

REGION 4

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

[Note: This form provides the outline of information needed for intra-Service consultation. If additional space is needed, attach additional sheets, or set up this form to accommodate your responses.]

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PROJECT NAME: Keystone Pit Restoration Project

I. Service Program:

Ecological Services

Federal Aid

Clean Vessel Act

Coastal Wetlands

Endangered Species Section 6

Partners for Fish and Wildlife

Sport Fish Restoration

Wildlife Restoration

Fisheries

Refuges/Wildlife

II. State/Agency: Florida, USFWS

III. Station Name: Crocodile Lake National Wildlife Refuge (41581)

IV. Description of Proposed Action:

This project consists of filling an abandoned limestone rock mining pit with suitable fill material to re-create the historic upland elevation and then restoring the area to hardwood hammock by planting native vegetation. The borrow pit presently displaces and fragments tropical hardwood hammock, a globally-imperiled ecosystem which provides important habitat for five federally endangered and threatened species.

The borrow pit is 2.16 acres in size and has been excavated to a depth of approximately 12 feet below grade. The bottom of the pit holds approximately 2 feet of standing water at all times. However, due to the isolation of the pit from tidal waters, this standing water exhibits minimal

ecological value as a wetland. The waters within the borrow pit are not considered jurisdictional wetlands by either the U.S. Army Corps of Engineers or Florida Department of Environmental Protection due to fact that they are man-made and isolated from natural water bodies.

The restoration design includes placing 36” of clean limerock material to isolate the contaminated fill material from the groundwater. The pit will then be filled to within 36” of historical elevation with the US 1 material, and then topped with clean limestone fill and organic soils to match adjacent upland elevation. The reclaimed area will then be re-vegetated with native canopy trees planted on 10-foot centers, and approximately 20 rubble piles (20 ft in diameter and 10 ft high) will be constructed to provide artificial nest structures for the endangered Key Largo woodrat.

Fill for the project will come from the U.S. Highway 1 Improvement Project where existing organic and inorganic material has been excavated to accommodate an expanded roadway and bridge over Jewfish Creek. The material contains low levels of contaminants including lead, arsenic and petroleum-based hydrocarbons. However, the levels of contamination are low, and below standards considered hazardous to most wildlife and aquatic life. In addition, the design of the project will prevent wildlife from coming into contact with any contaminated material, further reducing the possibility of adverse impacts to the ecosystem as a result of the project.

V. Pertinent Species and Habitat

A. Include species/habitat occurrence map: Refer to the South Florida multi-species recovery plan for the most recent species/habitat occurrence maps (USFWS 1999).

B. Complete the following table:

SPECIES	CRITICAL HABITAT	STATUS
Stock Island Tree Snail (<i>Orthalicus reses reses</i>)	None	Threatened
Eastern Indigo Snake (<i>Drymarchon corais couperi</i>)	None	Threatened
Key Largo Cotton Mouse (<i>Peromyscus gossypinus allapicola</i>)	None	Endangered
Key Largo Woodrat (<i>Neotoma floridana smalli</i>)	None	Endangered
Schaus Swallowtail Butterfly (<i>Heraclides aristodemus ponceanus</i>)	None	Endangered
American Crocodile (<i>Crocodylus acutus</i>)	Yes	Endangered

¹STATUS:E=endangered, T=threatened, PE=proposed endangered, PT=proposed threatened, CH=critical habitat, PCH=proposed critical habitat, C=candidate species.

VI. Location (attach map): Refer to the Multi-Species Recovery Plan of South Florida for the most up to date location maps.

A. Ecoregion Number and Name: 53; Southeast Region

B. County and State: Monroe County, Florida

C. Section, township, and range (or latitude and longitude):
Sections T 58 S, T 59 S, and T 60 S; Ranges R 39 E, R 40 E, and R 41 E..

D. Distance (miles) and direction to nearest town: 35 miles southwest of Miami, Florida.

E. Species/habitat occurrence: Along with the five endangered and threatened species listed, other wildlife including neotropical songbirds and other migratory and non-migratory birds may be affected by the proposed action.

VII. Determination of Effects:

A. Explanation of effects of the action on species and critical habitats in item V. B., (attach additional pages as needed):

Toxicity of Fill Material

Fill material from the Highway 1 Improvement Project is contaminated by chemicals associated with roadways, including heavy metals and petroleum hydrocarbons. The contamination was assessed by the collection and analysis of a composite soil sample from each of 30 test pits throughout the improvement area. These data are presented in an August 15, 2006 report titled *Preliminary Impact to Construction, Jewfish Creek Bridge/US 1 Roadway, Lake Surprise Test Pit Investigation* prepared by WRS Infrastructure and Environment, Inc. (Attachment 1).

The WRS report identified petroleum hydrocarbons in approximately 25 percent of the composite samples. Concentrations of three different petroleum hydrocarbons (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene) exceeded either residential or commercial soil clean-up target levels (SCTL) in composite samples (up to four composite samples for each chemical). The WRS report identifies the locations of samples that exceeded SCTL, and the project will not utilize fill material from these locations.

The WRS report identified low-level concentrations of arsenic and lead in the fill material within the study area. Arsenic was found in all composite samples, and arsenic concentrations in all but two composite samples exceeded residential SCTL (2.16 mg/kg). Lead was found in all but three composite samples, however lead concentrations did not exceed either residential or commercial SCTL's in any of the samples (400 mg/kg residential, 1,400 mg/kg commercial).

Food chain modeling (EPA 1993, 2005a, 2005b) was used to assess risks for birds and mammals exposed to lead and arsenic in the fill material. Insectivorous birds < 100 grams may be at risk from lead in the fill material, but only if these birds forage on soil invertebrates exclusively from the fill material. Foraging for soil invertebrates at locations other than the fill site will considerably reduce this risk. No herbivorous or carnivorous birds would be at risk from the lead. Arsenic concentration in the fill (5 mg/kg) was sufficiently low and did not result in any risk prediction for any bird species. No associated risk was predicted for any terrestrial mammal species as a result of either lead or arsenic at concentrations present in the fill material.

The assessments discussed above for the terrestrial habitat assume the organisms are directly exposed to the fill material. The project is designed to specifically avoid any contact between wildlife and the fill material; the entire restoration site will be capped with three feet of clean fill material and planted with native vegetation. By preventing contact between wildlife and the fill material, the already minimal risk associated with the contaminants in the fill material will be further reduced.

Impacts to adjacent wetland communities and surface waters are not predicted to occur as leaching of contaminants from the fill material is unlikely as a result of the project design and upland location. Hydration sufficient to result in leaching of contaminants is unlikely to occur as the fill material is located in an upland location, will be buried below three feet of clean soil, and will be elevated above the water table. If hydration of the fill material does occur, only a small fraction of the contaminants are predicted to leach into groundwater. This minimal leaching may result in low concentrations of contaminants in the vicinity of the restoration site, but the great distances between the restoration site and surface waters will further reduce the concentrations of any contaminants reaching surface waters due to dilution.

Although the average lead concentration in 30 composite samples (34.0 mg/kg) exceeded the threshold effects level for benthic organisms (30.2 mg/kg), and a number of detected petroleum hydrocarbon concentrations in individual samples exceeded their respective threshold and probable effect levels, the dissolved concentration that will reach either adjacent wetlands or surface waters will be well below levels shown to affect aquatic organisms.

Effect on Individual Species

Stock Island Tree Snail - Not Likely to Adversely Affect.

Two small populations of the Stock Island tree snail are located on the refuge; however, snails are not found in the immediate area of the Keystone pit. The site is adjacent to hardwood hammock that has been seriously degraded from invasive exotic plants and the subsequent

treatment of the area with herbicides. As a result, the site does not provide quality habitat for the tree snail, and the nearest known population is located approximately 2 miles north of the pit.

As hardwood hammock recovers on the reclamation site, S.I. tree snails may move into the restoration site. However, the potential for contact with contaminated fill material is low. Exposure to potentially contaminated soils would be minimal given tree snails are arboreal invertebrates that only move down to the ground once a year to lay their eggs in the leaf litter. Only fill material deemed to be the least contaminated will be used in the restoration project to minimize possible adverse effects of low-levels of contaminants. In addition, the probability of direct contact to the contaminated fill material, if only for a brief period, is effectively eliminated by the project design which includes capping the entire restoration site with three feet of clean fill material. As a result, future populations of SI tree snails on the site are not likely to be adversely affected by the restoration project.

The project will provide positive benefits to SI tree snail populations on the refuge. Loss of habitat was a major factor in the decline of the SI tree snail in the Florida Keys and this project will create 2.16 acres of hardwood hammock habitat important to the SI tree snail and its long-term survival on the refuge. The restoration project would also eliminate habitat fragmentation caused by the presence of the pit and reestablish continuity between larger tracts of hammock north and south of the pit which would enhance movement and dispersal of snails throughout the refuge.

Eastern Indigo Snake - Not Likely to Adversely Affect

The Eastern indigo snake is present on the refuge in small numbers but it is questionable as to whether a viable population still exists on North Key Largo. The last documented sighting of this species was in 2000 at the abandoned NIKE Missile Site. The Eastern indigo snake may occupy the degraded hardwood hammock and open fields adjacent to the Keystone Pit and could be affected by the activities associated with the restoration project. Noise disturbance would be short-term and only last through the duration of the project (approximately 1 year). Given the

small population size of the E. indigo snake on North Key Largo and the degraded conditions of its habitat at the project site, it is highly unlikely that this species is located in the area and would be adversely affected by activities associated with the restoration project.

As hardwood hammock recovers on the reclamation site, Eastern indigo snakes may move into the restoration area. However, the potential for contact with contaminated fill material is low. Only fill material deemed to be the least contaminated will be used in the restoration project to minimize possible adverse effects of low-levels of contaminants. In addition, the probability of direct contact to the contaminated fill material, if only for a brief period, is effectively eliminated by the project design which includes capping the entire restoration site with three feet of clean fill material. As a result, future populations of Eastern indigo snakes on the site are not likely to be adversely affected by the restoration project.

Conversely, the project will provide positive benefits to Eastern indigo snake populations on the refuge. Loss of habitat was a major factor in the decline of the Eastern indigo snake in the Florida Keys and this project will create 2.16 acres of hardwood hammock habitat important to the species and its long-term survival on the refuge. The restoration project would also eliminate habitat fragmentation caused by the presence of the pit and reestablish continuity between larger tracts of hammock north and south of the pit which would enhance movement and dispersal of these snakes throughout the refuge.

Key Largo Cotton Mouse - Not Likely to Adversely Affect

The KL cotton mouse is not found in the immediate area of the Keystone pit. The pit is adjacent to hardwood hammock that has been degraded by invasive exotic plants and the subsequent treatment of the area with herbicides. As a result, this area does not provide quality habitat for the cotton mouse, and the nearest known population is located approximately 500 ft west of the site. Noise disturbance associated with the restoration should not adversely affect the KL cotton mouse given there are no known animals in vicinity and the fact that this species occupies areas adjacent to developed areas and roads that experience a high degree of activity and noise.

As hardwood hammock recovers on the reclamation site, KL cotton mice will likely move into the restoration site. However, the potential for contact with contaminated fill material is low. Only fill material deemed to be the least contaminated will be used in the restoration project to minimize possible adverse effects of low-levels of contaminants. In addition, the probability of direct contact to the contaminated fill material, if only for a brief period, is effectively eliminated by the project design which includes capping the entire restoration site with three feet of clean fill material. As a result, future populations of KL cotton mice on the site are not likely to be adversely affected by the restoration project.

Conversely, the project will provide positive benefits to KL cotton mouse populations on the refuge. Loss of habitat was a major factor in the decline of the KL cotton mouse in the Florida Keys and this project will create 2.16 acres of hardwood hammock habitat important to the KL cotton mouse and its long-term survival on the refuge. The restoration project would also eliminate habitat fragmentation caused by the presence of the pit and reestablish continuity between larger tracts of hammock north and south of the pit which would enhance movement and dispersal of this species throughout the refuge.

Key Largo Woodrat - Not Likely to Adversely Affect

The KL woodrat is not found in the immediate area of the Keystone pit. The site is adjacent to hardwood hammock that has been degraded by invasive exotic plants and the subsequent treatment of the area with herbicides. As a result, this site does not provide quality habitat for the woodrat, and the nearest known woodrat population is located approximately 500 ft west of the site. Noise disturbance associated with the restoration should not adversely affect the KL woodrat given there are no known animals in vicinity and the fact that this species occupies areas adjacent to developed areas and roads that experience a high degree of activity and noise.

As hardwood hammock recovers on the reclamation site, woodrats will likely move into the restoration site. However, the potential for contact with contaminated fill material is low. Only fill material deemed to be the least contaminated will be used in the restoration project to

minimize possible adverse effects of low-levels of contaminants. In addition, the probability of direct contact to the contaminated fill material, if only for a brief period, is effectively eliminated by the project design which includes capping the entire restoration site with three feet of clean fill material. As a result, future populations of KL woodrats on the site are not likely to be adversely affected by the restoration project.

Conversely, the project will provide positive benefits to KL woodrat populations on the refuge. Loss of habitat was a major factor in the decline of the KL woodrat in the Florida Keys and this project will create 2.16 acres of hardwood hammock habitat important to the KL woodrat and its long-term survival on the refuge. The restoration project would also eliminate habitat fragmentation caused by the presence of the pit and reestablish continuity between larger tracts of hammock north and south of the pit which would enhance movement and dispersal of this species throughout the refuge.

Schaus Swallowtail Butterfly - Not Likely to Adversely Affect

The Schaus swallowtail butterfly is not found in the immediate area of the Keystone pit. The pit is adjacent to hardwood hammock that has been seriously degraded from invasive exotic plant and the subsequent treatment of the area with herbicides and as a result does not provide quality habitat for the butterfly.

As hardwood hammock recovers on the restoration site, Schaus swallowtail butterflies will likely move into the area. However, the potential for contact with contaminated fill material is low. Exposure would be minimal given butterflies are arboreal invertebrates living their entire lives among trees, shrubs and herbaceous plants. Only fill material deemed to be the least contaminated will be used in the restoration project to minimize possible adverse effects of low-levels of contaminants. In addition, the probability of direct contact to the contaminated fill material, if only for a brief period, is effectively eliminated by the project design which includes capping the entire restoration site with three feet of clean fill material. As a result, future

populations of Schaus swallowtail butterflies on the site are not likely to be adversely affected by the restoration project.

Conversely, the project will provide positive benefits to Schaus swallowtail butterfly populations on the refuge. Loss of habitat was a major factor in the decline of the Schaus swallowtail butterfly in the Florida Keys and this project will create 2.16 acres of hardwood hammock habitat important to the Schaus swallowtail butterfly and its long-term survival on the refuge.

American Crocodile - Not Likely to Adversely Affect

Mangrove wetlands adjacent to the restoration site provide critical habitat for the American crocodile, and these reptiles could be exposed to contaminants from the fill material if leaching of contaminants and transport to adjacent surface waters were to occur. As discussed previously, the probability of harmful concentrations of contaminants reaching adjacent surface waters is extremely low as a result of the project location in uplands, the project design, and the significant distances to surface waters.

The project site is situated in the middle of a high hammock, making it highly unlikely that contaminants would leach out of the pit into adjacent mangrove wetlands occupied by crocodiles. The pit is isolated from Barnes Sound by approximately 1,000 linear ft of hammock substrate and approximately 1 mile of mangrove wetlands, resulting in a significant ecological buffer to surface waters and wetlands potentially occupied by crocodiles.

There is little evidence suggesting that current populations of the American crocodile have been impacted by contaminants. The contaminated fill material that is the subject of this project has been in place in and adjacent to mangrove wetlands occupied by crocodiles along U.S. Highway 1 for over 70 years. Despite the potential for leaching of contaminants from this fill material into occupied crocodile habitat, there has been no detectable adverse effects on the crocodile population within the refuge which borders the highway. The crocodile population within the Florida Bay/Barnes Sound area has continued to grow and flourish over the years from less than

200 animals documented in the mid-1970s to the present population of 800-1,000 crocodiles. As a result, the American crocodile is not likely to be adversely affected by the restoration project.

B. Explanation of actions to be implemented to reduce adverse effects:

SPECIES/CRITICAL HABITAT	ACTIONS TO MINIMIZE ADVERSE EFFECTS
Stock Island Tree Snail	Any potential risk from contaminants in the fill will be reduced by capping the fill with three feet of clean, uncontaminated soil. Only the least contaminated fill material from the US 1 project will be used.
Schaus Swallowtail Butterfly	Same as Above
Key Largo Cotton Mouse	Same as Above
Key Largo Woodrat	Same as Above
Eastern indigo Snake	Same as Above
American Crocodile	Fill material will be isolated from groundwater by a base layer of clean limerock fill material. Only the least contaminated fill material from the US 1 project will be used.

VIII. Effect Determination and Response Requested:

SPECIES / CRITICAL HABITAT	DETERMINATION			RESPONSE ¹ REQUESTED
	NE	NA	AA	
Stock Island Tree Snail		X		concurrence
Eastern Indigo Snake		X		concurrence
Key Largo Woodrat		X		concurrence
Key Largo Cotton Mouse		X		concurrence
Schaus Swallowtail Butterfly		X		concurrence
American Crocodile		X		concurrence

DETERMINATION/RESPONSE REQUESTED:

NE=no effect. This determination is appropriate when the proposed action will not directly, indirectly, or cumulatively impact, either positively or negatively, any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested is optional but a "Concurrence" is recommended for a complete Administrative Record.

NA= not likely to adversely affect. This determination is appropriate when the proposed action is not likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat or there may be beneficial effects to these resources. Response Requested is a "Concurrence".

AA= likely to adversely affect. This determination is appropriate when the proposed action is likely to adversely impact any listed, proposed, candidate species or designated/proposed critical habitat. Response Requested for listed species is "Formal Consultation". Response Requested for proposed or candidate species is "Conference".

USEPA. 2005b. Ecological Soil Screening Levels for Arsenic, Interim Final. OSWER Directive 9285.7-62

USEPA. 1993. Wildlife Exposure Factors Handbook. EPA/600/R-93/187a.

USFWS. 1999. South Florida multi-species recovery plan. U.S. Fish and Wildlife Service, Ecological Services, Vero Beach, Florida.