

# Florida Keys Mole Skink

## *Plestiodon egregius egregius*



Photograph by Dick Bartlett.

### Species Overview

**Status:** Listed as state Threatened on Florida's Endangered and Threatened Species List

#### Current Protections

- 68A-27.003(a), F.A.C., No person shall take, possess, or sell any of the endangered or threatened species included in this subsection, or parts thereof or their nests or eggs except as allowed by specific federal or state permit or authorization.
- 68A-27.001(4), F.A.C. Take – to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. The term "harm" in the definition of take means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. The term "harass" in the definition of take means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

#### 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 harm or harassment 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 due to harm.

- The permitting standards for incidental take policy in Florida's Imperiled Species Management Plan identifies the Florida Keys mole skink as a cryptic species.
- Permitting standards for the Florida Keys mole skink will focus on cooperation and acquiring information, with the understanding that as information is gained, permitting standards may need to be adjusted.
- For Florida Keys mole skinks, information on distribution and habitat use may constitute a [scientific benefit](#). Even if surveys are conducted, detection is difficult because little is known about the life history, behavior, or biology of this species.

### Biological Background

A species' biological background provides context for conservation measures and permitting guidelines. It focuses on the habitats that support essential behavioral patterns, threats to the species, and what may constitute significant disruption of essential behavioral patterns. The Florida Keys mole skink (*Plestiodon egregius egregius*) is a small, slender, cryptic lizard that is endemic to the Florida Keys. Here, we define 'cryptic' as those species that may not be easily observed, tracked, or surveyed due to camouflage or

behavior rather than rarity. These brownish lizards are about 5 inches in total length and have a red or brownish-red tail that is about two thirds of its total length. There are 2 pairs of light stripes that extend from the head that may reach the base of the tail (Florida Natural Areas Inventory [FNAI] 2001). The Florida Keys mole skink is generally found on shorelines, on or under tidal wrack, driftwood, rocks, leaf litter or human debris. Florida Keys mole skinks are sometimes also found in pine rockland and tropical hardwood hammock habitats (Florida Fish and Wildlife Conservation Commission [FWC] 2011). These skinks are partly fossorial (adapted to dig and spend time underground), but can frequently be seen running above ground, or “swimming” in loose sand. The Florida Keys mole skink is one of 5 subspecies of mole skinks that occur in Florida.

Little is known about the life history of the Florida Keys mole skink. Florida Keys mole skinks generally prey on roaches, spiders and crickets (Mount 1963). Closely related mole skinks will lay 3 to 7 eggs in nests under surface cover (Mount 1963, Christman 1992, Bartlett and Bartlett 1999). Female mole skinks will remain with their eggs until hatching (Mount 1963, Christman 1992). Mating occurs in March. Laboratory tests have shown that this species reaches sexual maturity at one year of age (Christman 1992). Florida Keys mole skinks have been observed in various anthropogenic areas, including cemeteries, vacant lots, backyards and golf courses (FNAI 2016), which suggests that this species may be somewhat tolerant to light development.

There are two other skink species that occur in the Florida Keys. Adult southeastern five-lined skinks have stripes that extend past the hind legs and onto the tail, and juvenile five-lined skinks have a bright blue tail (FNAI 2001). Ground skinks have a bronze to brown body and tail, and have a prominent dark lateral stripe (FNAI 2001). In July 2015 FWC issued a request for the public to submit sightings information for imperiled reptile species in the Keys; once verified, this information will assist in increased knowledge of this species’ range. Therefore, these guidelines are subject to change as data gaps are filled.

#### **Habitat features that support essential behavioral patterns**

Florida Keys mole skinks primarily rely on coastal habitats. They use sandy areas of shoreline and can be found on or under features such as tidal wrack, logs, leaf litter, rocks, driftwood, or anthropogenic debris (Carr 1940, Duellman and Schwartz 1958, Christman 1992). Within the Upper Keys, this species will also use areas of rockland hammocks (FNAI 2016).

Florida Keys mole skinks primarily consume invertebrates including roaches, spiders and crickets (Mount 1963). Eggs are laid underground between April and June. Female Florida Keys mole skinks will attend and guard the nest until hatching (Mount 1963, Bartlett and Bartlett 1999).

#### **Threats**

Development and habitat modification along shorelines and within pine rockland and hardwood hammocks have already extirpated Florida Keys mole skinks from some areas (FWC 2013). Maintaining natural communities within beach dune and coastal strand communities is important to long term management of the Florida Keys mole skink (FWC 2012).

Activities that would degrade or alter beach dune and coastal strand habitat will negatively affect populations of Florida Keys



*Tropical Hardwood hammock, Florida Keys mole skink habitat. Photograph by Randy Grau, FWC.*

mole skinks. Additionally, activities that would degrade or alter secondary Florida Keys mole skink habitat, including pine rockland and hardwood hammocks, would negatively affect populations of Florida Keys mole skinks. Incompatible recreational activities, such as improper compliance of boating regulations or pet regulations may also degrade essential Florida Keys mole skink habitat.

Roadways may contribute to habitat fragmentation and reduce genetic diversity (Jochimsen et al. 2004). Additionally, roadways may be a source of mortality due to vehicle strikes.

The Florida Keys mole skink may be vulnerable to both feral and non-native species, such as the red imported fire ant (*Solenopsis invicta*), black spiny-tail iguanas (*Ctenosaura similis*), tegus (*Tupinambis spp.*), and monitor lizards (*Varanus spp.*) and feral cats (*Felis catus*).

Pine rocklands are a pyrogenic ecosystem and are stressed by altered fire regimes (FWC 2012). Extended periods of fire exclusion may degrade this ecosystem to the point where it is no longer suitable for Florida Keys mole skinks (Enge et al. 2003).

### Potential to Significantly Impair Essential Behavioral Patterns

Little is known about the Florida Keys mole skink breeding and feeding behaviors, however, its habitat needs are linked to intact coastal dune and strand communities. Activities that degrade coastal dune and strand habitat, including coastal wrack and debris (e.g., logs, driftwood, rocks) can negatively affect this species breeding capabilities. Additionally, clearing or modification of pine rocklands and hardwood hammocks may affect suitable secondary habitat for this species.

## Distribution and Survey Methodology

The range map (right) represents the principle geographic range of the Florida Keys mole skink, including intervening areas of unoccupied habitat. This map is for informational purposes only and not for regulatory use.

**Counties:** Monroe

### Recommended Survey Methodology

Surveys can sometimes be used to determine if Florida Keys mole skinks are present in an area. Because this is a cryptic species, surveys conducted in accordance with the methodology described below may not detect this species. Because the Florida Keys mole skink is designated as a state-

Threatened species in Florida, any survey methods that will require

trapping or handling a Florida Keys mole skink will need to be performed with a scientific collecting permit. Opportunistic surveys will not need a permit if the observer is not handling any animals and not moving any cover objects (i.e., driftwood) that may injure a skink. The objective of the surveys are to document the



occurrence of the Florida Keys mole skink; thus, if this skink is detected on the first survey date, there is no need to continue surveys. Surveys targeting Florida Keys mole skinks should be coordinated with FWC.

Surveys are not required, but are recommended during project planning.

- Surveys for the Florida Keys mole skink should begin in March and continue through the rainy season (May through October), when reptiles are most active.
- Opportunistic surveys can be completed by methodically turning over cover objects (e.g., rocks, logs, manmade objects). When searching wrack lines this species is most often found on the ocean side.
- Drift-fence surveys are effective at capturing lizard species. A guide to establishing a drift-fence survey can be found within:  
Enge, K. M. 1997. A standardized protocol for drift-fence surveys. Technical Report No. 14. Florida Fish and Wildlife Conservation Commission. Tallahassee, Florida.
- Drift-fence surveys should be conducted for at least two weeks.
- More than one drift-fence array should be used.
- Because traps are targeting a protected species, traps should be checked daily.
- In addition to drift fence surveys, coverboards have had documented success in attracting mole skinks (USFWS 2011). To maximize coverboard success to document Florida Keys mole skink occurrence the following survey protocols can be used.
  - Coverboard checks should be conducted minimally every 2 weeks for 3-5 months, which should be focused from May through October. More specifics on the standard methodology for this type of coverboard survey are below:
  - Coverboard surveys will require online registration for a scientific collecting permit since the observer could injure a state-Threatened species when placing or replacing (after surveys) coverboards. Additionally, these coverboards will attract non-target species.
  - Coverboards should be 2 x 2 feet in size, made of untreated plywood; minimally, use 8 coverboards per site, set at 5 meter intervals.
  - To develop suitable microhabitats under artificial refugia coverboards should be seasoned for at least 30 days prior to sampling (Wilson and Gibbons 2009). Seasoning allows conditions to develop, such as rotting leaf litter, that mimic natural occurrences (e.g., fallen logs) and therefore coverboards should be placed on site in advance of a survey to naturally weather.

The objective of the surveys is to detect the Florida Keys mole skink; thus, if observers detect this species on the first survey date, there is no need to continue surveying. If Florida Keys mole skinks are found, the applicant should coordinate with FWC.



*Coverboard placement in a tropical hardwood hammock. Photo by Jonathan Mays.*

## Recommended Conservation Practices

Recommendations are general measures that could benefit the species but are not required. No FWC permit is required to conduct these activities.

- Reduce actions that would compact soil or remove vegetation near on shoreline, dune, and coastal strand habitats.
- Leave beach, dune and coastal strand debris in place to provide microhabitat.
- Refrain from clearing or fragmenting key habitats (including pine rockland and tropical hardwood hammocks).
- Design projects to minimize loss of beach dune, coastal strand, pine rockland and tropical hardwood hammock habitat.
  - Consider provisions in the Monroe County Comprehensive Plan regarding protection of tropical hardwood hammocks and other native habitats (Monroe County 2015a).
  - Adhere to Land Planning Regulations for the Florida Keys Area of Critical State Concern – Monroe County (Rule Chapter 28-20) and Sections 118-7, 118-10(1), and 118-10(4) of the Monroe County Land Development Code regarding designing development away from natural areas and sensitive habitats, restrictions to developing tropical hardwood hammock, and maintenance of native trees (State of Florida 2014, Monroe County 2015b).
- Remove and control nonnative exotic species (e.g., red imported fire ants and nonnative lizards) that may directly or indirectly impact the Florida Keys mole skink.
- Remove and control feral domestic animals (e.g., feral cats) that may directly or indirectly impact the Florida Keys mole skink. (e.g., species that cause vegetation restructuring) or directly predate upon this snake.
- To prevent the establishment and spread of invasive and exotic plants, avoid or minimize disturbance of the soil in areas where Florida Keys mole skinks are believed to be.
- Avoid or minimize fertilizer, herbicide, and pesticide runoff into wetlands.

## Measures to Avoid Take

### Avoidance Measures that Eliminate the Need for FWC Take Permitting

This section describes all measures that would avoid the need for an applicant to apply for an FWC take permit.

- Avoid impacts to coastal dune, coastal strand, pine rockland and tropical hardwood hammock habitats used by Florida Keys mole skink. Specifically, avoid removing microhabitat features and soil compaction.

### Examples of Activities Not Expected to Cause Take

This list is not an exhaustive list of exempt actions. Please contact the FWC if you are concerned that you could potentially cause take.

- Activities that occur on impacted land not consistent with Florida Keys mole skink habitat.
- Routine maintenance of vegetation in existing linear utility and highway right-of-way's.
- Water management actions for human health and safety, such as flood control.
- Mosquito control measures. The FWC recommends following guidelines described by the Florida Keys Mosquito Control District (2016) which limit direct and indirect effects on non-target vertebrates.

### **Florida Forestry Wildlife BMP's and Florida Agricultural Wildlife BMP's**

- Due to its geographic distribution, this species is not included in the Florida Forestry Wildlife BMP's or Florida Agricultural Wildlife BMP's program, and thus these practices do not apply.

### **Other authorizations for Take**

- As described in Rule 68A-27.007(2)(c), F.A.C., land management activities (e.g., wetland restoration, prescribed fire, mechanical removal of invasive species; and herbicide application) that benefit wildlife and are not inconsistent with FWC Management Plans are authorized and do not require a permit authorizing incidental take.

## **Coordination with Other State and Federal Agencies**

The FWC participates in other state and federal regulatory programs as a review agency. During review, FWC identifies and recommends measures to address fish and wildlife resources to be incorporated into other agencies' regulatory processes. For example, the FWC commented on the Big Pine Key and No Name Key Habitat Conservation Plan (HCP), which notes the importance of tropical hardwood hammock for federally-listed species and restricts the loss native habitat for species covered under the plan. The HCP assists in determining the location of potential new development and in prioritizing mitigation areas on these keys. FWC coordinated with local jurisdictions on the Monroe County Comprehensive Plan (Monroe County 2015a), Chapter 118 of the Land Development Code, and the Land Planning Regulations for the Florida Keys Area of Critical State Concern – Monroe County (Chapter 28-20, F.A.C.; State of Florida 2014). Chapter 380 of the Florida Statutes addresses FWC's interactions with counties.

The FWC provides recommendations for addressing potential impacts to state listed species in permits issued by other agencies. If permits issued by other agencies adequately address all of the requirements for issuing a Species of Special Concern or state-Threatened species take permit, the FWC will consider these regulatory processes to fulfill the requirements of Chapter 68A-27, F.A.C., with no additional application process. This may be accomplished by issuing a concurrent take permit from the FWC, by a memorandum of understanding with the cooperating agency, or by a programmatic permit issued to another agency. These permits would be issued based on the understanding that implementation of project commitments will satisfy the requirements of Rule 68A-27.005 and Rule 68A-27.007, F.A.C.

### **Review of Land and Water Conversion projects with State-Listed Species Conditions for Avoidance, Minimization and Mitigation of Take**

- FWC staff, in coordination with other state agencies, provide comments to federal agencies (e.g., the Army Corps of Engineers) on federal actions, such as projects initiated by a federal agency or permits being approved by a federal agency.
- FWC staff works with landowners, local jurisdictions, and state agencies such as the Department of Economic Opportunity on large-scale land use decisions, including long-term planning projects like sector plans, projects in Areas of Critical State Concern, and large-scale comprehensive plan amendments.
- FWC staff coordinates with state agencies such as the Department of Environmental Protection (DEP) and the five Water Management Districts on the Environmental Resource Permitting (ERP) program, which regulates activities such as dredging and filling in wetlands, flood protection, stormwater management, site grading, building dams and reservoirs, waste facilities, power plant development,

power and natural gas transmission projects, oil and natural gas drilling projects, port facility expansion projects, some navigational dredging projects, some docking facilities, and single-family developments such as for homes, boat ramps, and artificial reefs.

## FWC Permitting: Incidental Take

As defined in Rule 68A-27.001, F.A.C., incidental take is take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Activities that result in impacts to Florida Keys mole skinks can require an Incidental Take Permit from the FWC (see [above](#) for actions that do not require a permit). Permits may be issued when there is a scientific or conservation benefit to the species and only upon showing by the applicant that the permitted activity will not have a negative impact on the survival potential of the species. Scientific benefit, conservation benefit, and negative impacts are evaluated by considering the factors listed in Rule 68A-27.007(2)(b), F.A.C. These conditions are usually accomplished through a combination of avoiding take when practicable, minimizing take that will occur, and mitigating for the permitted take. This section describes the minimization measures and mitigation options available as part of the Incidental Take Permit process for take of this species. This list is not an exhaustive list of options.

### Minimization Measure Options

The options below are intended to address the evaluation factors required for consideration when issuing an incidental take permit. These options can lessen the impact of activities, and ultimately may reduce what is needed to achieve a conservation or scientific benefit (see below).

#### Seasonal, Temporal, and Buffer Measures

- Seasonality of Florida Keys mole skinks is poorly known, although activity levels likely increase during the rainy season (May through October) and the breeding season (March). However, we are uncertain about how increased skink activity levels and likelihood of take may be related.
- Avoid disturbing potential skink nesting sites (debris) during the mating and hatching season, presumably during late spring and summer.

#### Design Modification

- Design projects to leave coastal sand dune and coastal strand intact, including natural debris.
- Minimize areas of soil compaction around coastal sand dune, coastal strand, pine rockland and hardwood hammock habitat.
- Minimize the amount of suitable habitat (i.e., coastal sand dune, coastal strand, pine rockland and tropical hardwood hammock) converted to other land uses.
- Design roads away from suitable habitats to minimize road mortality.

#### Method Modification

- When activities must occur within habitat potentially occupied by the Florida Keys mole skink, refer to the seasonal or temporal restrictions above to minimize take.
- Provide information to project personnel on identifying and avoiding directly crushing the Florida Keys mole skink, and other cryptic species found in similar habitats.

### Mitigation Options

Mitigation is scalable depending on the impact, with mitigation options for significant impairment or disruption of essential behavioral patterns constituting take. The Florida Keys mole skink is a cryptic species. Therefore, the permittee would satisfy mitigation under scientific benefit by providing any snake sighting information for this species. In most cases, requirements outlined by the county will satisfy the applicant's responsibilities under Rule 68A-27, F.A.C., and associated enforcement policies. However, under certain

circumstances, the FWC may require additional measures to achieve scientific or conservation benefit specific for take of Florida Keys mole skinks. Potential options for mitigation are described below.

#### Scientific Benefit

This section describes research and monitoring activities that provide scientific benefit, per Rule 68A-27.007, F.A.C. Conducting or funding these activities can be the sole form of mitigation for a project. Since this species is cryptic and there is limited information available, the options provided below are subject to change as new information becomes available. For projects greater than 12 acres in scope, the first three options are preferred. For projects with shorter duration and a footprint of smaller than 12 acres, the last two bullets are an option.

- Projects that help to refine the survey method for the Florida Keys mole skink would need to be conducted with FWC cooperation (SAP Actions 7, 8).
- Mitigation can be applied to support research projects consistent with actions in the Species Action Plan when methodologies are approved by FWC (SAP Action 6).
- Monitoring options can include multi-year monitoring or funding for multi-year monitoring that contributes to a portion of a range wide survey (SAP Actions 7, 8).
- Sharing sightings data (live and dead observations) with FWC, including photographs when available (SAP Action 9).
- Providing dead specimens to FWC for location vouchers and future genetics work (SAP Action 5).

#### Habitat

- Habitat acquisition may be a mitigation option. Easements and/or land use agreements that would help to conserve coastal dune, coastal strand, pine rockland and hardwood hammock are preferred (SAP Actions 2, 11).
- Predator control, such as the removal or reduction of feral animals and invasive species including feral cats, red imported fire ants, black spiny-tail iguanas, tegus, and monitor lizards (SAP Action 4).
- Removal of exotic plant species in pine rockland and hardwood hammock habitats (SAP Action 4).

#### Funding

- No funding option has been identified at this time. However, funding options as part of mitigation will be considered on a case by case basis.

#### Information

- The information option for this cryptic species may rise to the level of scientific benefit for the Florida Keys mole skink.

#### Programmatic Options

- No programmatic option available for this species.

#### Multispecies Options

- Options that benefit the Florida Keys mole skink may also benefit beach-nesting birds, including the state-Threatened least tern (*Sternula antillarum*).

## FWC Permitting: Intentional Take

Intentional take is not incidental to otherwise lawful activities. Per Rule 68A-27, F.A.C., intentional take is prohibited and requires a permit. For state-Threatened species, intentional take permits may only be considered for scientific or conservation purposes (defined as activities that further the conservation or



survival of the species taken). Permits are issued for state-Threatened species following guidance in Rule 68A-27.007(2)(a), F.A.C.

**Intentional take for human safety**

- There are no circumstances for which Florida Keys mole skink may be taken for human safety.

**Aversive Conditioning**

- Not applicable for the Florida Keys mole skink.

**Permits Issued for Harassment**

- Not applicable for the Florida Keys mole skink.

**Scientific Collecting and Conservation Permits**

Scientific collecting permits may be issued for the Florida Keys mole skink using guidance found in Rule 68A-27.007(2)(a), F.A.C. Activities requiring a permit include any research that involves capturing, handling, or marking wildlife; conducting biological sampling; or other research that may cause take.

**Considerations for Issuing a Scientific Collecting Permit**

- 1) Is the purpose adequate to justify removing the species (if the project requires this)?
  - Permits will be issued if the identified project is consistent with the goal of the Species Action Plan (i.e., improvement in status that leads to removal from Florida's Endangered and Threatened Species List), or addresses an identified data gap important for the conservation of the species.
- 2) Is there be a direct or indirect effect of issuing the permit on the wild population?
- 3) Will the permit conflict with program intended to enhance survival of species?
- 4) Will purpose of permit reduce likelihood of extinction?
  - Projects consistent with the goal of the Species Action Plan or that fill identified data gaps in species life history or management may reduce the likelihood of extinction. Applications should clearly explain how the proposed research will provide a scientific or conservation purpose for the species.
- 5) Have the opinions or views of other scientists or other persons or organizations having expertise concerning the species been sought?
- 6) Is applicant expertise sufficient?
  - Applicants must have prior documented experience with this or similar species; applicants should have met all conditions of previously issued permits; and applicants should have a letter of reference that supports their ability to handle the species.

**Relevant to all Scientific Collecting for Florida Keys mole skinks**

- Walking, visual encounter and opportunistic surveys that do not involve touching the animals or altering the microhabitat do not require a permit.
- Any activity that requires trapping or handling a Florida Keys mole skink requires a permit. For example, these activities include taking a scale or tail clip for assistance in taxonomic analyses.
- Applications must include a proposal that clearly states the objectives and scope of work of the project, including a justification of how the project will result in a conservation benefit to the species. The proposal also must include a thorough description of the project's methods, time frame and final disposition of all individuals. Permit amendment and renewal applications must be "stand alone" (i.e., include all relevant information on objectives and methods).

- Permits may be issued to display a specimen if the specimen was obtained via rehabilitation facility or was encountered dead.
- Permits may be issued for captive possession (removal from the wild) if the individual is deemed non-releasable.
- Capturing and handling protocols, and a justification of methods, must be included in the permit application and should identify measures to lessen stress for captured skinks.
- Methodologies for any collection of tissues such as blood and scale clips should be clearly spelled out, including measures taken to reduce stress and injury to the skinks.
- Disposition involving captive possession for any period of time must include a full explanation of whether the facility has appropriate resources for accomplishing the project objectives and for maintaining the animals in a safe and humane manner.
- Any mortality should be reported immediately to the FWC at the contact information below. The FWC will provide guidance on proper disposition of specimens.
- Geographical or visual data gathered must be provided to FWC in the specified format.
- A final report should be provided to the FWC in the format specified in the permit conditions.

## Additional information

Information on Economic Assessment of this guideline can be found at <http://myfwc.com/wildlifehabitats/imperiled/management-plans/>

## Contact

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

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