

SPECIES CONSERVATION GUIDELINES
South Florida



Stock Island Tree Snail

The Standard Local Operating Procedures for Endangered Species (SLOPES) for the Stock Island tree snail (*Orthalicus reses reses*) provides a tool to determine if a project, *i.e.*, a Federal permit, a Federal construction project, or other such action, may adversely affect the Stock Island tree snail. Here we describe what actions might have a detrimental impact on this tree snail and how these effects can be avoided or minimized.

Life History

The U.S. Fish and Wildlife Service (Service) listed the Stock Island tree snail as a threatened species in 1978 because of population declines, habitat destruction and modification, pesticide use, and overcollecting. There are two other species of *Orthalicus* in the Florida Keys, the Florida (or banded) tree snail (*O. floridensis*) and the Florida Keys tree snail (*O. reses nesodryas*) (Emmel and Perry 2002). As a result of unauthorized introduction efforts, the Stock Island tree snail now occurs in the native range of both of the other species. The distribution and ecology of the Stock Island tree snail are summarized in Service (1999).

The Stock Island tree snail lives in tropical hardwood hammocks, feeding on epiphytic growth on hardwood tree trunks, branches, and leaves. Probable food items include a variety of fungi, algae, and lichens found on many of the native hammock trees. Mixobacteria and some small mites may serve as a secondary food source. Essential factors affecting food availability are the light intensity and moisture content of the hammock habitat.

The Stock Island tree snail is entirely arboreal except when it moves to the forest floor for nesting. When nesting it digs a shallow hole in the humus layer, usually at the base of a tree, and lays eggs, approximately 15 eggs per clutch (Deisler 1987, McNeese 1989). Egg-laying snails are especially vulnerable to predation, desiccation, and trampling (Deisler 1987). The humus layer is essential for egg-laying, and hammocks that contain well-developed soils or leaf litter are important for nesting activity and dispersal.

Stock Island tree snails are active mainly during the wet season (May through November), when they breed, feed, and disperse. They mate and nest in late summer and early fall during the wettest part of the rainy season. During dry periods (December through April) they aestivate, *i.e.*, they become inactive after sealing themselves with mucous to a tree trunk or branch, thereby protecting them from desiccation.

Habitat

The Stock Island tree snail prefers tropical hardwood hammocks with smooth-barked native trees, which may be easier to crawl over and to attach to when they were aestivating (Voss

1976). However, most native and several exotic trees are known to be suitable hosts (McNeese 1997). Larger trees are more likely to support more Stock Island tree snails than smaller trees probably because they provide the snails with an increased surface area for foraging (Deisler 1987). Although the minimal hammock size needed to support a viable population is not known, the habitat must include an area large enough to provide for foraging, nesting, and microclimate (air temperature and humidity) requirements.

Distribution

Historically, the Stock Island tree snail was believed to have a very limited distribution, occurring only in tropical hardwood hammocks on Stock Island and Key West in the Florida Keys, Monroe County, although it may have been found in other hammock areas in the Lower Keys. The Florida (or banded) tree snail, is the most widespread of the *Orthalicus*, occurring historically throughout the Keys and on the mainland. The Florida Keys tree snail occurs throughout the Keys, being seen most often in the Lower and Middle Keys, from Sugarloaf Key north.

Although the Stock Island tree snail is nearly extirpated from its historical range, its distribution has been artificially extended by the introduction of individuals to Key Largo and the southernmost parts of the mainland. Privately-owned lands to which these translocations were made include Calusa Cove Camp Ground and various subdivisions in Key Largo, and Monkey Jungle in Miami. The Stock Island tree snail was also translocated to public lands at John Pennkamp Coral Reef State Park, Key Largo Hammock State Botanical Site, Everglades National Park, and Big Cypress Preserve.

The consultation area for the Stock Island tree snail is delineated in Figure 1. No Critical Habitat has been designated.

Determination

The SLOPES flowchart in Figure 2 and this section can help you determine the impact of your project on the Stock Island tree snail.

If your project area is outside the consultation area, then no effect to the Stock Island tree snail is anticipated. If, by chance, you encounter a Stock Island tree snail on your site outside the consultation area, you should contact the Service to discuss what protective measures should be implemented.

If your project area is inside the consultation area, you should check for the presence of suitable habitat. Suitable habitat for the Stock Island tree snail is tropical hardwood hammock. If there is no tropical hardwood hammock present in your project area, then no effect to the snail is anticipated.

If your project area is inside the consultation area and tropical hardwood hammock is present,

you should assume that the Stock Island tree snail is present and that the project may affect it.

If the tropical hardwood hammock is protected and its integrity is maintained in the project area, the project is not likely to adversely affect Stock Island tree snail. If the project will modify or destroy hammock, then the project is likely to adversely affect the Stock Island tree snail, and formal consultation is required. Early contact and discussion with the Service will facilitate the completion of the project.

Protective Measures

The Stock Island tree snail has, for the most part, been extirpated from its historical range due to a number of factors including habitat destruction and fragmentation, pesticide use, overcollecting, and predation by fire ants and black rats. Most of the hardwood hammocks that could serve as suitable habitat for the snail on Stock Island and Key West have been destroyed or severely altered by past human activities. Remnants of hammock that remain on these islands tend to be small in size and low in quality due to disturbance, making them unsuitable for the tree snail.

Tropical hardwood hammock supports many unique species, and the Service encourages project modifications that limit impacts to hammocks and that restore them. Destruction of this habitat type reduces reproduction in the Stock Island tree snail by disrupting hammock soils and leaf litter used as nest areas. Habitat fragmentation may destroy the microclimate (air temperature and humidity) important for feeding, shelter, and reproduction. The following are protective measures that could be incorporated into your project to minimize the impacts to hammocks, and, thus, to the Stock Island tree snail.

1. Protect and maintain the integrity of all tropical hardwood hammock in its entirety. This habitat should not be destroyed or modified in any way. Tree trimming should not be done. Trees should not be selectively removed because hammock composition contributes to microclimate requirements.
2. Remove invasive exotic vegetation, especially Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*). Replant with native vegetation. Note, many exotic trees including Brazilian pepper are hosts for the Stock Island tree snail, and should be inspected for snails prior to removal.
3. Prohibit any collection of the Stock Island tree snail and any unauthorized translocation. The release of Stock Island tree snails outside of its historical range could result in competition with other native tree snail species, or hybridization with the Florida Keys tree snail.
4. Refrain from using any pesticides (including mosquito sprays), herbicides, and any other biocides. Usage on or near snail habitat can kill snails directly or alter behavior associated with feeding and reproduction.

5. Use native vegetation and prevent excessive watering of ornamental plants and lawns which modifies snail behavior by bringing snails out of aestivation during the winter months and exposing them to cold temperatures and desiccation.
6. Control for fire ants, which are snail predators [but need to work out details since pesticides are also a problem]. Fire ants are known to kill other tree snails in the Florida Keys (Tuskes 1981).
7. Develop waste control program. Snail predators including black rats and raccoons are more abundant in areas where trash is disposed.

Literature Cited

- Deisler, J.E. 1987. The ecology of the Stock Island tree snail, *Orthalicus reses reses* (Say). Bulletin Florida State Museum Biological Science 31(3):107-145.
- Emmel, T.C. and M.W. Perry. 2002. Evaluation of the genetic and systematic distinction of the Stock Island tree snail and its relatives. Final report to the U.S. Fish and Wildlife Service, Vero Beach, Florida.
- McNeese, P.L. 1989. A proposal for the study of the Stock Island tree snail, *Orthalicus reses reses*, at its type locality. Monroe County Environmental Resources Department; Marathon, Florida.
- McNeese, P.L. 1997. Survey of the Stock Island tree snail (*Orthalicus reses reses*) on Stock Island. Lewis Environmental Services, Inc., Summerland Key, Florida.
- Tuskes, P.M. 1981. Population structure and biology of *Liguus* tree snails on Lignumvitae Key, Florida. Nautilus 95(4):162-169.
- U.S. Fish and Wildlife Service (Service). 1999. South Florida multi-species recovery plan. Atlanta, Georgia. <http://verobeach.fws.gov/Programs/Recovery/vbms5.html>. Accessed October 10, 2003.
- Voss, R.S. 1976. Observations on the ecology of the Florida tree snail *Liguus fasciatus* (Muller). Nautilus 90:65-69.

GIS Layers

Appendices