Florida Brown Snake of the Lower Keys

Storeria victa

Photograph by Kevin Enge, FWC.

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 brown snake (Lower Keys population) as a cryptic species.
- Permitting standards for the Florida brown snake will focus on cooperation and acquiring information, with the understanding that as information is gained, permitting standards may need to be adjusted.
- For Florida brown snakes, 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 Lower Keys Florida brown snake (*Storeria victa*) is a small (maximum length of around 30.5 centimeters or 12 inches), cryptic snake. Here, we define 'cryptic' as those species that may not be easily observed, tracked, or surveyed due to camouflage or behavior rather than rarity. Florida brown snakes are secretive and difficult to observe than rarity. Florida

brown snakes are secretive and difficult to observe beneath the logs and rocks under which they seek cover. The overall color of the snake is brown, though some specimens are olive. There is often a light mid-dorsal stripe flanked by a row of dark spots on either side (FWC 2013).

The Florida brown snake has known occurrences in the Lower Keys (Big Pine Key, Little Torch Key, Middle Torch Key, No Name Key, and Sugarloaf Keys) and in the Upper Keys (Key Largo and Upper Matecumbe). There is potential for additional occurrences on other Keys outside of those listed; therefore, any projects conducted in or occurring in habitat described below may impact the Florida brown snake or its habitat.

Genetic research is needed to confirm the taxonomic status of Florida brown snakes in the Lower Keys and settle dissention among species experts. Some herpetologists believe that the Lower Keys population is a distinct species, while others consider it a subspecies. Although Christman (1980) presented evidence suggesting the Florida brown snake (Hay 1892) warranted status as a distinct species, it was generally considered a subspecies of the brown snake (*Storeria dekayi*) until Crother (2000) concurred with Christman. The taxonomic status could affect the future state listing status of the Florida brown snake (Lower Keys population). A change in taxonomic status requires a consensus from the scientific community (FWC 2013).

Due to the sparsity of data, little is known about the ecology of the Florida brown snake, including reproduction and microhabitat. Currently, FWC and USFWS has ongoing work in the Florida Keys to help fill data gaps for reptile species. Following capture during surveys, non-lethal tissue samples will be collected and analyzed in effort to resolve taxonomic questions about the species. We are also working to identify the most viable sampling methodologies for this species. Additionally, 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 these species' range. Therefore, these guidelines may be updated to include new information collected during ongoing research.

Habitat features that support essential behavioral patterns

Mostly due to its secretive nature and difficulty in sampling, little is known about the Florida brown snake's life history or specific habitat requirements. The Florida brown snake has been found in hardwood hammocks containing freshwater and brackish marshes or very small freshwater ponds (Florida Natural Areas Inventory [FNAI] 2011), and occurs in pine rocklands (FNAI 2001). The Florida brown snake is more terrestrial than its mainland-Florida relative, the peninsular brown snake (Weaver et al. 1992), so intact habitat with even small bodies of water may represent optimal habitat for this species. They are generally found beneath cover objects like rocks (FNAI 2001). Florida brown snakes are primarily nocturnal and have been found crossing roads at night in the Keys (Lazell 1989, Weaver et al. 1992).

Pine rockland habitat. FWC Photograph.

Little is known about the Lower Keys population of the Florida brown snake's microhabitat use, reproductive biology, and diet, so we look to studies from other mainland brown snakes for guidance. Brown snakes in Everglades National Park (Long Pine Key) gave birth June through September (6-13 young), with most births happening in the months of July and August (Dalrymple et al. 1991). Florida brown snakes reach sexual maturity at 2 or 3 years old (Ernst and Ernst 2003). Their diet consists primarily of slugs and earthworms, but also snakes, insects, isopods, spiders, and small fish and amphibians (Ernst and Ernst 2003).

Threats

The Lower Keys population of the Florida brown snake is assumed to have declined due to development of suitable upland habitat, road mortality and invasive species (FWC 2013). Activities that would impact upper layers of soil, especially those causing soil impaction or tilling would be harmful to the Lower Keys population of the Florida brown snake and its prey base. Those activities could include, but are not limited to, development, agricultural practices, and other forms of land conversion.

Activities that would clear, further fragment, and/or degrade hardwood hammock or freshwater and brackish small ponds within this habitat, are a source of habitat alteration that can significantly impair the essential behaviors (breeding, feeding, and sheltering) of the Lower Keys population of the Florida brown snake. Examples include mosquito ditch enhancements, and development in key habitats (FWC 2013). This is particularly true if snakes are restricted to habitats near sources of fresh water surrounded by grassy and shrubby vegetation. However, populations may persist in areas where the landscape has been cleared and left vacant to undergo ecological succession, especially where freshwater sources remain (FWC 2013). This species is tolerant of some habitat disturbance and has been found in an old suburban development on Little Torch Key (FNAI 2011).

Road mortality is a significant threat. Therefore, the addition of roads, conversion of gravel roads to asphalt or concrete, or increased speed limits could result in higher mortality. Vehicle-caused mortality removes adults from the population, as indicated by literature, museum, and FNAI records (Paulson 1968, Lazell 1989; FLMNH and FNAI records). Besides direct mortality, roads fragment snake populations, making them more vulnerable to extinction through the reduction of genetic diversity (Jochimsen et al. 2004). Big Pine Key may be a prime area for vehicle-caused mortality because of its dense road network. Considering peninsular populations, the Florida brown snake was the most commonly killed snake species on a highway crossing Paynes Prairie in northern Florida (Dodd et al. 2004).

The Florida brown snake is also threatened by elements that may negatively impact many other Keys species as well, including the spread of invasive plants and animals. Potential predators in the Keys exist in higher numbers due to human alteration of the natural environment (intentional and unintentional). Therefore, unnatural levels of predation may be a significant threat, especially in combination with other threats. Specific predators of snakes in the Lower Keys are unknown, but feral and domestic cats, dogs, raccoons (*Procyon lotor*), crabs (*Brachyura* spp.), large anurans, and raptors eat small snakes. Opossums (*Didelphis virginiana*) from the Upper Keys have been recently introduced to the previously uninhabited Lower Keys (R. Grau, FWC, personal communication). Also known to eat small snakes, the non-native cane toad (*Rhinella marina*) may be a threat to the Florida brown snake (Meshaka et al. 2004). Additionally, Florida brown snakes are preyed upon by non-native Cuban treefrogs (*Osteopilus septentrionalis*; Maskell et al. 2003). Therefore, invasive species control could provide a conservation benefit.

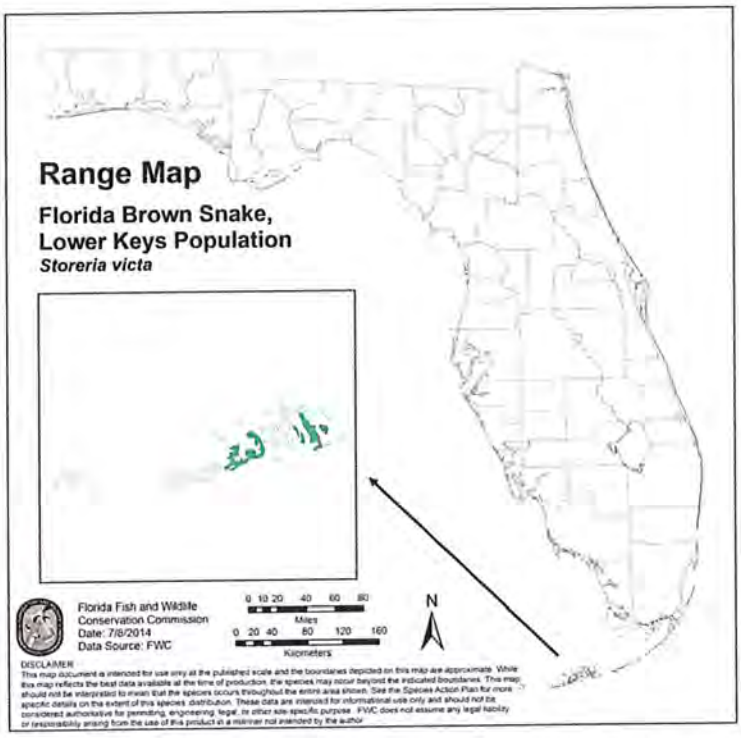
Tropical Hardwood hammock habitat. Photograph by Randy Grau, FWC.

Potential to Significantly Impair Essential Behavioral Patterns

Little is known about the lower Keys population of the Florida brown snake breeding and feeding behaviors. Its habitat needs are linked to intact tropical hardwood hammocks and pine rocklands (FNAI 2001), so clearing or fragmentation of this habitat could be detrimental. However, populations may persist in areas where tropical hardwood hammock has been cleared and left vacant to undergo ecological succession (FWC 2013).

Distribution and Survey Methodology

The range map (right) represents the principle geographic range of the Lower Keys population of the Florida brown snake. This map is for informational purposes only and is not for regulatory purposes.



Counties: Monroe

Recommended Survey Methodology

Surveys can be used to determine if Florida brown snakes 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. Surveys can be completed by methodically turning cover objects (e.g., rocks, logs, manmade objects), gently raking through leaf litter, and by using coverboards (see above). These snakes are usually found beneath cover objects (FNAI 2001). There will be an online registration for use of coverboards, including minimum standards.

- Surveys are not required, but are recommended during project planning.
- Surveys should coincide with the rainy season, when most reptiles have heightened activity. The rainy season in the Florida Keys occurs May through October.
- Surveys are not recommended on sites with strictly impermeable surfaces, gravel, or planted sod with no leaf litter present.

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

To maximize the chance of finding a Florida brown snake, the following survey protocols can be used.

- Opportunistic surveys, where natural debris is turned to look for snakes should be conducted minimally every 2-3 days for 1-5 months, which should be focused from May through October. Opportunistic surveys do not require a permit if the observer is not touching the animal.
- Coverboard checks should be conducted minimally every 2 weeks for 3-5 months, which should be focused from May through October. The standard methodology for this type of coverboard survey is

as follows:

- 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.

Coverboard placement in a tropical hardwood hammock. Photograph 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 soil compaction activities, particularly during the rainy season when Florida brown snakes are likely most active.
- Protect habitat adjacent to freshwater sources.
- Leave leaf litter and woody debris in place as microhabitat.
- Avoid placement of impermeable surfaces, such as roads or parking lots, in and adjacent to intact pine rockland and tropical hardwood hammocks.
- Refrain from clearing or fragmenting key habitats (intact pine rockland and tropical hardwood hammocks).
- Maintain or restore hydrology in pine rockland and tropical hardwood hammocks suitable for Florida brown snakes.
- Develop a prescribed fire regime that minimizes woody encroachment into wetlands and uplands.
- Remove and control nonnative exotic species that may indirectly impact the Florida brown snake

(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 brown snakes are believed to be.
- Avoid or minimize fertilizer, herbicide, and pesticide runoff into wetlands.
- Design projects to minimize loss of tropical hardwood hammock and pine rockland.
  - 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 (Chapter 28-20, F.A.C.) 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 2015*b*).
- Maintain or restore hydrology in pine rockland and tropical hardwood hammocks suitable for Florida brown snakes.

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 pine rockland and tropical hardwood hammock habitats used by Florida brown snakes. Specifically, avoid topsoil removal and 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 brown snake 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 brown snakes 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 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 Florida brown snakes. 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

- Peak seasonal activity of Florida brown snakes is not known, although activity levels likely increase during the rainy season (May through October). Concentrating site activities within the dry season should minimize take. However, we are uncertain about how increased snake activity levels and likelihood of incidental take may be related.

Design Modification

- Design projects to leave leaf litter and course woody debris intact.
- Minimize area of soil compaction and tilling to the upper soil layers.
- Minimize amount of suitable habitat (i.e., pine rockland and tropical hardwood hammock) converted to other land uses.
- Design roads away from suitable habitats to minimize road mortality.
- Design projects to minimize changes in timing, quantity, or quality of water that could degrade hydrologic features associated with optimal habitat.
- Design projects to avoid or minimize fertilizer, herbicide, and pesticide runoff into wetlands.
- Avoid placement of impermeable surfaces, such as roads or parking lots in and adjacent to intact pine rockland and tropical hardwood hammocks.
- Incorporate culverts into new road designs that will allow for maintenance and/or restoration of natural hydrology.

Method Modification

- When activities must occur within habitat occupied by the Florida brown snake, refer to the Seasonal, Temporal, and Buffer Measures above to minimize take.
- Provide information to project personnel on identifying and avoiding directly crushing the Florida brown snake 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 brown snake 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 brown snakes. 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.

- A study of habitat use preferences and seasonality patterns, including notes on natural history

observations when applicable (e.g., sex, clutch size, prey items, etc.).

- Mitigation can be applied to support research projects consistent with actions in the Species Action Plan when methodologies are approved by FWC.
- Monitoring options can include multi-year monitoring or funding for multi-year monitoring that contributes to a portion of a statewide survey (SAP Action 7).
- Provide deceased Florida brown snake specimens with latitude and longitude data to FWC for use in taxonomic study and eventual museum deposition (SAP Action 8).
- Provide sighting information and accompanying pictures of Florida brown snakes with latitude and longitude data to FWC (SAP Action 8).

Habitat

- Habitat acquisition may be a mitigation option. Easements and/or land use agreements that would help to conserve pine rockland and hardwood hammock are preferred (SAP Actions 2, 10).
- 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.

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 Florida brown snakes.

Programmatic Options

- No programmatic option available.

Multispecies Options

- Protections provided for this snake will also benefit the Key ringneck snake (also state-Threatened), peninsula ribbon snake, and red rat snake. When mitigation is provided for species like the white-crowned pigeon (*Patagioenas leucocephala*) in tropical hardwood hammock, that mitigation may provide a conservation benefit for the Florida brown snake if it occurs within the range of those species.

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 brown snakes may be taken for human safety.

Aversive Conditioning

- Not applicable for the Florida brown snake.

Permits Issued for Harassment

- Not applicable for the Florida brown snake.

Scientific Collecting and Conservation Permits

Scientific collecting permits may be issued for the Florida brown snake 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. Please note that these activities include any research that involves capturing, handling, or marking snakes; 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 Brown Snakes

- Walking, visual encounter, and opportunistic surveys that do not involve touching the animals or altering the microhabitat do not require a permit.
  - A permit will be issued by completing an online registry, and will be required prior to use of coverboards for collection of presence/absence data.
  - Any activity that requires trapping or handling a Florida brown snake requires a permit. For example, these activities include taking a scale or tail clip of the snake 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 scientific or conservation purpose 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 a 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 snakes.
- 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 snakes.
- Disposition involving captive possession for any period of time must include a full explanation of whether the facility has the 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. For regional information, visit http://myfwc.com/contact/.

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