

COMPATIBILITY DETERMINATION

Use: Utilization of limestone-based fill material from the U.S. 1 Improvement Project (18 Mile Stretch) with documented low-level contamination of lead, arsenic and petroleum hydrocarbons for habitat restoration at the Keystone Pit.

Refuge Name: Crocodile Lake National Wildlife Refuge, established April 1980

Establishing and Acquisition Authority(ies):

Crocodile Lake National Wildlife Refuge was established under the authorities of the Land and Water Conservation Fund Act of 1965, as amended in 1976 (Public Law 94-422), and the Endangered Species Act of 1973 (Public Law 93-295, 87 Stat. 884), as amended.

Refuge Purpose(s):

Crocodile Lake National Wildlife Refuge was established under authority of the Endangered Species Act of 1973 and the Fish and Wildlife Act of 1956. The refuge was created specifically to protect critical habitat for federally listed species. The primary purposes from the enabling legislation are as follows:

“... to conserve (A) fish or wildlife which are listed as endangered species or threatened species or (B) plants ... 16 U.S.C. ' 1534 (Endangered Species Act of 1973).”

“... for the development, advancement, management, conservation, and protection of fish and wildlife resources ... 16 U.S.C. ' 742f(a)(4) ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such

acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude ... 16 U.S.C. ' 742f(b)(1) (Fish and Wildlife Act of 1956).”

Crocodile Lake National Wildlife Refuge Comprehensive Conservation Plan (2006):

Restoration of the Keystone Pit to historic elevation by filling with suitable substrate was specifically identified as an important strategy to “actively manage Key Largo cotton mouse habitat including nesting, resting, and foraging areas for the long-term survival of the species” (Objective 1.6, page 29).

National Wildlife Refuge System Mission:

The mission of the National Wildlife Refuge System is “to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generation of Americans” (National Wildlife Refuge System Administration Act of 1966, as amended [16 U.S.C. 668dd-668ee]).

Description of Use:

Project Description - This project consists of filling an abandoned limestone rock mining pit with limestone-based 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 critical habitat for five federally endangered 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, with no measurable fluctuation in water levels, suggesting limited to negligible groundwater exchange.

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 line the bottom and 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 also 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.

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]flouranthene) 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 to negligible.

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. 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, hydration sufficient to result in leaching of contaminants is unlikely to occur. 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 (approximately 1 mile) will further reduce the concentrations of any contaminants reaching surface waters due to dilution through the

adjacent limestone substrate and mangrove wetlands.

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 may reach either adjacent wetlands or surface waters would be well below levels shown to affect aquatic organisms.

Availability of Resources:

All aspects of this restoration project will be funded through the FDOT. No additional refuge resources will be needed to complete this restoration project.

Anticipated Impacts of the Use:

The project is anticipated to have a significant beneficial impact on trust resources on Crocodile Lake National Wildlife Refuge. The restoration of approximately 2 acres of tropical hardwood hammock will enhance the ecosystem by reducing habitat fragmentation of existing hardwood hammock, and consequently, increasing total hammock area. In addition, this project will directly support recovery efforts for several federally threatened and endangered species, including the Key Largo Woodrat, Key Largo cotton mouse, Schaus swallowtail butterfly, and the Stock Island tree snail.

The project is anticipated to have a negligible negative impact on trust resources. The pit will be lined as well as capped with three feet of clean fill material and planted with native vegetation, which will minimize leaching of contaminants into the groundwater and prevent direct contact between the fill material and wildlife. Therefore, the minimal risk associated with the low contaminant levels in the fill material will be further reduced to negligible due to the project

design.

Public Review and Comment:

The proposed project was reviewed during a February 20, 2007 public meeting of the Florida Keys National Marine Sanctuary Advisory Council (SAC), a federal legislatively-mandated group representing marine industry, conservation organizations, and local communities. This public meeting was advertised in local newspapers and also through radio advertisements, and was attended by approximately 30 persons including SAC members and the public. Based on the presentation of the proposed project and subsequent council discussion, the SAC endorsed the project through a majority vote. Additional public comment will be solicited for 7 days by notification in local newspapers and by posting notices at the refuge headquarters and the local Post Office.

Determination (check one below):

- Use is Not Compatible
- Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

- 1). Only fill material deemed to have the lowest levels of contamination will be utilized for the project as described in the report titled *Preliminary Impact to Construction, Jewfish Creek Bridge/US 1 Roadway, Lake Surprise Test Pit Investigation* prepared by WRS Infrastructure and Environment, Inc.. Fill material will be isolated from groundwater by a base layer of clean limerock fill material. Additionally, the entire restoration site will be capped with 36” of clean fill material, further reducing the possibility of wildlife contact with contaminants;
- 2). All work will be conducted by the Florida Department of Transportation through their prime contractor and/or sub-contractors. The Service will not perform any of the work required to complete the project;
- 3). All sub-contractors participating in the project will be required to operate under a Special Use Permit issued to the prime contractor for the project. All requirements of the Special Use Permit will be adhered to at all times;

