites in the 2001 survey have been reduced compared to 1988 survey data. This is attributed mostly to conversion to pine plantations or development as well as the exclusion of fire. No plants were found at seven sites during recent surveys, but it is difficult to say whether the plants are actually extirpated or were simply not visible due to the absence of recent fire or other disturbance.

Appropriate management is occurring on the SJBP and has created a positive stimulus for telephus spurge. Cursory surveys from a recent site visit (August 2004) by USFWS biologists as well as discussions with staff from SJBP lead us to believe that the SJBP houses the largest and best managed populations of telephus spurge to date.

The telephus spurge occurrence records in the proposed North Glades project area are documented as FNAI 7 and 8. Originally located in 1988, surveyors documented approximately 200 plants at each site. Upon more specific surveys, the applicant's contractors located approximately 17,250 plants within a 6.43 acre area. Based on individual plant count data, this is the second largest population documented to date and is located in the western most extent of the species range since FNAI 9 is believed extirpated.

The North Glades applicant has conducted additional surveys within the RGP-86 Conservation Units in Bay County, Florida, and within the BPMB. As a result, one new population of telephus spurge containing over 200 plants was located in the BPMB and on adjacent lands that have no conservation designation. These 200 plants within BPMP will be managed and monitored in conjunction with the existing management requirements of the RGP-86 permit. We refer to this site as FNAI 42, the designation it will be given once data is entered.

The Service's recovery plan for telephus spurge states a goal of 15 populations of telephus spurge that are distributed throughout the species' historical range and that are adequately managed and protected before the species can be delisted (USFWS 1994). To apply this criterion, we would have to determine how many populations exist. The number of occurrences is greater than the number of populations because more than one occurrence may be part of the same population. We estimate that St. Joe Buffer Preserve's 12 locations equate to 3 populations. Bay County sites located on Panama City Beach (FNAI 7 and 8) are one population, and FNAI 42 will be a separate population (once there is a complete build out within the RGP-86 permitted area). Due to the extensive area covered by the RGP-86 permit and associated mitigation bank areas, not all suitable habitat has been surveyed throughout the RGP-86 area nor the mitigation bank areas, but the potential for locating additional telephus spurge sites seems fairly high.

ENVIRONMENTAL BASELINE

Under Section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, we are required to take into consideration the environmental baseline. The

environmental baseline includes past and ongoing natural factors and past and present impacts from all Federal, State, or private actions and other activities in the action area (50 CFR 402.02), including Federal actions in the area that have already undergone Section 7 consultation and the impacts from State and private actions that are contemporaneous with the consultation in progress.

Status of the Species Within the Action Area

This revision of the original BO focuses specifically on the North Glades development. The original BO identified several federally listed species known or presumed to occur within the project boundary. At the time it was determined that plant surveys within the RGP-86 project area were limited considering the size of the project area. A conservation measure incorporated into the permit stipulated that all impacts to telephus spurge would be avoided and that consultation would be re-initiated if impacts could be avoided. Since completion of the original BO, additional surveys for telephus spurge have occurred within the RGP-86 permit boundaries. This resulted in the location of one additional site of telephus spurge referred to above as FNAI 42. Also during that time, a landowner proposed the North Glades development project that would impact telephus spurge at FNAI 7 and 8. Upon realization that the North Glades development would adversely impact the telephus spurge, the Corps re-initiated consultation with the Service and will continue to do so should additional sites containing telephus spurge be located and impacted by future development plans within the RGP-86 permit area.

The proposed North Glades project area consists of 66.96 acres. Of this, 6.43 acres contains approximately 17,250 telephus spurge plants. The applicant estimates that 4.10 acres and approximately 10,425 plants will be adversely impacted by the proposed development. The remaining 2.33 acres with approximately 6,825 plants will be managed and conserved through a perpetual conservation easement. It is unlikely that if the population were left without management in its current location that it would persist over time due to habitat loss and degradation. There are no other Federal actions ongoing or proposed for the action area at the present time.

Factors Affecting Species Environment Within the Action Area

This analysis describes factors affecting the environment of the species in the action area. The baseline includes State, local, Tribal, and private actions within the action area already affecting the species or that will occur contemporaneously with the proposed action and would affect the environment of the telephus spurge. Unrelated Federal actions affecting the telephus spurge that have completed formal or informal consultation are also part of the environmental baseline, as are Federal and other actions within the action area that benefit the telephus spurge.

RGP-86 was cooperatively developed by several State and Federal agencies to address the cumulative effects of existing and anticipated development pressures within a fast growing region of the Florida panhandle. The area addressed by the permit is approximately 47,480 acres in southwest Bay County and southeast Walton County. Approximately 90 percent of the property is presently in silviculture (forestry) management and is owned by the St. Joe Company.

Current forestry practices are now giving way to more lucrative residential and commercial developments for which the RGP-86 permit was intended.

Several development projects have occurred or are proposed in the vicinity of telephus spurge sites FNAI 7 and 8. These include Hombre Golf Club, Wingate Motel, Bay Medical Center, Sonny's Bar-B-Q, Beckrich Office Complex, "Alf Coleman," Highlands West, and Home Depot. One of these sites, Wingate Motel, is known to have telephus spurge that will likely be impacted by the proposed project. Another project, Home Depot, was recently completed prior to telephus spurge being documented on the periphery. It is likely that plants were destroyed by the construction of businesses and access roads associated with Home Depot.

Within the RGP area, approximately 10,665 acres of uplands and wetlands will be designated as Conservation Units. These areas will be removed from development potential and industrial forestry practices. They will eventually be restored in accordance with specific prescriptions for wildlife management that focus on listed species. Restoration and management of two wetland mitigation banks will secure for conservation two large, strategically placed parcels totaling approximately 7,700 acres. The previous land use of the banks is industrial forestry. It was intended for these mitigation banks to assist in the recovery of several federally listed species, including telephus spurge. The majority of the BPMB is of the soil types suitable to telephus spurge.

Telephus spurge sites FNAI 7 and 8 occur in an area proposed for a development project that would be permitted under RGP-86. FNAI site 42 is located in the BPMB and adjacent lands to the south of the bank boundary. Surveys for telephus spurge were conducted in 15 different locations within the Conservation Unit areas of the RGP (ERC, 2004). No additional populations have been located but due to the amount of habitat covered under the RGP-86 permit and the availability of suitable habitat, we believe that additional telephus spurge locations may exist. The Corps will continue to re-initiate consultation if the species is located prior to development. Active management within the mitigation banks and the Conservation Unit areas will improve the habitat for telephus spurge.

EFFECTS OF THE ACTION

Direct Effects

An estimated count of 10,425 plants of telephus spurge will be lost due to the proposed project, with a corresponding loss of habitat (4.10 acres). However, viability of the remaining North Glades telephus spurge population (6,825 plants over 2.33 acres) in the action area will be maintained and managed.

Indirect Effects

The applicant owns the remaining portion of the population and has agreed to place it into a conservation easement and manage it, so the population is not subject to direct impacts from future development projects. However, given the location of the population and the proposed development, this population will be isolated from any other natural habitat thereby reducing the

chance for natural expansion or rescue effect should this population be inadvertently disturbed. This site will be managed in as natural a state as possible given that the location will become completely surrounded by urban development (highways, restaurants, commercial stores, etc.).

Private activities in the action area that may adversely impact the species indirectly include human trampling, increased exotic species invasion and competition, increased edge effect (i.e., increased sunlight, increased temperature), contaminant impacts from parking lot and highway runoff, as well as the proposed management attempts such as mowing and exotic species control.

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 Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require a separate consultation pursuant to section 7 of the Act.

Specifically for the North Glades project, the 6,825 plants located on the remaining 2.33 acres within the conservation easement area could potentially be impacted by future development plans. The applicant has agreed to protect and manage appropriately this remaining 2.33 acres of the telephus spurge habitat and population into perpetuity, therefore no other State, tribal, local, or private actions are reasonably certain to occur at this particular site that would affect the telephus spurge.

Future actions within the RGP boundary will include industrial, commercial, and private residential development, which in turn could lead to further fragmentation, fire suppression and/or direct impacts to unknown, yet existing, populations of telephus spurge. Additional evaluation of telephus spurge habitat will occur on a project-by project basis using the procedures described in Appendix III.

CONCLUSION

Transplanting endangered or threatened plant species from project impact areas, while minimizing impacts to individuals, is generally not recommended. The intent of the Act is to protect the ecosystems upon which these federally listed species depend. Thus, protecting habitat is considered to be a key factor for ensuring conservation of listed species. In this case, even if the entire plant population on North Glades was protected from direct impacts, the long-term plans for the surrounding area will eventually see this population further fragmented and eventually isolated from all natural corridors. This project will involve transplanting of telephus spurge individuals to a protected site that has yet to be identified, and will also include the long-term commitment of active management and monitoring of the parent population within the North Glades conservation easement. At a minimum, we will learn whether transplanting telephus spurge is a viable option to be used for future unavoidable impacts to the species. At

most, we will create a new population that resides in a more natural setting conducive for long-term protection, management and viability.

The USFWS has set a goal of 15 populations of telephus spurge that are distributed throughout the species' historical range and that are adequately managed and protected before the species can be delisted (USFWS 1994). Currently three centrally located populations are protected in the St. Joe Buffer Preserve. The total number of locations of this plant is not considered a limiting factor toward recovery of the species; rather, it is the protection of populations that is limiting the species' recovery. The Conservation Measures provided by the applicant will increase the number of protected populations from three to five or possibly, six. This includes the three on the SJBP, the North Glades population (FNAI 7 and 8), the BPMB population (FNAI 42) and possibly an additional population depending on placement and the results from the translocation efforts. The location of the transplanted plants will determine whether they will be considered a new population.

After reviewing the current status of telephus spurge, the environmental baseline for the action area, the effects of the proposed development, the cumulative effects, and the proposed conservation measures, it is our biological opinion that the proposed development is not likely to jeopardize the continued existence of telephus spurge. No critical habitat has been designated for this species; therefore none will be affected.

CONSERVATION RECOMMENDATIONS FOR TELEPHUS SPURGE

Section 7(a)(1) of the 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 discretional agency activities to minimize or avoid the 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. Place the translocation study area more than 3 kilometers from other known populations if connected by natural habitat or about 1 kilometer if permanently unsuitable habitat is in between the populations. If the translocation is deemed successful, the transplanted population would count as an additional protected population and will aid in reaching the recovery goal of 15 protected populations.

2. Develop in cooperation with USFWS a long-term conservation strategy for telephus spurge on St. Joe Company lands in Bay and Gulf counties.

In order for us to be kept informed about actions that minimize or avoid adverse effects or that benefit listed species or their habitats, we request notification of the implementation of any conservation recommendations.

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.

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Appendix I - Memo Dated April 30, 2004 from WilsonMiller, Inc.

WilsonMiller

TO: Hildreth Cooper, USFWS
Gail Carmody, USFWS
Don Hambrick, USACE

FROM: Ann Redmond and Trina Mitchell

CC: Dave Tillis, Thomas Estes, St. Joe Company

SUBJECT: *Euphorbia telephioides* (Telephus Spurge) Populations in the Action and Project Area

DATE: April 30, 2004

On March 18, Hildreth Cooper informed WilsonMiller that the Service is concerned about the presence of telephus spurge populations in the Action and Project Areas. Patty Kelly, U.S. Fish and Wildlife Service (USFWS), had raised some questions about the impacts of the RGP on the species. Following the Biological Assessment of January 2004, a more detailed discussion of the telephus spurge has occurred. The content is related below.

The Telephus spurge was first listed in 1992 (USFWS 1994). Based on vouchered specimens, this plant is an endemic species that occurs in Bay, Gulf, and Franklin Counties, Florida (Institute for Systematic Botany 2002). The plant occurs from Panama City Beach east to the Ochlockonee River (USFWS 1994). It has been recorded in 41 locations, nearly half of which are on public land (Map 1).

All known occurrences of Telephus spurge are on sites within 4 miles of the Gulf of Mexico (USFWS 1994). Numerous populations are protected on St. Joseph Bay State Buffer Preserve and adjacent tracts of land (SJBBP); many occurrences are on private timberlands and utility right-of-ways (Chafin 2000, FNAI 2003, Hilsenbeck 2004, Willson 2004). Ed and Lisa Keppner have searched for the telephus spurge in Bay County and have found none (Keppner 2004). Hilsenbeck (2004) believes that the spurge's listing as a G1/S1 plant should be downgraded based on the abundance of the species in the SJBBP area.

<u>Populations in Action Area</u>

Two populations of Telephus spurge (*Euphorbia telephioides*) have been documented outside the Action Area, but near the Project Area, and one has been documented within the Project Area (FNAI 2003, 2004; Chafin 2004; Kindell 2004; WilsonMiller 2004)(Map 2). FNAI (2003) element occurrence (EO) data indicate that during the 2001 survey, no plants were observed in population EUPHTELE*0009 outside the Project Area (Table 1). The other two populations were re-confirmed in 2001 (Table 1), including the one within the Project Area.

WilsonMiller, Inc., resurveyed for the population within the Project Area (EUPHTELE*0007) on April 21, 2004, and found numerous individuals along US 98 within an area approximately 0.5 mile long (Map 3). Individuals were observed within the "beauty strip," a narrow strip (about 20 feet wide) of longleaf pine-false rosemary-saw palmetto habitat located on the north side of US 98, between the highway and the slash pine plantation.

Table 1. Recorded Locations of Telephus Spurge in Bay County, Florida

Location	Last Observation	EO Data	EO Data	FNAI Map Label
Project Area	2004-04-21	2004-04-21. In a ~0.5-mile-long, 20-ft-wide strip along the north side of U.S.98. 2001-08-01. Now only on north side of road (PNDKIN02FLUS). 1988-08-08: 1.9 MI W OF JCT US98 AND US98 BYP; BOTH SIDES OF ROAD.	2004-04-21. More than 600 plants observed by WilsonMiller ecologists in the "beauty strip" of longleaf pine, wiregrass, false rosemary, saw palmetto, and Sporobolus floridana. 2003-09-26: no plants seen in survey of north side of road - habitat intact; narrow strip of flatwoods between US98 to south and titi/baygall to north; mostly shrubby (Ilex glabra, I. coriacea) with a few patches of wiregrass (PNDJOH01FLUS); 2001-08-01: 100+ plants seen. Etiolating in dense duff, about 10% of them in fruit or flower. Most plants are small, with only a few leaves. (PNDKIN02FLUS). 1988-08-08:200+, FLOWERING, FRUITING IN LEAF; NICE POPULATION.	EUPHTELE*0007
Outside Project Area, South side of US Highway 98	2001-08-01	2001-08-01: Directions given in this field in 1988 do not match where EO is mapped in GIS database. 1988-08-08: 0.7 MI E OF 30D ON ALT 30, S SIDE OF ROAD.	2001-08-01: Approximately 30 plants seen only within road right-of way, at edge of the flatwoods. All plants were small, and about 10 of them had fruits and flowers, (PNDKIN02FLUS) 1988-08-08: 200, FLOWERING AND FRUITING.	EUPHTELE*0008
Outside Project Area, south of US Highway 98 on CR30H	1988-08-23	1988-08-23: 0.2 MI S OF US 98 BYP ON CR 30H, E SIDE.	2001-08-01: no plants seen, possibly due to very dense vegetation. (PNDKIN02FLUS). 1988-08-23: 200+ COMMON IN OPEN AREAS, IN LEAF, FRUIT, FLOWER	EUPHTELE*0009

Source: WilsonMiller 2004; FNAI 2003, 2004.

Additional populations of Telephus spurge may be located within the Project Area west of the area indicated on Map 2, in cleared or recently planted areas, along roads, or along the edges of pine plantations.

Species Habitat Requirements

This species occurs in dry habitats along the Gulf coast on both sides of the Apalachicola River (USFWS 1994). This species occurs in longleaf pine savannas, scrubby and mesic flatwoods, and coastal scrub on low sand ridges near the Gulf of Mexico (Chafin 2000). The habitats for the population reconfirmed by WilsonMiller and for those recorded in the FNAI 2003 data are under power lines, in natural pinelands, and in remnant longleaf pine-saw palmetto-rosemary/wiregrass flatwoods. Hilsenbeck (2004) has observed the Telephus spurge in a wider variety of habitats in the SJBBP area than have been previously noted, from seasonally wet prairies to sandhills. In the wet prairies it co-occurred with *Rhynchospora oligantha* and a variety of sedges.

Habitat Conditions within the Project Area

Suitable habitat for Telephus spurge within the Project Area is almost entirely in planted pine and thus is typically in poor to very poor condition. However, the habitat in which the EUPHTELE*0007 population occurs is remnant longleaf pine-saw palmetto-rosemary/wiregrass flatwoods in a long, narrow strip along the north side of U.S. 98 (Map 2). This area is poor to good quality, lower quality resulting primarily from fire suppression.

Soils for the easternmost two populations are mapped as Leon Sand surrounded by Pottsburg Sand. Soils in the western population are mapped as Pamlico-Dorovan and Pottsburg Sand, although it occurs next to Leon Sand and it is unlikely that the spurge would occur in the wet Pamlico-Dorovan soils. These same types of soils complexes occur in the Breakfast Point Peninsula Conservation Unit and the Breakfast Point Mitigation Bank (Map 4; NRCS 1984).

Silviculture-associated activities that have been detrimental to this species include bedding, dense shading, and fire suppression (USFWS 1994). Coastal real estate and road development in the vicinity of Panama City Beach are known to have destroyed Telephus spurge habitat (USFWS 1994). Suitable habitat may already be protected where it occurs under power lines; however, herbicide use in these areas is a concern. Cooper (2004b) indicated that USFWS staff thought the EUPHTELE*0009 population may have been destroyed by the recent Pier Park development, but this site is 2.9 miles east of the Pier Park site and has not yet been cleared or developed.

Effects of the Proposed Action

A “may affect, not likely to adversely affect” determination was made for Telephus spurge in the Biological Assessment.

Where suitable habitat occurs under planted pine, it probably has been substantially degraded; where habitat occurs in the “beauty strip” and in power line and road right-of-ways, it likely has been somewhat protected and maintained. Power line right-of-ways and, to a lesser extent, road right-of-ways will continue to be somewhat protected and

maintained as suitable habitat under the Proposed Action. One of the two populations verified in 2001 occurred in road right-of way; the other two populations (one verified and one not verified in 2001) occurred in longleaf-palmetto flatwoods.

Direct and indirect beneficial effects associated with the Proposed Action on potentially suitable habitat within the Project Area include the immediate preservation and eventual restoration of uplands within the conservation units and immediate protection and beginning restoration within the Devil's Swamp and Breakfast Point Mitigation Banks.

Potentially suitable habitat may be negatively affected by eventual construction of roads, residential communities, and other developments. Negative effects would likely include loss of potential habitat within the Project Area, outside the conservation units.

General Conservation Measures of RGP 86

The Applicant will implement methods recommended by USFWS (1994) in suitable habitat in the conservation units and in the mitigation banks. Suitable habitats include sandhills, scrubby and mesic flatwoods, and powerline right-of-ways through these habitats.

- Reduction of canopy without compacting, mixing, and/or rutting soils or destroying ground cover;
- Burning appropriately, primarily during the growing season (generally April through September) and depending on habitat. For instance, natural fire regime in sandhills is more frequent than in scrub (2 to 5 years in sandhills; catastrophic fire every 20 to 80 years in scrub [FNAI and FDNR 1990]);
- Substituting mowing for use of herbicides;
- Preventing vehicles from driving through easily damaged scrub habitats.

Specific Conservation Measures for Telephus Spurge

Further discussion with Hildreth Cooper of the USFWS about the Telephus spurge population resulted in the drafting of this memorandum, which is intended to provide draft language for a conservation measure to be added to the biological opinion. Proposed language for this conservation measure follows:

> If the Applicant proposes a project that would impact the telephus spurge population indicated on Map 3 (WilsonMiller Observations of Telephus Spurge), impacts to this population should be avoided. If the proposed project cannot avoid impacts to this telephus spurge population, then re-initiation of consultation may be required. Consultation will take into consideration potential transplanting of individuals that would be impacted by a proposed project. Those individuals may be transplanted to appropriate areas of the Breakfast Point Mitigation Bank.
>
> To support this process, the specific location of this population (WilsonMiller Observations) is provided on Map 3 and on Figure 5 of the

Biological Opinion (attached), and will also be recorded in the St. Joe Company's internal real estate database no later than May 1, 2004.

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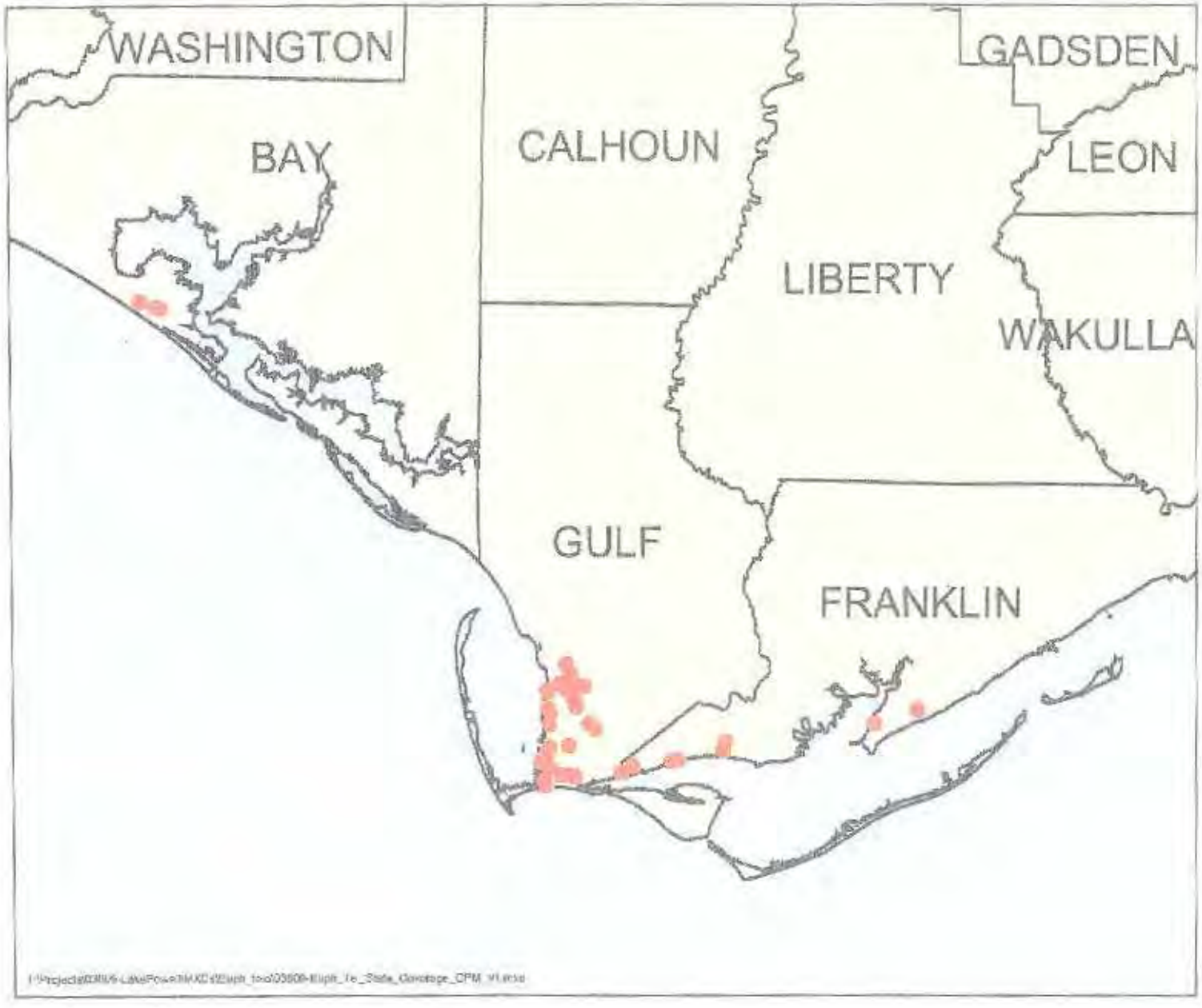

Map 1

Locations of Recorded Population of Telephus Spurge (*Euphorbia telephioides*)

Legend

- FNAI Species Points

Disclaimer:
This action was prepared using GIS data provided by various sources that may include but not limited to federal, state, district and local agencies. Data provided by other sources are not warranted by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey, or for zoning verification.

Map Date
03/18/04

0 4.5 9 18 Miles

WilsonMiller

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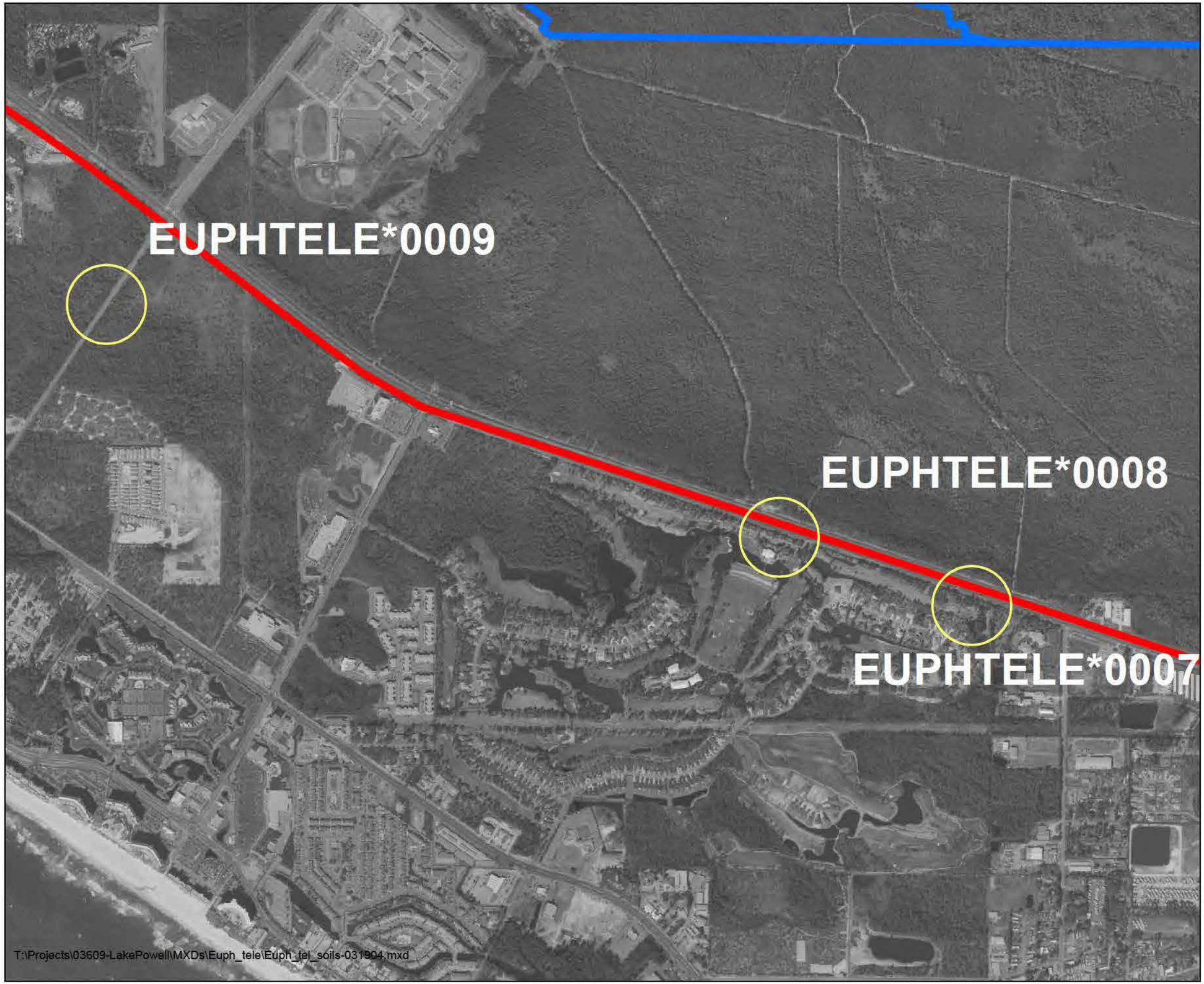

Map 2

Locations of Recorded Populations of Telephus Spurge *(Euphorbia telephioides)* within the West Bay to East Walton RGP (on 2003 FDOT Aerials)

Legend

- RGP Area (Including Tidal Soils)
- Breakfast Point
- FNAI Points for Euphorbia telephioides

EUPHTELE*0007 FNAI Map Label for Occurrence Record

Disclaimer:
This exhibit was prepared utilizing GIS data provided by various sources that may include but not limited to federal, state, district and local agencies. Data provided by other sources are not warranted by WilsonMiller for accuracy or for any particular use that may require accurate information. This map is for informational purposes only and should not be substituted for a wetland jurisdictional determination, true title search, property appraisal, survey, or for zoning verification.

Map Date:
03/22/04

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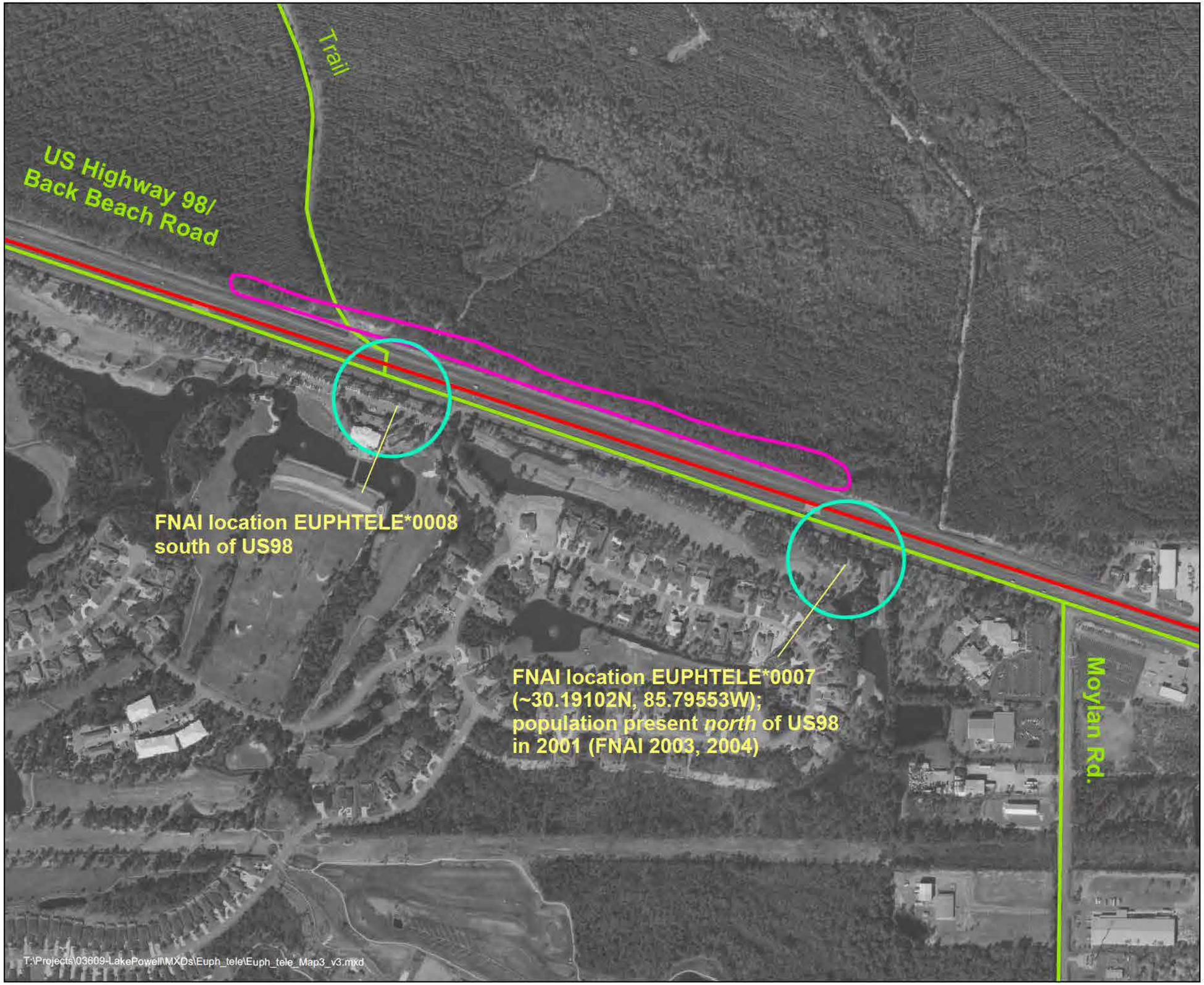

Map 3

Observed Population of Telephus Spurge *(Euphorbia telephioides)* within the West Bay to East Walton RGP

Legend

- WilsonMiller Observations of Telephus Spurge
- FNAI Telephus Spurge location EUPHTELE*0007
- RGP Area
- Roads

Disclaimer:
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Map Date:
04/21/04

0 150 300 600 Feet

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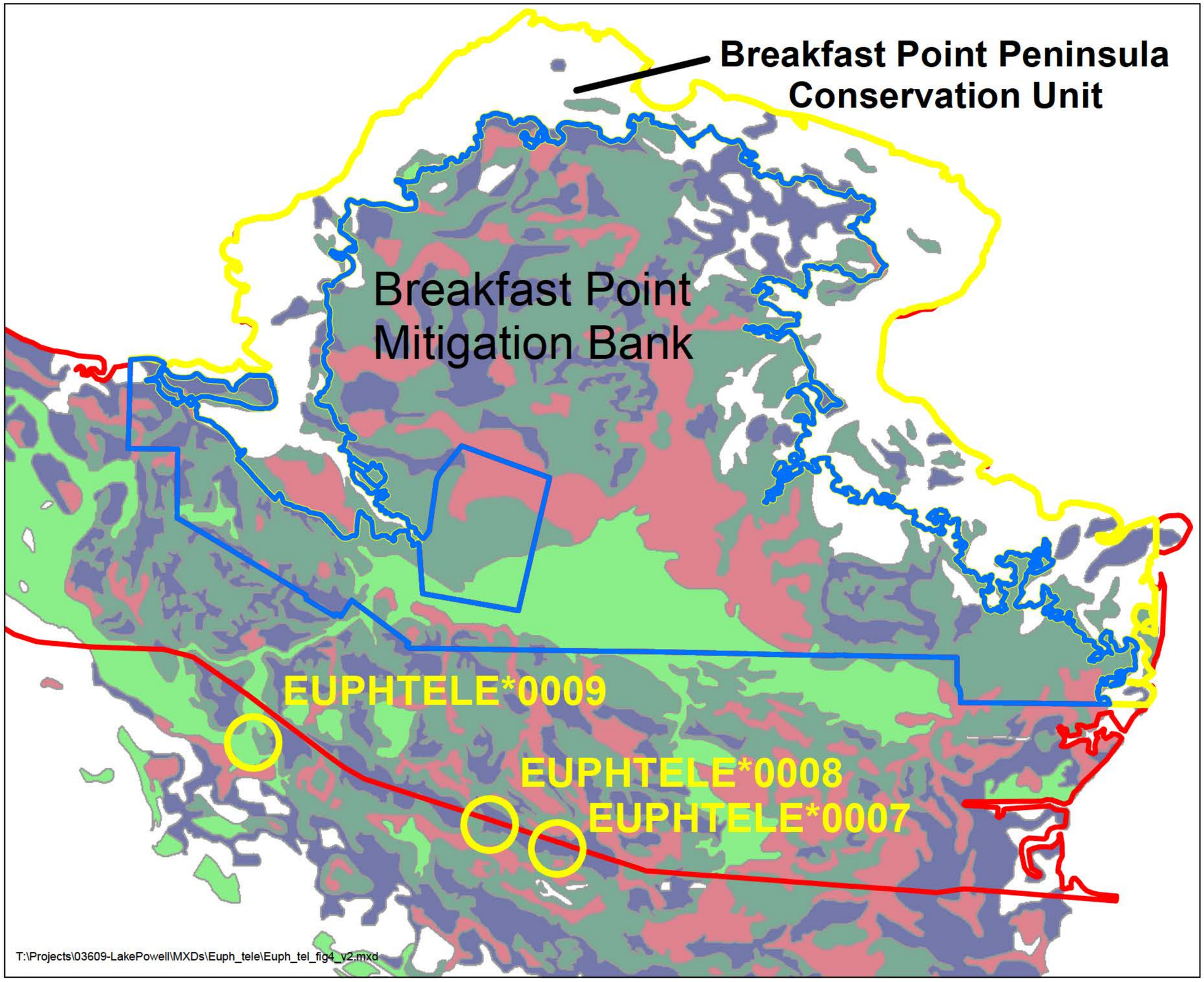

Map 4

Locations of Recorded Populations of Telephus Spurge on NRCS Soils Data

Legend

- FNAI Points for Telephus Spurge
- EUPHTELE*0007 Map Label ID for FNAI Points
- RGP Area
- Breakfast Point Mitigation Bank
- Breakfast Point Peninsula Conservation Unit

NRCS Soil Types:

- LEON SAND
- PAMLICO-DOROVAN COMPLEX
- POTTSBURG SAND
- RUTLEGE SAND

Disclaimer:
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Map Date:
05/06/04

0 0.3 0.6 1.2 Miles

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Recommendations for the necessary actions regarding E. telephioides At the Glades North site Bay County, Florida

The following is a summary of the actions ERC Tallahassee has completed to satisfy the components of the USFWS document titled ***Guidance on completion of consultation for*** *E. telephioides* (ET), provided by Hildreth Cooper (see Attachment A). The structure of the summary below follows that found in the USFWS document.

1) Brief description of proposed action:

Preserve and restore ET habitat in the conservation easement of the Glades North site. A large, viable population has been located in the proposed conservation easement associated with Glades North, this will afford long term protection of ET and provide a monitoring plan to assess successful restoration and appropriate response of ET to restoration activities. This is an experimental restoration that will combine knowledge of natural history with a mechanical woody vegetation removal schedule that is designed to mimic periodic fires. This is the most pragmatic approach to preservation of an existing population in situ near the Glades North development and urban build out. (See Attachment B1)

Preserve and restore ET habitat in the Breakfast Point Mitigation Bank. A large, viable population has been located on the BPMB lands and will be managed in conjunction with the existing mitigation instrument with an emphasis for the successful restoration of plant communities known to contain ET. With our efforts to provide a restoration and monitoring plan to assess the restoration of the habitat in which the ET is currently found, we expect the total number of plants to increase (with the reduction in fire suppressed vegetation) through the use of selective logging - vegetation removal and prescribed burns. (See Attachment B2)

Limited transplantation study of no more than 500 plants. A plan to locate and transfer ET that will be negatively affected by the impact sites on the Glades North site has been created. 5 plots will be set up in the BPMB and each will receive 100 plants. These will be quantitatively monitored for 5 years to assess their overall survival and viability. (See Attachment C)

2) Description of direct impact area should include: (most already provided in "Attachment L" of the permit application package)

- **Acreage of project area**
- **Acreage of plant population**
- **Acreage of plant population to be impacted**
- **Approx. number of plants found within project**
- **Approx. number of plants to be "taken" from site**

- **GIS layer with points of occurrence documenting plant locations**

Acreage of project area*:	66.96 acres
Acreage of plant population*:	6.43 acres
Acreage of plant population to be impacted:**	4.10 acres
Approx. number of plants found in project area*:**	17,250
Approx. number of plants to be "taken" from project area*:**	10,425

(* See Figure 1)
(** See Figure 2)
(*** See Figure 3)

3) Proposed actions to minimize effects to *Euphorbia telephioides*:

- **Management plan for remaining population, including area to east of North Glades (i.e. burning/mowing commitments, invasive control, keep natural, etc)**
  - **Long term protection commitment of population (conservation easement, Bay County Conservancy, St. Joe conservation unit, etc)**
  - **Monitoring plan—set up plots beginning prior to construction for pre-impact comparison, number of years client will monitor plots with justification of timeline, annual report on monitoring results with caveat to adjust management should the population decline below an acceptable % (support % with available literature if possible) over documented timeframe (support with literature if possible).**
- **Monitoring plan for translocation site to include the following:**
  - **# of plots to be monitored;**
  - **number of years client will monitor plots with justification of timeline;**
  - **annual report on monitoring results with caveat to adjust management should the population decline below an acceptable % (support with available literature if possible) over documented timeframe (support with literature if possible);**
  - **Description/supporting info for introduction site, i.e. similar habitat community type, same**

soil type, distance from parent population (FWS prefers site to be 1 km or > from known populations), map, acreage of site (needs to be sufficient size to support a viable population (200+ plants, unless better literature available to support);

- **Plan for movement of plants, time of year, when to complete movement, who to move;**
- **GIS layer/map with location of translocated site and specific plant locations;**
- **How/when will movement of population to introduced site be deemed a success?**

Management plan(s) for remaining populations, two separate reports detail how the population in the conservation easement will be restored, monitored and managed (Attachment B1) and the other report details the restoration, monitoring and management of the population within BPMB (Attachment B2). Finally, a Monitoring plan for the translocation of E. telephioides is included in a report called: Guidelines for transplantation methodology and long-term monitoring of relocated *Euphorbia telephioides* (Attachment C).

4) Provide (include map/GIS layer) survey data results (positive or negative) from other locations throughout the RGP boundary and the species range which are not reported by common data sources such as Florida Natural Areas Inventory (FNAI) data source:

Gis data for other locations of Euphorbia telephioides not reported by common data sources are included as separate electronic attachments to this document labeled:

Etelephiodes_GN.shp
Etelephiodes_BPMA.shp

5) If possible, discuss proposed projects which might impact other documented *Euphorbia telephioides* sites (impact meaning management, development, etc):

Projects along the Highway 98 corridor may inadvertently effect existing *Euphorbia telephioides* populations, however we believe we have crafted a regional solution to maintaining a population in Bay County through protection and management of the North Glades and Breakfast Point Mitigation Bank populations

Figure 1 - Acreage of Glades North project area, Proposed Conservation Easement and E. telephioides population within project area

Legend

- Proposed Site Plan
- Project Area - 66.96 acres
- Plant Population Area - 6.43 acres
- Consevation Easement - 2.19 acres
- 2003 B&W Aerial DOQQ

N

1:3,600

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erc Ecological Resource Consultants, Inc.

Figure 2 - Acreage of Glades North project area, Proposed Conservation Easement, proposed impacts/no impacts to E. telephioides population within project area

Legend

- Proposed Site Plan
- Project Area - 66.96 acres
- Plant Impact Area - 4.10 acres
- Plant No Impact Area - 2.33 acres
- Consevation Easement - 2.19 acres
- 2003 B&W Aerial DOQQ

N

1:3,600

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Figure 3 - Acreage of Glades North project area, Proposed Conservation Easement, with proposed impacts/no impacts to E. telephioides population within project area

Legend

- Proposed Site Plan
- Project Area - 66.96 acres
- Consevation Easement - 2.19 acres
- Impacted Plants
- Impacted Plants ~10,433 plants
- Non-Impacted Plants
- Non-Impacted Plants ~6818 plants
- 2003 B&W Aerial DOQQ

N

1:3,600

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Attachment A

USFWS document titled ***Guidance on completion of consultation for*** *E. telephioides* (ET), provided by Hildreth Cooper

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DRAFT FWS PCFO 8-3-04

Guidance on completion of consultation for *Euphorbia telephioides* at North Glades:

COE provides letter to FWS requesting initiation of formal section 7 consultation
Provide to FWS a Biological Evaluation including the following components:

1) Brief description of proposed action
2) Description of direct impact area should include: (most already provided in "Attachment L" of the permit application package)
    - Acreage of project area
    - Acreage of plant population
    - Acreage of plant population to be impacted
    - Approx. number of plants found within project
    - Approx. number of plants to be "taken" from site
    - GIS layer with points of occurrence documenting plant locations
3) Proposed actions to minimize effects to *Euphorbia telephioides*:
    - Management plan for remaining population, including area to east of North Glades (i.e. burning/mowing commitments, invasive control, keep natural, etc)
        - Long term protection commitment of population (conservation easement, Bay County Conservancy, St. Joe conservation unit, etc)
        - Monitoring plan—set up plots beginning prior to construction for pre-impact comparison, number of years client will monitor plots with justification of timeline, annual report on monitoring results with caveat to adjust management should the population decline below an acceptable % (support % with available literature if possible) over documented timeframe (support with literature if possible).
    - Monitoring plan for translocation site to include the following:
        - # of plots to be monitored;
        - number of years client will monitor plots with justification of timeline;
        - annual report on monitoring results with caveat to adjust management should the population decline below an acceptable % (support with available literature if possible) over documented timeframe (support with literature if possible);
        - Description/supporting info for introduction site, i.e. similar habitat community type, same soil type, distance from parent population (FWS prefers site to be 1 km or > from known populations), map, acreage of site (needs to be sufficient size to support a viable population (200+ plants, unless better literature available to support);
        - Plan for movement of plants, time of year, when to complete movement, who to move;
        - GIS layer/map with location of translocated site and specific plant locations;
        - How/when will movement of population to introduced site be deemed a success?
4) Provide (include map/GIS layer) survey data results (positive or negative) from other locations throughout the RGP boundary and the species range which are not reported by common data sources such as Florida Natural Areas Inventory (FNAI) data source.
5) If possible, discuss proposed projects which might impact other documented *Euphorbia telephioides* sites (impact meaning management, development, etc).

Attachment B

B1: Monitoring Plan for the Conservation Easement Population

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***As per* guidance on completion of consultation for *Euphorbia telephioides* at North Glades, USFSW document.**

3. Proposed actions to minimize effects to *Euphorbia telephioides*.

a. Long term Management plan for existing (in situ) population <u>inside</u> of North Glades site on lands to be designated as a conservation easement. Includes Long term protection commitment of population on conservation lands and monitoring plan. This population is located at least 1 kilometer (0.62 miles) from the existing population on the Breakfast Point Mitigatioon Bank site.

1. Monitoring Plan for *Euphorbia telephioides* to be used at the reference site and the restoration site of the conservation easement at the North Glades site, Bay county, Florida.

Introduction

Why develop monitoring procedures?
Monitoring procedures or protocols are detailed study plans that explain how the methodology is to be carried out and how the data are to be collected, managed, analyzed and reported, and are very important components of quality assurance for natural resource restoration and monitoring programs. Protocols are necessary to ensure that changes detected by monitoring are actually occurring in nature and not simply a result of measurements taken by different people or in slightly different ways.

Developing a monitoring procedure requires that the life history of the organism in question is known. In general, little is known about the biology of *Euphorbia telephioides* (ET) but we are beginning to understand more about the distribution and populations of this plant. For example, we know that ET is an herbaceous perennial that sprouts each year from underground stems and produces flowers in late spring and has ripened fruit (capsules) by mid summer. ET continue to flower throughout the growing season. A measurement of plants toward the end of the growing season will give an indication as to their ability to reproduce, i.e. count individuals in flower and fruit. Plants begin to turn yellow and senesce by later summer/early fall. Plants were observed with leaves and stems in late October of 2004. All known populations are found in a relatively small area of Florida and in some locations the populations could be described as locally abundant. We also know that this species grows in a range of primarily upland plant communities, all of which would have historically burned with a 2-5 year fire frequency and all of which are dominated by a canopy of *Pinus palustris* (longleaf pine) and/or *P. elliottii* (slash pine) with a groundcover that contains wiregrass (Clewell, 1997). ET grows in variety of dry to mesic sites, all with sandy soils and all sites are located within a few miles of the coastline of the Gulf of Mexico. These general factors will guide the restoration strategy and guide our selection of reference sites.

It's important to get consensus on the scope and design since changing these is time consuming and costly once you begin the field work and measurements.
Designing natural resource monitoring of rare plants is something you want to get right the first time, since it's difficult and costly to make major changes after you collected the data as per a particular methodology. Monitoring involves systematic data collection that provides information on the progress of the restoration project

and allows the monitoring practitioners to determine if the project goals have been met. A restoration project involving ET should be monitored until it appears to be healthy with appropriate reproduction and viability. Ideally a reference site should be used for collection of base-line data but due to the lack of management in areas where this plant is currently known to occur, it may not be possible to locate an ideal reference site. The reference site should be similar to restoration site in terms of soils, plant community composition, fire regime, topographic and physiographic location, hydrology, etc. (*fide* Hildreth Cooper, USFWS, personal communication, August 11, 2004).

What are the measurements of success?

From the results of monitoring it can be determined if the restored population is successfully growing in similar conditions to those of the reference site. For this particular study, success would entail a restored, healthy ET populations in appropriate habitat. A healthy population for the purpose of this study is one in which the plants within the restoration site are determined to be viable and self-perpetuating. Excellent viability according to USFWS would mean a population of 200+ individuals in a natural, appropriate landscape (site has been well managed and burned, i.e. no fire suppression), with indication of sexual reproduction, and with intact associated native vegetation that displays appropriate growth form (*fide* Hildreth Cooper, USFWS, personal communication, August 11, 2004).

This is not an outline for the study of population dynamics since a study of this magnitude would take decades of intensive quantitative measurements of the following: germination rates, seed and seedling survival, pollination biology, herbivory, individual survivorship, mortality, and reproductive success of individual plants using molecular techniques. This study seeks to measure the long term prognosis/success of a restored TE site through the use of quantitative measurements in quadrats over a five (5) year period and comparison to a reference site.

Monitoring

Ecologic restoration of plant communities is dynamic and is expected to go through various series or successional stages until a particular ecologic target is achieved. As such, periodic evaluation regarding the attainment of target conditions requires monitoring of sample areas to measure the effectiveness of the restoration techniques and the appropriate response of ET to the changes in its immediate environment. The annual monitoring will provide quantitative and qualitative information that can be objectively analyzed. The results of this analysis will allow for interpretation and conclusions from the data. These results will then be reported and if it is deemed that the current methodology is not producing the appropriate ecological response and the population is in decline, the methodology will be rethought and adaptive management can be applied as needed.

Ecological monitoring or sampling techniques described in this attachment will allow for the objective measure of species composition, species richness, as well as the proportional distribution (frequency, density and coverage) of lifeforms (groundcover, shrubs and trees). The experimental design for sampling of populations that allows for objective conclusions is derived from widespread and generally accepted procedures/protocol found in Field and Laboratory Methods for General Ecology (Brower, et.al.,1990; Barbour, Burk and Pitts, 1980). The

distribution, fecundity and overall health of the vegetation on this site is expected to respond favorable to the physical removal of primarily woody/fire suppressed vegetation by mechanical means. In order to track the changes in community structure, species composition and species diversity, we propose to use a transect along which plots will be sampled for the cover, density and frequency of groundcover/shrubs and trees. In areas where trees display a random distribution, i.e. outside of planted pine areas, point quarter sampling will be used to measure the canopy.

Plants will be identified using vascular plant identification manuals appropriate for this area of Florida (Clewell, 1985; Godfrey, 1988; Hall, 1978; Tobe, et. al. 1995 and Wunderlin 1998).

Extensive observations of similar ecosystems and studies were utilized in the development of the protocols (Burks, K.C. 1982; Burks, K.C. 1995; Clewell, 1985a; Ewel, 1990; FNAI, 1990; Frost, et. al. 1986; Glitzenstein, et. al., 1995; Harper, 1914; Anglin, 2004 personal communication; Burks, 2004 personal communication). In addition to using quantitative methods through such means as transects and plots, qualitative observations on the overall health and succession of plant assemblages will be noted by photography and notes during quantitative measurements. Invasive exotics will also be noted during all sampling on site. All vegetative sampling will be done once annually in summer (July-September) to ensure that ET can be measured in flower and in fruit.

Protocols

Vegetative monitoring will be carried out pre-restoration in August of 2004 and once annually thereafter for five (5) years. Two types of monitoring will be carried out, quantitative and qualitative. The quantitative monitoring/sampling will be through the use of transects, plots and point quarter method. The proposed location of quantitative transect are shown on a forthcoming map. The qualitative monitoring will record the overall health and notes on lifeforms of associated vegetation as well as any sightings of invasive exotics in the quadrats and in the immediate surrounding area.

An annual report will include the results of the quantitative and qualitative measurements/observations. This summary will include interpretation and drawing conclusions from the data and how these findings are instructive of the overall progress toward the restoration goals for ET. This critical thinking will allow for evaluation, readjustment and interpretation of the restoration methodology and techniques. Adaptive management will be used to adjust and revise management activities accordingly. Photographs taken during the sampling will visually support written observations and overall trends toward restoration goals.

Quantitative Plant Sampling

1. Groundcover, shrubs and subcanopy.

Definitions of vegetation lifeforms.

a. **Groundcover** is the herbaceous or weakly woody plant layer closest to the ground, typically less than 1.5 m tall and if weakly woody the plants have a diameter of less than 2.54 cm (1 in) at 1.5 m height.

b. **Shrub layer** are woody plants typically less than 1.5 meter tall but could grow as tall as 3 m. Stems are always woody and plants may have several stems from a common root system. No stem diameter requirement, although typically will be less than 2.54 cm (1 in) in diameter at 1.5 m.
c. **Subcanopy layer** are woody plants 3 m tall or taller with a stem 10 cm (4 in) diameter or less at breast height (1.5 m). Typically subcanopy plants have a single stem. Young trees or saplings with slender stems are often included in this layer.

If space allows, the quantitative sampling will be designed along a 50 meter transect that will be placed in a polygon of a particular plant assemblage that is known to contain ET. If the site cannot accommodate a single, linear, unbroken 50 meter transect, a modification to the standard transect approach will be used by breaking up the transect such so as to create several short transects that when combined would equal 50 meters. If transect will not yield a representative sample of the ET population then the location of each plot will be determined either by a systematic method such as a grid or by a standard random procedure such as using a randomly selected point as the center of the plot. The overall goal being to sample a transect that could be described as a representative sample within a known population of ET. These representative samples will measure the proportional distribution of groundcover, shrub, subcanopy and tree species. Trees are not the subject of this sampling technique but will be noted if they occur in the plots described below. Tree samping is a separate measurement, see trees sampling below. Each sample plot will be located along five points/locations, with each point distributed every ten meters (these will be georeferenced and marked by insertion of an iron piece at each point) along the transect. At each point three, 1 m x 1 m plots or square quadrats will be measured and sampled. These permanent plots will be georeferenced and marked by insertion of an iron piece at each corner for future location with a metal detector. The plots will be distributed in a linear fashion perpendicular to the 50 meter transect. Each transect will thus have five groups of three 1m x 1m plots for a total of 15 separate plots. All groundcover coverage will be measured using the following scale: 3%, 6%, 12%, 25%, 50%, 75%, 100%. This scale was developed for use with a square, 1 m x 1 m plot. Beginning with the total area of each plot, i.e.100% coverage, the proportional relationship of each successive subdivision of the square is calculated by simply halving each portion, such that you end up with areas of the following percentage: 50, 25, 12.5, 6.23, 3.1, etc. These subdivisions can be estimated and consistently applied by training field botanists to visualize each species as it relates to the overall plot and fitting its coverage into the coverage classes above.
The cover, density, frequency and shrub (if any) height will be recorded in each plot. Shrub height measure will use the following scale:1 less than 0.5m; 2=0.5-2m; 3=2-5m; 4=5-10m; 5=10m or greater.

2. Trees. Trees in this sampling technique include all woody plants with a main trunk greater than 10 cm (4 in) diameter at breast height (breast height =1.5 m) and have a stem at least 3 m tall. Basal areas of trees are determined from trunk circumference measured 1.5 m above the ground, generally a flexible tapeline is used with circumference units converted into diameter units for ease of use. A direct measurement of foliage coverage is difficult in trees, but the basal area generally is accepted by the scientific community as proportional to coverage.

This site consists of a relatively natural stand of upland pine forest. Point quarter sampling will be used, five points along the 50 m transect (each 10 m apart) will be used as the center for four compass directions (N, S, E, W), which divide the sampling site into four quarters or quadrants. Every 10 m of the transect will be georeferenced and marked with a metal piece to aid in relocation for annual monitoring. In each quadrant, the distance in meters to the center point of the nearest individual tree, regardless of species will be measured. Only one tree per quadrant is measured so that a total of four plants per point are measured. The tree is identified and the dbh is recorded as diameter expressed in cm.

Photography

The photographic specifications used in conjunction with the quantitative plant sampling protocol will include photographing the sampling site at either end of the 50 meter transect line. The photographs will include as much view as is typical for a standard 35 mm digital camera. Close up photos of important features may also be collected along the transects. All labeling of photographs in final reports will include the date of photo, photographer, location and figure or photo number. Electronic storage of photographs should be backed up for future reference.

Baseline Monitoring

Before ecological restoration activities are begun, the monitoring plots will be sampled. This data will be used for future comparison and will include the following information for each plot or quadrant.

1. General site conditions on, around and in the vicinity of the transects and plots.
2. Evidence of past land use activities will be noted, especially those that might effect plant distribution, composition and abundance.
3. The proportional distribution of groundcover, shrub and tree species using the protocol of sampling outlined in quantitative plant sampling, above.
4. Presence of invasive exotics in or adjacent to plots.

Analyzing the Data

The annual monitoring will provide quantitative and qualitative information that can be objectively analyzed. The results of this analysis will allow for interpretation and conclusions from the data. These results will then be reported and evaluated. If it is determined that the restoration methodology is not producing the appropriate ecological response as this relates to the success for this species, the methodology will be re-evaluated.

Reports and Record Keeping

Reports including all observations, raw and processed data, digital photographs will be compiled into a report this will be available to agency staff by the end of November of each year. Annual monitoring will in July of each year. A copy of all records, in addition to those submitted, will be maintained at the offices of Ecological Resource Consultants, ERC.

Success

This restoration project is expected to be successful in restoring the pre-existing plant communities and increasing the health of the ET population or at least show a strong trend toward this effect on the site. The measurement for increased health of ET will be quantitative, i.e. measuring coverage of various life forms of associated

speices, measuring coverage and numbers of individuals, with notes on those that display increased flowering, fruiting inside the plots, overall species richness and invasive exotic coverage; and subjective, general appearance of plants and general aspect of the population overall, evidence of invasive exotic encroachment. A complete list of plants species (species richness) typical for each sampling area (restoration site and possibly a reference site) will be included in the report and new plants added to as they are discovered in the sample sites.

Reference Site

If it can be located, an appropriate reference community will be selected from well managed public lands that contain a healthy, viable population of ET. The same sampling technique as described in the quantitative plant sampling above, will be used to collect relevant data that will be used for comparison. Target conditions of the restoration site may be modified in lieu of new information collected from reference communities. Target community type and realistic goals for this may need revision with the approval by the authorizing agencies.

Restoration of the ET site within the North Glades conservation easement site

The procedure for restoration at the North Glades conservation easement (NGCE) is unique as it is designed to mimic fire. It is our understanding that the use of fire will not be an option at the NGCE site. Because of this, an experimental approach has been developed that involves using fire ecology principles without the direct use of fire which can be unpredictable and would not be a pragmatic choice for use in the proposed urban buildout. We propose that mowing of the site at least once a year in March be carried out within the NGCE. By mechanically removing annual growth a simulation of fire may be achieved. The longleaf pines would be maintained in what would look to that average observer as a “park like” aspect, i.e. groundcover should be generally kept under 0.5 meter, including woody species such as gallberry (*Ilex glabra*) and fetterbush (*Lyonia* spp.).

From our understanding of ET natural history we have observed that this species is found in areas that would have burned at least once every 2-5 years. In addition, by examination of historic aerials, ET typically grew in fire created, open landscapes with widely scattered trees. At the NGCE site, the judicious use of mechanical means to reduce woody growth would mimic the effects of fire on woody growth found in the groundcover/low shrub layer and subcanopy. Mechanical means would not mimic all aspects of fire but it would provide part of the physical environment that will enhance ET growth and reproduction. We have observed that the easement along highway 98 has been mowed for many years, inhibiting the formation of unnaturally dense vegetation that is typically found in fire suppressed pine dominated communities. This mechanical removal of groundcover and shrub vegetation (basically all woody vegetation except for the existing canopy) has unintentionally enhanced the ET population on the Glades North site. It is hoped that the proposed restoration involving the removal of woody vegetation will ultimately result to the same or similar success in regard to the enhancement of the ET population in the NGCE area. Because there is always the chance for colonization by unwanted species, all invasive exotics will be removed/controlled as per the permit.

Removal and maintenance of woody vegetation

As already stated, the definition of trees in this report are those woody vascular plants that include subcanopy and canopy woody plants with a main trunk greater than 10 cm (4 inches) at breast height and have stem greater than 3 meters tall. Lack of appropriate fire or mechanical removal of woody vegetation in the groundcover, shrub and subcanopy layers often results in an artificial landscape of native woody species that would have no historical equivalent reference. In many cases species such as *Ilex glabra*, *Ilex coriacea*, *Cyrilla racimiflora*, *Cliftonia monophylla*, *Magnolia virginiana* , etc. would only have reached the density and dominance that one encounters in fire suppressed landscapes in ecotones of wetlands and within wetlands in landscapes that would have historically burned once every 2-5 years. To further complicate this picture of the landscape, silvicultural activities have created a landscape of pine monoculture (in this case slash pine) planted on furrows. The restoration of such a landscape depends on many factors such as last site preparation date and age of planted pines, length of time without fire, mechanical thinning or removal of competing woody vegetation. The goal of restoration at the NGCE is to thin the pines to appropriate density and remove all inappropriate woody vegetation. A machine such as a gyrotrac that will not rut and significantly disturb the soils will be used to reduce the fire suppressed woody vegetation to wood chips. Trees and any other vegetation that should not be removed will be designated by appropriate flagging by ERC staff, all other woody vegetation will be maintained by cutting at or within 1-3 inches of the soil or duff surface. The cut woody stems are to be reduced to wood chips or into similarly small fragments. Wood chips should be distributed so as not to make large areas of thick deposits that might inhibit ET growth. If it is feasible removal of all the cut woody stems from the site would be beneficial to the ET.

The timeline for the restoration can be broken down into the following general sequence. After year 5, October of 2008, the woody vegetation will be removed by the current owner every other year in perpetuity, no further monitoring will be required after this time.

	Year				
	2004	**2005**	**2006**	**2007**	**2008**
Baseline Monitoring	August				
Selective Harvesting / Vegetation Removal	Oct.	Oct.	Oct.	Oct.	Oct.
Annual Monitoring		July	July	July	July
Annual Reporting	Nov.	Nov.	Nov.	Nov.	Nov.

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Attachment B

B2: Monitoring Plan for the Breakfast Point Population

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***As per* guidance on completion of consultation for *Euphorbia telephioides* at North Glades, USFSW document.**

3. Proposed actions to minimize effects to *Euphorbia telephioides*.

a. Long term Management plan for existing (in situ) population <u>outside</u> of Glades North site. Includes Long term protection commitment of population on conservation lands and monitoring plan. This population is located at least 1 kilometer (0.62 miles) from the existing population on the North Glades site.

1. Monitoring Plan for *Euphorbia telephioides* to be used at the reference site and the restoration site in the Breakfast Point Mitigation Bank, Bay county, Florida.

Introduction

Why develop monitoring procedures?

Monitoring procedures or protocols are detailed study plans that explain how the methodology is to be carried out and how the data are to be collected, managed, analyzed and reported, and are very important components of quality assurance for natural resource restoration and monitoring programs. Protocols are necessary to ensure that changes detected by monitoring are actually occurring in nature and not simply a result of measurements taken by different people or in slightly different ways.

Developing a monitoring procedure requires that the life history of the organism in question is known. In general, little is known about the biology of *Euphorbia telephioides* (ET) but we are beginning to understand more about the distribution and populations of this plant. For example, we know that ET is an herbaceous perennial that sprouts each year from underground stems and produces flowers in late spring (April) and has ripened fruit (capsules) by mid summer (June-July). ET continue to flower throughout the growing season. A measurement of plants toward the end of the growing season (July) will give an indication as to their ability to reproduce, i.e. count individuals in flower and fruit. All known populations are found in a relatively small area of Florida and in some locations the populations could be described as locally abundant. We also know that this species grows in a range of primarily upland plant communities, all of which would have historically burned with a 2-5 year fire frequency and all of which are dominated by a canopy of *Pinus palustris* (longleaf pine) and/or *P. elliottii* (slash pine) with a groundcover that contains wiregrass (Clewell, 1997). ET grows in variety of dry to mesic sites, all with sandy soils and all sites are located within a few miles of the coastline of the Gulf of Mexico. These general factors will guide the restoration strategy and guide our selection of reference sites.

It's important to get consensus on the scope and design since changing these is time consuming and costly once you begin the field work and measurements.

Designing natural resource monitoring of rare plants is something you want to get right the first time, since it's difficult and costly to make major changes after you collected the data as per a particular methodology.

Monitoring involves systematic data collection that provides information on the progress of the restoration project and allows the monitoring practitioners to determine if the project goals have been met. A restoration project involving ET should be monitored until it appears to be healthy with appropriate reproduction and viability. Ideally a reference site should be used for collection of base-line data but due to the lack of management in areas where this plant is currently known to occur, it may not be possible to locate an ideal reference site. The reference site should be similar to restoration site in terms of soils, plant community composition, fire regime, topographic and physiographic location, hydrology, etc. (*fide* Hildreth Cooper, USFWS, personal communication, August 11, 2004).

What are the measurements of success?

From the results of monitoring it can be determined if the restored population is successfully growing in similar conditions to those of the reference site. For this particular study, success would entail restored, healthy ET populations in appropriate habitat. A healthy population for the purpose of this study is one in which the plants within the restoration site are determined to be viable and self-perpetuating. Excellent viability according to Norden and Chafin, FNAI, 2003 and the USFWS (*fide* Hildreth Cooper, August 10, 2004) would mean a population of 200+ individuals in a natural, appropriate landscape (site has been well managed and burned, i.e. no fire suppression), with indication of sexual reproduction, and with intact associated native vegetation .

This is not an outline for the study of population dynamics since a study of this magnitude would take decades of intensive quantitative measurements of the following: germination rates, seed and seedling survival, pollination, herbivory, individual survivorship, mortality, and reproduction for individual plants. This study seeks to measure the long term prognosis/success of a restored TE site through the use of quantitative measurements in quadrats over a ten year period and comparison to a reference site.

Monitoring

Ecologic restoration of plant communities is dynamic and is expected to go through various successional stages until a particular ecologic target is achieved. As such, periodic evaluation regarding the attainment of target conditions requires monitoring of sample areas to measure the effectiveness of the restoration techniques and the appropriate response of ET to the changes in its immediate environment. The annual monitoring will provide quantitative and qualitative information that can be objectively analyzed. The results of this analysis will allow for interpretation and conclusions from the data. These results will then be reported and if it is deemed that the current methodology is not producing the appropriate ecological response and the population is in decline, the methodology will be rethought and adaptive management can be applied as needed.

Ecological monitoring or sampling techniques described in this attachment will allow for the objective measure of species composition, species richness, as well as the proportional distribution (frequency, density and coverage) of lifeforms (groundcover, shrubs and trees). The experimental design for sampling of populations that allows for objective conclusions is derived from widespread and generally accepted procedures/protocol found in Field and Laboratory Methods for General Ecology (Brower, et.al.,1990; Barbour, Burk and Pitts, 1980).

The distribution, fecundity and overall health of the vegetation on this site is expected to respond favorable to the proposed physical removal of primarily woody/fire suppressed vegetation by mechanical means and by prescribed fire. In order to track the changes in community structure, species composition and species diversity, we propose to use a transect along which plots will be sampled for the cover, density and frequency of groundcover/shrubs and trees. In areas where trees display a random distribution, i.e. outside of planted pine areas, point quarter sampling will be used to measure the canopy.

Plants will be identified using vascular plant identification manuals appropriate for this area of Florida (Clewell, 1985; Godfrey, 1988; Hall, 1978; Tobe, et. al. 1995 and Wunderlin 1998).

Extensive observations of similar ecosystems and studies were utilized in the development of the protocols (Burks, K.C. 1982; Burks, K.C. 1995; Clewell, 1985a; Ewel, 1990; FNAI, 1990; Frost, et. al. 1986; Glitzenstein, et. al., 1995; Harper, 1914; Anglin, 2004 personal communication; Burks, 2004 personal communication, Huffman, 2004, personal communication). In addition to using quantitative methods through such means as transects and plots, qualitative observations on the overall health and succession of plant assemblages will be noted by photography and notes during quantitative measurements. Invasive exotics will also be noted during all sampling on site. All vegetative sampling will be done once annually in summer (July-September) to ensure that ET will be reproducing, e.g. in flower or fruit.

Protocols

Vegetative monitoring will be carried out pre-restoration in August of 2004 and biannually thereafter for five (5) years. Two types of monitoring will be carried out, quantitative and qualitative. The quantitative monitoring/sampling will be through the use of transects, plots and point quarter method. The qualitative monitoring will record the species richness as well as any sightings of invasive exotics in the quadrats and in the immediate surrounding area.

An annual report will include the results of the quantitative and qualitative measurements/observations. This summary will include interpretation and drawing conclusions from the data and how these findings are instructive of the overall progress toward the restoration goals for ET. This critical thinking will allow for evaluation, readjustment and interpretation of the restoration methodology and techniques. Adaptive management will be used to adjust and revise management activities accordingly. Photographs taken during the sampling will visually support written observations and overall trends toward restoration goals.

Quantitative Plant Sampling

1. Groundcover, shrubs and subcanopy.

Definitions of vegetation lifeforms.

a. **Groundcover** is the herbaceous or weakly woody plant layer closest to the ground, typically less than 1.5 m tall and if weakly woody the plants have a diameter of less than 2.54 cm (1 in) at 1.5 m height.

b. **Shrub layer** are woody plants typically less than 1.5 meter tall but could grow as tall as 3 m. Stems are always woody and plants may have several stems from a common root system. No stem diameter requirement, although typically will be less than 2.54 cm (1 in) in diameter at 1.5 m.

c. **Subcanopy layer** are woody plants 3 m tall or taller with a stem 10 cm (4 in) diameter or less at breast height (1.5 m). Typically subcanopy plants have a single stem. Young trees or saplings with slender stems are often included in this layer.

If space allows, the quantitative sampling will be designed along a 50 meter transect that will be placed in a polygon of a particular plant assemblage that is known to contain ET. If the site cannot accommodate a single, linear, unbroken 50 meter transect, a modification to the standard transect approach will be used by breaking up the transect such so as to create several short transects that when combined would equal 50 meters. If transect will not yield a representative sample of the ET population then the location of each plot will be determined either by a systematic method such as a grid or by a standard random procedure such as using a randomly selected point as the center of the plot. The overall goal being to sample a transect that could be described as a representative sample within a known population of ET. These representative samples will measure the proportional distribution of groundcover, shrub, subcanopy and tree species. Trees are not the subject of this sampling technique but will be noted if they occur in the plots described below. Tree samping is a separate measurement, see trees sampling below. Each sample plot will be located along five points/locations, with each point distributed every ten meters (these will be georeferenced and marked by insertion of an iron piece at each point) along the transect. At each point three, 1 m x 1 m plots or square quadrats will be measured and sampled. These permanent plots will be georeferenced and marked by insertion of an iron piece at each corner for future location with a metal detector. The plots will be distributed in a linear fashion perpendicular to the 50 meter transect. Each transect will thus have five groups of three 1m x 1m plots for a total of 15 separate plots. All groundcover coverage will be measured using the following scale: 3%, 6%, 12%, 25%, 50%, 75%, 100%. This scale was developed for use with a square, 1 m x 1 m plot. Beginning with the total area of each plot, i.e.100% coverage, the proportional relationship of each successive subdivision of the square is calculated by simply halving each portion, such that you end up with areas of the following percentage: 50, 25, 12.5, 6.23, 3.1, etc. These subdivisions can be estimated and consistently applied by training field botanists to visualize each species as it relates to the overall plot and fitting its coverage into the coverage classes above.
The cover, density, frequency and shrub (if any) height will be recorded in each plot. Shrub height measure will use the following scale:1 less than 0.5m; 2=0.5-2m; 3=2-5m; 4=5-10m; 5=10m or greater.

Plots will be used to measure trees, each will be 10 m x 10 m. One plot will be randomly distributed at one point, chosen from the 5 points used to sample groundcover as described above, along the 50 meter transect. Each 10 m x 10 m plot will be georeferenced and marked by insertion of an iron piece at each corner for future location with a metal detector. The center of the plot will be located at the randomly chosen point along the 50 meter transect. In each plot the trees will be identified and the dbh will be recorded along with an estimate of the tree height using the following scale:1=10m or less; 2=11-20m; 3=21-29m; 4=30m or greater. Density and cover can be calculated from measuring basal area in the methodology described above.

Photography

The photographic specifications used in conjunction with the quantitative plant sampling protocol will include photographing the sampling site at either end of the 50 meter transect line. The photographs will include as much view as is typical for a standard 35 mm digital camera. Close up photos of important features may also be collected along the transects. All labeling of photographs in final reports will include the date of photo, photographer, location and figure or photo number. Electronic storage of photographs should be backed up for future reference.

Baseline Monitoring

Before ecological restoration activities are begun, the monitoring plots will be sampled. This data will be used for future comparison and will include the following information for each plot or quadrant.

5. General site conditions on, around and in the vicinity of the transects and plots.
6. Evidence of past land use activities will be noted, especially those that might effect plant distribution, composition and abundance.
7. The proportional distribution of groundcover, shrub and tree species using the protocol of sampling outlined in quantitative plant sampling, above.
8. Presence of invasive exotics in or adjacent to plots.

Analyzing the Data

The once annual monitoring will provide quantitative and qualitative information that can be objectively analyzed. The results of this analysis will allow for interpretation and conclusions from the data. These results will then be reported and evaluated. If it is determined that the restoration methodology is not producing the appropriate ecological response as this relates to the success for this species, the methodology will be re-evaluated.

Reports and Record Keeping

Reports including all observations, raw and processed data, and digital photographs will be compiled into a report. Annual monitoring will occur in summer (July-September) of each year. A copy of all records, in addition to those submitted, will be maintained at the offices of Ecological Resource Consultants, ERC.

Success

This restoration project is expected to be successful in restoring the pre-existing plant communities and increasing the health of the ET population or at least show a strong trend toward this effect on the site. The measurement for increased health of ET will be quantitative, i.e. measuring coverage of various life forms of associated species, measuring coverage and numbers of ET individuals, with notes on those that display increased flowering, fruiting inside the plots, overall species richness and invasive exotic coverage; and subjective, general appearance of plants and general aspect of the population overall, evidence of invasive exotic encroachment. A complete list of plants species (species richness) typical for each sampling area (restoration site and possibly a reference site) will be included in the report and new plants added to as they are discovered in the sample sites.

Reference Site

If it can be located, an appropriate reference community will be selected from well managed public lands that contain a healthy, viable population of ET. The same sampling technique as described in the quantitative plant sampling above, will be used to collect relevant data that will be used for comparison. Target conditions of the restoration site may be modified in lieu of new information collected from reference communities. Target community type and realistic goals for this may need revision with the approval by the authorizing agencies.

Restoration of the ET site within the BPMB

The procedure for restoration follows that proposed for the regional general permit (RGP) for Breakfast Point Mitigation Bank. See the following for a download of this permit from the U.S. Army Corps of Engineers, Jacksonville, Florida. http://www.saj.usace.army.mil/permit/permitting/general_permits/SAJ_86/SAJ86_TOC.htm

The timeline for the restoration can be broken down into the following general sequence. August 2004 obtain baseline data from restoration site in BPMB and reference site June-August 2005 controlled burn After the 2005 burn cycle, another burn cycle may be initiated after 2 years if appropriate amounts of vegetation/organic fuels have been produced, i.e. enough to carry a fire. This burn regime will be determined by the a qualified St. Joe forester (Kevin Smith) and in consultation with the qualified mitigation supervisor (John Tobe) as per the permit referenced above. All invasive exotics will be removed/controlled as per the permit.

The timeline for the restoration can be broken down into the following general sequence. After 2011 the site will no longer be managed by the mitigation bank sponsor and will most likely be managed in perpetuity by the State of Florida, no further monitoring will be required after November 2013.

	Year							
	2004	2005	2006	2007	2008	2009	2010	2011
Baseline Monitoring	August							
Prescribed Burn		April-July		April-July		April-July		April-July
Exoctic Species Removal		All	All	All	All	All	All	
Annual Monitoring		July	April & June	July	July	July	July	July
Annual Reporting		Jan.	Jan.	Jan.	Jan.	Jan.	Jan.	Jan.

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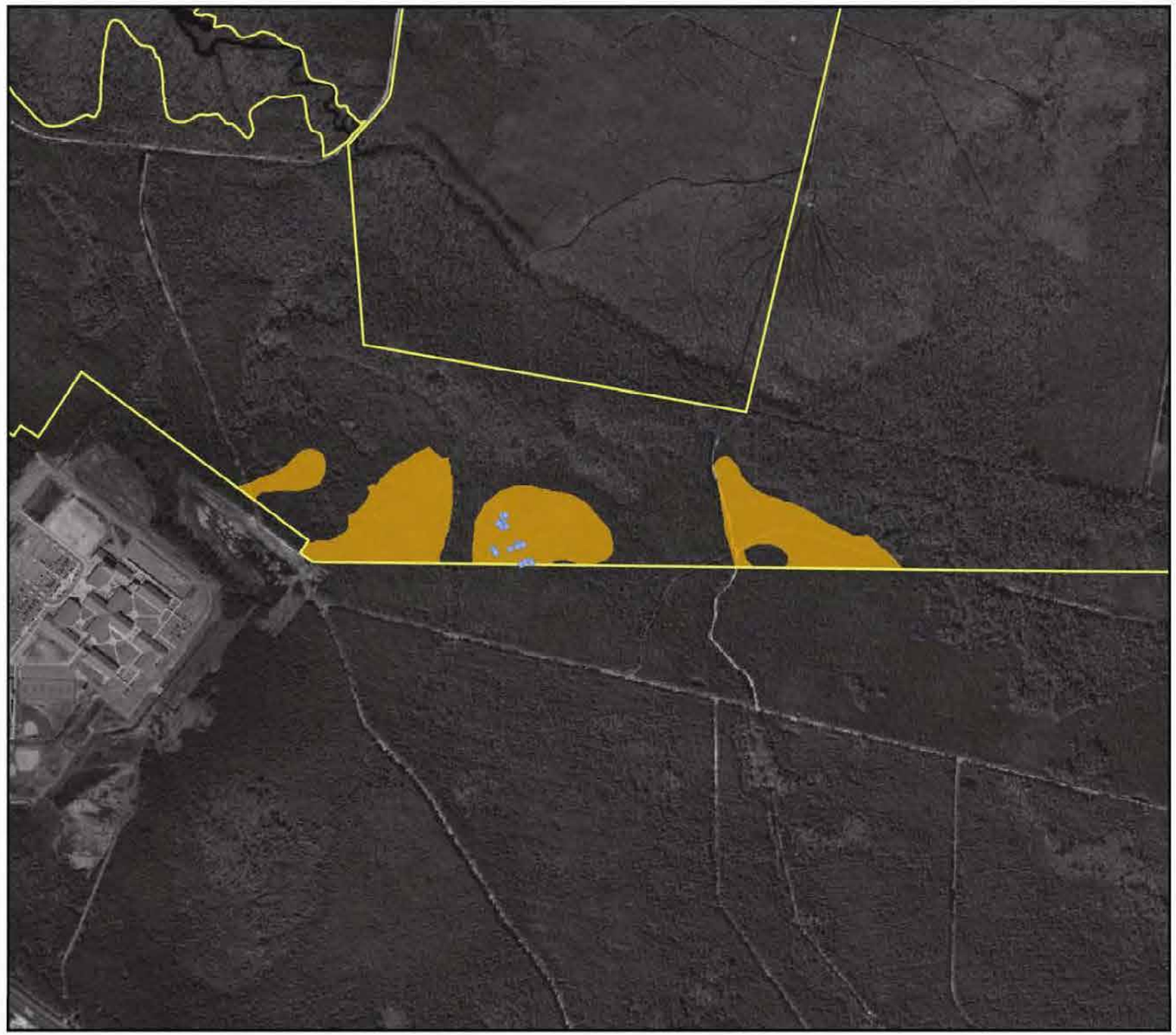

Figure 1 - E. Telephioides found in the Breakfast Point Mitigation Area (BPMA)

Legend

- Plant populations in BPMA
- Search Area BPMA
- Breakfast Point Mitigation Area
- 2003 B&W Aerial DOQQ

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Ecological Resource Consultants, Inc.

Attachment C

Transplantation Methodology

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***As per* guidance on completion of consultation for *Euphorbia telephioides* at North Glades, USFSW document.**

3. Proposed actions to minimize effects to *Euphorbia telephioides*.

a. Guidelines for transplantation methodology and long-term monitoring of relocated Telephus Spurge, *Euphorbia telephioides*.

I. Introduction

Why attempt to transplant *Euphorbia telephioides* (ET) from the Glades North site?

ET is a Florida endemic with a limited distribution in Gulf, Franklin and Bay counties. Because ET has been determined to be a species that is critically imperiled and in Florida it is considered to be imperil worldwide according to the Florida Natural Areas Inventory (see www.fnai.org). In addition, this species is considered threatened by the U. S. Endangered Species Act/U. S. Fish and Wildlife Service (USFWS). According to the link supplied by the USFWS (see www.natureserve.org), ET is known from 40 occurrences with total of fewer than 5,000 plants. Also published as a "natureserve conservation status factors", the global short term trend reports a "total number of plants known on private lands reduced from 1,000's in 1988 to 100's in 2001 survey". After some qualitative measurements of one known FNAI occurrence in Bay county and field inspections of some known and unknown populations in Gulf county, the information endorsed by the USFWS on the naturaserve site (as it pertains to the number of occurrences and total number of plants) is incorrect, see attachment L, A Preliminary Survey for *Euphorbia telephioides*, Telephus Spurge, unpublished report by Tobe, J, et. al., April 2004. It is the opinion of the author that there are currently more that 40 known populations and a greater number of individual plants than were reported in the 2001 survey. This begs the question as to why transplantation should be considered if another known population could be reinvigorated through a rigorous management plan. It is the author's assumption that transplantation is going to be considered for the population of ET in question and thoughts on this topic are the subject of this paper.

Relocation of rare plants (and animals) has always been controversial however most biologists agree that this is a pragmatic solution for populations of rare species that will be otherwise destroyed if not "rescued". In addition, translocation of existing plants is considered to be part of the recovery plan for ET, except that no one published any attempts at relocation of this species (Center for Plant Conservation, Missouri Botanical Garden, 1995; U.S. Fish and Wildlife Service, 1994).

Why develop transplantation methodologies and monitoring procedures?

Transplantation methodologies and monitoring procedures or protocols are detailed study plans that explain how the methodology is to be carried out and how the data are to be collected, managed, analyzed and reported, and are very important components of quality assurance for natural resource relocation and monitoring programs. Protocols are necessary to ensure that changes detected by monitoring are actually occurring in nature and not simply a result of measurements taken by different people or in slightly different ways.

Developing a transplantation methodology requires that a detailed life history of the organism is question is known and can be applied to a strategy for relocation.

In general, little is known about the biology of *Euphorbia telephioides* (ET) but we are beginning to understand more about the distribution and populations of this plant. For example, we know that ET is an herbaceous perennial that sprouts each year from underground stems and produces flowers in late spring and has ripened fruit (capsules) by mid summer. ET continues to flower throughout the growing season. A measurement of plants toward the end of the growing season will give an indication as to their ability to reproduce, i.e. count individuals in flower and fruit. All known populations are found in a relatively small area of Florida and in some locations the populations could be described as locally abundant. We also know that this species grows in a range of primarily upland plant communities, all of which would have historically burned with a 2-5 year fire frequency and all of which are dominated by a canopy of *Pinus palustris* (longleaf pine) and/or *P. elliottii* (slash pine) with a groundcover that contains wiregrass (Clewell, 1997). ET grows in variety of dry to mesic sites, all with sandy soils and all sites are located within a few miles of the coastline of the Gulf of Mexico. These general factors will guide the restoration strategy and guide our selection of reference sites.

It's important to get consensus on the scope and design since changing these is time consuming and costly once you begin the field work and measurements.

Designing natural resource monitoring of rare plants is something you want to get right the first time, since it's difficult and costly to make major changes after you collected the data as per a particular methodology. Monitoring involves systematic data collection that provides information on the progress of the transplantation/translocation project and allows the transplantation monitoring practitioners (e.g. ERC/USFWS staff) to determine if the project goals have been met. A transplantation/translocation project involving ET should be monitored until it appears mature and self-sustaining, which could take years or decades. Assessment of translocated plants will involve a comparison of adult survival and reproductive individuals between translocated plants and plants similarly measured in the reference sit. Thus the monitoring of translocated plants will have to be paired with an "undisturbed" or at least an appropriately managed reference site. Ideally the reference site should be used for collection of base-line data. The reference site should be similar to translocation site in terms of soils, plant community composition, fire regime, topographic and physiographic location, hydrology, etc. (*fide* Hildreth Cooper, USFWS, personal communication, August 11, 2004).

Parameters to be measured in the translocation and reference site.

Quantitative plant monitoring of a both translocation and reference sites will include the following measurements for each vascular plant species identified in the sample quadrat: (1) density, (2) coverage, (3) frequency. The following are specific measurements to be made of ET in the quadrats: (1) number of reproductive plants (flowering or fruiting), (2) if it can be determined, the number of seedlings versus vegetative plants, (3) notes on the number of etiolated or stressed plants, (4) evidence of herbivory or any other gross morphological damage. This data will be collected once annually toward the end of the growth cycle. Sample timing should be worked out as much as is feasible with the burn management cycle. The sampling ranges above are preferred since this plant tends to go dormant in fall and unless a

summer burn or mechanical injury initiates new growth, the plant body is likely to be absent after November. The timing of the sampling will allow for the collection of population related data such as number of sprouts in a given area, how much the translocated population has been able to spread vegetatively and sexually, by measuring the total number of sprouts and seedlings in a given area.

What are the measurements of success?

From the results of monitoring it can be determined if the transplanted population is successfully growing in similar conditions to those of the reference site. For this particular study, success would entail the establishment of new, healthy plant populations in appropriate habitat. A healthy population for the purpose of this study is one in which the translocated plants are determined to be viable and self-perpetuating. Excellent viability according to Norden and Chafin, FNAI, 2003 and the USFWS (*fide* Hildreth Cooper, USFWS, personal communication, August 11, 2004), would mean a population of 200+ individuals in a natural, appropriate landscape (site has been well managed and burned, i.e. no fire suppression), with indication of sexual reproduction, and with intact associated native vegetation.

This is not an outline for the study of population dynamics since a study of this magnitude would take decades of intensive quantitative measurements of, for example, the following: germination rates, seed and seedling survival, pollination biology, herbivory, individual survivorship, mortality, and reproduction for individual plants. This study seeks to create a successful transplantation methodology and a means to measure the survivorship and make an estimate as to the long term prognosis/success of the transplants through the use of quantitative measurements in quadrats over a five (5) year period.

Selection of the site to be used for the transplants, i.e. the translocation site.

The translocation site is to be determined by more field work to locate a site that most closely resembles the Glades North site. Extant ET populations were discovered after a search of Breakfast Point Mitigation Bank (BPMB). Our search strategy was based on overlaying the published soil survey polygons on the 2004 DOQQ's and searching for the best aerial signatures. We have searched the bulk of these CU's and have determined that the ET does not occur in the areas we searched. As of August 11, 2004 we have located a population of over 200 plants within the Breakfast Point Mitigation Bank. This site is currently planted in slash pine and fire suppressed. If plants are to be transplanted, areas adjacent to this population would be appropriate sites as they would be within the 1 kilometer range as recommended by the recovery plans for rare plants.

Site preparation of recipient site prior to transplantation.

The recipient site will be prepared for reception of the donor plant material by removing excessive, fire suppressed woody vegetation mechanically or through a management plan that includes burning. In all cases the recipient site should have a management plan that includes controlled fire in a cycle that occurs every 2-5 years. And if at all possible burning should be done between, May-August.

If the site consists of fire suppressed planted pine, especially those in pine plantations, some thinning will probably be needed to prevent damaging crown fires.

The extent of thinning will be determined in a case by case basis. The intact groundcover should show appropriate response after burning, i.e. woody species may stump sprout but should have been burned to ground level and percent coverage greatly reduced.

II. Transplantation methodology

Selection of the thickened root/rhizome.

ET is an herbaceous perennial with thickened roots/rhizomes that move vertically and horizontally through the soil column and a deep taproot that is generally found vertically in the soil column. In a limited sample we found that the thickened roots could be located within the upper 6-14 inches (16-35 cm) of the soil surface, the tap root can extend to an undetermined depth. The thickened roots/rhizomes act as a storage organ much like the familiar tuber of a potato. These thickened roots/rhizomes are the organ of choice for producing more plants. Standard plant propagation techniques often involve dividing thickened roots as a means of asexual propagation. The deeper taproot might also be used, if it can be readily extracted. As of this time no known published reports are known for specific propagation techniques for ET. Propagation by seed production is another alternative but it is unlikely that the large number of seeds needed for a large scale study would be available. It is our proposal that those plants slated for destruction will be the source material for ET used for transplantation.

Within the development footprint for the Glades North site, we propose to locate and dig the thickened roots-rhizomes in early fall, most of the summer grown, above ground stems, will have disappeared since the plants will have entered fall/winter dormancy. Provisions to identify and relocate sufficient plant material will have to be made in late July-early August. In fall the thickened portions will have accumulated food reserves, typically in the form of starches and will have the greatest chance for transplantation survival as they will have the entire winter to adjust to the new soil environment. The final length of thickened rhizome to use in transplantation/translocation will be determined in the field. At this time we estimate a 6-12 inch (16-30 cm) section of the root can be collected and stored in a bag of moist sand for transport to a new location. Hundreds of root fragments can be stored for several days in a single large zip lock bag kept at 50 °F (10 °C). A large cooler with ice would easily handle up to 20 zip lock bags filled with root fragments. Thus up to 1,000+ root fragments could easily be stored and transported in a large, standard cooler.

Planting the collected roots or donor material.

After the appropriate recipient site has been selected and prepared. The transplantation/recipient sites will be selected and divided to produce a 1m x 1m grid pattern. Each 1m x 1m area will be considered a potential sample site. When a1 m x 1 m plot or square quadrat is selected as a translocation site it will be georeferenced using a GPS and marked by insertion of an iron piece at each corner for future location with a metal detector, **see Figure 1**. From the grid described above, 5 random sample sites will be selected for the donor material. Careful attention to ecotones and microhabitats will be considered and reasonable scientific judgment will be rendered in the placement of all sample sites. Alternate sample sites will be randomly selected if the first choice is deemed inappropriate (i.e. a solid clump of saw palmetto, excessive rutting or a stump hole, etc.). Once the sample site has

been chosen, the 1m x 1m square will be subdivided into four quadrats. Each will receive 25 root/rhizome fragments for 100 root-rhizome sections in each 1m x 1m sample site; **see Figure 1**.

III. Baseline Monitoring

Before restorative and translocation activities that disrupt the landscape are begun, the plots to be monitored will be sampled. This data will be used for future comparison and will include the following information for each plot or quadrant.

9. General site conditions on, around and in the vicinity of the plots.
10. Evidence of past land use activities will be noted, especially those that might effect plant distribution, composition and abundance.
11. The proportional distribution of groundcover, shrub and tree species using the protocol of sampling outlined in quantitative plant sampling, below.
12. Presence of invasive exotics in or adjacent to plots.

In addition to the randomly selected sample site, eight, 1m x 1m plots will be configured such that each occupies and surrounds each of the sample sites, **see Figure 2**. Each of these 8 plots will have all vascular plants identified with their density, coverage with notes on non-vegetated areas. The reason for establishing these plots is to be able to measure any ET colonization of the immediate surroundings through the five (5) years of sampling. Thus we will be able to provide information on the progress of the transplantation/translocation project and determine if the project goals have been met. A transplantation/translocation project involving ET should be monitored until it appears mature and self-sustaining, which could take years or decades. Assessment of translocated plants will involve a comparison of adult survival, seed production, germination rates, seed survival, seedling survival, and growth rates between translocated plants and plants similarly measured in the reference sit.
For tree measurements, if the site has not been site prepped for silviculture, a standard 20 meter transect can be used to determine tree density. The placement of this transect can begin at the center of each sample site and extend from the center, northward for 10 meters, southward for 10 meters, basically on either side of the center of the plot in a north/south orientation. The point-quarter method can be used to determine tree density at 0 and 10 and 20 meters, **see Figure 3**. If site is currently a pine plantation or trees are evenly spaced a 10m x10m quadrat can be used to measure all trees within. To place this sample quadrat or plot use the center of the original sample plot and create a 10m x 10m quadrat, **see Figure 4**. In this latter case each pine within the quadrat will be measured at breast height to calculate the tree density based on basal diameter. See monitoring methodology below.

IV. Long Term Monitoring

All monitoring will continue for at least five (5) years. The quantitative sampling sites used for reference sites will be randomly selected from an appropriate landscape using the same methodology as described above from a known area of ET occurrence. Each 1m x 1m plots or square quadrat used as a reference will be georeferenced and marked by insertion of an iron piece at each corner for future location with a metal detector, see Figure 1. These representative samples will measure the proportional distribution of groundcover and shrubs. If trees have been planted in rows, simple measurements will determine the planting distances and

density. For additional information about groundcover, shrub and subcanopy monitoring see attachment B.

V. Photography

The photographic specifications used in conjunction with the quantitative plant sampling protocol will include photographing the sampling site by standing over the plot and including the 1mX1m sample area. The photographs will include as much view as is typical for a standard digital camera. Close up photos of important features may also be collected within the quadrats. No editing of photos will be used other than that used to manipulate photos for processing into formats suitable for report writing. All photos will be dated and georeferenced whenever possible. All labeling of photographs in final reports will include the date of photo, photographer, location and figure or photo number. Electronic storage of photographs will be saved for future reference.

VI. Analyzing the Data

The once annual monitoring will provide quantitative and qualitative information that can be objectively analyzed. The results of this analysis will allow for interpretation and conclusions from the data. These results will then be reported and evaluated. If it is determined that the translocation methodology is not producing the appropriate ecological response as this relates to the success of this endeavor, the methodology will be re-evaluated.

Figure 1

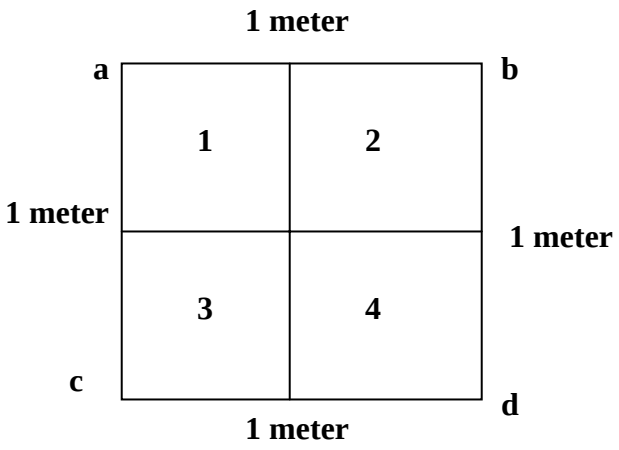

Figure 1. The transplant/recipient site will have the dimensions of 1m x 1m. This is also called a square quadrat. At each corner of the quadrat an iron stake will be inserted to permanently mark the quadrat at points a, b, c and d. The quadrat is divided into four sections labeled 1, 2, 3 and 4. Twenty-five donor plants will be planted in each section for a total of 100 donor plants per quadrat.

Figure 2

3 meters

3 meters

1	**2**	**3**
8	100 Donor plants will be planted in the central sample site or recipient site	**4**
7	**6**	**5**

3 meters

3 meters

Figure 2. Configuration of eight 1m x 1m plots organized around the central sample site. The central sample site is that depicted in figure 1 it is also called the recipient site. All vascular plants in each of the eight plots will be measured for density and coverage. The central sample site will receive the donor plants. The idea is to measure how successfully the donor plants might move into the surrounding eight plots over time.

Figure 3

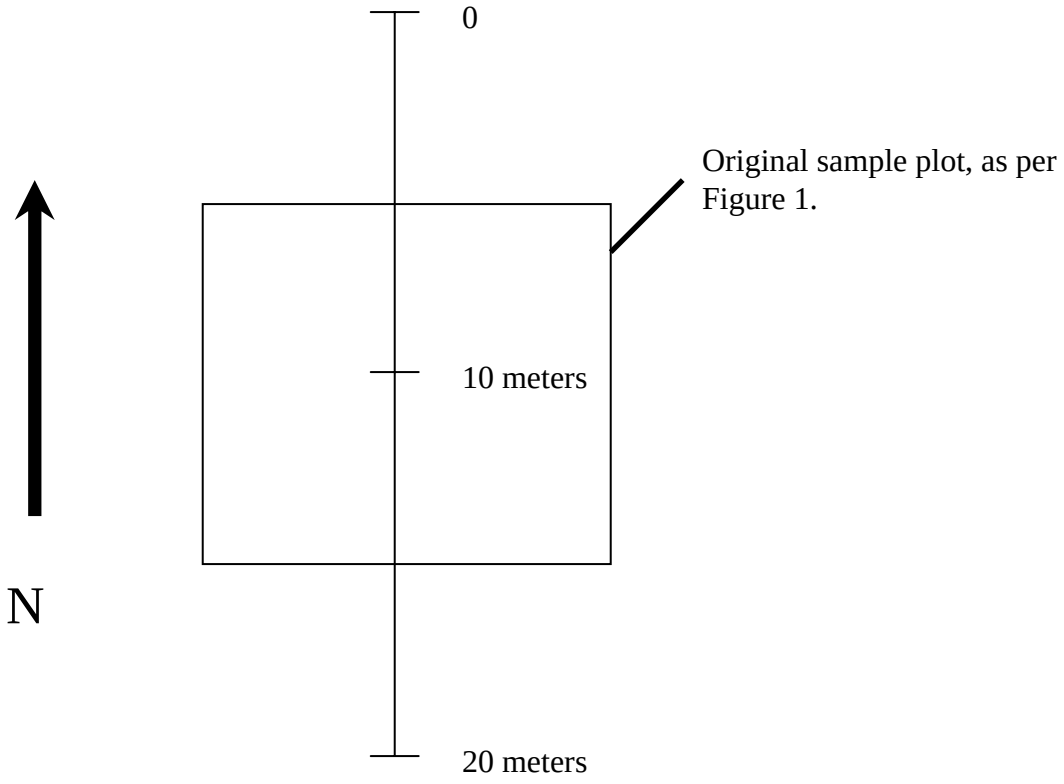

Figure 3. The placement of this transect can begin at the center of each sample site and extend from the center, northward for 10 meters on either side in a north/south orientation. The point-quarter method can be used to determine tree density at 0 and 10 and 20 meters.

Figure 4

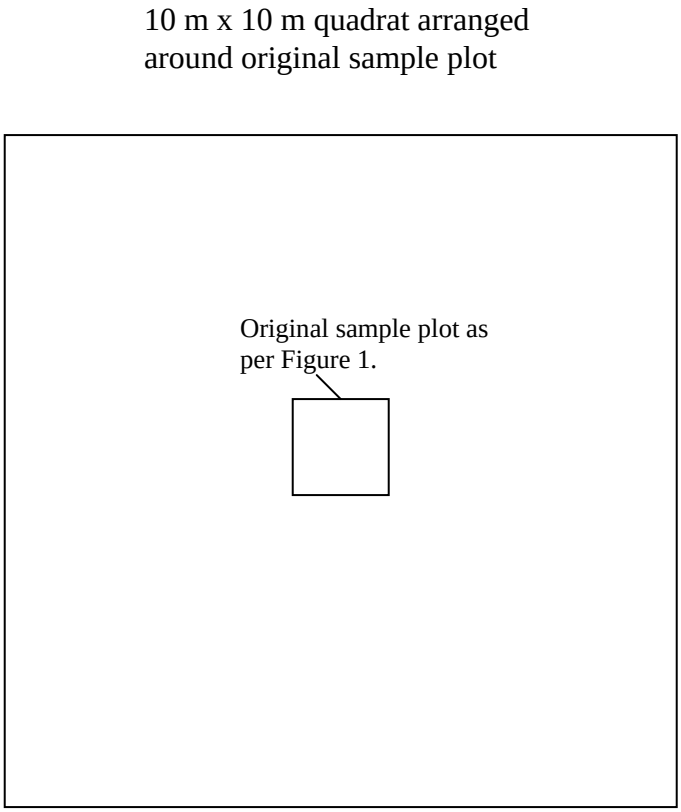

Figure 4. 10m x 10m plot used to sample trees if site is currently a pine plantation or trees are evenly spaced. All trees are measured within this plot. To place this sample plot use the center of the original sample plot and create a 10m x 10m quadrat.

Appendix III

RGP-86 Telephus Spurge Pre-Application Evaluation

Endangered Species Act formal consultation was conducted between the U.S. Fish and Wildlife Service (Service) and the Corps of Engineers as part of the development of the RGP-86. Consultation was based on the presence of telephus spurge (*Euphorbia telephioides)* at three locations in Gulf and Bay counties and the observance of suitable habitat throughout the action area. Best available methods were used to determine potential impacts to telephus spurge that could be expected from implementation of the permit. However, it is reasonable to expect that with a project area covering more than 47,000 acres (about 1/3 of which is potentially developable) undetected habitat could be present. To avoid and minimize potential take of telephus spurge in these situations, the following survey protocol was developed. This evaluation must be completed by all applicants and performed by a qualified plant ecologist/field botanist.

Step 1: Preliminary Project Site Review

Applicants and/or their consultants shall contact the Service for the latest information on the telephus spurge. The proposed project site shall be reviewed to determine if any known occurrences of the telephus spurge are present in the vicinity.

Step 2: Procedures for Reviewing Other Data to Determine Whether Additional Field Surveys Should be Conducted:

The telephus spurge occurs in a variety of soil types and plant communities ranging from sandhill to mesic flatwoods to pine savannahs. Suitable soil types are primarily the drier Leon sand and Pottsburg sand, although the plant is sometimes found in mesic soils, particularly within the ecotone surrounding sandy soils. Most of the known locations have been impacted by silviculture. Telephus spurge has been found in pine plantations with bedding present. Specific project sites must be reviewed using the procedures outlined below to determine the presence or absence of the telephus spurge.

1. Review the project site using NRCS soils data for Bay and Walton Counties, high-resolution infrared and/or true color aerials (scale of 1 inch=400 feet), and historic aerials of your project area.

2. Look for the following positive indicators:

- Suitable soils. Suitable soil types include Leon sand, Pottsburg sand, and Hurricane sand.

- Open canopy. Features to look for on the infrared aerials include the absence of a dense, closed canopy cover. Absence is a positive indicator. Dense canopy cover like titi appears dark red and smooth. The absence of a dense canopy shows up lighter often with patchy red areas throughout.

3. The presence of one or more positive indicators means that the site is potential telephus spurge habitat.

- If yes, then you must conduct field surveys to determine whether telephus spurge is present. **Continue to step 3.**
- If no, then **you are finished with the telephus spurge evaluation. Go to step 4.**

Step 3: Field Assessment of Potential Telephus Spurge (*Euphorbia telephioides*) Habitat

Before beginning any field work, develop a search pattern recognition of *Euphorbia telephioides* by examining photographs or herbarium species or by visiting field locations. See www.plantatlas.usf.edu for a photo reference collection.

Select potential survey polygons based on presence of Leon sand or Pottsburg sand. After reviewing aerial photography and conducting preliminary site inspections, add those areas that have a relatively open canopy and

remnant native groundcover. Be sure to include roadsides, open trails, utility easements, burned areas, and wetland ecotones. Eliminate areas that are densely vegetated with shrubs and trees or are obviously wet most of the year.

Selected polygons should be field surveyed for presence or absence of telephus spurge using a qualitative transect method. The surveys should be supervised by a qualified botanist. Straight line transects at 20-foot intervals should be laid out to cover the entire polygon. Alternate on each side of the transect with 10-foot square quadrants. (Figure 1) The quadrant boundaries can be estimated and visually scanned for telephus spurge. Areas with extremely dense vegetation can be overlooked.

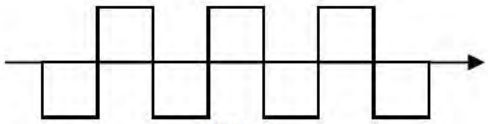

Fig. 1

Surveys can be conducted anytime from April through September. The plant generally dies back at the end of the growing season and does not re-grow to a noticeable height until several weeks after the last frost. Ideal survey months are July through September.

Step 4: Telephus Spurge Findings

	Yes	No
1. Positive indicators were detected in Step 2.	___	___
2. Field surveys detected presence of telephus spurge. **If yes, re-initiation of consultation is required.**	___	___
3. Appropriate documentation is included to support these findings. Negative and positive survey data are provided to USFWS in a GIS format.	___	___

Signature _____ Date_____

Ecologist/Botanist who performed the evaluation

Appendix IV.

RGP-86 Flatwoods Salamander Pre-Application Evaluation

Endangered Species Act formal consultation was conducted between the U.S. Fish and Wildlife Service and the Corps of Engineers as part of the development of RGP-86. Consultation was based on presumed presence of salamanders due to the proximity of two known locations and the observance of suitable habitat in the action area. Best available methods were used to determine potential impacts to flatwoods salamanders that could be expected from implementation of the permit. However, it is reasonable to expect that with a project area covering more than 47,000 acres (about 1/3 of which is potentially developable) undetected habitat could be present. In order to avoid and minimize potential take of salamanders in these situations, the following habitat evaluation was developed. This evaluation must be completed by all applicants and performed by a qualified ecologist/biologist.

Step 1: Preliminary Project Site Review

1. Applicants and consultants shall obtain and review an informational brochure developed by the Florida Fish and Wildlife Conservation Commission. The brochure is available from Florida Fish and Wildlife Conservation Commission, Bureau of Wildlife Diversity Conservation, 620 South Meridian Street, Tallahassee, Florida 32399-1600.

2. Applicants and/or their consultants shall compare aerial photographs of their project site to Figures 2, 3 and 4 of the Biological Opinion. Note all data points located within the project site and within 450 meters (1,476 feet) of the project site or limits of construction.

3. If any data points of Figure 4 are located within the project site or within 450 meters of the project site or limits of construction, **re-initiation of consultation is required. Continue with Step 2.**

4. Other data points of Figures 2 and 3 that are within the project site action area (including 450 meters) do not need further evaluation. Previous work conducted as part of the biological opinion addressed these sites. **Continue with Step 2.**

Step 2: Procedures for Reviewing Other Data to Determine Whether Additional Field Surveys Should be Conducted (based on Palis 2003)

There is a potential that suitable habitat may have been overlooked during the analysis for the biological opinion. Therefore, specific project sites must be reviewed using the procedures outlined below to determine whether they need to be field surveyed.

1. Review project site using high-resolution recent infrared aerials (scale of 1 inch = 400 feet), NRCS soils data for Bay and Walton counties, and historical aerials of your project area that are of as high a resolution as is obtainable. Note any ponds[1] not depicted on Figures 2 or 3 with similarity of appearance to those of Figure 4 in the biological opinion.

2. Features to look for on the infrared aerials are as follows:

- Absence of a dense titi cover completely surrounding ponds. Absence is a positive indicator. Dense titi appears relatively dark red and smooth
- A graminaceous, treeless ecotone along part of the pond edges. Presence is a positive indicator. Wet, herbaceous edges appear as smooth grayish blue, greenish grayish blue, or as a light band along the edge.
- Absence of deep water. Absence of deep water is a positive indicator. Deep water appears dark blue or almost black.

[1] "Ponds" are not traditional open waterbodies, but are ephemeral wetlands that are ponded for a portion of the year.

3. On historical aerials, look for open savannahs or pine flatwoods around ponds. These are positive indicators and appear as smooth, light-colored areas with scattered-to-no-trees.

4. On soil maps, where ponds occur, look for hydric or mesic soils around pond; hydric or mesic soils are positive indicators of flatwoods salamander use.

5. The presence of all of the above positive indicators means that the pond(s) should be field surveyed.

- If yes, then you must conduct field surveys to determine whether the pond(s) is a potential flatwoods salamander pond. **Continue with Step 3.**
- If no here and no to Step 1. 3., then **you are finished with the flatwoods salamander evaluation - Go to Step 5** (Flatwoods Salamander Findings).
- If no here and yes to Step 1. 3., then **re-initiation of consultation is required.**

Step 3: Field Assessment of Potential Flatwoods Salamander (*Ambystoma cingulatum*) Ponds

The Description Data Sheet (next page) may be completed at the same time as other fieldwork, such as wetland delineation. The field data sheet that must be completed at the time of the field survey follows. Photographs must also be taken of the ecotone and pond, particularly noting the location of the most graminaceous portion of ecotone and wetland groundcover.

Potential Flatwoods Salamander *(Ambystoma cingulatum)* Pond
Description Data Sheet

Instructions: Circle the number of the most appropriate descriptor in each category. If no description option applies, circle "other" and describe. In some categories, such as ECOTONE VEGETATION DESCRIPTION, SPECIES COMPOSITION, and SURROUNDING UPLANDS, circle the number for all appropriate descriptors.

Pond# _____ Date _____ Observer(s) _____

ECOTONE VEGETATION DESCRIPTION
(If more than one descriptor applies, circle and estimate percentage of pond perimeter.
Also circle appropriate grass and shrub species)

1) undisturbed graminaceous (*Aristida stricta, Calamovilfa curtissii*)[1], few to no shrubs (*Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia*) _____%
2) disturbed graminaceous (*Aristida stricta, Calamovilfa curtissii*; bedded/rutted), few to no shrubs (*Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia*) _____%
3) undisturbed graminaceous (*Aristida stricta, Calamovilfa curtissii*) under thick *Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia*) _____%
4) weedy graminaceous (*Andropogon, Panicum verrucosum*, and/or *weedy Rhynchospora*), few to no shrubs (*Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia*) _____%
5) disturbed graminaceous (*Aristida stricta, Calamovilfa curtissii*; bedded/rutted), under thick *Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia* _____%
8) weedy graminaceous (*Andropogon, Panicum verrucosum*, weedy *Rhynchospora*) under thick *Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia* _____%
9) thick shrubs (*Clethra, Cliftonia, Cyrilla, Hypericum, Ilex myrtifolia, Lyonia*) over little to no graminaceous (*Aristida stricta, Calamovilfa curtissii, Andropogon, Panicum verrucosum*, weedy *Rhynchospora*) _____%
10) no ecotone _____%
11) other:_____ _____%

GRAMINACEOUS ECOTONE EXTENT DESCRIPTION

1) > 75 % of pond perimeter
2) 51-75% of pond perimeter
3) 26-50 % of pond perimeter
4) <25% of pond perimeter

GRAMINACEOUS ECOTONE WIDTH DESCRIPTION

1) > 0 m wide
2) 6-10 m wide
3) 3-5 m wide
4) 1-2m wide

1 "Undisturbed graminaceous" and "disturbed graminaceous" mean that the appropriate ground cover species are present (*Aristida stricta, Calamovilfa curtissii*, wiry *Rhynchospora* spp., and *Sporobolus*). However, "disturbed graminaceous" indicates that the soil has been disturbed by human activities such as chopping, bedding, ATV or skidder tracks. "Weedy graminaceous" means that not only are the appropriate ground cover species absent, but that the soil has been disturbed.

POND GRAMINACEOUS GROUNDCOVER SPECIES COMPOSITION
(place asterisk adjacent to visually dominant species)

1) *Aristida affinis*
2) *Carex*
3) *Dichanthelium (Panicum) erectifolium*
4) *Eriocaulon compressum*
5) *Panicum rigidulum*
6) *Rhynchospora inundata/corniculata*
7) *Rhynchospora* _____
8) *Sphagnum*
9) *Xyris*
10) other: _____

POND GRAMINACEOUS VEGETATION COVERAGE

1) extensive throughout basin, marsh-like
2) over most of basin (> 75 %)
3) scattered and local in basin (approx 25-74%)
4) limited to basin edge
5) sparse
6) none

POND CANOPY SPECIES COMPOSITION
(place asterisk adjacent to visually dominant species)

1) *Taxodium ascendens*
2) *Nyssa biflora*
3) *Pinus elliottii*
4) *Ilex myrtifolia*
5) other: _____

POND CANOPY COVERAGE

1) <25% 2) 26-50% 3) 51-75% 4) >75%

POND SUBSTRATE

1) relatively firm mud/sand with little to no leaf/needle litter
2) relatively firm mud/sand with abundant leaf/needle litter
3) soft and peaty (thick leaf/needle litter)

APPROXIMATE WATER DEPTH (_____ m)

If site dry, estimate using high water stains on trees: ____ m

WATER COLOR

1) clear to light stain 2) moderate stain (ice tea) 3) dark stain (coffee) 4) no water

SURROUNDING UPLANDS
(circle every applicable number and indicate relative percentage of area around pond)

1) undisturbed graminaceous (*Aristida stricta, Sporobolus*) dominated, few to no shrubs _____%
2) disturbed graminaceous (*Aristida stricta, Sporobolus*) dominated, few to no shrubs _____%
3) approximately 50/50 undisturbed graminaceous (*Aristida stricta, Sporobolus*)/shrubs _____%

4) approximately 50/50 disturbed graminaceous (*Aristida stricta, Sporobolus*)/shrubs _____%
5) disturbed with sparse vegetation (i.e., principally pine straw) _____%

6) shrub dominated (shrubs knee high or less), sparse graminaceous (*Aristida stricta*, *Sporobolus*) _____%

7) shrub dominated (shrubs between knee and head high), sparse graminaceous (*Aristida stricta*, *Sporobolus*) _____%
8) shrub dominated (shrubs head high or more), sparse graminaceous (*Aristida stricta*, *Sporobolus*) _____%
9) weedy graminaceous (e.g., *Andropogon*), few to no shrubs _____%
10) shrub dominated (shrubs knee high or less), sparse weedy graminaceous (*Andropogon*, etc.) _____%
11) shrub dominated (shrubs knee to head high), sparse weedy graminaceous (*Andropogon*, etc.) _____%
12) shrub dominated (shrubs head high or more), sparse weedy graminaceous (*Andropogon*, etc.) _____%
13) other _____ _____%

UPLANDS SPECIES PRESENT
(circle number and place asterisk by visually dominant species)

1) *Andropogon*
2) *Aristida stricta*
3) *Conradina canescens*
4) *Cyrilla racemiflora*
5) *Ilex glabra*
6) *Kalmia hirsuta*
7) *Licania michauxii*
8) *Lyonia lucida*
9) *Myrica cerifera*
10) *Pteridium aquilinum*
11) *Quercus minima/pumila*
12) *Serenoa repens*
13) *Vaccinium darrowi/myrsinites*
14) _____

General Notes: _____
_____
_____
_____

SKETCH WETLAND/UPLAND (North ↑)
(delineate locations of vegetational differences in ecotone and in wetland and uplands)
(**photograph** the ecotone and pond noting the location of the most graminaceous portion of ecotone and wetland ground cover, note photo points)

Step 4: Expert Review of Field Results

When Steps 2 and 3 have been completed, the completed field data sheets and photographs should be sent to a recognized flatwoods salamander expert. In addition, the current and historical aerials, soil data, and a map of the

project site should also be forwarded to the expert. The expert will review all the information to determine whether the pond might be a potential flatwoods salamander pond.
The field data sheet used in Step 3 has been organized so that the descriptors under each category of interest are ordered from best to worst conditions for flatwoods salamanders. For example, under the category Ecotone Vegetation Description, the first descriptor [1) undisturbed graminaceous… few to no shrubs…] describes the best conditions for flatwoods salamanders and the last two descriptors [9) thick shrubs… and 10) no ecotone] describe the worst conditions.

The expert will evaluate the descriptors selected for each category of interest to determine whether the pond might be a potential flatwoods salamander breeding pond. If mostly low number descriptors were selected on the field data sheet, then the pond is more likely to be considered a potential breeding pond; conversely, if primarily high number descriptors were selected on the field data sheet, then the pond is less likely to be considered a potential breeding pond. However, no formula presently exists that encompasses all the possibilities that might eliminate or elect a pond for further consideration as a potential breeding pond.

If the expert cannot determine whether or not the pond should be considered a potential flatwoods salamander breeding pond, s/he may request additional information from the ecologist/biologist who visited the pond and/or the project applicant. If the request for additional information is not fulfilled within a reasonable time period or the response is not sufficiently helpful, the expert may also elect to visit the pond himself at the expense of the project applicant.

The expert will provide a written determination as to whether the surveyed pond(s) is likely to be a potential flatwoods salamander breeding pond.

Review Time Frames:

- Provide field data sheets to expert;
- Expert reviews field data sheets within 10 working days of receipt, and
    - Requests additional information, or
    - Provides[2] written determination;
- Project applicant or their consultant provides additional information to expert;
- Expert provides written determination to project applicant within 5 working days of receipt of sufficient additional information;
- Project applicant provides the expert's written determination and background documentation (prepared map of ponds, aerials, soil data, field data sheets, and photographs) to the agencies as part of the pre-application Item #8.

2 "Provides" implies postmarked, emailed or faxed.

Step 5: Flatwoods Salamander Findings

	Yes	No
1. The project site contains or is within 450 meters (1,476 feet) one or more of the data points indicated in Figure 4 of the biological opinion. **If yes, re-initiation of consultation is required.**	____	____ of
2. The project site contains or is within 450 meters of potential habitat not evaluated in the biological opinion.	____	____
3. Field evaluations and expert review were necessary for additional habitat.	____	____
4. Expert review indicates that suitable habitat is located within the project action area. Name of flatwoods salamander expert _____. **If yes, re-initiation of consultation is required.**	____	____
5. Appropriate documentation is included to support these findings.	____	____

Signature _____ Date _____

Ecologist/Biologist who Performed the Evaluation