

# Homosassa Shrew

## *Sorex longirostris eionis*



Photograph by Justin C. Davis, FWC.

### Species Overview

**Status:** Removed from Florida's Endangered and Threatened Species List.

#### Current protections

- 68A-4.001, F.A.C., General Prohibitions and Requirement – Prohibits the take, transport, sale, and possession of wildlife.
- 68A-1.004, F.A.C., Take – The term take shall include taking, attempting to take, pursuing, hunting, molesting, capturing, or killing any wildlife or freshwater fish, or their nests or eggs by any means whether or not such actions result in obtaining possession of such wildlife or freshwater fish or their nests or eggs.
- 68A-29.002, F.A.C., Regulations Relating to the Taking of Mammals – Prohibits take, transport, sale, purchase or possession of certain species of mammals unless authorized by 68A-9 or 68A-24, F.A.C.

#### Cryptic Species

The Homosassa shrew is identified in Florida's Imperiled Species Management Plan as a cryptic species. Cryptic species are those that may be difficult to detect due to behavior, habitat, or physical features, even when using standardized survey techniques in occupied habitat. Interpretation of when take may occur is difficult without a clear understanding of essential behavioral patterns of the species or habitat features that may support those behavioral patterns. The documented difficulties in detecting cryptic species and the lack of a reliable detection methodology leads to different considerations for take.

- Detection is difficult even when surveys are conducted using recommended protocols, because of their presumed low densities across their range. The intent is to limit the actions that would lead to direct, or intentional take, and recommend non-regulatory methods to minimize activities that might cause take.
- Permitting standards for Homosassa shrew will focus on cooperation and acquiring information, with the understanding that as information is gained, permitting standards may need to be adjusted.

### Biological Background

This section describes the biological background for this species and provides context for the following sections. It focuses on the habitats that support the Homosassa shrew and the threats faced by the species.

The Homosassa shrew is a subspecies of the southeastern shrew (*Sorex longirostris*) that occurs in the northern two-thirds of the state of Florida. Little is known about the life history, behavior, and biology of the Homosassa shrew. As such, we provide summary information for the southeastern shrew species as a whole, *Sorex longirostris*.

Shrews are secretive, living and foraging under leaf or pine straw litter and other debris, and using mole runs; these traits make shrews difficult to study. Shrews tend to be solitary, using echolocation for orientation, and only occupy the same tunnel systems with other individuals during the breeding season (French 1980b).

Homosassa shrews occur in very low densities and are difficult to capture. Recent survey efforts in parts of

the presumed range captured shrews in most areas surveyed, although capture rates were low (Smith et al. 2015, Teets and Doonan 2015). Average population densities for all *Sorex* species is 14 shrews per hectare (ha) according to Smallwood and Smith (2001), but have been calculated at 44 shrews per ha by French (1980a). However, French (1980a) indicated that the plot design and location used to create the latter estimate may overestimate density. Few authors have captured 10 or more shrews in 1 locality (French 1980a; see summary in French 1980b).

Pregnant females have been found from March through October and reported litter size range from 1 to 6 offspring (French 1980a). Females can have between 1-3 litters per year (French 1980a). Young remain in the nest until nearly full grown. Southeastern shrews (*S. l. longirostris*) typically build nests under logs or other woody debris, and they line the nest with leaves (Whitaker and Hamilton 1998). Most individuals do not breed during the first summer, and they typically survive only 1 winter (French 1980b). Average generation time is estimated at approximately 9 months (French 1980; Trani et al. 2007). Young shrews are found starting in May in Georgia and Alabama, and increase in abundance throughout the breeding season. In November and December, increased death of adult shrews has been observed (French 1980a). As a species, *S. longirostris* is reported to consume a wide range of invertebrates, including spiders, butterfly and moth larvae, and both adult and larval beetles (French 1984, Whitaker and Hamilton 1998, Davis et al. 2010), and are likely to exploit a variety of prey items according to seasonal availability (Barnard and Brown 1981).

Homosassa shrews have been found in multiple habitat types including, palmetto thickets, longleaf pine sandhills, cypress swamps, bay swamps, slash pine and longleaf pine flatwoods, hydric hammocks, xeric hammocks, sand pine scrub, and clear-cuttings (Jones et al. 1991). Teets and Doonan (2015) captured *S. longirostris* in upland mixed woodland, sandhill, dome swamp and mesic flatwoods. Smith et al. (2015) collected *S. longirostris* in mixed pine-hardwood forest, mixed wetland forest and pine flatwoods.

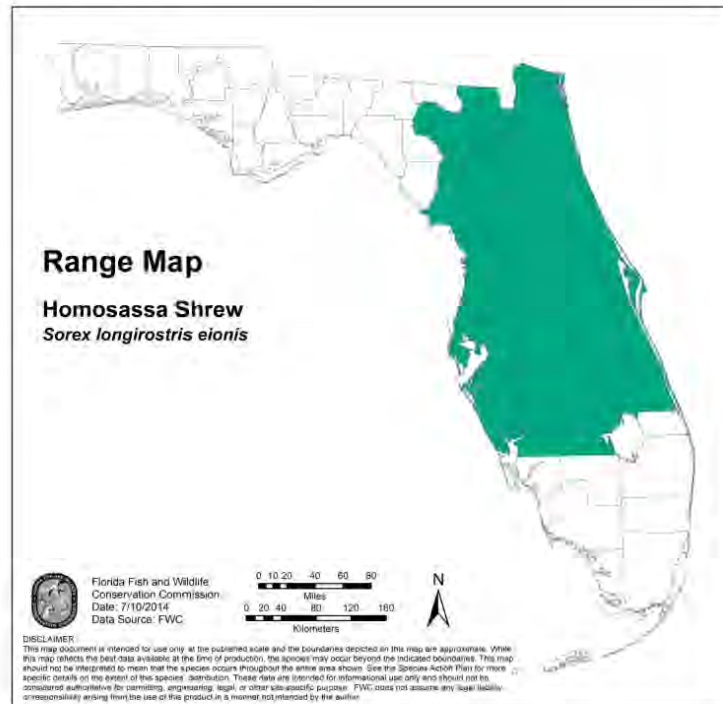
### **Threats**

A Biological Status Review (BSR) found that the Homosassa shrew did not meet the criteria for state listing in Florida (FWC 2017). However, there are threats that may affect the Homosassa shrew in the future. Habitat loss and degradation due to urbanization and agricultural practices is considered the greatest threat to the Homosassa shrew (FWC 2017). Barrett (2017) conducted an analysis of Homosassa shrew habitat with projected future development which predicts a decline in the amount of suitable habitat on private lands by 20% over the next 40 years due to urban growth (Barrett 2017). It is projected that the Homosassa shrew's native habitat will continue to be lost and degraded as the human population in the state continues to grow and expand (Barrett 2017, Zwick and Carr 2006). Furthermore, Layne (1992) and Loss et al. (2013) identified free-ranging cats as a source of mortality, and anecdotal observations suggest that human-influenced incidental mortalities may also occur from swimming pools and lawn-maintenance activities.

## Distribution and Survey Methodology

The range map represents the geographic area encompassing all observations of individuals of a species, including intervening areas of unoccupied habitat. This map is informational only and is not for regulatory purposes.

**Counties:** Alachua, Baker, Bradford, Brevard, Charlotte, Citrus, Clay, Columbia, DeSoto, Duval, Flagler, Gilchrist, Glades, Hardee, Hernando, Highlands, Hillsborough, Indian River, Lake, Levy, Manatee, Marion, Nassau, Okeechobee, Orange, Osceola, Pasco, Pinellas, Polk, Putnam, Sarasota, Seminole, St. Johns, St. Lucie, Sumter, Suwannee, Union, and Volusia.



## Recommended Survey Methodology

Surveys can be used to determine if Homosassa shrews are present in an area. However, surveys are not required for any activity.

Homosassa shrews are considered generalists as they are found in multiple habitat types. However, *S. longirostris* prefer moist habitats that attract many invertebrate prey species such as areas with recently fallen coarse woody debris scattered around the landscape, and areas with grasses, forbs, and litter that cover the ground (Davis et al. 2010, Teets and Doonan 2015).

A study by Teets and Doonan (2015) confirmed that drift fence surveys were more effective than camera traps for detecting Homosassa shrews. Teets and Doonan (2015) recommended a modified drift fence design with shorter 50'-long array arms and the use of 1-gallon buckets to allow for easier installation and reduced capture of larger, non-target species. In order to minimize shrew mortality, drift fence buckets should be checked frequently (Teets and Doonan 2015).

## Recommended Conservation Practices

Recommendations are general measures that could benefit the Homosassa shrew but are not required.

- Maintain downed coarse woody debris during timber-removal operations (this includes leaving logging slash created from limbing gates and timber operations onsite and even spreading throughout a stand, if possible), and limit fuelwood harvests that would remove coarse woody debris or existing stumps and logs.
- Leave snags standing when personnel safety allows; sites with snags may support more *Sorex* than do other areas.

- Limit the use of heavy equipment in undisturbed habitats, particularly in riparian areas or hardwood hammocks to avoid soil compaction and disturbance to the uppermost soil layers (humus and topsoil). Reduce mortality from cats by keeping cats indoors. Do not maintain feral cat colonies near or on public lands or near parks in residential areas.

## Prohibitions and Permitting

Homosassa shrews are protected by the general prohibitions outlined in Rule 68A-4.001, F.A.C.: no wildlife or freshwater fish or their nests, eggs, young, homes, or dens shall be taken, transported, stored, served, bought, sold or possessed in any manner or quantity at any time except as specifically permitted by these rules nor shall anyone take, poison, store, buy, sell, possess or wantonly or willfully waste the same except as specifically permitted these rules. They are also protected by 68A-29.002, F.A.C. which states that no person shall take, buy, sell, transport, or possess Homosassa shrews, their nests, or young. Take is defined in Rule 68A-1.004, F.A.C., as pursuing, hunting, molesting, capturing, or killing (or attempting to do those things). A permit is required for any other activity that involves the possession, capture, sell, purchase, transport, hunting or killing of Homosassa shrews. These permits are issued for justifiable purposes as outlined in Rule 68A-9.002, F.A.C. Justifiable purposes are scientific, educational, exhibition, propagation, management or other justifiable purposes.

### No Permit Needed

The following activities could cause take, but are authorized in rule to be conducted without a permit:

- Homosassa shrews may be taken as nuisance wildlife without a permit if following the methods outlined in Rule 68A-9.010 (2) and (3), F.A.C.

### Permits for Justifiable Purposes - Scientific Collecting and Educational Use

Any survey methodology that requires handling or capture of a Homosassa shrew will require a permit.

Maintaining Homosassa shrews in captivity for educational use will also require a permit.

- Trapping may impact the wild population's ability to forage, rest, and rear young. The trapping protocol must be included with the permit application, with sufficient detail to allow evaluation, and should identify measures to minimize mortality to Homosassa shrews and non-target species.
- Applicants for scientific collecting permits should identify if trapping will occur on lands owned by other entities. Coordination with county land managers, state foresters, and national parks should be addressed in the scientific collecting application.
- A summary of the applicant's expertise relative to the proposed work must be included in the application.
- Applicants should have met all conditions of previously issued permits for Homosassa shrews or other species. Camera-based surveys do not require a scientific collecting permit.
- Specimens of *Sorex* found deceased should be submitted to the FWC or deposited in the collection of the Florida Museum of Natural History in Gainesville with summary the standard data as specified:
  - Standard data should include the location (county, property/site name) and coordinates, the general habitat type, and date of collection.
  - Report standard data for every Homosassa shrew collected or observed.
  - Homosassa shrew mortality should be reported to the FWC.

### Other Permits

For any other justifiable purpose permit that does not fall under scientific collecting or educational use, please submit your request to [WildlifePermits@myfwc.com](mailto:WildlifePermits@myfwc.com).

## Additional information

Information on the economic impacts assessment of the Species Conservation Measures and Permitting Guidelines for the Homosassa shrew can be found at

<http://myfwc.com/wildlifehabitats/imperiled/management-plans/>

## Contact

For more species-specific information or related permitting questions, contact us at (850) 921-5990 or [WildlifePermits@myfwc.com](mailto:WildlifePermits@myfwc.com). For regional information, visit <http://myfwc.com/contact/fwc-staff/regional-offices>.

## Literature Cited

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## Applicant Guidance:

### Scientific Collecting Permits for State-Listed Species

The following information is provided as guidance to assist applicants in submitting a complete and sufficient application that includes all information necessary to determine whether the application meets criteria to issue a permit. Submitting a complete and sufficient application can expedite the permitting process by preventing delays triggered by missing information.

#### Permit Application Checklist

You will need to gather or have access to the information below in order to complete and submit the application in the [Online Permit System](#).

#### To register as a new user, you will need:

- To determine if you are registering as an Individual or Non-Individual (business or other entity) Applicant.
- Applicant's contact information including name, physical and mailing addresses, phone and fax numbers and email address.
- Applicant's social security number or driver's license state of issuance and number. If applying as Non-Individual, you will need the organization's FEIN/FEID number and name of contact person.
- To also apply for a self-issuing Registered Agent permit in the [Online Permit System](#) (this only applies to those applications requesting to designate sub-permittees). Once issued, you can manage sub-permittees who have delegated approval to work under the permit in your absence.

#### To apply for a scientific collecting permit, you will need:

- Your user name and password (created when registering as a new user).
- Project name, description, address, and driving directions.
- To identify project activity as either: bird banding, live possession, salvage, scientific collecting (multi-purpose or undefined activity), or voucher.
- To list the project county/counties, township, range and section, latitude, longitude and parcel identification number (if applicable).
- A summary of research/educational scope and objectives, target species, methodology, final disposition.
- Information from previous state-issued permits.

#### You will need the following attachments:

- A research plan detailing the purpose, scope, objectives, methodology and disposition of the proposed scientific work, or an educational plan and documentation of the facility's wildlife conservation program (*required*).
- Benefit to Survival Potential (*required; see next page*).
- Copies of current or former state-issued permits (*if applicable; outstanding reports for prior permits must be provided before permits will be issued.*)
- A wildlife acquisition form/letter, and supporting documentation such as photographs, brochures, published research material, (*required to document listed species legally obtained*).

Attachments may be uploaded as part of the online application. The following file types are accepted: \*.doc, \*.docx, \*.xls, \*.xlsx, \*.pdf, \*.txt, \*.ppt, \*.png, \*.tif, \*.gif, .jpg, and \*.jpeg. There is no limit to the number of attachments; however, the online system will only accommodate attachments that are each 20 megabytes or less.

## Factors considered when issuing permits

Intentional take permits (including scientific collecting and educational use) for state-Threatened species may be issued for purposes that further the conservation or survival of the species. FWC staff considers the factors outlined in Rule 68A-27.003(2), [F.A.C.](#), when determining if an application will benefit the survival potential of the species. These factors are presented below with additional information to assist applicants in submitting a complete application.

[Species Conservation Measures and Permitting Guidelines](#) (Guidelines) can inform applicants about species-specific permitting considerations. Guidelines include sections on intentional take and scientific collecting. Consulting the Guidelines is strongly encouraged as a first step in preparing your application. For species that do not yet have Guidelines developed, refer to the [Species Action Plan](#).

### Benefit to Species' Survival Potential:

Please respond to each of the following questions. Responses should be submitted as an application attachment in the online permit system. The attachment should be titled "Benefit to Survival Potential".

1. Is the project's purpose adequate to justify removal of specimens?  
If specimens will be removed from the wild, outline the consistency with the goals and objectives of the Species Action Plan to justify removal.
2. What probable direct or indirect effect will the project have on the wild population?  
If proposed activities may affect the wild population, explain what the probable effects are, and if the effect furthers conservation and survival. If it does, explain how. Explain any measures that will be taken to minimize potential effects to the wild population.
3. Does the project conflict with any programs intended to enhance the survival of the species?  
Refer to the [Guidelines](#) or [Species Action Plan](#) for the species to determine if any proposed activities in the application conflict with the conservation actions identified for the species.
4. Will the project likely reduce the threat of extinction?  
Explain how the proposed activities in the application will provide a conservation or scientific purpose that addresses the threat of extinction. Refer to the [Biological Status Review Report](#) for the species for factors contributing to risk of extinction. The Species Action Plan also outlines threats to the species and conservation actions to address those threats.
5. What are the opinions and views of experts?  
Opinions of those with species expertise will be considered during application review. Include any known relevant opinions, along with the individual or organization from which they originate.
6. Are the expertise, facilities, and resources available to the applicant adequate to accomplish the project objective?  
Document the experience, knowledge, and capability of all individuals listed on the permit application (if you are a Registered Agent, please upload this information for yourself and anyone authorized to work under the permit to your account). Document the adequacy of facilities and equipment available to you to conduct the proposed activity.
7. Is there a concern for human safety?  
If applicable, document any relevant risk to human safety posed by the species, and demonstrate that available deterrent methods have been exhausted.