FINAL DAMAGE ASSESSMENT AND RESTORATION PLAN/ ENVIRONMENTAL ASSESSMENT

for 7 OIL SPILLS

in NORTHEAST FLORIDA

Florida Department of Environmental Protection

June 25, 2003

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i. Summary

This Final Damage Assessment and Restoration Plan/Environmental Assessment ("Final DARP/EA") has been prepared by the Florida Department of Environmental Protection, in its' capacity as State Trustee. This plan addresses restoration of natural resources and services injured by 7 oil spills in northeastern Florida (Duval and Brevard Counties). The purpose of restoration as outlined in this Final DARP/EA, is to make the environment and public whole for injuries to natural resources and natural resource services resulting from these spills. This restoration plan will return injured natural resources and natural resource services to "baseline" conditions, i.e., the conditions that would have existed had the incidents not occurred, and compensate for interim losses of natural resources. For these incidents, the Florida Department of Environmental Protection ("FDEP") has the responsibility as natural resource Trustee to: assess the nature, extent, and severity of natural resource injuries, plan for appropriate restoration projects, prepare draft and final restoration plans, and implement restoration.

Under Section 1002 of the Oil Pollution Act (33 U.S.C. § 2701 *et seq*.; "OPA"), each party responsible for a vessel or a facility from which oil is discharged, or which poses a substantial threat of a discharge of oil, is liable for natural resource damages resulting from the incident involving such discharge or threat. In four (4) incidents, the responsible parties were unidentifiable ("mystery spills") and all actions by the State to recover damages from three (3) identified responsible parties were unsuccessful. OPA allows for claims to be submitted to the Federal Oil Spill Liability Trust Fund for payment in the absence of a known responsible party or where recovery has been unsuccessful. The measure of damages recoverable by the Trustee as defined in Section 1006(d) of OPA equals the sum of: 1) the costs to restore, rehabilitate, replace, or acquire the equivalent of the injured resources; 2) compensation for the diminution in value of injured resources pending their recovery; and 3) the reasonable costs of assessing these damages. All recoveries for the first two elements are to be spent implementing a plan developed by the Trustee to restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources.

This Final DARP/EA is intended to inform members of the public of the Trustee's assessment of resource and service losses attributable to these incidents and on the restoration actions that the Trustee's have selected.

FIGURE 1: FLORIDA REGIONAL MAP

1.0 Introduction and Purpose

1.1 Introduction

This document summarizes the Trustee's assessment of injuries to public natural resources resulting from the seven (7) incidents that occurred in the northeast region of Florida (see Figure 1). It sets forth the Trustee's final decisions for restoration projects to restore resources to their baseline and to compensate for the interim loss of resources and/or services pending recovery to baseline.

Although the NOAA natural resource damage assessment regulations were not in place at the time of the initial claim, the Trustee has used 15 C.F.R. Part 990 as a guide in preparing a claim. In accordance with these regulations, the Trustee selected methods for injury assessment and restoration planning which are technically reliable, valid and cost-effective for the incident.

The Trustee investigated several resource injuries caused by these incidents and consulted with a variety of experts in relevant scientific and technical disciplines. Based on this work, the Trustee believes that these incidents caused significant injury to wetlands\ and mudflat (saltmarsh), water column and seabirds. The Trustee will use restoration costs as the measure of damages for injuries to the ecological resources. These costs, when finalized, will include the cost to design, permit, construct, and monitor the restoration projects.

The description and evaluation of restoration alternatives in this plan are based on the technical expertise, judgments and restoration experience of the Trustee and other consulting scientists. The restoration projects will undergo appropriate design, construction, implementation, and monitoring. Any permit applications will also be subject to a public comment period under Federal, State, and local laws prior to final project design and implementation.

1.2 Description of the Incidents

In the northeast region, one (1) spill case examined was on the outer coast (a shipwreck on the beach in heavy surf). The other six (6) cases were either relatively contained in ports or were of small volume (Figure 2: Location of spill sites for cases in the northeast region). Thus, the extent of surface oiling was limited in most cases. Subsurface contamination was dispersed rapidly such that impacts to water column organisms were limited.

Natural resources or their services impacted as a result of these incidents include wetlands, water column and seabirds and their habitats. Response actions removed the majority of the shoreline oil within a few days of oiling. However, these response actions did not prevent natural resource impacts from occurring; likewise, these response actions did not operate to restore or rehabilitate natural resource injuries that resulted from the discharge of oil.

1.3 Affected Environment

This section provides brief descriptions of the physical and biological environments affected or potentially affected by these incidents and targeted for restoration activities, which occurred in Brevard (3) and Duval (4) Counties. The physical environments impacted include the St. Johns River and the marine waters of the Atlantic Ocean and the adjacent coastal habitats. The biological environment includes marshes, a variety of fish and invertebrates, shellfish, sea turtles and birds.

The physical habitat for the northeast section of the state of Florida is divided into a northern region and a southern region. For the cases involved in this claim, the northern region includes Duval, Nassau, St Johns, and Flagler counties and the southern region Brevard, Volusia and Indian River Counties.

Figure 2. Location of spill sites for cases in the northeast region.

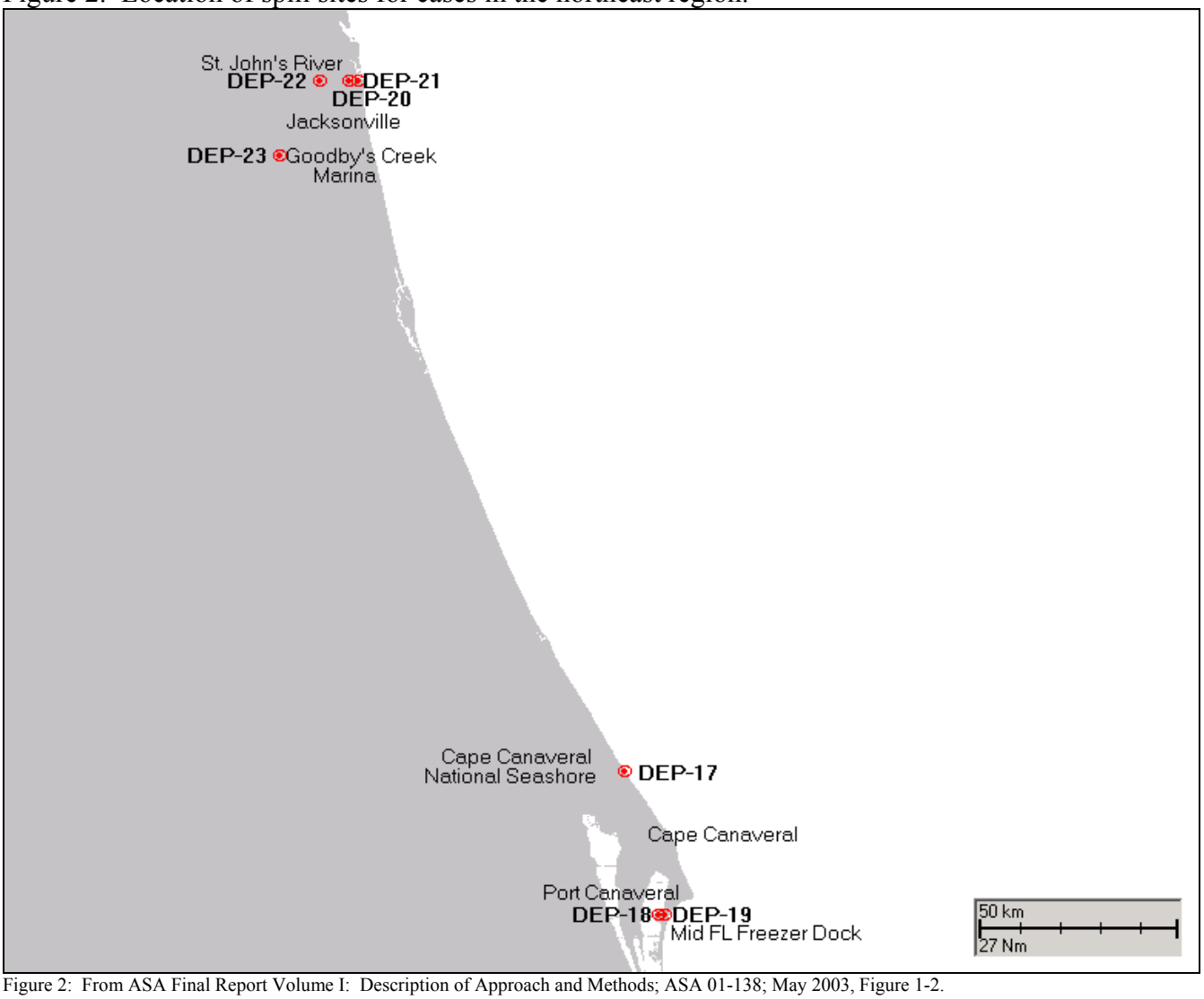

Figure 2: From ASA Final Report Volume I: Description of Approach and Methods; ASA 01-138; May 2003, Figure 1-2.

The northern region experienced spills predominately in the St. Johns River. The shoreline is composed primarily of saltmarsh, (exposed and sheltered) and a few sections of sand beach. The Mayport Basin at the mouth of the St. Johns River is comprised of seawalls with its outer area consisting of riprap and sand beaches to the Atlantic Ocean. Further up the river is Goody's Creek. It is an estuarine tributary to the St. Johns River. Its physical environment consists of salt and hardwood marshes. The St. Johns River was designated an American Heritage River by President Bill Clinton in 1997. The St. Johns River is also a designated manatee habitat. The river is used daily by the local residents for recreational purposes, boating and fishing. The river has a thriving maritime industry, which operates within the Port of Jacksonville.

Further south, the region that has been impacted by spills is Brevard County. The area of impact was on a coarse grain sand beach, predominately used for recreational purposes. On the landward side of the beach are sheltered and exposed saltmarsh as well as mangroves. The Port of Canaveral is home to a variety of industries including major cruise lines.

The environment for that area consists of seawalls directly within the port and sandy beaches and exposed marshes and mangroves on the outer fringes. The beach habitat provides critical nesting areas and three species of sea turtles nest on Brevard County beaches. These are the loggerhead sea turtle, the green sea turtle, and the leatherback sea turtle. The loggerhead is Federally-listed as threatened and is the most common nesting turtle in Brevard County. The green and leatherback turtles are Federally-listed as endangered.

Appendix A contains a list of all Federally-listed threatened and endangered species found in Florida. The inclusion of a species on the list does not necessarily indicate that individuals are found in the area of the incident and/or the selected restoration, but is included here because many of these species are known to exist within or use the impacted shoreline and ocean areas.

1.4 Natural Resource Trustee and Authorities

In Florida, natural resource Trusteeship authority is designated according to Section 1006(b) of OPA and the Florida Pollutant Discharge and Control Act, Florida Statute 376.011 through 376.21. Under terms of these statutes, the Governor has designated the Florida Department of Environmental Protection (FDEP) as Trustee for pollutant impacts to living and non-living resources in the coastal and marine environments of Florida. The Trustee is responsible for assessing injuries from incidents to trust resources and developing and implementing a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of injured natural resources ("restoration plan"). OPA § 1006(c).

Pursuant to Section 376.121, Florida Statutes and Section 1002(a) of OPA, each party responsible for a vessel or facility from which oil is discharged, or which poses a substantial threat of a discharge of oil, into or upon the navigable waters of the United States or adjoining shorelines, is liable for natural resource damages from incidents that involve such actual or threatened discharges of oil. OPA Section 1006(d)(1) defines the measure of damages to natural resources as the cost of restoring, rehabilitating, replacing or acquiring the equivalent of the injured natural resources, compensation for the diminution in value of those natural resources pending restoration, and the reasonable costs of assessing such damages. All recoveries for the first two elements are to be spent implementing a restoration plan developed by the Trustee. OPA § 1006 (f).

In the incidents covered by this plan, attempts to recover from the identified responsible parties were unsuccessful.

1.4.1 Determination of Jurisdiction to Conduct Natural Resource Damage Assessment

Pursuant to Section 990.41 of the regulations for conducting natural resource damage assessments ("NRDA") under OPA, 15 CFR Part 990, the Trustee determined that legal jurisdiction to pursue restoration under OPA existed for these incidents. These oil spills constitute an "incident" within the meaning of Section 1001(14) of OPA - an "occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil." Although not all of the responsible parties were identified, these incidents most likely originated from vessels transiting the area. Because these discharges were not authorized by permit issued under Federal, State, or local law, and did not originate from a public vessel or from an onshore facility subject to the Trans-Alaska Pipeline Authorization Act, these incidents are not an "excluded discharge" within the meaning of OPA Section 1002(c). Finally, natural resources covered by the Trusteeship authority of NOAA and/or Florida have been injured as a result of these incidents (natural resource injuries are discussed more fully below). These factors established jurisdiction to proceed with an assessment under the OPA NRDA regulations.

The Federal Trustee NOAA (National Oceanic and Atmospheric Administration) opted out of the assessment when the magnitude of the spills failed to reach the level of federal interest.

1.4.2 Determination to Conduct Restoration Planning

In accordance with 15 CFR Section 990.42, the State Trustee determined that the requisite conditions existed to justify proceeding with natural resource damage assessments and restoration planning beyond the preassessment phase. These conditions, discussed more fully below, include: existence of natural resource injuries resulting from the discharge or from associated response actions; response actions inadequate or inapplicable to restoration of natural resource injuries and losses; and existence of feasible actions to address the injured resources. Thus, the Trustee acted appropriately in proceeding with the damage assessment and restoration planning process.

1.5 Public Participation

OPA Section 1006(c)(5) requires that the Trustee involve the public in the restoration planning process. The OPA NRDA regulations interpret this provision as requiring, at a minimum, that Trustee provide the public with the opportunity to comment on a draft damage assessment and restoration plan, and that public comments be considered in producing the final plan (15 CFR Section 990.55(c)).

The Trustee solicited proposals for restoration projects from local cities, counties and environmental groups to develop the selected restoration alternatives (Appendix D). Proposals submitted for consideration are listed in Appendix E. Proposals that were timely submitted and met the categories for selection criteria are viewed in Appendix F.

The trustee provided the public an opportunity to comment on a public review of this Final DARP/EA. On May 29, 2003 the DRAFT DARP/EA was released and posted on the FDEP – BER webpage at www.dep.state.fl.us/law/ber. The Draft DARP/EA was accessed by clicking the "Natural Resource Damage Claims" link. Public Notice was published in The Florida Times Union on June 6 & 8, 2003. The Trustee received no public response by the review close date of June 20, 2003. As a result, there were no significant changes in the evaluation or selection of restoration projects since the Draft DARP/EA. This Final NE DARP/EA will be posted at the same location.

1.6 Administrative Record

The Trustee has maintained records to document the information considered as they have planned and implemented assessment activities and addressed restoration and compensation issues and decisions. These records are compiled in an administrative record, which is available for public review at the address listed below. The administrative record facilitated public participation in the assessment process and will be available for use in future administrative or judicial review of Trustee actions to the extent provided by federal or state law.

Documents within the administrative record can be viewed at the following location by appointment through the person indicated:

Florida Department of Environmental Protection
Bureau of Emergency Response
Division of Law Enforcement
3900 Commonwealth Blvd., M.S. 659
Tallahassee, FL 32399-3000
Attn: Holly Fortune
850-245-2010

1.7 Summary of the Natural Resource Damages Claim

The goal of a claim for natural resource damages under OPA is the restoration of injured natural resources and their services. Two types of restoration were considered for these incidents: primary and compensatory restoration. Primary restoration is any action taken to accelerate the return of injured natural resources and their services to baseline condition, i.e., the condition that would have existed had the incidents not occurred. Natural recovery, in which no human intervention is taken, is a primary restoration alternative that must be considered for each incident. Compensatory restoration is any action taken to compensate for interim losses of natural resources and/or services pending recovery to baseline.

The Trustee determined and quantified injuries in three categories: 1) saltmarsh [Section 3.3], 2) water column - biomass of fish and invertebrates [Section 3.4], and 3) birds [Section 3.5]. The Trustee selected the primary and compensatory restoration alternatives shown in Table 1. The Trustee will seek to implement compensatory restoration through the Oil Spill Liability Trust Fund.

Table 1: Selected Alternatives to Address Natural Resource Injuries and Services

Injury Category	Primary Restoration	Compensatory Restoration
Wetlands and mudflats (saltmarsh)	Natural Recovery	Habitat Restoration
Water Column - Fish and Invertebrates	Natural Recovery	Habitat Restoration
Birds	Natural Recovery	Habitat Restoration

2.0 Selection of Injuries to Include in the Assessment

2.1 Description of Natural Resource Injuries and Service Losses

These incidents and responses adversely affected the state's natural resources. The Trustee is pursuing restoration costs for natural resource injury, loss or destruction. The OPA NRDA regulations (15 CFR Section 990.30) define "injury" as "an observable or measurable adverse change in a natural resource or impairment of a natural resource service." The regulations define "services" as "the functions performed by a natural resource for the benefit of another natural resource and/or the public." These incidents injured or destroyed natural resources and caused reductions in natural resource services.

Saltmarsh: Estimated saltmarsh injuries ranged from 0 m^2 to 157 m^2 for a cumulative total of 250 m^2.

Water Column: Estimated water column injuries ranged from 0 kg to 277 kg for a cumulative total of 317 kg of fish and invertebrates.

Birds: Estimated bird injuries range from 0 birds (a probability) to 32 birds for a cumulative total of 36 birds.

No injuries to marine mammals (cetaceans or manatees) were observed or predicted by the model. Fish and invertebrate injuries were negligible in all of the northeast cases. This is attributable to small release volumes and/or large dilution volumes (offshore case), as well as fast weathering in the heat of Florida.

2.2 Application of Injury Selection Criteria

The NRDA regulations for OPA at 15 CFR Section 990.51(f) describes several factors to guide a Trustee in the selection of potential injuries to include in an assessment. These factors are:

(1) The natural resources and services of concern;
(2) The procedures available to evaluate and quantify injury, and associated time and cost requirements;
(3) The evidence indicating exposure;
(4) The pathway from the incident to the natural resource and/or service of concern;
(5) The adverse change or impairment that constitutes injury;
(6) The evidence indicating injury;
(7) The mechanism by which injury occurred;
(8) The potential degree, and spatial and temporal extent of the injury;
(9) The potential natural recovery period; and
(10) The kinds of primary and/or compensatory restoration actions that are feasible.

The Trustee identified 23 cases, 7 of which occurred in northeast Florida, to be analyzed for natural resource damages using the "type A" modeling approach. The "type A" approach is a simplified procedure under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) for assessing injuries and damages, requiring a minimum of fieldwork. It is designed for small spills, where it is not cost-effective for Trustees to perform extensive sampling in the field to assess injuries. Applied Science Associates (ASA) was hired by the Trustee to perform the analysis. ASA developed the "type A" Natural Resource Damage Assessment Model for Coastal and Marine Environments (NRDAM/CME) for the US Department of the Interior. The NRDAM/CME (Version 2.4, April 1996) was published as part of the CERCLA "type A" Natural Resource Damage Assessment (NRDA) Final Rule (Federal Register, May 7, 1996, Vol. 61, No. 89, p. 20559-20614). The technical documentation is French et al (1996a,b,c).

ASA has continued development of the model system as SIMAP (Spill Impact Model Analysis Package). The updates in SIMAP are summarized as follows:

1) updated and higher resolution habitat and depth mapping,
2) allows more detailed and time varying current data to be used,
3) simulation of subsurface releases (only surface releases are modeled in the NRDAM/CME),
4) updated physical fates algorithms,
5) higher resolution calculations,
6) use of updated oil toxicity data (French McCay, 2002),
7) potential to use site- and event-specific biological data,

8) calculation of biomass lost and production foregone for scaling compensatory restoration and restoration costs,
9) Windows 95+, 2000 or NT interface.

Given the updated methods and flexibility, SIMAP was used to evaluate injuries for the 23 spill cases. The 7 northeastern spill cases are evaluated in this Final DARP/EA (Table 2). Damages are based on restoration costs for habitat restoration in compensation for the injuries (using fish and wildlife production per unit of habitat restored and habitat equivalency analysis).

The ASA modeling report consists of a main document describing the model and methods, and 7 appended volumes for each of the northeast cases (Appendices B and C). Some of the input data are used for several cases within a region.

In order to analyze each case, several databases were developed with specific mapping and data for the location and event:

- Habitat mapping and gridding for model use.
- Depth data gridded for model use.
- Current data: tidal and river flow, as applicable to the location.
- Wind data for the two weeks after the event (hourly wind speed and direction).
- Biological abundance by species. For the estuarine and marine locations involved in the 23 cases, the needed data are available from the NRDAM/CME (French et al, 1996c).
- A restoration cost database. The habitat, fish, invertebrate, and wildlife injuries are translated to equivalent habitat areas needed for compensatory restoration. A simplified trophic level (food chain) model is used, as has been used for restoration scaling in OPA NRDA cases such as the North Cape (French et al., 2001). The compensatory habitats are wetland (e.g., mangrove or saltmarsh), as appropriate to the injuries in the cases. Restoration costs per area of habitat in Florida are used. The damage claim is based on total compensatory restoration cost.

Table 2. The NE cases

Case No.	Region	County	Location	Case Volume	ASA #
92-07-0805	NE	Brevard	Cape Canaveral National Seashore	XII	17
94-07-0304	NE	Brevard	Port Canaveral	XIII	18
95-1B-1042	NE	Brevard	Port Canaveral	XIV	19
94-08-1164	NE	Duval	St Johns River	XV	20
94-08-1195	NE	Duval	St Johns River	XVI	21
96-1A-0538	NE	Duval	St Johns River	XVII	22
95-08-0017	NE	Duval	St Johns River	XVIII	23

Table 2. Excerpted from Table E-1, ASA Final Report Volume I: Description of Approach and Methods; ASA 01-138; May 2003

Oil spill modeling was performed for each of the 7 cases. Table 3 provides a summary of the NE Region incident information. The objectives were to provide (1) an assessment of the pathways and fate of the oil, and thus estimate exposure to the water surface, shoreline and other habitats, water column, and sediments; and (2) an estimate of injuries to wildlife, aquatic organisms, and habitats.

Table 3*. Summary of NE Region Spill Incidents and Model Inputs

ASA #	Location	Date and Time	Oil Type	Spill Volume	Release Depth
NE CASES					
17	Cape Canaveral National Seashore	Dec. 17, 1992 7:25 pm	Diesel	1,200 gallons	Surface
18	Port Canaveral	Mar.19, 1994 6:00 pm	Lube oil	437.5 gallons*	Surface
19	Port Canaveral	Aug. 4, 1995 4:00 am	Diesel	1,000 gallons	9.1 – 10.1 m
20	St. John's River	Nov. 9, 1994 7:30 am	Lube oil	350 gallons*	Surface
21	St. John's River	Nov. 17, 1994 12:00 pm	Lube oil	300 gallons*	Surface
22	St. John's River	June 13, 1996 2:00 am	Diesel	2,000 gallons*	Surface
23	St. John's River	Jan. 9, 1995 6:30 am	Diesel	150 gallons	Surface

Table 3. Excerpted from Table E-2, ASA Final Report Volume I: Description of Approach and Methods; ASA 01-138; May 2003

Table 3* Note: *Spill volume corrected for amount evaporated before the spill size estimate was made based on observations of oil in the water.

The appended report describes the data inputs for and results of the modeling. Inputs include habitat and depth mapping, winds, currents, other environmental conditions, chemical composition and properties of the source oil, specifications of the release (amount, timing, etc.), toxicity parameters, and biological abundance.

Model results are displayed by a Windows graphical user interface that animates the trajectory and concentrations over time. The figures included in Appendices B and C are snapshots taken from that output. The model output is available on CD and may be viewed with the SIMAP Viewer software, which is the model interface that displays the output data (See Section 1.6).

Table 4. Summary of injuries for the 23 cases. Sea turtle injuries are totals for in water and on beaches.

DEP Case No.	Region	ASA #	Volume	Wetland Oiled (m^2)	Birds Killed (#)	Sea Turtles Killed (#)	Biomass of Fish and Invertebrates Lost (kg)
92-07-0805	NE	17	XII	0	0	0	277
94-07-0304	NE	18	XIII	0	32.82	0	0
95-1B-1042	NE	19	XIV	0	0.18	0	40.1
94-08-1164	NE	20	XV	0	.56	0	0
94-08-1195	NE	21	XVI	28	0	0	0
96-1A-0538	NE	22	XVII	157	2.2	0	0
95-08-0017	NE	23	XVIII	65	0.04	0	0
TOTALS				250	36	0	317

Table 4. Excerpted from Table E-3, ASA Final Report Volume I: Description of Approach and Methods; ASA 01-138; May 2003

Based upon these modeled inputs, the Trustee chose to include saltmarsh, water column and birds in the assessment underlying this Final DARP/EA. The Trustee judged that the injuries were significant and that procedures for assessing injury and scaling appropriate restoration for these categories would involve reasonable costs.

3.0 Restoration Planning

3.1 Injury Assessment, General

The goal of injury assessment is to determine the nature, degree, and extent of any injuries to natural resources and services. This information is necessary to provide a technical basis for evaluating the need, type, and scale of restoration actions. Specifically, the Trustee must determine that there is: (1) exposure, a pathway, and an adverse change to a natural resource or service as a result of an actual discharge; or (2) an injury to a natural resource or impairment of a natural resource service that resulted from the substantial threat of a discharge.

Injury determination and injury quantification are terms used to describe the two basic components of an injury assessment. Determination of injury requires that a Trustee demonstrate that the incident caused an adverse effect on the resources or services. Injury quantification involves determining the severity, extent and duration of the adverse effect. The Trustee has the option of quantifying the adverse effect directly and/or quantifying the reduction in services provided by a natural resource caused by the incident. The natural resource or service change is defined as the difference between post-incident conditions and baseline conditions. Injury assessment techniques used for the natural resource categories chosen by the Trustee for inclusion in restoration planning are discussed later in this document.

3.2 Developing a Restoration Plan, General

3.2.1 Primary and Compensatory Restoration

In selecting restoration projects for each category of natural resource injury or loss, the Trustee identified feasible restoration actions to promote recovery of the resources to baseline (primary restoration) and/or to compensate for interim losses of resources or services pending recovery (compensatory restoration). Primary restoration actions include natural recovery and one or more active restoration actions designed to directly restore natural resources or services to baseline on an accelerated time frame. The Trustee selected natural recovery as the primary restoration for saltmarsh, water column and seabird injury categories.

Compensatory restoration actions compensate the public for the interim losses. The scale of the compensatory restoration action is based on knowledge of the interim losses associated with the selected primary restoration action. The OPA NRDA regulations identify a variety of methods that may be used for scaling compensatory restoration actions. When determining the scale of restoration actions that provides natural resources and/or services of the same type and quality, and of comparable value as those lost, the Trustee must consider using a service-to-service scaling approach. Under this approach the Trustee determines the scale of restoration actions that will provide a flow of natural resource services equivalent in quantity to the lost flow of services, taking into account the different time periods in which the services are provided through the use of discounting.

The Trustee may also consider the valuation scaling approach. With this approach, the Trustee explicitly measures the lost value associated with injured resources and/or services and then determines the scale of restoration actions necessary to produce natural resources and/or services of equivalent value to the public.

For compensatory restoration actions, the Trustee has chosen the service-to-service approach as the most appropriate method for saltmarsh, and a valuation scaling approach for bird, fish and invertebrates.

3.2.2 Criteria for Evaluating Restoration Alternatives

The Trustee solicited for and received 2 timely and sufficiently detailed project proposals (Appendix D and E). In accordance with the OPA NRDA regulations, only those alternatives considered technically feasible and capable of being implemented in accordance with applicable laws, regulations and/or permits may be considered for inclusion in a restoration plan (15 CFR Section 990.53 (a)(2)). The Trustee evaluated the feasible restoration alternatives for each category of injury or loss according to the following criteria as set forth in 15 CFR Section 990.54:

(1) the cost to carry out the alternative;
(2) the extent to which each alternative is expected to meet the Trustee' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
(3) the likelihood of success of each alternative;
(4) the extent to which each alternative will prevent future injury as a result of the incident, and avoid collateral injury as a result of implementing the alternative;
(5) the extent to which each alternative benefits more than one natural resource and/or service; and
(6) the effect of each alternative on public health and safety.

Additionally based upon state grant program concerns and the need to expedite completion of the restoration projects, the Trustee added three additional criteria to be considered when evaluating the restoration alternatives:
(7) the extent to which each alternative is consistent with applicable management plans, including recovery plans for the threatened and endangered sea turtles.
(8) the capability of each alternative to be carried out in the timeframe provided and that all monitoring be addressed within the permitting requirements.
(9) The extent to which matching funds are available.

Further, since these incidents were moderate in size, the Trustee has combined the impacts so that whenever possible a larger multifaceted restoration project can be funded. These projects usually provide a greater cost/benefit ratio as overhead, planning, permitting and construction costs are shared and therefore greatly reduced.

3.2.3 Environmental Consequences (Indirect, Direct, and Cumulative)

To restore resources and/or services lost as a result of these incidents, the Trustee examined a variety of projects under the following restoration alternatives: (1) no action and natural recovery, and (2) ecological restoration. The Trustee intends to avoid or reduce negative impacts to existing natural resources and services to the greatest extent possible. However, in implementing or approving the implementation of restoration actions, the Trustee could undertake actions that may have short- or long-term effects upon existing habitats or non-injured species. This section addresses the potential overall cumulative, direct, and indirect impacts, and other factors to be considered in selecting suitable restoration projects.

The Trustee believes that the projects selected in this restoration plan will not cause significant impacts to natural resources or the services that they provide. Further, the Trustee does not believe the projects will affect the quality of the human environment in ways deemed "significant."

Cumulative Impacts: Since the Trustee chose the projects primarily to improve recovery of injured natural resources; the cumulative environmental consequences will be largely beneficial. These cumulative impacts include restoration of the injured ecosystem and by increasing the numbers of birds, fish and invertebrates. Any unanticipated cumulative adverse effects on an area or other area program, plan, or regulatory regime from a selected project identified prior to implementation will result in reconsideration of the project by the Trustee. Project monitoring will confirm that cumulative impacts will be beneficial rather than adverse.

Indirect Impacts: Environmental consequences will not be limited to the project locations. Indirect beneficial impacts will occur. Cumulative beneficial impacts at the project locations, and in the surrounding area, are expected.

Direct Impacts: Overall, the actions described in this Final DARP/EA will have no negative impact on the surrounding ecosystems. Nor should these projects have any short-term negative impacts.

Any project that requires a permit for implementation will integrate best management practices, other conditions, and consultations to ensure that the project will be constructed in accordance with federal, state, and local regulations.

3.2.4 Monitoring

The OPA NRDA regulations specify that a restoration plan must include a description of monitoring needed to document restoration progress, performance, and success. Monitoring is an essential component of any restoration project. Monitoring focuses on selected features of the restored systems at periodic intervals and ensures: 1) an objective assessment of performance criteria established in the restoration plan, and 2) permit compliance. Monitoring may include the collection of certain baseline information prior to any restoration activity. Most importantly, monitoring allows objective evaluation of the need for any mid-course corrections. The monitoring actions judged appropriate for the selected restoration alternatives are discussed in the injury-specific restoration sections below.

3.3 Wetland and Mudflat (saltmarsh) Injury and Restoration Plan

3.3.1 Injury Determination and Quantification

3.3.1.1 Description of the Injury

The incidents, based on hindcasting of the timing and path of the oil, resulted in shoreline impacts and wetland injury. Concentrations of polycyclic aromatic hydrocarbons (PAH) in the water column are known to be toxic to wetland and mudflat habitat. The SIMAP model calculated exposure of wetlands, mudflats and associated fauna (Table 5). The injured fauna (predominantly small fishes and invertebrates) are not readily observed or measured due to their size and extremely ephemeral nature. Fauna could be eaten by foraging fishes and seabirds, decompose rapidly, or transported out of the area. Thus, direct observation of the associated fauna is unlikely.

3.3.1.2 Injury Quantification

Injury to wetlands, mudflats and associated faunal injuries, primarily fishes and invertebrates, was calculated using the SIMAP model. Based on biological resources in the area of the incidents, current data, water depth, wind speed and direction and toxicity data, SIMAP calculated the direct impacts to wetlands, mudflats and associated fauna (fish and invertebrates). In addition, there is a loss of future productivity from the wetland and fish and invertebrates that were killed.[1] Appendices B and C present the fish and invertebrate injury quantification information from the SIMAP report.

Table 5. Intertidal Wetland and Mudflat (saltmarsh) Injuries for NE Region

DEP Case No.	ASA #	Volume	Wetland and Mudflats Oiled (m^2)
92-07-0805	17	XII	0
94-07-0304	18	XIII	0
95-1B-1042	19	XIV	0
94-08-1164	20	XV	0
94-08-1195	21	XVI	28
96-1A-0538	22	XVII	157
95-08-0017	23	XVIII	65
NE Regional Total			250

Table 5. Excerpted from Table E-3, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

3.3.2 Wetland and Mudflat Restoration Planning

3.3.2.1 Selected Primary Restoration Alternative

[1] The impact on each species is relatively small compared to the total population so changes in natural and fishing mortality of surviving animals are assumed not to compensate for the killed animals during the natural lifespan of the animals killed (French-McCay et al., 2001).

While mortality of vegetation in wetlands occurs above about 14 mm of oil, according to literature review in French et al. (1996a), fortunately, none of the wetland exposures exceeded this threshold dose. Shoreline habitats, however, were oiled by more than 0.1 mm (>100 g/m^2) of oil, which is the minimum (dose) in the model for impact to wildlife in the intertidal areas.

Wetland, mudflat and associated faunal injuries are expected to recover rapidly. In the wetland, the amount of oiling was not enough to be lethal to the plants such that the entire habitat would be destroyed. Therefore recovery was estimated to be 1 year. The associated faunal injuries are also expected to recover rapidly and naturally due to fish and invertebrate reproductive recruitment potential. The Trustee believes that production from unaffected organisms and recruitment from tributaries and other areas of the Atlantic Ocean will provide sufficient egg and young production to sustain the populations of fish and invertebrates injured by these incidents, Therefore, the Trustee selected natural recovery as the primary restoration alternative.

3.3.2.2 Selected Compensatory Restoration Alternatives

The Trustees selected wetland restoration as the alternative to produce compensatory wetland, mudflat (saltmarsh) and faunal compensation.

1. Wetland Restoration: Wetland restoration can compensate for the loss of the injured wetlands and support seabird, fish and invertebrate production. The Nature Conservancy project includes the removal of exotic vegetation and accumulated trash and debris on intracoastal islands in the St. Johns River system in Duval County. The Nature Conservancy then plans to plant the area with native vegetation and has plans for long term maintenance through a management program. Through the restoration of this habitat, the Trustee can provide the fish and invertebrate biomass that was lost. The amount of restoration required to offset the fish biomass losses is determined based on literature estimates of secondary productivity.

3.3.2.3 Non-Selected Compensatory Restoration Alternatives

1. Natural Recovery: There is an interim loss associated with the wetland and mudflat injury: the habitat and associated fauna that were lost and their future production (biomass of individual if it had grown, not reproductive production) will not be restored through natural recovery. Compensatory restoration is necessary to provide the biomass that was lost.

2. DEP Pumpkin Hill Creek Road Stabilization: The Trustees determined the road stabilization project although beneficial to the adjacent wetlands was not an appropriate use of restoration funds. It would not increase the amount of wetland to compensate for that lost nor that which would be required to offset the fish biomass losses.

3.3.2.4 Evaluation of Compensatory Restoration Options and Environmental Consequences

It is well recognized in the ecological sciences that wetland habitat contributes to the production of fish and invertebrate biomass, which satisfies the goal of compensatory restoration. Wetland habitat restoration is likely to succeed as it has been successfully implemented throughout Florida. Wetlands are created by scraping down unproductive upland habitat or disturbed wetlands, which are dominated by exotics, to appropriate elevations for wetland growth. While this project involves habitat conversion, the Trustees do not believe that this conversion causes collateral injury. In fact, wetland restoration, once the source of exotics have been removed, benefits other resources injured by these incidents by providing foraging, roosting and nesting habitat for seabirds. Wetland restoration is not expected to have any effects, positive or negative, on public health and safety; however the alternative is consistent with natural resource management plans, including plans for exotic plant removal, shoreline erosion protection, and shoreline habitat restoration.

Based upon past Trustee restoration experience, average wetland habitat creation costs are estimated at approximately $30,000 per acre, excluding oversight and monitoring costs.

3.3.2.5 Project Selection

Based upon the above analysis, the Trustee selected wetland habitat creation as the restoration alternative to compensate for wetland, mudflat and associated faunal biomass and production lost as a result of these incidents. Wetland habitat creation is much more certain to be, and is, a cost-effective alternative. The wetland alternative will also benefit other resources, and would provide the incidental benefit of removal of problematic exotic plant species.

3.3.2.6 Restoration Scaling

The Trustees used a service-to-service scaling method or Habitat Equivalency Analysis (HEA) to determine the wetland compensatory restoration project scale. In this case, the size of the wetland habitat project is selected and scaled so that the restored habitat leads to a net gain in wetland, mudflat, fish and invertebrates production over and above that produced by the location before the restoration. The size of the habitat (acreage) is scaled to compensate for the injury (interim loss). The wetland compensatory restoration requirements are 37 m^2 (Table 6).

Table 6. Wetland compensatory restoration requirements for faunal injuries in intertidal wetlands and mudflats (saltmarsh for NE).

DEP Case No.	ASA #	Case Volume	Wetland and Mudflat Injury (m^2-years)	Compensatory Wetland Area (m^2)
92-07-0805	17	XII	-	-
94-07-0304	18	XIII	-	-
95-1B-1042	19	XIV	-	-
94-08-1164	20	XV	-	-
94-08-1195	21	XVI	28	4
96-1A-0538	22	XVII	157	23
95-08-0017	23	XVIII	65	10
NE Regional Total			250	37

Table 6. Excerpted from Table E-6, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

3.3.2.7 Monitoring Plan for Wetland and Mudflat (saltmarsh) Restoration

Project monitoring to evaluate the success of the wetland restoration will be conducted as part of the permitting process related to the project. The Trustee will perform project oversight and administration of the selected restoration project.

3.4 Water Column Injury and Restoration Plan

3.4.1 Injury Determination and Quantification

3.4.1.1 Description of the Injury

These incidents, based on hindcasting of the timing and path of the oil, resulted in water column concentrations of polycyclic aromatic hydrocarbons (PAH) that are known to be toxic to aquatic organisms in laboratory tests. Exposure of the water column biota, as calculated by the SIMAP model, would be distributed within a large volume of ocean water, and not readily observed or measured due to its extremely ephemeral nature. The oiled and injured organisms (predominantly small fishes and invertebrates) would be expected to be eaten by foraging fishes and seabirds, decompose rapidly, or be transported by the current out of the area. Thus, direct observation of the water column injury was unlikely.

3.4.1.2 Injury Quantification

Injury to the water column biota, primarily fishes and some invertebrates, was calculated using the SIMAP model. Based on biological resources in the area of the incident and toxicity data, SIMAP calculated the direct kill of fish and invertebrates. In addition to the direct kill, there is a loss of future productivity from the fish and invertebrates that were killed.[2] SIMAP computed

[2] The impact on each species is relatively small compared to the total population so changes in natural and fishing mortality of surviving animals are assumed not to compensate for the killed animals during the natural lifespan of the animals killed (French-McCay et al., 2001).

the normal production (as net somatic growth) expected from the killed organisms and summed those losses over predicted life-spans. The direct kill and the foregone production were quantified as the total biomass lost.[3] Total biomass loss is calculated using the number of fish killed by age class and species, standard fisheries equations of length versus age, and weight versus length, and survival, mortality, and growth rate determinations. The fish and invertebrate biomass loss resulting from the incidents totaled 317 kilograms wet weight (French-McCay et al., 2001). Appendix B and C present the fish and invertebrate injury quantification section of the SIMAP report.

Table 7. NE Water Column Injuries - Biomass of Fish and Invertebrates Lost (kg)

DEP Case No.	ASA #	Case Volume	Biomass of Fish and Invertebrates Lost (kg)
92-07-0805	17	XII	277
95-1B-1042	19	XIV	40.1
Regional Total			317

Table 7. Excerpted from Table E-3, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

3.4.2 Water Column Restoration Planning

3.4.2.1 Selected Primary Restoration Alternative

The water column resource injuries are expected to recover rapidly and naturally due to fish and invertebrate reproductive recruitment potential. The Trustees believe that production from unaffected organisms and recruitment from tributaries and other areas of the Atlantic Ocean will provide sufficient egg and young production to sustain populations of fish injured by the incident. Therefore, the Trustees selected natural recovery as the primary restoration alternative.

3.4.2.2 Selected Compensatory Restoration Alternatives

The Trustees selected further funding of the Nature Conservancy's wetland restoration project as the alternative to produce compensatory fish and invertebrate biomass.

1. Wetland Restoration: Wetlands support fish and invertebrate production and, through the restoration of this habitat, the Trustee can provide the fish and invertebrate biomass that was lost. The amount of restoration required to offset the fish biomass losses is determined based on literature estimates of secondary productivity. Combining these injuries with the wetland and bird injury will allow the Trustee to support a portion of the overall project.

[3] Because the number of organisms affected are relatively small portions of the total reproductive stock, sufficient eggs will be produced to replace the lost animals in the next generation (French McCay et al., 2001).

3.4.2.3 Non-Selected Compensatory Restoration Alternatives

1. Natural Recovery: There is an interim loss associated with the water column injury: the fish and invertebrates that were lost and their production forgone will not be restored through natural recovery. Compensatory restoration is necessary to provide the biomass that was lost.

3.4.2.4 Evaluation of Compensatory Restoration Options and Environmental Consequences

It is well recognized in the ecological sciences that wetland habitat (saltmarsh) contribute to the production of fish and invertebrate biomass, which satisfies the goal of compensatory restoration. Wetland habitat restoration is likely to succeed as it has been successfully implemented throughout Florida. Wetlands, which are dominated by exotics, have less habitat value than those that are dominated by native species. Wetlands are created by scraping down unproductive upland habitat, dominated by exotics, to appropriate elevations for salt marsh growth. While this project involves habitat restoration, the Trustees do not believe that this conversion causes collateral injury. In fact, salt marsh creation benefits other resources injured by these incidents by providing foraging, roosting and nesting habitat for seabirds. Wetland restoration is not expected to have any effects, positive or negative, on public health and safety; however the alternative is consistent with natural resource management plans, including plans for exotic plant removal, shoreline erosion protection, and shoreline habitat restoration.

Based on past Trustee restoration experience, saltmarsh habitat creation costs as estimated $30,000 per acre, excluding oversight and monitoring costs.

3.4.2.5 Project Selection

Based upon the above analysis, the Trustee selected saltmarsh restoration as the restoration alternative to compensate for fishery biomass and production lost as a result of these incidents. Saltmarsh habitat restoration is certain to be successful, and is a cost-effective alternative. The wetland alternative could also benefit other resources, and would provide the incidental benefit of removal of problematic exotic plant species.

3.4.2.6 Restoration Scaling

The Trustee used a service-to-service scaling method or Habitat Equivalency Analysis (HEA) to determine the wetland compensatory restoration project scale. The same concepts of service-to-service scaling that were described earlier apply here as well. In this case, the size of the habitat project is selected so that the biomass of fish and invertebrates provided by the habitat is equivalent to the biomass that was lost due to the injury. The wetland project has to be 342 m^2 in size to compensate for the 317 kg of fish and invertebrate biomass lost in these incidents.

Table 8. Summary of Compensatory Restoration Requirements for Acute Mortality to Fish and Invertebrates if salt marsh is created (m^2)

DEP Case No.	ASA #	Case Volume	Biomass of Fish and Invertebrates Lost (kg)	Fish and Invertebrates (m^2)
92-07-0805	17	XII	277	316
95-1B-1042	19	XIV	40.1	27
NE Regional Total			317	342

Table 8. Excerpted from Table E-3 and E-4, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

3.4.2.7 Monitoring Plan for Water Column Restoration

Project monitoring to evaluate the success of the wetland restoration will be conducted as part of the permitting process related to the project. The Trustee will perform project oversight and administration of the selected restoration project.

3.5 Bird Injury and Restoration Plan

3.5.1 Injury Determination and Quantification

3.5.1.1 Description of the Injury

The SIMAP indicates that seabirds, mostly widgeons, gadwalls and herons, were exposed to a surface oil slick. Birds that were exposed were expected to suffer sub-lethal injury or death due to a combination of smothering and toxicity. The number of birds calculated to have been exposed and killed was estimated as 36 birds [range from <1 bird (a probability) to 32.82 birds]. This small number would be expected to go largely unobserved (Ford et al., 2001).

3.5.1.2 Injury Quantification

The Trustee used SIMAP to quantify the injury to birds. SIMAP calculated the number of exposed birds based on the area affected by the incidents and the number and type of birds expected within that area. The model converts sub-lethal injury to a smaller number of birds killed. The calculated injury for birds is primarily widgeons, gadwalls and herons (French-McCay et al., 2003 – Appendices B and C). The impact on local bird abundance is relatively small compared to the total population, so changes in mortality of surviving birds are assumed not to compensate for the killed animals during the natural lifespan of the animals killed. It is assumed that these birds were fully-grown so there would have been no additional production from weight gain over their lifetime; thus, there is not a production foregone injury component.[4]

3.5.2 Bird Restoration Planning

3.5.2.1 Selected Primary Restoration Alternative

The Trustee expects the natural reproductive potential of unaffected organisms to support the species of birds injured by these incidents. In other words, it is expected that the birds will be

[4] There is also no reproductive loss component.

back to baseline in one generation through natural reproductive processes. Therefore, the Trustee selected natural recovery as the primary restoration alternative.

3.5.2.2 Selected Compensatory Restoration Alternative

What is not replaced through natural recovery are the birds that were killed. So, there is an interim loss and compensatory restoration is necessary to replace the birds that were lost. The Trustee selected the following alternatives as compensatory restoration for the bird injury.

1. Wetland Restoration: The Trustee considered saltmarsh restoration as a way to restore the birds that were lost due to the incidents. In addition to supporting fish and invertebrate production, saltmarsh habitat supports bird productivity through provision of nest sites, foraging areas and other services. As indicated above, there is a saltmarsh restoration project available in Duval County. The amount of restoration required to offset the bird losses can be determined based on literature estimates of salt marsh secondary production.

3.5.2.3 Non-Selected Compensatory Restoration Alternative

1. Natural Recovery: There is an interim loss associated with the bird injury. However, the birds that were lost are not replaced through natural recovery. Therefore, the Trustee could not select natural recovery as the compensatory restoration alternative.

3.5.2.4 Evaluation of Compensatory Restoration Options and Environmental Consequences

It is well recognized in the ecological sciences that wetland habitat contributes to the production of bird, fish and invertebrate biomass, which satisfies the goal of compensatory restoration. The debris removal, which is a large part of this project, will remove monofilament and other injurious garbage has been documented in bird deaths. The wetland habitat restoration is likely to succeed as it has been successfully implemented throughout Florida. Wetlands, which are dominated by exotics, have less habitat value then those which are dominated by native species. While this project involves habitat restoration, the Trustee does not believe that this will cause collateral injury. Wetland restoration will benefit birds by providing higher quality and safer foraging, roosting and nesting habitat for seabirds. Wetland restoration is not expected to have any effects, positive or negative, on public health and safety.

3.5.2.5 Project Selection

Based upon the above analysis, the Trustee selected salt marsh restoration as the compensatory restoration alternative. This alternative has a documented record of success, is cost-effective, would replace the lost birds relatively quickly, and could indirectly benefit a range of other injured wildlife.

3.5.2.6 Restoration Scale

The Trustee used a service-to-service scaling method or Habitat Equivalency Analysis (HEA) to determine the wetland compensatory restoration project scale (Table 9). The same concepts of

service-to-service scaling that were described earlier apply here as well. In this case, the size of the habitat project is selected so that the biomass of birds provided by the habitat is equivalent to the biomass that was lost due to the injury. The wetland project has to be 473 m^2 in size to compensate for the 36 birds lost in these incidents.

Table 9. Summary of compensatory restoration requirements for acute mortality to birds if Saltmarsh is Created (m^2).

DEP Case No.	ASA #	Case Volume	Number of Birds Lost (#)	Birds (m^2)
94-07-0304	18	XIII	32.82	410
95-1B-1042	19	XIV	0.18	4
94-08-1164	20	XV	0.56	12
96-1A-0538	22	XVII	2.2	45
95-08-0017	23	XVIII	0.04	0.3
			36	473

Table 9. Excerpted from Table E-3 and E-4, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

3.5.2.7 Monitoring Plan for Bird Restoration

Project monitoring to evaluate the success of the wetland restoration will be conducted as part of the permitting process related to the project. The Trustee will perform project oversight and administration of the selected restoration project.

3.6 Summary of Restoration Planning

The Trustee selected a saltmarsh restoration project proposed by The Nature Conservancy in response to these incidents. The saltmarsh restoration project in the St Johns River watershed will replace the wetland, bird, fish and invertebrate biomass that was lost due to these incidents.

Table 10. Summary of compensatory restoration requirements for injuries if saltmarsh is created (m^2)

DEP Case No.	ASA #	Case Volume	Compensatory Wetland Area (m^2)	Birds (m^2)	Fish and Invertebrates (m^2)	Total Compensatory Wetland Area (m^2)
92-07-0805	17	XII	-	0	316	
94-07-0304	18	XIII	-	410	0	
95-1B-1042	19	XIV	-	4	27	
94-08-1164	20	XV	-	12	0	
94-08-1195	21	XVI	4	0	0	
96-1A-0538	22	XVII	23	45	0	
95-08-0017	23	XVIII	10	0.3	0	
NE Regional Total			37	473	342	852

Table 10. Excerpted from Table E-6 and E-4, ASA Final Report Volume I: Description of Approach and Methods ASA 01-138 May 2003

The costs of restoration are what become part of a natural resource damages claim. The detailed costs of restoration are in the project proposals as found in the Administrative Record (Section 1.6). Table 11 details the breakdown of the selected project costs. Once this restoration plan is final, the Trustee proposes to fund a portion of this project out of State funds and then seek reimbursement from the Federal Oil Spill Liability Trust Fund for payment.

Table 11: Project costs

Nature Conservancy Habitat Restoration	**Cost**
Personnel	$31,597
Travel	$852
Supplies	$8,090
Communication	$1,700
Miscellaneous	$200
Total	$42,439
Indirect Costs	$10,610
Total Project Costs	$53,049

The restoration equivalent for the injuries incurred as a result of these releases total 852m^2. With 4,040m^2 per acre, this is the equivalent of 0.2 acres. Since an acre of successful wetland habitat creation in Florida is documented at an estimated value of $30,000 per acre, the scaled value of the Trustee restoration plan for this region is the equivalent of $6,500.

In review of the budget for the Nature Conservancy Fund Restoration Plan, the Trustees have determined that the funding of $6,500, specifically for supplies necessary to complete habitat restoration, is the most equitable use of restoration funds. This portion of the budget will be used specifically for the equipment and materials required for the removal of debris and exotic species, as well as obtaining plants and vegetation necessary to recultivate a natural saltmarsh environment. Trustee funding of the supplies necessary to complete the habitat restoration phase of this project meets the Trustee directive to measure the damages to natural resources and restore, rehabilitate, replace or acquire the equivalent of the injured natural resources.

3.7 Assessment Costs

The Trustee has selected restoration to compensate for the natural resource and service injuries. In addition to recovering the costs of restoration, OPA provides for the Trustee to identify and recover their costs of conducting the natural resource damage assessment. The Trustee has incurred costs from performing the assessment and expects to incur future assessment costs. These past and anticipated costs will be presented to the Federal Oil Spill Liability Trust Fund at the time the Trustee submit their full restoration claim for payment.

3.8 Restoration Oversight and Administrative Costs

Once the restoration project is implemented, the Trustee will oversee the project by reviewing project purchases and monitoring reports as to materials removed and native species supplied for this project. The trustee will also determine whether corrective actions are necessary. The Trustee will engage in other actions to administer the project during this period, including

documenting what the trustee spends on the project for the year. The costs of these activities are another part of the cost of restoration and they will be included in the claim that the Trustee will submit to the Federal Oil Spill Liability Trust Fund.

4.0 Compliance with Applicable Laws and Regulations

Implementation of the Trustee's selected restoration alternatives is subject to the requirements of laws and regulations, in addition to the Oil Pollution Act, relating to environmental protection and the safe use of waterways, among other things. This section discusses the specific requirements and prohibitions of several laws that are likely applicable to the selected projects, as well as the procedures that the Trustee is required to follow in complying with these laws.

The Trustee provided notification to the FDEP agencies that have coastal consistency review responsibilities for comment on review of this DARP/EA. On May 29, 2003 the DRAFT DARP/EA was released and posted on the FDEP – BER webpage at www.dep.state.fl.us/law/ber. The Draft DARP/EA was accessed by clicking the "Natural Resource Damage Claims" link. The Trustee received three responses supporting the DARP/EA by the review close date of June 20, 2003. As a result, there were no significant changes in the evaluation or selection of restoration projects since the Draft DARP/EA.

Applicable State laws are summarized in the Coastal Zone Management Act section, and compliance with these laws was ensured through the consistency determination and review process.

The general policies and prohibitions of these laws are described in the following sections.

4.1 Wetland, Bird, Fish and Invertebrate Injury: Saltmarsh Habitat Restoration

Nature of likely impacts. This project will result in restoration of intertidal areas heavily impacted by invasive species, into native salt marsh habitat. Salt marsh habitats are known for their support of fishery production (Yanez-Arancibia et al., 1980), and their importance to birds as foraging, roosting and nesting areas. The project can also be implemented so as to avoid any adverse environmental impacts to surrounding aquatic habitats. Thus, this project will result in a net improvement in natural resource services provision once implemented.

Effects on public health and safety. This project will have no effects on public health and safety, adverse or beneficial.

Unique characteristics of the geographic area. The area of the St Johns River that will be affected by the wetland project is not unique.

Controversial aspects of the project or its effects. The Trustees know of no controversial aspects of the selected project. Removal of exotic species is a priority throughout the State of Florida, and salt marsh habitats are appreciated for their contribution to recreational fisheries.

Uncertain effects or unknown risks. There are no uncertain adverse effects or unknown adverse risks associated with this project. Saltmarsh habitat restoration is a long-established and successful technology and the Trustees have overseen several such projects in Florida.

Precedential effects of implementing the project. There are no precedential effects of implementing the project, as saltmarsh habitat restoration is commonly implemented throughout Florida.

Possible significant, cumulative impacts. There are no adverse impacts expected from this project. The project size is small in scale relative to the extent of saltmarsh habitat in the area and in the region, thus no significant cumulative impacts are foreseen.

Effects on National Historic Sites or nationally significant cultural, scientific or historic resources. There are no discovered National Historic Sites, or nationally significant cultural, scientific, or historic resources in the areas in which the project will be implemented. However, from historic preservation experts advise that coastal zones can be rich in undiscovered artifacts and sites. The Federal Clean Water Act and State environmental permits required for this project will entail consulting with historic preservation experts to ensure that the digging involved in implementing this project will ensure the protection and preservation of any historic or cultural resources found.

Effects on endangered or threatened species. The saltmarsh project on the St. Johns River will have no adverse impacts on endangered or threatened species except possibly to support endangered and threatened fish and bird species.

Violation of environmental protection laws. No environmental protection laws will be violated during the implementation of these projects. It is a requirement of the OPA NRDA regulations that restoration alternatives considered be capable of being implemented in compliance with all applicable laws and regulations.

Conclusion. This project will beneficially restore intertidal habitat populated with invasive species into native intertidal saltmarsh habitat, thus enhancing the habitat's value for fishery and bird species. The project is small in scale, and thus its impacts are not judged to be significant, as defined by NEPA.

4.2 Coastal Zone Management Act

The broad purpose of the Coastal Zone Management Act, 16 U.S.C. § 1451 *et seq*. (CZMA), which is administered by NOAA, is to preserve, protect, develop, and where possible, to restore or enhance the resources of the Nation's coastal zone for this and succeeding generations. States that produce acceptable coastal zone management plans are provided with financial assistance and authorized to review Federal activities within the State's coastal zone to ensure that these actions are consistent with the State's program. The States' plans identify permissible land and water uses, and their associated impacts on the regulated coastal zone.

Activities funded, approved, or implemented by Federal agencies and which will have an impact on State coastal zones must be consistent with the State's Coastal Zone Management Program and in particular with "enforceable policies" identified in their management plans. A certification of consistency by the Federal project proponent, and a concurrence from the affected State is required, in general no later than 90 days before final Federal approval of the activity. Florida's Final Coastal Management Program Plan was approved by NOAA in 1981. The Department of Environmental Protection is the agency designated to conduct consistency reviews for the State of Florida; the Department of Community Affairs was designated agency until July 1, 2002.

The Trustee reviewed the Florida Coastal Management Program Plan and identified several enforceable policies that are applicable to some or all of the restoration actions. In analyzing these policies, consisting of chapters of the Florida Statutes, the Trustee determined that the restoration project proposed in this Draft DARP/EA are consistent with the FCMP. The Draft DARP/EA was submitted to various DEP programs for review and concurrence.

The Trustee's consistency analysis was related to the following relevant FCMP enforceable policies and their general purposes:

Chapter 161 FS – Beach and Shore Preservation: these provisions regulate construction, reconstruction, and other physical activity in the coastal zone, and regulate actions for protection and preservation of the coastal zone, particularly from erosion.

Chapter 253 FS – State Lands: these provisions regulate the acquisition of land by the State, and the management, conservation, protection, disposition, and use of State-owned lands. Florida DEP is mandated to regulate land use in order to assure the maximum benefit and use for the general public. The wetland project will be implemented on, or will affect the use of, State-owned lands. The project will remove invasive species and create habitat that is supportive of recreational fisheries production.

Chapter 258 FS – State Parks and Preserves: these provisions require the Division of Recreation and Parks to promote the State park system for the use, enjoyment and benefit of the people of Florida and for visitors.

Chapter 370 FS – Saltwater Fisheries: these provisions require Florida Fish and Wildlife Conservation Commission to administer, develop and conserve marine fishery resources of the State, including through the protection and enhancement of the marine and estuarine environments and water quality. These provisions recognize the importance of marine commercial and recreational fishing, and the importance of protecting and conserving sea turtles and their habitat. The wetland project was specifically selected to replace fishery resource production lost due to this incident.

Chapter 372 FS – Wildlife: these provisions implement the State policy of conservation and wise use of freshwater fish and wildlife species, with particular emphasis on endangered and threatened species. The saltmarsh project, will further the policies of this chapter.

Chapter 375 FS – Outdoor Recreation and Conservation: the applicable provisions of this chapter concern public use and benefit, now and into the future, pertaining to public beaches.

Chapter 376 FS – Pollutant Discharge Prevention and Removal: the policies and goals of this chapter are highly similar to those of the Federal Oil Pollution Act under which this restoration plan was developed. These provisions prohibit the discharge of pollutants, including oil, into or upon any coastal water, estuary, tidal flat, beach or lands adjoining the seacoast. Among other things DEP is directed to recover damages resulting from pollution discharges, for use to restore damaged natural resources to pre-discharge conditions. These provisions authorize basing the measure of damages on the cost of actions to restore injured resources when restoration is feasible. This Final DARP/EA is fully consistent with the provisions of this chapter.

Chapter 403 FS – Environmental Control: these provisions regulate routine or expected discharges of pollution into the air and waters of the State. Permits may be issued for discharges that do not unacceptably degrade water quality and if the project is in the public interest. These provisions regulate dredge and fill projects, which includes the wetland habitat creation project. Provisions of this chapter also recognize the importance of wetlands resources in the State, for their ecological, shore stabilization, and water quality functions.

Chapter 582 FS – Soil and Water Conservation: like other chapters of the Florida Statutes, these provisions are concerned with erosion and loss of soil resources in the State, and the impacts of soil erosion on water quality.

4.3 Endangered Species Act

The purpose of the Endangered Species Act, 16 U.S.C. § 1531 *et seq.*, is to achieve conservation of endangered and threatened species, and the ecosystems upon which such species depend. All projects funded by Federal agencies are required to insure that those activities are not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of habitat designated as critical for such species, unless the agency is granted an exemption for the action. The Department of the Interior, through the Fish and Wildlife Service, has been delegated primary authority to oversee Federal compliance with the Endangered Species Act, though NOAA is delegated this responsibility for certain species including sea turtles when they are at sea.

If it is determined that a Federal threatened or endangered species may be in the action area of the project, the Trustee must consult with the Fish and Wildlife Service to ensure that implementing the project will not jeopardize the listed species. If the action agency demonstrates that the project does not constitute a "major construction activity," and the project will not adversely affect a listed species or its critical habitat, it submits a "no effect determination" to the Fish and Wildlife Service for its concurrence. If the project constitutes a major construction activity, then the action agency must prepare a biological assessment with a

more in-depth evaluation of the potential effects of the project on the listed species, which may still lead to a no effect determination. If the project is likely to adversely affect either a listed species or its critical habitat, then more formal consultation procedures are required.

The Federally endangered West Indian manatee may occur in waters around the location of the wetland habitat creation project. Several species of threatened or endangered birds may use habitats adjacent to the location of the wetland restoration project. The wetland habitat creation project will create new habitat available for use by birds. The project can also be implemented outside of the nesting seasons of any of the listed species. The project is not expected to impact the West Indian Manatee, in that no measurable discharges of pollutants, including sediments, are anticipated in implementing the project.

The Trustee does not believe that any of its projects constitute major construction activities, and thus does not believe that a biological assessment is required to complete its Endangered Species Act consultation requirements. The Trustee believes that implementation of any of its restoration projects is not likely to have adverse effects on any Federal endangered or threatened species. Compliance with the provisions of this law will be addressed in the permitting process for the selected project.

4.4 Marine Mammal Protection Act

The Marine Mammal Protection Act, 16 U.S.C. § 1361 *et seq.*, is the principal Federal legislation for the protection of marine mammals. The Act recognizes the important role that marine mammals play in the ecosystem as well as their recreational and aesthetic value. The Act prohibits, with few exceptions, the taking or importing into the United States of marine mammals or their products. The Act defines "take" as "to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal." The U.S. Fish and Wildlife Service and NOAA share responsibility for the management and conservation of these species. In order to comply with this Act, the Trustee will ensure that implementation of the saltmarsh habitat restoration project will not result in the take of West Indian manatees, by avoiding any measureable discharge of pollutants or sediments into adjacent waters that may be occupied or used by manatees.

4.5 Federal Water Pollution Control Act (Clean Water Act)

The FWPCA, 33 U.S.C. § 1251 *et seq*., was established to restore and maintain the chemical, physical and biological integrity of the Nation's waters. The Act sets a long-term goal of eliminating the discharge of pollutants into navigable waters, and an interim goal of attaining water quality that provides for the protection and propagation of fish, shellfish, and wildlife, as well as opportunities for water recreation. The FWPCA and its amendments comprise a complex set of programs and regulations for accomplishing the purposes of the Act, including, among other things, permit programs for discharges from facilities and other "point sources," specific discharge limitations for certain identified pollutants or categories of pollutants, provision for qualitative and quantitative water quality standards to be set by the States for their water bodies, and regulation of dredge and fill operations.

The Act's definitions of "pollutant," "discharge," and "fill" are so broad as to make the Act applicable to the wetland habitat creation project. In general terms, the Trustee or their contractor will be required to apply for a permit to discharge pollutants into the marine environment in order to implement this project. The permit will need to include a certification that the discharges involved will not violate any of the State's applicable water quality standards. Further, to comply with the Act's guidelines for dredge and fill projects, the Trustee will have to demonstrate that there is no practicable alternative to the project that will have less adverse impact on the aquatic ecosystem, that the discharges will not contribute to the significant degradation of the marine environment, and that the project will be performed to minimize potential adverse impacts.

Given their previous experience with implementing saltmarsh habitat creation projects, the trustee is confident that the restoration alternatives can be implemented in compliance with the FWPCA.

4.6 Rivers and Harbors Act

Provisions of the Rivers and Harbors Act (33 U.S.C. § 401 *et seq.*) that are applicable to the Trustee's restoration projects prohibit the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States. During permit application consultations with the Army Corps of Engineers required for compliance with the Clean Water Act, the Trustee will verify compliance with the requirements of the Rivers and Harbors Act.

4.7 Archaeological Resources Protection Act

The Archaeological Resources Protection Act, 16 U.S.C. § 470aa *et seq.*, was established for the purpose of protecting, for present and future generations of the American people, archaeological resources and sites on public lands, which include lands owned by the Federal government or Indian tribes. The Act prohibits any person, without a permit, from excavating, removing, damaging, altering, or defacing archaeological resources on or from public lands. The Act is administered by the Department of the Interior (DOI). The Trustee will verify compliance with the Act during the permitting process.

4.8 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) - Essential Fish Habitat Assessment for Saltmarsh Restoration Project

The Magnuson-Stevens Act (16 U.S.C. § 1801 *et seq.*) as amended and reauthorized by the Sustainable Fisheries Act (Public Law 104-297) established a program to promote the protection of essential fish habitat (EFH) through the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. After EFH has been described and identified in fishery management plans by the respective regional fishery management councils, Federal agencies are obligated to consult with the Secretary of Commerce, acting through the National Marine Fisheries Service, with respect to any action authorized,

funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that *may* adversely affect any EFH.

The South Atlantic Fishery Management Council ("SAFMC") is responsible for issuing fishery management plans and identifying EFH for areas including northeast Florida. Saltmarsh habitat is the only identifiable EFH that is relevant to the restoration project. The SAFMC has identified the following managed species that utilize mangrove habitat during one or more of their lifestages: sub-adult red drum, juvenile goliath grouper, post larval and juvenile gray snapper, juvenile mutton snapper, and adult white grunt.

The Trustee believes that there will be no adverse effects on saltmarsh EFH resulting from implementation of the wetland restoration project. This project will comprise removing invasive species, so as to recreate intertidal saltmarsh. Thus, this project will result in only beneficial impacts, by creating additional essential fishery habitat.

4.9 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, 16 USC § 661 *et seq.*, requires that agencies receiving Federal funds consult with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and State wildlife agencies for activities that result in the impoundment, diversion, channel deepening, or control or modification of any stream or water body, to minimize and mitigate any adverse effects on fish and wildlife resources and habitats. Impoundments of less than 10 acres of surface water are exempted from the consultation requirements. The wetland habitat creation project involves physical construction activity near surface waters, and this project will consist mainly of scraping down an upland area to create intertidal habitat elevations. Thus, it is unlikely that this project will involve impounding, diverting or other control or modification to surface waters. Even if temporary impounding surface waters were required in order to implement this project, it would likely involve far less than 10 acres of surface waters.

4.10 Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act, 16 USC § 2901 et seq., encourages all agencies receiving Federal funds to use their statutory and administrative authorities to the maximum extent practicable and consistent with the agency's statutory responsibilities, to conserve and to promote the conservation of nongame fish and wildlife species and their habitats. The Trustee's wetland habitat creation project is expected to fully comply with this Act.

The Trustee's saltmarsh habitat restoration project was selected to compensate for the loss of fishery resources and production caused by these incidents. Saltmarsh habitats have been documented as assisting in the production of fish biomass, by providing food, shelter, and nursery functions to fish and invertebrates.

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Appendix A: **Florida Threatened and Endangered Species**

Species	**Federal Status**	**Habitat**
Florida panther Puma (=Felis) concolor coryi	E	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Pond swamp, Mangrove
Key deer *Odocoileus virginianus clavium*	E	Tropical hardwood hammock, Mesic temperate hammock, Pine rockland, Mesic pine flatwoods, Hydric pine flatwoods, Freshwater marsh, Mangrove, Saltmarsh
Key Largo cotton mouse *Peromyscus gossypinus allapaticola*	E	Tropical hardwood hammock
Key Largo woodrat *Neotoma floridana smalli*	E	Tropical hardwood hammock
Lower Keys rabbit *Sylvilagus palustris hefneri*	E	Beach dune/Coastal strand, Freshwater marsh, Mangrove, Saltmarsh
Puma (=Mountain lion) *Puma (=Felis) concolor*	T (S/A)	High pine, Tropical hardwood hammock, Scrub, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
Rice rat (=silver rice rat) *Oryzomys palustris natator (=O. argentatus)*	E (CH)	Freshwater marsh, Mangrove, Saltmarsh
Southeastern beach mouse *Peromyscus polionotus niveiventris*	T	Beach dune/Coastal strand
West Indian manatee *Trichechus manatus*	E (CH)	Mangrove, Seagrass, Nearshore reef
Audubon's crested caracara Polyborus plancus audubonii	T	Mesic temperate hammock, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie
Bachman's warbler *Vermivora bachmanii*	E	Mesic temperate hammock, Flowing water swamp
Bald eagle *Haliaeetus leucocephalus*	T	High pine, Scrubby high pine, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh
Cape Sable seaside sparrow *Ammodramus(=Ammospiza) maritimus mirabilis*	E (CH)	Wet prairie, Freshwater marsh
Everglade snail kite *Rostrhamus sociabilis plumbeus*	E (CH)	Hydric pine flatwoods, Freshwater marsh, Pond swamp

Florida grasshopper sparrow *Ammodramus savannarum floridanus*	E	Dry prairie, Wet prairie
Florida scrub-jay *Aphelocoma coerulescens*	T	Scrub, Scrubby flatwoods
Ivory-billed woodpecker *Campephilus principalis*	E	Mesic temperate hammock, Seepage swamp, Flowing water swamp, Pond swamp
Kirtland's warbler *Dendroica kirtlandii*	E	Tropical hardwood hammock, Scrub, Scrubby high pine, Beach dune/Coastal strand, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Seepage swamp, Flowing water swamp, Pond swamp
Piping plover *Charadrius melodus*	T	Beach dune/Coastal strand, Nearshore reef
Red-cockaded woodpecker *Picoides (= Dendrocopos) borealis*	E	High pine, Mesic pine flatwoods, Hydric pine flatwoods
Roseate tern *Sterna dougallii dougallii*	T	Beach dune/Coastal strand, Saltmarsh, Seagrass, Nearshore reef
Whooping crane *Grus americana*	XN	Dry prairie, Wet prairie, Freshwater marsh
Wood stork *Mycteria americana*	E	Hydric pine flatwoods, Wet prairie, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove, Saltmarsh, Seagrass
American alligator *Alligator mississippiensis*	T (S/A)	Hydric pine flatwoods, Wet Prairie, Freshwater marsh, Seepage swamp, Pond Swamp, Mangrove, Hydric pine flatwoods, Wet prairie, Seepage swamp, Flowing water swamp, Pond swamp
American crocodile *Crocodylus acutus*	E (CH)	Mangrove, Seagrass
Atlantic salt marsh snake *Nerodia clarkii (=fasciata) taeniata*	T	Saltmarsh
Bluetail (=blue-tailed) mole skink *Eumeces egregius lividus*	T	High pine, Scrub
Eastern indigo snake *Drymarchon corais couperi*	T	High pine, Tropical hardwood hammock, Scrubby high pine, Beach dune/Coastal strand, Maritime hammock, Mesic temperate hammock, Pine rockland, Scrubby flatwoods, Mesic pine flatwoods, Hydric pine flatwoods, Dry prairie, Cutthroat grass, Freshwater marsh, Seepage swamp, Flowing water swamp, Pond swamp, Mangrove
Green sea turtle *Chelonia mydas (incl. Agassizi)*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Hawksbill (=carey) sea turtle *Eretmochelys imbricata*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef

Kemp's (=Atlantic) ridley sea turtle *Lepidochelys kempii*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Leatherback sea turtle *Dermochelys coriacea*	E	Beach dune/Coastal strand, Seagrass, Nearshore reef
Loggerhead sea turtle *Caretta caretta*	T	Beach dune/Coastal strand, Seagrass, Nearshore reef
Sand skink *Neoseps reynoldsi*	T	High pine, Scrub
Highlands tiger beetle *Cicindela highlandensis*	C	Scrub
Schaus swallowtail butterfly Heraclides (= Papilio) aristodemus ponceanus	E	Tropical hardwood hammock
Stock Island tree snail *Orthalicus reses* (not incl. *nesodryas*)	T	Tropical hardwood hammock
Avon Park harebells *Crotalaria avonensis*	E	Scrub
Beach jacquemontia *Jacquemontia reclinata*	E	Beach dune/Coastal strand
Beautiful pawpaw *Deeringothamnus pulchellus*	E	Mesic pine flatwoods, Hydric pine flatwoods
Big Pine partridge pea *Chamaecrista lineata var. keyensis*	C	Pine rockland
Blodgett's silverbush *Arygythamnia blodgettii*	C	Tropical hardwood hammock, Pine rockland
Britton's beargrass *Nolina brittoniana*	E	High pine, Scrub, Scrubby high pine, Scrubby flatwoods
Cape Sable thoroughwort *Chromolaena frustrata*	C	Tropical hardwood hammock, Pine rockland
Carter's mustard *Warea carteri*	E	High pine, Scrub, Scrubby high pine, Scrubby flatwoods, Mesic pine
Crenulate lead-plant *Amorpha crenulata*	E	Pine rockland
Deltoid spurge *Chamaesyce(=Euphorbia) deltoidea ssp. deltoidea*	E	Beach dune/Coastal strand, Pine rockland
Florida bonamia *Bonamia grandiflora*	T	High pine, Scrub, Scrubby high pine

Florida brickell-bush *Brickellia mosieri*	C	Pine rockland
Florida golden aster *Chrysopsis (=Heterotheca) floridana*	E	Scrub
Florida perforate cladonia *Cladonia perforata*	E	Scrub
Florida pineland crabgrass *Digitaria pauciflora*	C	Pine rockland, Freshwater marsh, Seepage swamp
Florida ziziphus *Ziziphus celata*	E	High pine, Scrub
Florida's semaphore cactus *Opuntia corallicola*	C	Tropical hardwood hammock, Beach dune/Coastal strand
Four-petal pawpaw *Asimina tetramera*	E	Scrub
Fragrant prickly-apple *Cereus eriophorus var. fragrans*	E	Scrub, Scrubby flatwoods
Garber's spurge *Chamaesyce(=Euphorbia) garberi*	T	Pine rockland
Garrett's mint *Dicerandra christmanii*	E	High pine, Scrub, Scrubby high pine
Highlands scrub hypericum *Hypericum cumulicola*	E	Scrub
Johnson's seagrass Halophila johnsonii	T	Seagrass
Key tree-cactus *Pilosocereus (=Cereus) robinii*	E	Tropical hardwood hammock
Lakela's mint *Dicerandra immaculata*	E	Scrub
Lewton's polygala *Polygala lewtonii*	E	High pine, Scrub, Scrubby high pine
Okeechobee gourd *Cucurbita okeechobeensis ssp. Okeechobeensis*	E	Freshwater marsh, Pond swamp
Papery whitlow-wort *Paronychia chartacea(=Nyachia pulvinata)*	T	High pine, Scrub
Pigeon wings *Clitoria fragrans*	T	High pine, Scrub, Scrubby high pine, Scrubby flatwoods

Pineland sandmat *Chamaesyce ssp. pinetorum*	C	Pine rockland
Pygmy fringe-tree *Chionanthus pygmaeus*	E	Scrub, Scrubby high pine
Sand Flax *Linum arenicola*	C	Pine rockland
Sandlace *Polygonella myriophylla*	E	Scrub, Scrubby high pine
Scrub blazing star *Liatris ohlingerae*	E	High pine, Scrub, Scrubby flatwoods
Scrub buckwheat *Eriogonum longifolium var. gnaphalifolium*	T	High pine, Scrub, Scrubby high pine
Scrub lupine *Lupinus aridorum*	E	Scrub
Scrub mint *Dicerandra frutescens*	E	High pine, Scrub, Scrubby high pine
Scrub plum *Prunus geniculata*	E	High pine, Scrub, Scrubby high pine
Short-leaved rosemary *Conradina brevifolia*	E	High pine, Scrub
Small's milkpea *Galactia smallii*	E	Pine rockland
Snakeroot *Eryngium cuneifolium*	E	Scrub
Tiny polygala *Polygala smallii*	E	High pine, Scrub, Pine rockland, Scrubby flatwoods
Wedge spurge *Chamaesyce deltoidea ssp. serpyllum*	C	Pine rockland
Wide-leaf warea *Warea amplexifolia*	E	High pine
Wireweed *Polygonella basiramia(=ciliata var. b.)*	E	Scrub

E = Endangered
T = Threatened
T (S/A) = Similarity of Appearance to a Threatened Taxon
E (CH) = Endangered, Critical Habitat Designated
XN = Experimental Population, Non-Essential
C = Candidate Taxon, Ready for Proposal

Appendix B: Estimation of Natural Resource Damages for 23 Florida Cases Using Modeling of Physical Fates and Biological Injuries; Volume I: Description of Approach and Methods (French-McCay, et al., 2003). See Section 1.6

FlaDEP-NRDA-Main-May2003.pdf

Appendix C: Estimation of Natural Resource Damages for 23 Florida Cases Using Modeling of Physical Fates and Biological Injuries; DEP Volumes XII - XVIII (French-McCay, et al., 2003). See Section 1.6

FlaDEP-Vol-XII_ASA-17.pdf
FlaDEP-Vol-XIII_ASA-18.pdf
FlaDEP-Vol-XIV_ASA-19.pdf
FlaDEP-Vol-XV_ASA-20.pdf
FlaDEP-Vol-XVI_ASA-21.pdf
FlaDEP-Vol-XVII_ASA-22.pdf
FlaDEP-Vol-XVIII_ASA-23.pdf

Appendix D: NE Project Solicitation List (Northeast Region for NPFC Claim)

1. DEP Industrial Waste Section (NED)
2. DEP Technical Support (NED)
3. DEP Drinking Water (NED)
4. DEP State Lands/Environmental Resource Permitting (NED)
5. DEP State Parks and Recreation (Northern and Central Region)
6. DEP Pumpkin Hill Creek Buffer Preserve
7. City of Jacksonville RESD
8. DEP Beaches and Coastal Systems (NED)
9. Army Corp of Engineers Jacksonville
10. St. Johns River Water Management District
11. Timucuan Ecological and Historic Preserve
12. Guana/ Tolomato/ Mantanzas National Estuaries
13. US Fish and Wildlife Services
14. Flagler County Road & Bridges
15. Archie Carr Refuge
16. NAS Jax and Mayport
17. USCG
18. Sea Turtle Preservation Society
19. DEP Planner (NED)
20. DEP External Affairs (Central District)
21. DEP Planner (Central District)

22. DEP State Lands/ Environmental Resource Permitting (Central District)
23. University of Central Florida – Marine Program

APPENDIX E: List of all Proposed Restoration Projects Submitted to the Northeast Region For NPFC Claim

1. Sea Turtle Preservation Society request for funding for educational material, signage and a vehicle.

2. DEP requested funding for Aquifer Restoration Demonstration Project: Using Cyclic Biosparging to Remediate Nitrate Contamination at Two Suwannee River Basin Dairies

3. DEP requested funding for sewer mining.

4. Planning Committee for the Lower St. River Basin Initiative had various projects that included WWTP system improvements, reuse retrofitting, stormwater treatment, nutrients removal and water quality enhancement for a variety of non-coastal watersheds.

5. DEP Pumpkin Hill Creek State Buffer Preserve requested funding for road stabilization project to prevent disturbance of sediments and reduce turbidity problem.

6. The Nature Conservancy proposal for restoring various sea island in Northeast Duval County to their natural state as well as protecting the natural communities as they presently exist.

Appendix F: Project Selection Spreadsheet