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**Species Conservation Guidelines****South Florida****Key Largo Woodrat**

The Species Conservation guidelines for the Key Largo woodrat (*Neotoma floridana smalli*) provides a tool to assist the user in determining if their project, *i.e.*, a Federal permit, a Federal construction project, or other such action, may adversely affect the Key Largo woodrat. Here we describe what actions might have a detrimental impact on the Key Largo woodrat and how these effects can be avoided.

**Life History**

The U.S. Fish and Wildlife Service (Service) listed the Key Largo woodrat as an endangered species in 1984 due to destruction and alteration of tropical hardwood hammock forest. The Key Largo woodrat represents the southernmost subspecies of the eastern woodrat (*Neotoma floridana*), which occurs widely in the eastern United States. The distribution and ecology of this subspecies are summarized in Service (1999).

The Key Largo woodrat is a small rodent. It feeds primarily on a variety of leaves, buds, seeds, and fruits (Brown 1978), though it is an omnivore and probably also consumes a variety of invertebrates. It is well known for its habit of building large stick nests (Brown 1978), and may be more limited by availability of shelter than of food. It depends heavily on the natural vegetation of tropical hardwood hammocks to obtain material for nest construction. Stick nests, which can be 1.2 m (3.9 ft) in height and 2 to 2.5 m (6.5 to 8.1 ft) in diameter, are used for shelter, nesting, resting, feeding, and breeding. Only one adult woodrat usually inhabits a nest, and one individual may use several nests. Active stick nests are strong indicators of healthy woodrat populations (Barbour and Humphrey 1982). However, habitats with abundant natural cover have fewer stick nests, and woodrats are found in areas both with and without stick nests (Goodyear 1985). Woodrats also nest below ground in limestone solution holes and in the root systems of large trees (Frank et al. 1997). They are active climbers and spend considerable amounts of time in trees (Goodyear 1985).

**Habitat**

The Key Largo woodrat is mainly associated with mature tropical hardwood hammock vegetation (Barbour and Humphrey 1982, Goodyear 1985). However, a range of successional habitat conditions are also used (Goodyear 1985), and intermediate-aged hammock may provide better habitat conditions than old, mature hammock (Sasso 1999, Sasso and Gaines 2002). Hammocks provide a shady, humid microclimate with less wind and temperature variation than more exposed habitats. Vegetative composition and structure influence density and distribution of the Key Largo woodrat by affecting its ability to find food resources, nest materials, and

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secure cover.

Much of the original tropical hardwood hammock on Key Largo was cleared in the past for development or agriculture, and the southern portion of Key Largo is nearly completely developed. The primary threats to the Key Largo woodrat are habitat destruction, degradation, and fragmentation. Its extirpation in south Key Largo is generally attributed to land clearing followed by residential and commercial development (Brown 1978, Hersh 1981). Surveys suggest that fewer than 90 Key Largo woodrats now exist in the wild.

### Distribution

The Key Largo woodrat is found only in the tropical hardwood hammocks of Key Largo in Monroe County (Schwartz 1952, Sherman 1955), north of the intersection between U.S. Highway 1 and C.R. 905. Historically, it occurred throughout the forested uplands of Key Largo, though its present range includes only the northern one-third portion of Key Largo where large tracts of contiguous tropical hardwood hammock occur (Barbour and Humphrey 1982, Humphrey 1992). A population of Key Largo woodrats was also introduced and established on Lignumvitae Key in 1970 (Brown and Williams 1971, Barbour and Humphrey 1982), but that population has since been extirpated.

Several islands north of Key Largo (Palo Alto, Pumpkin, Swan, Little Totten, and Old Rhodes Keys) contain suitable habitat for the Key Largo woodrat, though the status of any Key Largo woodrat populations there is unknown. The consultation area is delineated in Figure 1.

No critical habitat has been designated for the Key Largo woodrat. \

### Determination

The SLOPES flowchart in Figure 2 and this section can help you determine the impact of your project on the Key Largo woodrat.

If your project area is outside the consultation area (Figure 1), then no effect to the Key Largo woodrat is anticipated. If, by chance, you encounter a Key Largo woodrat on your site outside the consultation area, appropriate protective measures must still be implemented (see below).

If your project area is inside the consultation area, you should check for the presence of suitable habitat. Suitable habitat for the Key Largo woodrat is tropical hardwood hammock, and any area within 500 m (1625 ft) of hammock. If there is no tropical hardwood hammock present in your project area, then no effect to the Key Largo woodrat is anticipated.

If your project area is inside the consultation area and tropical hardwood hammock is present, you should assume that the Key Largo woodrat is present and that the project may affect it.

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If the tropical hardwood hammock is protected and its integrity is maintained in the project area, and there is a buffer of 500 m (1625 ft) around the hammock, the project is not likely to adversely affect the Key Largo woodrat. If the project will modify or destroy hammock, then the project is likely to adversely affect the Key Largo woodrat, and formal consultation is required. Early contact and discussion with the Service will facilitate the completion of the project.

**Conservation Measures**

Habitat destruction, degradation, and fragmentation result in many adverse affects to woodrats, including 1) genetic isolation of woodrat populations, which makes the subspecies more vulnerable to natural catastrophes such as hurricanes or fire (Service 1993); 2) loss of food resources and the ability of woodrats to forage; 3) changes in habitat structure and vegetation species composition; 4) reduction of home range size and disruption of movement and dispersal patterns; 5) loss of ability to build stick nests by affecting availability of nest material and ground cover; 6) loss of arboreal habitat. Road construction also disrupts the integrity of the hammocks and causes road mortality of dispersing woodrats. Other threats associated with human encroachment include predation by feral cats, dumping of trash, and competition with black rats.

The majority of high quality hammock habitat available on north Key Largo has been protected through acquisition and management by the Service and State of Florida. Crocodile Lake National Wildlife Refuge was acquired in 1980, and Dagny Johnson Key Largo Hammock Botanical State Park was acquired in 1982. There are still some private lands where development could occur.

Tropical hardwood hammock supports many unique species, and the Service encourages project modifications that do not impact hammocks, as well as those that restore hammocks. The following are protective measures that could be incorporated into your project to minimize the impacts to the Key Largo woodrat.

1. Protect and retain the integrity of all tropical hardwood hammock in its entirety, and maintain a 500 m (1625 ft) buffer between the project area and the hammock. All remaining hardwood hammock habitat is critical for the survival of the Key Largo woodrat.
2. Leave vegetation litter and fallen logs in tropical hardwood hammocks where they naturally lie. Fallen logs create natural runways, which are a key habitat component for woodrats (Hersh 1981). Previous clearing and removal of ground materials can reduce the structural complexity on which woodrats depend.
3. Improve habitat by planting or encouraging native plant species, and eliminating exotic vegetation. Remove exotic vegetation in tropical hardwood hammock and in adjacent upland buffers.

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4. Maintain natural waterflow, restore hydrology, and improve water quality in woodrat habitat.
5. Create habitat by refilling and recreating areas that have been dredged or altered.
6. Remove nuisance predators. Feral cats and dogs, black rats, and raccoons can prey on woodrats. Black rats may also compete with woodrats for resources. Eliminate food sources and home sites for raccoons and black rats, and control free-roaming feral cats and dogs.
7. Control blatant killing and prevent poisoning. Woodrats may be intentionally killed by humans in an effort to get rid of black rats, or they may be unintentionally killed by rodent control poison set out for black rats (Service 1993).
8. Destroy fire ant colonies in and near Key Largo woodrat habitat. Fire ants are a known threat to small mammals, especially those that are newborn (Killion and Grant 1993, Vinson 1997).
9. Refrain from spraying for mosquitos, which may impact the availability of invertebrate species that the Key Largo woodrat feeds on.
10. Remove contaminants from any illegal dumpsites in the project area. Some contaminants pose an adverse threat to the Key Largo woodrat.
11. Remove trash and debris already in the project area, and dispose of new waste properly. Although actual debris may not greatly affect Key Largo woodrats, dumping may attract black rats.
12. Prevent fires in and near tropical hardwood hammocks. Uncontrolled wildfires can quickly destroy large areas of hammock.
13. If destruction of portions of tropical hardwood hammock is unavoidable, you should compensate for the loss by purchasing suitable habitat for the Key Largo woodrat elsewhere in Key Largo. This should be a last resort option.

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## **GIS Layers**

## **Appendices**

### **Notes**

Community table says tropical hardwood hammock only, jives with text

County table says Monroe Co., jives with text

Recent requested woodrat 10a1A permit modification for woodrat trapping Cindy S. says "In areas where fire ants are present, traps shall be ringed with 10% Sevin-dust or another approved pesticide."