# Request to Evaluate the Status of the Homosassa Shrew (*Sorex longirostris eionis*)

**Scientific and common name of the species to be evaluated**

Homosassa shrew, *Sorex longirostris eionis*

**Name, address, and signature of the person submitting the request**

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## Introduction

This is to request that the Florida Fish and Wildlife Conservation Commission (FWC) review and evaluate the status of the Homosassa Shrew (HOSH; *Sorex longirostris eionis*) under the provisions established in Rule 68A-27.0012, F.A.C. and determine whether it is appropriate to list HOSH on the State-designated Threatened Species list (Rule 68A-27.003, F.A.C.).

The HOSH was assigned Species of Special Concern status by Florida Game and Fresh Water Fish Commission (predecessor to FWC) in 1985. The status review in 2011 found that the HOSH did not meet listing requirements but the Listing Recommendation stated that given "...the *Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1)* cautioned 'assessors should adopt a precautionary but realistic attitude, and ... resist an evidentiary attitude to uncertainty when applying the criteria.' Staff recommends that the Homosassa shrew be maintained as a Species of Special Concern until more data can be collected" (FWC 2011).

There is new information on shrew ecology and the HOSH since the 2011 review. The FWC Imperiled Species Management Plan (ISMP; FWC 2016) provides a framework for management of HOSH going forward, following the outcome of this requested evaluation.

## Biological Information

The procedures for listing species on the State-designated Threatened Species list (Rule 68A-27.0012, F.A.C.) stipulate that species may be petitioned through a species evaluation request submitted by the public or FWC staff. According to this rule, this request must include a biological score calculated using the process described by Millsap et al. (1990), the supporting data, or references to the data, and the score assigned for each biological variable used to determine the biological score. That information is provided below together with other available information on extent of occurrence, area of occupancy,

and quantitative analyses, which is relevant for application of IUCN Red List Criteria to evaluate this request.

**Biological Score – The calculated total Biological Score = 19.** Members of the Habitat and Species Conservation staff evaluated the HOSH using the best data available regarding the species to calculate the Biological Score (Millsap et al. 1990). Note that much of the life history information reflects the species, *Sorex longirostris*, as a whole.

- **Population Size (2 out of 10).** There are no data on the population size of HOSH. Smallwood and Smith (2001) reported the average density estimate for all *Sorex* species as 14 shrews per hectare (ha). Using this density estimate, the potential population size of HOSH within the identified area of occupancy (AOO) is 34,361,124 individuals. However, this could be an overestimate of the population size in Florida given the low detection rates reported by Catano and Stout (2015), Smith et al. (2015), and Teets and Doonan (2015). The study by Teets and Doonan (2015) detected 12 HOSH over two years in north Florida, while Smith et al. (2015) reported 18 captures over three years. Catano and Stout (2015) found *Blarina carolinensis* (southern short-tailed shrews) but did not detect HOSH on their study sites in central Florida.

- **Population Trend (8 out of 10).** No information exists to determine population trends of HOSH. However, HOSH populations are likely negatively impacted by conversion of natural habitat into urban or agricultural sites (Jones et al. 1991, Layne 1992, FWC 2013).

- **Range Size (4 out of 10)**. The accepted range (EOO; extent of occurrence) for the HOSH includes 38 counties within the northern two-thirds of peninsular Florida, from the Caloosahatchee River north and east to the Suwannee River (Jones et al. 1991). The total area of this range exceeds 20,000 $km^2$.

- **Distribution Trend (2 out of 10).** No data are available to estimate historic or current trends in HOSH population distribution. It is suspected that the HOSH distribution has declined as a result of habitat loss from urbanization or degradation (Jones et al. 1991, Layne 1992).

- **Population Concentration (0 out of 10).** Shrews found in the southeastern U.S. are considered solitary mammals and do not congregate or aggregate (Platt 1976).

- **Reproductive Potential for Recovery (3 out of 10).**
    - **Average number of offspring per female per year (3 out of 5).** Homosassa shrews are known to breed from March-October and can have 1-3 litters per year, with 1-6 offspring per litter (French 1980).

    - **Age at first reproduction (0 out of 5).** The age of sexual maturity is unclear for HOSH, but is presumed to be less than one year given this species' short lifespan (70-90 weeks) and estimated generation time (9 months) (French 1980, Trani et al. 2007). French (1980) observed reproductive females of *S. longirostris* in the first summer after birth, but the average age of sexual maturity was not identified.

- **Ecological Specialization (0 out of 9.9)**
  - **Dietary specialization (0 out of 3.3).** French (1984) found that the species as a whole (*S. longirostris*) consumed a wide range of invertebrates, which supports findings that shrews exploit a variety of prey items that changes with seasonal availability (Barnard and Brown 1981)

  - **Reproductive specialization (0 out of 3.3).** Little information is available to assess habitat requirement for breeding success of HOSH. Due to their generalist habitat preferences (Earl et al. 2016), it is possible that HOSH will use alternate breeding sites with little change in the number of individuals.

  - **Other specializations (0 out of 3.3).** Homosassa shrews are not known to have any behavioral or ecological specializations that would limit population growth.

**IUCN Red List Criteria**

**Extent of Occurrence.** The Homosassa shrew was originally identified in Homosassa Springs, Citrus County, Florida, and believed to be restricted to the type locality (Jones et al. 1991). However, research by Jones et al. (1991) found HOSH across the northern two-thirds of peninsular Florida. At this time, the accepted extent of occurrence (EOO) for the HOSH includes 38 counties found north of the Caloosahatchee River and east of the Suwannee River (Jones et al. 1991, FWC 2013).

**Area of Occupancy.** A FWC GIS analysis of potential habitat within the HOSH EOO estimates the maximum area of occupancy (AOO) to be 2,454,366 ha (24,544 $km^2$ = 9,476 $mi^2$) (Mark Barrett, FWC, personal communication). Due to the limited capture data within the HOSH range and their associated habitat types, it is unknown if this analysis accurately reflects the current AOO.

**Quantitative Analyses.** A population viability analysis for the Homosassa shrew has not been published.

**Threats**

The primary threats to HOSH continue to be habitat loss and degradation (Jones et al. 1991, Layne 1992). Many studies have shown that *S. longirostris* often occur in areas with coarse woody debris, snags, and vegetation cover, all of which may serve as necessary habitat components for this species (Layne 1992, Davis et al. 2010, Fritts et al. 2015, Earl et al. 2016). Changes in land use or land management practices that negatively impact those components of the habitat can be considered threats because they could severely impact local HOSH populations (Layne 1992, Davis et al. 2010). Zwick and Carr (2006) projected 34% of native habitat in Florida will be developed by 2060. Within the HOSH EOO, FWC GIS habitat models estimate approximately 12% of potentially suitable habitat will be lost over the next 20 years through development or habitat degradation (195,626 ha=1,956 $km^2$) (Mark Barrett, FWC, personal communication).

Additionally, Layne (1992) suggested that since house cats frequently prey on shrews, an increase in free-ranging cats in developed areas will likely result in high shrew mortality rates. No data, however, are available to assess the threat of predation on shrew populations.

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