Species Conservation Guidelines

South Florida

Lower Keys Rabbit

The Species Conservation guidelines for the Key Lower Keys rabbit (*Sylvilagus palustris hefneri*) 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 Lower Keys rabbit. Here we describe what actions might have a detrimental impact on the Lower Keys rabbit and how these effects can be avoided.

Life History

The U.S. Fish and Wildlife Service (Service) listed the Lower Keys rabbit as endangered on 21 June, 1990, due to habitat loss and fragmentation, predation by cats, and road mortality. The ecology of the Lower Keys rabbit in south Florida is summarized in Service (1999). The Lower Keys rabbit is a subspecies of the wide-ranging marsh rabbit (*S. palustris*). The species is polygamous and breeds throughout the year (Holler and Conway 1979). Although species does not display an apparent seasonal breeding pattern (Service 1994), it has been found that the highest proportion of females with litters occurs in March and September; the lowest proportion occurs in April and December. Holler and Conway (1979) reported that Lower Keys rabbits average 3.7 litters per year, which is a lower rate of fecundity in comparison to the southern Florida marsh rabbit (*S. p. paludicola*) at 5.7 litters per year. Current population estimates range between 100 and 300 individuals. Population losses are due to a loss of habitat, habitat fragmentation, loss of dispersal corridors, cat predation, and road mortality (Service 1999). The Lower Keys marsh rabbit, with its small body size, short life span, high reproductive output, and high habitat specificity, exhibits classic metapopulation community dynamics (Forys 1995). There are 41 subpopulations in 3 distinct metapopulations of rabbits that occur in disjunct patches on four keys that are socially isolated from other patches, but interact through dispersal (Howe 1988, Forys and Humphrey 1994, 1999).

Habitat

Normally, marsh rabbits are restricted to relatively undisturbed wetlands (Ivey 1959, Padgett 1989). However, the Lower Keys rabbit is habitat specific, and is dependent upon a transitional zone between marshes and associated upland areas of grasses and sedges for foraging, cover and reproduction (Wolfe 1992). The major vegetation types consist of shore-grass (*Monanthchloe littoralis*), marsh fimbry (*Fimbristylis castaneasea*), saltwort (*Batis maritima*) and glasswort (*Salicornia spp*). The Lower Keys rabbit also inhabits the transitional areas of freshwater wetlands and uplands. These sites are dominated by sawgrass (*Cladium jamiacense*) and

cordgrass (*Spartina spp*) (Forys and Humphrey 1999). The most important food species for the Lower Keys marsh rabbit appears to be seaside oxeye (*Borrichia frutescens*), which is common in the mid-saltmarsh area. Rabbits have been seen foraging on a variety of grass, sedge, shrub and tree species, but have not been seen eating tree leaves or bark. The marsh rabbit spends most of its time feeding in the mid- and high- marsh areas (Forys and Humphrey 1994). Lower Keys marsh rabbits usually travel through a variety of habitats between their natal and permanent home ranges, including areas with dense ground cover, mangroves, upland hardwood hammocks, and vegetation between the road shoulder and the water (Forys and Humphrey 1994). The distance among habitats is important because the ability of rabbits to re-colonize vacant habitat patches depends upon the presence of habitat corridors (Service 1999). Forys (1995) reported that these habitat patches occur in a highly fragmented mosaic of native and disturbed habitat, with few contiguous areas of native habitat greater than 4.9 ha (12 acres).

Distribution

The historical range of the Lower Keys marsh rabbit extended from Key West to Big Pine Key encompassing a linear distance of approximately 48 km (Layne 1974, Hall 1981). The Lower Keys rabbit probably occurred on all of the Lower Keys that provided suitable habitat, but did not occur east of the Seven-mile Bridge where the species is replaced by the southern Florida marsh rabbit. In 1995, a comprehensive survey located 81 areas covering 308.2 ha (761 acres) that provided suitable habitat for the Lower Keys rabbit. Its presence was recorded in 50 of the 81 areas. The majority of these area of suitable habitat are smaller than 2.9 ha (7.2 acres) and the total amount of habitat occupied by the species is about 245.8 ha (607 acres) (Forys et al. 1996). The Lower Keys rabbit has been found on only a few of the larger Lower Keys (specifically, Boca Chica, Saddlebunch, Sugarloaf and Big Pine Keys) and some of the smaller nearby islands (Layne 1974, Hall 1981). Check the consultation area in Figure 1 for the areas that may be affected by your project. Cox and Kautz (2000) identified two areas of suitable habitat on Sugarloaf and Geiger Keys that still need protection. No critical habitat has been designated for the Lower Keys rabbit.

Determination

The SLOPES flowchart (Figure 2) can help you determine the impact of your project on the Lower Keys rabbit.

If your project is outside the consultation area, then no effect to the Lower Keys rabbit is anticipated. If, by chance, you encounter a Lower Keys rabbit on your site outside the consultation area, appropriate protective measures should be implemented (see below), and you should contact the Service to discuss how best to proceed.

If your project is inside the consultation area, you should check for the presence of suitable habitat. Suitable habitat for the Lower Keys rabbit is high marsh areas consisting of transitional zones of grasses and sedges. If there are no transitional areas from emergent marsh to uplands in

your project area, then no effect is anticipated.

If your project is inside the consultation area and transitional areas from marsh to uplands is present (in particular, Boca Chica, Saddlebunch, Sugarloaf and Big Pine Keys and nearby islands) you can assume that the Lower Keys rabbit is present then the project may effect, and consultation is necessary. Conduct a survey of the habitat, and results should be summarized in consultation initiation package. See the SLOPES introduction for details on the proper way to prepare a consultation initiation package (Service 2004).

Lower Keys rabbit presence/absence can be determined using fecal-pellet surveys.

If suitable habitat is present at the project site, but no individuals are detected during surveys, it is appropriate to conclude the project "may affect, but is not likely to adversely affect" the species. However, if individual Lower Keys rabbits are detected, it is appropriate to conclude that the project is likely to adversely effect and formal consultation is required.

Conservation Measures

Approximately one-third of the total Lower Keys rabbit habitat is owned by the Department of Defense (DOD), one-third is part of the Service's Key Deer and Great White Heron National Wildlife Refuges, and the remaining one-third is privately owned (Service 1999). The species is vulnerable to habitat alteration, contaminants, vehicular traffic, dumping, poaching, domestic animals, feral hogs, fire ants, and exotic vegetation. These threats have resulted in a decrease in the number of populations; a decline in the individuals in those populations; the isolation of populations; an increase in road mortalities; the increase in feral cat-caused mortality; and the loss of foraging, cover, and nesting habitat (Service 1999). Below are some protective measures that might be incorporated into your project to minimize impacts to the Lower Keys rabbit.

1. Move project or adjust footprint to avoid disturbance of suitable habitat. Maintain native habitat transitional area between wetlands and uplands, and protect through conservation easements. If modification of the habitat is necessary, limit the size of the footprint. Protection and management of Lower Keys rabbit habitat on private lands through conservation easements and Safe Harbor agreements.

2. Restore native vegetation to highly modified transitional areas and travel corridors through the removal of invasive exotic vegetation.

3. Removal of invasive exotic vegetation, and reduce lawn mowing especially on Federal lands.

4. Establish protective buffers around known occupied habitat. Increase public awareness and stewardship through educational materials and public workshops.

5. A major source of mortality is free-roaming cats. Develop and implement a plan for the eradication of feral-cat populations, and establish deed restrictions to prohibit free roaming cats in rabbit sensitive areas.

6. Minimize road mortality through the use of "chatter strips," implementing slower speed zones and increase the enforcement of speed zones in known rabbit crossing areas.

7. Establish protective buffers around known occupied habitat.

8. Prevent the degradation of existing Lower Keys rabbit habitat through Federal, state, and non-governmental agencies land acquisition.

9. Sponsor the reintroduction of the Lower Keys rabbit from natural wild populations on Service owned and managed lands within the species historical range.

Literature Cited

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GIS Layers

LKMR_CA Consultation Area.

Appendices