**ATTACHMENT 1-18: Biological Information on Listed Species of Reptiles (excluding sea turtles) and Model Parameterization for Pesticide Effects Determinations**

1. **Introduction**

The purpose of this document is to summarize available information for currently listed, proposed and candidate reptile species (primarily from the US Fish and Wildlife Service). Data on sea turtles are excluded from this report but are included in a separate appendix. The focus of this effort is to capture information that may be used in ecological risk assessments of pesticides to make species-specific effects determinations. This report focuses on defining parameters, such as body weight and diet, which may be used to estimate pesticide exposures to listed reptiles. This report also focuses on defining species characteristics that may be used to assess potential indirect effects to the species (*e.g.,* diet and habitat).

A formal quality assurance and quality control plan was implemented in the collection of species specific data. The instructions for extracting information for reptiles are included in **SUPPLEMENTAL INFORMATION 1**. A template for the worksheet used to record relevant biological information for each species is provided in **SUPPLEMENTAL INFORMATION 2**. **SUPPLEMENTAL INFORMATION 3** contains the completed worksheets containing biological information on each listed reptile.

At this time, there are a total of 31 federally endangered and threatened species, subspecies or populations of reptiles that are listed under the Endangered Species Act (ESA) and occur in the United States, its territories and its waters. In addition, there is 1 species that is proposed as threatened and 3 candidate species (**Table A 1-18.1**). These species will be considered in the national level risk assessments for chlorpyrifos, diazinon, and malathion. This assessment does not consider foreign species listed under the ESA, as they occur outside of the action area for pesticide registrations in the US and its territories. Species excluded from this report also include those that are listed due to similarity of appearance to endangered or threatened species since there is no need to consult for pesticides on matters related to appearance[[1]](#footnote-1).

**Table A 1-18.1. Number of listed reptiles (excluding sea turtles) by status.**

|  |  |
| --- | --- |
| **Status** | **Number of listings** |
| Endangered | 10 |
| Threatened | 21 |
| Proposed | 1 |
| Candidate | 3 |
| Total | 35 |

1. **Species considered in National Level Effects Determinations**

There are a total of 35 listings for reptiles (excluding sea turtles) that will be discussed further in this report and included in pesticide risk assessments (**Table A 1-18.2**). Of these species, 13 have designated/proposed critical habitats. There are 24 species that occur in the Squamata order (*i.e.,* lizards and snakes). There are 10 species that occur in the Testudines order (*i.e.,* turtles and tortoises). In addition, there is one species of crocodile.

Although the Culebra Island Giant Anole (*Anolis roosevelti*) is likely extinct (the last confirmed sighting was in the 1930s), it has a designated critical habitat. Therefore, effects determinations will be made for the critical habitat of this species.

**Table A 1-18.2. Listed species of listed reptiles (excluding sea turtles) included in pesticide effects determinations.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***Scientific Name*** | **Common Name** | **Order** | **Listing Status\*** | **Critical Habitat?** | **USFWS Species ID (ENTITY\_ID)** |
| *Ameiva polops* | St. Croix Ground Lizard | Squamata | E | Yes | 163 |
| *Anolis roosevelti* | Culebra Island Giant Anole | Squamata | E | Yes | 162 |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | Testudines | T | No | 182 |
| *Crocodylus acutus* | American Crocodile (Florida population) | Crocodilia | T | Yes | 176 |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | Squamata | T | Yes | 166 |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | Squamata | T | Yes | 165 |
| *Drymarchon corais couperi* | Eastern Indigo Snake | Squamata | T | No | 173 |
| *Emoia slevini* | Slevin’s skink | Squamata | E | No | 10732 |
| *Epicrates inornatus* | Puerto Rican Boa | Squamata | E | No | 156 |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | Squamata | E | No | 174 |
| *Epicrates monensis monensis* | Mona Boa | Squamata | T | Yes | 164 |
| *Eumeces egregius lividus* | Bluetail Mole Skink | Squamata | T | No | 178 |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | Squamata | E | No | 151 |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | Testudines | T | Yes | 186 |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | Testudines | T | No | 181 |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | Testudines | C | No | 3534 |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | Testudines | T | No | 172 |
| *Graptemys oculifera* | Ringed Map Turtle | Testudines | T | No | 171 |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | Testudines | C | No | 6620 |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | Squamata | T | Yes | 183 |
| *Neoseps reynoldsi* | Sand Skink | Squamata | T | No | 179 |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | Squamata | T | No | 167 |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | Squamata | T | No | 180 |
| *Pituophis melanoleucus lodingi* | Black pine snake | Squamata | P (T) | No\*\* | 6097 |
| *Pituophis ruthveni* | Louisiana pine snake | Squamata | C | No | 3722 |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | Testudines | E | No | 168 |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | Testudines | E | Yes | 170 |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | Squamata | C | No | 7800 |
| *Sphaerodactylus micropithecus* | Monito Gecko | Squamata | E | Yes | 177 |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | Testudines | T | No | 169 |
| *Thamnophis eques megalops* | Northern Mexican gartersnake | Squamata | T | Yes | 1783 |
| *Thamnophis gigas* | Giant Garter Snake | Squamata | T | No | 187 |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | Squamata | T | Yes | 3271 |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | Squamata | E | No | 152 |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | Squamata | T | Yes | 152 |

\*E=endangered, T=threatened, P = proposed, C = candidate

\*\*Proposed

**3. Diets**

The diets of listed reptiles include a wide variety of aquatic and terrestrial animals and plants (**Table A 1-18.3**). The most frequently consumed food items include terrestrial invertebrates and vertebrates (mammals, reptiles and amphibians). Many species have diets that include a variety of food items. **Tables A 1-18.4 and A 1-18.5** define the terrestrial plant parts and terrestrial animals, respectively, consumed by listed reptiles. **Table A 1-18.6** defines the aquatic animals and plants consumed by each listed reptile species. Additional details and source information are provided in **SUPPLEMENTAL INFORMATION 3**.

**Table A 1-18.3. Number of listed species by taxa with each dietary item categories.**

|  |  |  |
| --- | --- | --- |
| **Dietary item** | | **Number of species** |
| Plant matter | Algae | 2 |
| Aquatic plants | 6 |
| Broadleaf plants | 7 |
| Fruit | 2 |
| Grass | 3 |
| Invertebrates | Freshwater | 9 |
| Saltwater | 1 |
| Terrestrial, above ground | 15 |
| Terrestrial, below ground | 4 |
| Vertebrates | Amphibians (terrestrial) | 10 |
| Birds (and chicks) | 6 |
| Carrion | 3 |
| Fish (freshwater) and amphibians | 9 |
| Fish (saltwater) | 1 |
| Mammals | 12 |
| Reptiles | 13 |

**Table A 1-18.4. Terrestrial plants included in diets of listed reptiles (excluding sea turtles).**

| ***Scientific Name*** | **Common Name** | **Grass** | **Broadleaf plants** | **Fruit** |
| --- | --- | --- | --- | --- |
| *Ameiva polops* | St. Croix Ground Lizard | No | No | No |
| *Anolis roosevelti* | Culebra Island Giant Anole | No | No | No |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | No | Yes | No |
| *Crocodylus acutus* | American Crocodile (Florida population) | No | No | No |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | No | No | No |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | No | Yes | No |
| *Drymarchon corais couperi* | Eastern Indigo Snake | No | No | No |
| *Emoia slevini* | Slevin’s skink | No | No | No |
| *Epicrates inornatus* | Puerto Rican Boa | No | No | No |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | No | No | No |
| *Epicrates monensis monensis* | Mona Boa | No | No | No |
| *Eumeces egregius lividus* | Bluetail Mole Skink | No | No | No |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | No | Yes | No |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | Yes | Yes | Yes |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | Yes | Yes | Yes |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | Yes | Yes | Yes |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | No | No | No |
| *Graptemys oculifera* | Ringed Map Turtle | No | No | No |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | No | No |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | No | No | No |
| *Neoseps reynoldsi* | Sand Skink | No | No | No |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | No | No |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | No | No | No |
| *Pituophis melanoleucus lodingi* | Black pine snake | No | No | No |
| *Pituophis ruthveni* | Louisiana pine snake | No | No | No |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | No | No |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | No | No |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | No | No | No |
| *Sphaerodactylus micropithecus* | Monito Gecko | No | No | No |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | No | No |
| *Thamnophis eques megalops* | Northern Mexican garter snake | No | No | No |
| *Thamnophis gigas* | Giant Garter Snake | No | No | No |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | No | No | No |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | No | No | No |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | No | Yes | No |

**Table A 1-18.5. Terrestrial animals included in diets of listed reptiles (excluding sea turtles).**

| ***Scientific Name*** | **Common Name** | **Terrestrial Inverts** | **Soil-dwelling Inverts** | **Mammals** | **Birds** | **Reptiles** | **Amphibians** | **Carrion** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Ameiva polops* | St. Croix Ground Lizard | Yes | Yes | No | No | No | No | No |
| *Anolis roosevelti* | Culebra Island Giant Anole | Yes | No | No | No | Yes | No | No |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | Yes | Yes | No | No | Yes | Yes | Yes |
| *Crocodylus acutus* | American Crocodile (Florida population) | No | No | Yes | No | Yes | No | No |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | Yes | No | Yes | Yes | Yes | No | No |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | Yes | No | No | No | No | No | No |
| *Drymarchon corais couperi* | Eastern Indigo Snake | Yes | No | Yes | Yes | Yes | Yes | No |
| *Emoia slevini* | Slevin’s skink | Yes | No | No | No | No | No | No |
| *Epicrates inornatus* | Puerto Rican Boa | Yes | No | Yes | Yes | Yes | No | Yes |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | No | No | Yes | Yes | Yes | No | No |
| *Epicrates monensis monensis* | Mona Boa | No | No | Yes | No | Yes | No | No |
| *Eumeces egregius lividus* | Bluetail Mole Skink | Yes | No | No | No | No | No | No |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | Yes | No | No | No | Yes | No | No |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | No | No | No | No | No | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | No | No | No | No | No | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | No | No | No | No | No | No | No |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | No | No | No | No | No | No | No |
| *Graptemys oculifera* | Ringed Map Turtle | Yes | Yes | No | No | No | No | No |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | No | No | No | No | No | No |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | Yes | No | Yes | Yes | Yes | Yes | No |
| *Neoseps reynoldsi* | Sand Skink | Yes | No | No | No | No | No | No |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | No | No | No | No | Yes | No |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | No | No | No | No | No | Yes | No |
| *Pituophis melanoleucus lodingi* | Black pine snake | No | No | Yes | Yes | No | No | No |
| *Pituophis ruthveni* | Louisiana pine snake | No | No | Yes | No | No | No | No |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | No | No | No | No | No | No |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | No | No | No | No | No | No |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | No | No | Yes | No | Yes | Yes | No |
| *Sphaerodactylus micropithecus* | Monito Gecko | Yes | No | No | No | No | No | No |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | No | No | No | No | No | No |
| *Thamnophis eques megalops* | Northern Mexican gartersnake | No | Yes | Yes | No | Yes | Yes | No |
| *Thamnophis gigas* | Giant Garter Snake | No | No | No | No | No | Yes | No |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | No | No | No | No | No | No | No |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | No | No | Yes | No | No | Yes | No |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | Yes | No | No | No | Yes | No | No |

**Table A 1-18.6. Aquatic food items of listed reptiles (excluding sea turtles).**

| ***Scientific Name*** | **Common Name** | **Algae** | **Aquatic plants** | **FW Inverts** | **SW inverts** | **FW Fish** | **SW fish** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *Ameiva polops* | St. Croix Ground Lizard | No | No | No | No | No | No |
| *Anolis roosevelti* | Culebra Island Giant Anole | No | No | No | No | No | No |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | No | Yes | Yes | No | No | No |
| *Crocodylus acutus* | American Crocodile (Florida population) | No | No | Yes | Yes | Yes | Yes |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | No | No | No | No | No | No |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | No | No | No | No | No | No |
| *Drymarchon corais couperi* | Eastern Indigo Snake | No | No | No | No | Yes | No |
| *Emoia slevini* | Slevin’s skink | No | No | No | No | No | No |
| *Epicrates inornatus* | Puerto Rican Boa | No | No | No | No | No | No |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | No | No | No | No | No | No |
| *Epicrates monensis monensis* | Mona Boa | No | No | No | No | No | No |
| *Eumeces egregius lividus* | Bluetail Mole Skink | No | No | No | No | No | No |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | No | No | No | No | No | No |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | No | No | No | No | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | No | No | No | No | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | No | No | No | No | No | No |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | Yes | Yes | Yes | No | No | No |
| *Graptemys oculifera* | Ringed Map Turtle | Yes | Yes | Yes | No | No | No |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | Yes | Yes | No | Yes | No |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | No | No | No | No | No | No |
| *Neoseps reynoldsi* | Sand Skink | No | No | No | No | No | No |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | No | No | No | Yes | No |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | No | No | Yes | No | Yes | No |
| *Pituophis melanoleucus lodingi* | Black pine snake | No | No | No | No | No | No |
| *Pituophis ruthveni* | Louisiana pine snake | No | No | No | No | No | No |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | Yes | No | No | No | No |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | Yes | Yes | No | No | No |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | No | No | No | No | No | No |
| *Sphaerodactylus micropithecus* | Monito Gecko | No | No | No | No | No | No |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | No | Yes | No | No | No |
| *Thamnophis eques megalops* | Northern Mexican garter snake | No | No | Yes | No | Yes | No |
| *Thamnophis gigas* | Giant Garter Snake | No | No | No | No | Yes | No |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | No | No | No | No | Yes | No |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | No | No | No | No | Yes | No |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | No | No | No | No | No | No |

**4. Exposure models**

Species-specific diets will be used to assess potential direct effects through consumption of pesticide-contaminated dietary items. These diets will also be used to consider potential indirect effects. For direct effects, exposures to the pesticide through the diet are assessed using either T-HERPS or KABAM, depending upon whether the species’ diet includes terrestrial and/or aquatic food items. If the species consumes plants, invertebrates or vertebrates (amphibians, reptiles, birds or mammals) that inhabit terrestrial areas, T-HERPS should be used (n = 27). If the species consumes aquatic organisms, then KABAM should be used (n = 15). **Table A 1-18.7** lists the models that will be run for each species. T-HERPS and KABAM require body weight (BW) in order to generate dose-based pesticide exposure estimates.If all other parameters are kept equal, decreases in the species BW parameter result in increases in risk. Therefore, for all listed reptiles, the lowest available BW value is used.

As noted in the Problem Formulation, to improve efficiency and expand EFED’s modeling capabilities to other, non-dietary routes of exposure for terrestrial organisms, the Terrestrial Effects Determination (TED) tool was developed. This tool integrates T-HERPS, T-HERPS and the earthworm fugacity model, along with several other models used by EFED. When this document indicates that T-HERPS or the earthworm fugacity models should be run for a species, the TED tool will be run. Assessors could also run the current version of T-HERPS. As discussed in the terrestrial exposure appendix, KABAM will not be run for chlorpyrifos, diazinon or malathion. In its place, BCF values will used to estimate exposure through consumption of aquatic food items.

**Table A 1-18.7. Models used for listed reptiles (excluding sea turtles).**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Scientific Name*** | **Common Name** | **T-HERPS?** | **KABAM?** | **BW (g)** |
| *Ameiva polops* | St. Croix Ground Lizard | Yes | No | 0.72 |
| *Anolis roosevelti* | Culebra Island Giant Anole | Yes | No | 78 |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | Yes | Yes | 110 |
| *Crocodylus acutus* | American Crocodile (Florida population) | Yes | Yes | 45000 |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | Yes | No | 85 |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | Yes | No | 4135 |
| *Drymarchon corais couperi* | Eastern Indigo Snake | Yes | Yes | 550 |
| *Emoia slevini* | Slevin’s skink | Yes | No | 8.9 |
| *Epicrates inornatus* | Puerto Rican Boa | Yes | No | 140 |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | Yes | No | 128 |
| *Epicrates monensis monensis* | Mona Boa | Yes | No | 70 |
| *Eumeces egregius lividus* | Bluetail Mole Skink | Yes | No | 3.7 |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | Yes | No | 20.6 |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | Yes | No | 3600 |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | Yes | No | 4500 |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | Yes | No | 4500 |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | No | Yes | 200 |
| *Graptemys oculifera* | Ringed Map Turtle | Yes | Yes | 220 |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | Yes | 88 |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | Yes | No | 60 |
| *Neoseps reynoldsi* | Sand Skink | Yes | No | 1.5 |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | Yes | 70 |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | Yes | Yes | 50 |
| *Pituophis melanoleucus lodingi* | Black pine snake | Yes | No | 1000 |
| *Pituophis ruthveni* | Louisiana pine snake | Yes | No | 1000 |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | Yes | 2380 |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | Yes | 2450 |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | Yes | No | 130 |
| *Sphaerodactylus micropithecus* | Monito Gecko | Yes | No | 0.15 |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | Yes | 26 |
| *Thamnophis eques megalops* | Northern Mexican gartersnake | Yes | Yes | 104 |
| *Thamnophis gigas* | Giant Garter Snake | No | Yes | 140 |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | No | Yes | 150 |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | Yes | Yes | 113 |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | Yes | No | 9.8 |

**5. Habitats**

**Table A 1-18.8** defines the generic habitat (i.e., terrestrial, wetland (aquatic-associated terrestrial) or aquatic) of each listed reptile. These generic habitats should be used to determine potential indirect effects by considering the appropriate exposure estimates and plant toxicity thresholds and endpoints. More details, including source information are provided in **SUPPLEMENTAL INFORMATION 3**. For habitats defined as terrestrial or aquatic-associated terrestrial, indirect effects to habitat will be assessed using AgDRIFT and TerrPlant. For habitats defined as aquatic, the Surface Water Concentration Calculator will be used with the species-specific aquatic bin. **ATTACHMENT 1-10** includes the aquatic bin assignments that may be used to estimate direct exposures to reptiles that consume aquatic organisms and to assess potential indirect effects.

**Table A 1-18.8. Generic habitat descriptions of listed reptiles.**

| ***Scientific Name*** | **Common Name** | **Terrestrial?** | **Aquatic-associated terrestrial?\*** | **Aquatic?** |
| --- | --- | --- | --- | --- |
| *Ameiva polops* | St. Croix Ground Lizard | Yes | Yes | No |
| *Emoia slevini* | Slevin’s skink | Yes | No | No |
| *Anolis roosevelti* | Culebra Island Giant Anole | Yes | No | No |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | No | Yes | Yes |
| *Crocodylus acutus* | American Crocodile (Florida population) | No | Yes | Yes |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | Yes | No | No |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | Yes | No | No |
| *Drymarchon corais couperi* | Eastern Indigo Snake | Yes | Yes | No |
| *Epicrates inornatus* | Puerto Rican Boa | Yes | No | No |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | Yes | No | No |
| *Epicrates monensis monensis* | Mona Boa | Yes | No | No |
| *Eumeces egregius lividus* | Bluetail Mole Skink | Yes | No | No |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | Yes | No | No |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | Yes | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | Yes | No | No |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | Yes | No | No |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | No | Yes | Yes |
| *Graptemys oculifera* | Ringed Map Turtle | No | Yes | Yes |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | Yes | Yes |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | Yes | No | No |
| *Neoseps reynoldsi* | Sand Skink | Yes | No | No |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | Yes | Yes |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | Yes | Yes | Yes |
| *Pituophis melanoleucus lodingi* | Black pine snake | Yes | Yes | No |
| *Pituophis ruthveni* | Louisiana pine snake | Yes | No | No |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | Yes | Yes |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | Yes | Yes |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | Yes | Yes | No |
| *Sphaerodactylus micropithecus* | Monito Gecko | Yes | No | No |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | Yes | Yes |
| *Thamnophis eques megalops* | Northern Mexican garter snake | Yes | Yes | Yes |
| *Thamnophis gigas* | Giant Garter Snake | Yes | Yes | Yes |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | Yes | Yes | Yes |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | No | Yes | Yes |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | Yes | No | No |

\*Bin 1; wetlands, riparian zones, beaches

**6. Obligate relationships**

Of all the listed reptiles, two appear to have obligate relationships. The Louisiana pine snake depends upon the Bairds pocket gopher for its diet and habitat, so it is assumed that the Louisiana pine snake is obligate to this species of gopher. The eastern massasauga rattlesnake depends upon crayfish burrows for hibernacula.

**7. Geographic ranges**

California has the most listed reptiles (8), followed by Florida (7), Alabama (7), Mississippi (7) and Arizona (6). The remaining states and territories with known occurrences of listed reptiles are provided in **Table A 1-18.9**. There are several states and territories where no listed reptiles occur. County specific location information for each listed species, subspecies or DPS is provided in **SUPPLEMENTAL INFORMATION 3**.

**Table A 1-18.9. Number of listed reptiles (excluding sea turtles) by state or territory.**

|  |  |
| --- | --- |
| **State** | **Number of species** |
| California | 8 |
| Florida | 7 |
| Alabama | 7 |
| Mississippi | 7 |
| Arizona | 6 |
| Puerto Rico | 6 |
| Louisiana | 5 |
| Nevada | 5 |
| New Mexico | 4 |
| Utah | 4 |
| Georgia | 3 |
| United States Virgin Islands | 3 |
| Pennsylvania | 2 |
| Ohio | 2 |
| Colorado | 2 |
| New York | 2 |
| Michigan | 2 |
| Indiana | 2 |
| Massachusetts | 2 |
| West Virginia | 1 |
| Illinois | 1 |
| Minnesota | 1 |
| Maryland | 1 |
| Rhode Island | 1 |
| Vermont | 1 |
| Connecticut | 1 |
| Delaware | 1 |
| New Jersey | 1 |
| Wisconsin | 1 |
| Texas | 1 |
| South Carolina | 1 |
| Tennessee | 1 |
| Missouri | 1 |
| Iowa | 1 |
| Guam | 1 |

1. **Elevation restrictions**

**Table A 1-18.10** lists the elevation restrictions listed reptiles that will be considered for pesticide effects determinations. Of these species, 8 have known elevation restrictions.

**Table A 1-18.10. Elevation restrictions of listed reptiles.**

|  |  |  |  |
| --- | --- | --- | --- |
| ***Scientific Name*** | **Common Name** | **Elevation restriction?** | **If yes, define (in m)** |
| *Ameiva polops* | St. Croix Ground Lizard | No | NA |
| *Anolis roosevelti* | Culebra Island Giant Anole | No | NA |
| *Clemmys muhlenbergii* | Bog Turtle (northern population) | Yes | sea level to 1500 |
| *Crocodylus acutus* | American Crocodile (Florida population) | No | NA |
| *Crotalus willardi obscurus* | New Mexican ridge-nosed Rattlesnake | Yes | 1680-2700 |
| *Cyclura cornuta stejnegeri* | Mona Ground Iguana | No | NA |
| *Drymarchon corais couperi* | Eastern Indigo Snake | No | NA |
| *Emoia slevini* | Slevin’s skink | No | NA |
| *Epicrates inornatus* | Puerto Rican Boa | Yes | Sea level - 400 |
| *Epicrates monensis granti* | Virgin Islands Tree Boa | No | NA |
| *Epicrates monensis monensis* | Mona Boa | No | NA |
| *Eumeces egregius lividus* | Bluetail Mole Skink | Yes | >30 |
| *Gambelia silus* | Blunt-nosed Leopard Lizard | Yes | <800 |
| *Gopherus agassizii* | Desert Tortoise (except AZ south and east of Colorado River) | Yes | <2,225 |
| *Gopherus polyphemus* | Gopher Tortoise (west of Mobile and Tombigbee Rivers in AL, MS, and LA) | No | NA |
| *Gopherus polyphemus* | Gopher Tortoise (Eastern) | No | NA |
| *Graptemys flavimaculata* | Yellow-blotched Map Turtle | No | NA |
| *Graptemys oculifera* | Ringed Map Turtle | No | NA |
| *Kinosternon sonoriense longifemorale* | Sonoyta mud turtle | No | NA |
| *Masticophis lateralis euryxanthus* | Alameda Whipsnake | No | NA |
| *Neoseps reynoldsi* | Sand Skink | No | NA |
| *Nerodia clarkii taeniata* | Atlantic Salt Marsh Snake | No | NA |
| *Nerodia erythrogaster neglecta* | Copperbelly Water Snake (Northern DPS) | No | NA |
| *Pituophis melanoleucus lodingi* | Black pine snake | No | NA |
| *Pituophis ruthveni* | Louisiana pine snake | No | NA |
| *Pseudemys alabamensis* | Alabama Red-belly Turtle | No | NA |
| *Pseudemys rubriventris bangsi* | Plymouth Red-Belly Turtle | No | NA |
| *Sistrurus catenatus* | Eastern Massasauga (=rattlesnake) | No | NA |
| *Sphaerodactylus micropithecus* | Monito Gecko | No | NA |
| *Sternotherus depressus* | Flattened Musk Turtle (Black Warrior River system upstream from Bankhead Dam) | No | NA |
| *Thamnophis eques megalops* | Northern Mexican garter snake | Yes | 40 to 2,590 |
| *Thamnophis gigas* | Giant Garter Snake | No | NA |
| *Thamnophis rufipunctatus* | Narrow-headed garter snake | Yes | 701 to 2,430 |
| *Thamnophis sirtalis tetrataenia* | San Francisco Garter Snake | No | NA |
| *Uma inornata* | Coachella Valley Fringe-toed Lizard | No | NA |

1. **Strategy for grouping species**

In order to efficiently assess the risks of a pesticide to listed reptiles, it is necessary to group them by their defining features that are relevant in the context of the risk assessment framework. There are two major factors that impact the risk of a pesticide to a species: exposure and effects. In terms of effects, relevance of surrogate test species for a listed species may alter the confidence associated with the risk call. Surrogacy is determined by taxonomy, specifically whether toxicity data are available for species within the same order as the listed species. Therefore, species are grouped according to their order (**Table A 1-18.2**). Because exposure is based on diet, reptiles are lumped according to their diet (**Tables A 1-18.4 to A 1-18.6**). Since indirect effects are based on diet and habitat, lumping according to diet will also serve the needs of indirect effects in terms of effects to or via prey base. Species are also grouped according to similarity of their habitats (**Tables A 1-18.8 and A 1-18.9**). A final consideration in this strategy is whether or not a species has an obligate relationship. If a species has an obligate relationship, it may be treated separately from other species. **Table A 1-18.11** summarizes the 11 groups of listed reptiles. Each group of species will share risk hypotheses and lines of evidence. Note that several species did not have similarities to other listed reptiles, therefore, they will be assessed separately.

**Table A 1-18.11. Summary of listed reptile groups.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Order** | **Species** | **N** | **Diet** | **Obligate relationship?** | **Critical habitat?** | **Habitat(s)** | **Model(s)** |
| Crocodilia | American crocodile | 1 | Aquatic invertebrates (FW and SW), fish (FW and SW), reptiles, mammals | No | Yes | Wetland, aquatic | KABAM, T-HERPS |
| Squamata | Louisiana pine snake | 1 | Mammals | Yes (Bairds pocket gopher) | No | Terrestrial | T-HERPS |
| Squamata | Eastern Massasauga | 1 | Mammals, amphibians, reptiles | Yes (crayfish) | No | Terrestrial, wetland | T-HERPS |
| Squamata (lizards) | St. Croix Ground Lizard, Culebra Island Giant Anole, Mona Ground Iguana, Blunt-nosed Leopard Lizard, Sand Skink, Monito Gecko, Coachella Valley Fringe-toed Lizard, bluetail mole skink | 8 | Terrestrial invertebrates, soil-dwelling invertebrates, broadleaf plants, reptiles | No | Yes (6) | Terrestrial | T-HERPS |
| Squamata (lizards) | Slevin’s skink | 1 | Terrestrial invertebrates | No | No | Terrestrial | T-HERPS |
| Squamata (terrestrial snakes) | New Mexican ridge-nosed Rattlesnake, Eastern Indigo Snake, Puerto Rican Boa, Virgin Islands Tree Boa, Mona Boa, Alameda Whipsnake, Black pine snake | 7 | Terrestrial invertebrates, vertebrates (mammals, birds, reptiles, amphibians), carrion | No | Yes (3) | Terrestrial, wetland | T-HERPS |
| Squamata (aquatic snakes) | Atlantic Salt Marsh Snake, Copperbelly Water Snake, Giant Garter Snake, Narrow-headed garter snake, San Francisco Garter Snake | 5 | Amphibians and fish (one species eats aquatic inverts and another eats mammals) | No | Yes (1) | Aquatic, wetland terrestrial | KABAM, T-HERPS |
| Squamata | Northern Mexican garter snake | 1 | Soil-dwelling invertebrates, mammals, reptiles, amphibians, aquatic invertebrates (FW) and fish | No | Yes | Aquatic, wetland terrestrial | KABAM, T-HERPS |
| Testudines (tortoises) | Desert tortoise, Gopher tortoise (2) | 3 | Grass, broadleaf plants, fruit | No | Yes (1) | Terrestrial | T-HERPS |
| Testudines (turtles) | Yellow-blotched Map Turtle, Alabama Red-belly Turtle, Plymouth Red-Belly Turtle, Flattened Musk Turtle | 4 | Aquatic plants, algae and aquatic invertebrates (FW) | No | Yes (1) | Aquatic, wetland | KABAM |
| Testudines | Bog turtle | 1 | Broadleaf plants, terrestrial invertebrates, soil-dwelling invertebrates, reptiles, amphibians, carrion, aquatic plants, aquatic invertebrates (FW) | No | No | Aquatic, wetland | KABAM, T-HERPS |
| Testudines | Ringed Map Turtle | 1 | Terrestrial and soil-dwelling invertebrates, algae, aquatic plants, aquatic invertebrates (FW) | No | No | Aquatic, wetland | KABAM, T-HERPS |
| Testudines | Sonoyta mud turtle | 1 | Fish and aquatic amphibians, aquatic invertebrates (FW), aquatic plants | No | No | Aquatic, wetland | KABAM |

**SUPPLEMENTAL INFORMATION 1. Instructions for extracting biological information for listed reptiles**

The purpose of this project is to compile biological information on federally listed endangered and threatened reptiles. This document contains instructions for extracting relevant biological information on each of these species and a form for entering this information. Species listed due to similarity of appearance (SAT) to a listed species are not considered here since there is no need to consult on these species.

**Instructions:**

Step 1. Copy the template (below) for the listed reptile species worksheet used to record biological information for individual species. Paste this into a new page at the end of this document. This worksheet will be used to record biological information for one of the listed reptile species listed in the table above.

Step 2. Go to the species profile for the species of interest.

Step 3. If available, acquire the most recent recovery plan available for the listed species of interest. Recovery plans can be located by clicking on the “recovery” quick link of the species profile for the species of interest. Save the pdf of the recovery plan.

Step 4. Extract information on body weight, habitat, diet and the other parameters listed in the attached sheet. When information is entered into the worksheet, note the source number in ( ). These data can generally be found in the life history portion of the recovery plan, so it is not necessary to review the entire recovery plan. When a data point is extracted, highlight the appropriate information in the PDF. When all data are extracted from the recovery plan, save the revised file. All information that appear in the species worksheet must have a source and must be highlighted in the original document. This is a critical component of the Quality Control (QC) for this project.

Step 5. If no body weight information is provided in the recovery plan, this value can be estimated using relationships between snout to vent length and body weights. In this approach, body weights for listed species should be predicted using regressions for the same genus (or family if genus is not possible). The mean of the weights estimated from these species regressions should be used. When a range of lengths is given, the corresponding range of weights should be calculated. The following sources have information that is useful for lizards and snakes:

Meiri, S. 2010. Length-weight allometries in lizards. Journal of Zoology, 281: 218-226.

Kaufman, G.A. and J.W. Gibbons. 1975. Weight-length relationships in thirteen species of snakes in the southeastern United States. Herpetologica, 31: 31-37.

Step 6. If data are not located in the recovery plan, other scientifically valid sources (*e.g.,* scientific literature, USFWS publications) may be used to acquire the necessary information. Please check with Kris Garber before extracting data from other sources.

Step 7. Enter “yes” in the second to last column for the species of interest when the worksheet for that species is complete. Save this file. Start back at step 1 with a new species.

Notes:

1. Many recovery plans include information on multiple listed species. If this is the case, data can be extracted at the same time for all of the species included in the recovery plan.
2. It is recommended that the data extractor do a search of the recovery plan for the term “obligate” to determine whether the listed species of interest has any obligate relationships with other species.
3. Kris Garber will complete the EFED model portion of the worksheet for all species.
4. For any questions, please see Kris Garber.

**SUPPLEMENTAL INFORMATION 2. Template for the listed reptile worksheet used to record biological information**

**Biological information on listed reptile species**

Species (common name):

Listed status: endangered threatened

Designated critical habitat? yes no

Map of range/occurrences in recovery plan? yes no

Population size (most current estimate):

Body weight (in g):

Locations known to occur:

Diet (enter as many as relevant):

insects small mammals fish

seeds birds aquatic invertebrates

grass reptiles aquatic plants

broadleaf plants terrestrial amphibians aquatic amphibians

Relevant EFED model(s): T-HERPS KABAM none

Habitat (enter as many as relevant):

Forest

Wetlands

Fallow fields

Agricultural areas

Elevation restriction:

Obligate relationships:

Comments:

Name of data extractor (date):

QC reviewer (date):

Sources:

Species specific recovery plan available on FWS website.

Other:

**SUPPLEMENTAL INFORMATION. Species (or Distinct Population Segment)-specific information for listed reptiles**

This appendix contains a summary of the biological and geographical information available (primarily from the US Fish and Wildlife Services) for listed reptile species and Distinct Population Segments (DPS).

**Species (common name): *Ameiva polops* (St. Croix Ground Lizard)**

Listed status: endangered (1, p 7)

Designated critical habitat? yes (1, p 7)

Primary Constituent Elements: not defined in FR for designation of critical habitat (3, 4)

Map of range/occurrences in recovery plan? no

Population size (most current estimate): 2,500 on Green Cay and 50 on Protestant Cay, 1984 estimates (1, p 3); none seen since 1968 on St. Croix mainland (1, p 3)

Snout to Vent Length (in mm): 35-77 (1, p 1)

Body weight (in g): 0.72-13 (range estimated using a regression of 7 *Ameiva* species from 2, Appendix S1)

Locations known to occur: Virgin Islands; Green Cay and Protestant Cay off the north shore of St. Croix (1, p 3)

Federal lands or Indian reservations species is known to occur: None (5)

Dates of Breeding Period: Not specified

Diet: amphipods, moths, hermit crabs (1, p 6)

Relevant EFED model(s): T-HERPS

Habitat: Beach and Forest (1, p 5)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-yr review initiated in 2007

Optimal habitat has exposed and canopied areas, litter (leaf or tidal), loose substrate and crab burrows (1, p 6)

Has been observed foraging in seagrass and under forest litter and in holes (1, p 6)

14 of the 18 A of designated critical habitat for this species is part of Green Cay National Wildlife Refuge (1, p 7)

Body weight (BW) is estimated from snout to vent length (SVL) for *A. polops* and regressions of body weight and SVL data of 7 other species in the *Ameiva* genus. The calculated equation and data (from 2, Appendix S1) are below (R2 = 0.76).

BW = 10^(3.676\*LOG(SVL)-5.821)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Genus | Species | Family | SVL (mm) | Log SVL | weight (g) | Log weight | limbs | sex | mass measure |
| *Ameiva* | *ameiva* | Teiidae | 127.7 | 2.11 | 107.9 | 2.03 | legged | male | mean |
| *Ameiva* | *exsul* | Teiidae | 93.77 | 1.97 | 6.2 | 0.79 | legged | female | mean |
| *Ameiva* | *festiva* | Teiidae | 88.2 | 1.95 | 39.4 | 1.60 | legged | male | mean |
| *Ameiva* | *plei* | Teiidae | 117.9 | 2.07 | 76.3 | 1.88 | legged | male | mean |
| *Ameiva* | *quadrilineata* | Teiidae | 68.05 | 1.83 | 14.6 | 1.16 | legged | male | mean |
| *Ameiva* | *undulata* | Teiidae | 87.25 | 1.94 | 19.4 | 1.29 | legged | unsexed | mean |
| *Ameiva* | *wetmorei* | Teiidae | 45.83 | 1.66 | 1.7 | 0.23 | legged | female | mean |

Name of data extractor (date): Elyssa Gelmann, 24 February 2012

QC reviewer (date): Kris Garber (4/9/12)

Sources:

1. USFWS. 1984. St. Croix Ground Lizard Recovery Plan. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/840329.pdf
2. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
3. USFWS. 1977. Final Correction and Augmentation of Critical Habitat Reorganization. Available online at: <http://ecos.fws.gov/docs/federal_register/fr161.pdf>.
4. USFWS. 1977. Final Determination of Endangered Status and Critical Habitat for St. Croix Ground Lizard. Available online at: http://ecos.fws.gov/docs/federal\_register/fr138.pdf.
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (Slevin's skink): *Emoia slevini***

Listed status: Endangered

Designated critical habitat? no

Spatial data in recovery plan? no

Population size (most current estimate): The skink has not yet been reported from the southern island of Saipan, or the northern islands of Farallon de Medinilla, Maug, or Uracas. The densest population was on Alamagan (island area of 2,800 ac; 1,130 ha) in the early 1990s, but researchers believe that overgrazing by introduced ungulates may preclude the long-term

viability of that population (Rodda 2002, p. 3; Fritts and Rodda 1993, p. 1). The catch rate (number of lizards captured per hour) quadrupled on Sarigan in a survey conducted in 2007, after eradication of feral ungulates from the island in 1998 (Vogt 2007, p. 5–5; Kessler 2011, p. 322). Its current status on Aguiguan, Guguan, Pagan, and Asuncion is unknown.

Slevin’s skink was most numerous in the Mariana Islands during prehistoric times, before the introduction of other competing lizards and predators, and loss of native forest (Vogt and Williams 2004, p. 65; Berger et al. 2005, p. 175). After World War II, Slevin’s skink had notably vanished from the larger southern Mariana Islands (Fritts and Rodda 1993, p. 4), which suggests the species may be sensitive to habitat destruction or changes in land use practices (Fritts and Rodda 1993, p. 4; Berger et al. 2005, p. 174). Slevin’s skink had not been recorded on Guam since 1945 or on Cocos Island since the early 1990s (Rodda and Fritts 1992, p. 171; Campbell 2011, in litt.), until a specimen was captured on Cocos Island in January of 2011 (Campbell 2011, pers. comm.).

Snout to Vent Length (in mm): 77

Body weight (in g): 8.9 (value estimated using a regression of 6 *Emoia* species from 3, Appendix S1)

Dates of Breeding Period:

Locations known to occur: Guam on the Mariana Islands

Federal lands or Indian reservations species is known to occur:

Migratory:

Diet: insects

Slevin’s skink is a fast-moving, alert, insectivorous lizard, typically found on the ground or at ground level, and active during the day.

Relevant EFED model(s): T-HERPS

Habitat (enter as many as relevant):

Forest

It is the only lizard endemic to the Mariana Islands and is on the Government of Guam’s Endangered Species List (Fritts and Rodda 1993, p. 3; Rodda *et al.* 1997, p. 568; Rodda 2002, p. 2; CNMI Division of Fish and Wildlife (DFW) 2005, p. 174; GDAWR 2006, p. 107; Guam Department of Agriculture 2014, in litt.). Slevin’s skink is a fast-moving, alert, insectivorous lizard, typically found on the ground or at ground level, and active during the day. Based on both older and more recent observations, the species occurs in the forest ecosystem, with most individuals observed on the forest floor using leaf litter as cover (Brown and Falanruw 1972, p. 110; GDAWR 2006, p. 107; Cruz et al. 2000, p. 21; Lardner 2013, in litt.).

Habitat size (home range):

Elevation restriction:

Obligate relationships:

Comments: Occasionally, individuals were observed in low hollows of tree trunks (Brown and Falanruw 1972, p. 110). It is a social species, seen often in the company of other individuals, including other nonnative skink species (Vogt and Williams 2004, pp. 59, 65). The females carry their eggs internally and give birth to live young (Brown 1991, pp. 14–15). Other specific life-history or habitat requirements of Slevin’s skink are not well documented (Rodda 2002, p. 3).

In summary, once widespread, the remaining known populations of Slevin’s skink are made up of a few individuals on Cocos Island, and occurrences of undetermined numbers of individuals on Alamagan and Sarigan. Populations of Slevin’s skink are decreasing from initial numbers observed on Cocos Island, Alamagan, Pagan, and Asuncion, and it has not been reobserved on Guam, Rota, Tinian, and Aguiguan; the species has been lost from 90 percent of its former range. The remaining populations of Slevin’s skink are at risk, due to continued habitat loss and destruction from agriculture, urban development, nonnative animals, and typhoons. Predation by rats, monitor lizards, and possible predation by the brown tree snake (if the snake is introduced to other islands), also contribute to the decline of Slevin’s skink.

Body weight (BW) is estimated from snout to vent length (SVL) for *E. slevini* and regressions of body weight and SVL data of 6 other species in the *Emoia* genus. The calculated equation and data (from 2, Appendix S1) are below (R2 = 0.89).

BW = 10^(3.464\*LOG(SVL)-5.585)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Genus | Species | Family | SVL (mm) | Log SVL | Weight (g) | Log Weight | Limbs | Sex | Mass measured |
| Emoia | atrocostata | Scincidae | 100 | 2 | 22 | 1.342423 | legged | male | heaviest |
| Emoia | caeruleocauda | Scincidae | 65 | 1.812913 | 2.4 | 0.380211 | legged | unsexed | heaviest |
| Emoia | cyanura | Scincidae | 46.4 | 1.666518 | 2.3 | 0.361728 | legged | female | mean |
| Emoia | lawesi | Scincidae | 92.35 | 1.965437 | 18.1 | 1.257679 | legged | female | mean |
| Emoia | nigra | Scincidae | 101.85 | 2.007961 | 28.7 | 1.457882 | legged | female | mean |
| Emoia | samoensis | Scincidae | 100 | 2 | 22.8 | 1.357935 | legged | female | mean |

Name of data extractor and date: Lewis Ross Brown, III, Env. Biologist, August 26, 2016

QC reviewer (date): Elizabeth Donovan, Senior Scientist, 12/13/16

Sources:

1. 2015\_USFWS\_[Endangered Status for 16 Species and Threatened Status for 7 Species in Micronesia; Final Rule](http://www.gpo.gov/fdsys/pkg/FR-2015-10-01/pdf/2015-24443.pdf) <http://www.gpo.gov/fdsys/pkg/FR-2015-10-01/pdf/2015-24443.pdf>
2. 2014\_USFWS\_[Proposed Endangered Status for 21 Species and Proposed Threatened Status for 2 Species in Guam and the Commonwealth of the Northern Mariana Islands](http://www.gpo.gov/fdsys/pkg/FR-2014-10-01/pdf/2014-22776.pdf) <http://www.gpo.gov/fdsys/pkg/FR-2014-10-01/pdf/2014-22776.pdf>
3. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.

**Species (common name): *Anolis roosevelti* (Culebra Island Giant Anole)**

Listed status: endangered (1, p 2)

Designated critical habitat? yes (1, p 2, 4)

Primary Constituent Elements: not defined in FR for designation of critical habitat (4, 5)

Map of range/occurrences in recovery plan? yes (1, p 3)

Population size (most current estimate): uncertain (1, p 6).

Snout to Vent Length (in mm): 160 (1, p 1)

Body weight (in g): 78 (estimated using a regression of 93 *Anolis* species from 2, Appendix S1)

Locations known to occur: Culebra Island, Puerto Rico (1, p 1)

Federal lands or Indian reservations species is known to occur: None (6)

Dates of Breeding Period: unknown (1, p 7)

Diet: insects, fruits, small lizards (1, p 7)

Relevant EFED model(s): T-HERPS

Habitat: Forest – tall gumbo-limbo and Ficus trees (1, p 2)

Species is presumed to be arboreal (1, p 7)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments: This species may be extinct (1, p 1)

Most recent survey conducted in 1986 did not locate any individuals of this species. Author of study recommended that the species be considered extinct (3).

Species was last seen by biologists in 1932 (1, p 1) and last claimed sighting in 1978 (1, p 2).

A five-year review was initiated in 2006 but has not been published.

It is assumed that this species eats insects and small lizards based on the diets of other species in the same genus (1, p 7)

Body weight (BW) is estimated from snout to vent length (SVL) for *A. roosevelti* and regressions of body weight and SVL data of 93 other species in the *Anolis* genus. The calculated equation and data (from 2, Appendix S1) are below (R2 = 0.92).

BW = 10^(2.935\*LOG(SVL)-4.574)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Genus | Species | Family | SVL (mm) | Log SVL | weight (g) | Log weight | limbs | sex | mass measure |
| *Anolis* | *acutus* | Polychrotidae | 66.00 | 1.82 | 4.3 | 0.63 | legged | unsexed | heaviest |
| *Anolis* | *aequatorialis* | Polychrotidae | 82.1 | 1.91 | 10.5 | 1.02 | legged | male | mean |
| *Anolis* | *agassizi* | Polychrotidae | 114 | 2.06 | 34 | 1.53 | legged | male | heaviest |
| *Anolis* | *aliniger* | Polychrotidae | 55.9 | 1.75 | 4.7 | 0.67 | legged | male | mean |
| *Anolis* | *allisoni* | Polychrotidae | 56.55 | 1.75 | 4.500 | 0.65 | legged | female | mean |
| *Anolis* | *angusticeps* | Polychrotidae | 45.3 | 1.66 | 2.6 | 0.41 | legged | male | mean |
| *Anolis* | *anisolepis* | Polychrotidae | 53 | 1.72 | 3.5 | 0.54 | legged | male | mean |
| *Anolis* | *aquaticus* | Polychrotidae | 64.65 | 1.81 | 7.80 | 0.89 | legged | male | mean |
| *Anolis* | *attenuatus* | Polychrotidae | 80.6 | 1.91 | 10.90 | 1.04 | legged | female | mean |
| *Anolis* | *auratus* | Polychrotidae | 43.9 | 1.64 | 1.90 | 0.28 | legged | unsexed | mean |
| *Anolis* | *bahorucoensis* | Polychrotidae | 43.9 | 1.64 | 1.7 | 0.23 | legged | male | mean |
| *Anolis* | *baleatus* | Polychrotidae | 156.3 | 2.19 | 80.8 | 1.91 | legged | male | mean |
| *Anolis* | *bicaorum* | Polychrotidae | 61.35 | 1.79 | 5.9 | 0.77 | legged | female | mean |
| *Anolis* | *biporcatus* | Polychrotidae | 88.7 | 1.95 | 28 | 1.45 | legged | female | mean |
| *Anolis* | *bombiceps* | Polychrotidae | 74 | 1.87 | 3.9 | 0.59 | legged | female | heaviest |
| *Anolis* | *bonairensis* | Polychrotidae | 75 | 1.88 | 8.9 | 0.95 | legged | male | heaviest |
| *Anolis* | *capito* | Polychrotidae | 68.45 | 1.84 | 7.8 | 0.89 | legged | unsexed | mean |
| *Anolis* | *carolinensis* | Polychrotidae | 49.25 | 1.69 | 2.3 | 0.36 | legged | female | mean |
| *Anolis* | *carpenteri* | Polychrotidae | 40.4 | 1.61 | 1 | 0.00 | legged | female | mean |
| *Anolis* | *casildae* | Polychrotidae | 100 | 2.00 | 20 | 1.30 | legged | female | heaviest |
| *Anolis* | *chloris* | Polychrotidae | 53.3 | 1.73 | 1.7 | 0.23 | legged | male | mean |
| *Anolis* | *chlorocyanus* | Polychrotidae | 67.75 | 1.83 | 6.9 | 0.84 | legged | male | mean |
| *Anolis* | *christophei* | Polychrotidae | 47.4 | 1.68 | 2.2 | 0.34 | legged | male | mean |
| *Anolis* | *chrysolepis* | Polychrotidae | 65.2 | 1.81 | 6.9 | 0.84 | legged | female | mean |
| *Anolis* | *coelestinus* | Polychrotidae | 73.65 | 1.87 | 9.3 | 0.97 | legged | male | mean |
| *Anolis* | *conspersus* | Polychrotidae | 66 | 1.82 | 8 | 0.90 | legged | male | mean |
| *Anolis* | *cooki* | Polychrotidae | 63 | 1.80 | 5.5 | 0.74 | legged | male | mean |
| *Anolis* | *cristatellus* | Polychrotidae | 67.3 | 1.83 | 8.4 | 0.92 | legged | male | mean |
| *Anolis* | *cupreus* | Polychrotidae | 46.15 | 1.66 | 1.8 | 0.26 | legged | male | mean |
| *Anolis* | *cuprinus* | Polychrotidae | 65.15 | 1.81 | 4.6 | 0.66 | legged | male | mean |
| *Anolis* | *cuvieri* | Polychrotidae | 132 | 2.12 | 46.6 | 1.67 | legged | male | mean |
| *Anolis* | *cybotes* | Polychrotidae | 61.23 | 1.79 | 9.3 | 0.97 | legged | male | mean |
| *Anolis* | *darlingtoni* | Polychrotidae | 72 | 1.86 | 7.1 | 0.85 | legged | male | mean |
| *Anolis* | *distichus* | Polychrotidae | 49.65 | 1.70 | 3.1 | 0.49 | legged | male | mean |
| *Anolis* | *dunni* | Polychrotidae | 58 | 1.76 | 3.2 | 0.51 | legged | male | heaviest |
| *Anolis* | *equestris* | Polychrotidae | 151.7 | 2.18 | 56 | 1.75 | legged | male | mean |
| *Anolis* | *evermanni* | Polychrotidae | 57.4 | 1.76 | 5.4 | 0.73 | legged | male | mean |
| *Anolis* | *frenatus* | Polychrotidae | 135.2 | 2.13 | 51.7 | 1.71 | legged | unsexed | mean |
| *Anolis* | *fuscoauratus* | Polychrotidae | 43.6 | 1.64 | 1.5 | 0.18 | legged | female | mean |
| *Anolis* | *gadovii* | Polychrotidae | 70.8 | 1.85 | 5 | 0.70 | legged | male | mean |
| *Anolis* | *garmani* | Polychrotidae | 107.65 | 2.03 | 33.8 | 1.53 | legged | male | mean |
| *Anolis* | *gemmosus* | Polychrotidae | 62.75 | 1.80 | 4.1 | 0.61 | legged | male | mean |
| *Anolis* | *grahami* | Polychrotidae | 62.55 | 1.80 | 6.1 | 0.79 | legged | male | mean |
| *Anolis* | *gundlachi* | Polychrotidae | 65.2 | 1.81 | 6.9 | 0.84 | legged | male | mean |
| *Anolis* | *haguei* | Polychrotidae | 45 | 1.65 | 2.6 | 0.41 | legged | male | mean |
| *Anolis* | *humilis* | Polychrotidae | 38.1 | 1.58 | 1.8 | 0.26 | legged | female | mean |
| *Anolis* | *insolitus* | Polychrotidae | 41.8 | 1.62 | 1 | 0.00 | legged | male | mean |
| *Anolis* | *intermedius* | Polychrotidae | 45.3 | 1.66 | 2.1 | 0.32 | legged | female | mean |
| *Anolis* | *isthmicus* | Polychrotidae | 63 | 1.80 | 3.7 | 0.57 | legged | male | heaviest |
| *Anolis* | *krugi* | Polychrotidae | 45.7 | 1.66 | 2.1 | 0.32 | legged | male | mean |
| *Anolis* | *lemurinus* | Polychrotidae | 63.85 | 1.81 | 5.5 | 0.74 | legged | female | mean |
| *Anolis* | *limifrons* | Polychrotidae | 37.01 | 1.57 | 1.8 | 0.26 | legged | unsexed | mean |
| *Anolis* | *lineatopus* | Polychrotidae | 59.2 | 1.77 | 4.9 | 0.69 | legged | male | mean |
| *Anolis* | *lividus* | Polychrotidae | 70 | 1.85 | 9 | 0.95 | legged | male | heaviest |
| *Anolis* | *longitibialis* | Polychrotidae | 69.8 | 1.84 | 9.1 | 0.96 | legged | male | mean |
| *Anolis* | *maculiventris* | Polychrotidae | 44.5 | 1.65 | 1.6 | 0.20 | legged | unsexed | mean |
| *Anolis* | *meridionalis* | Polychrotidae | 48 | 1.68 | 2.4 | 0.38 | legged | male | mean |
| *Anolis* | *microlepidotus* | Polychrotidae | 43.3 | 1.64 | 2.2 | 0.34 | legged | female | mean |
| *Anolis* | *nebulosus* | Polychrotidae | 42.2 | 1.63 | 1.5 | 0.18 | legged | male | mean |
| *Anolis* | *nigrolineatus* | Polychrotidae | 50.95 | 1.71 | 2 | 0.30 | legged | male | mean |
| *Anolis* | *occultus* | Polychrotidae | 37.7 | 1.58 | 0.6 | -0.22 | legged | male | mean |
| *Anolis* | *oculatus* | Polychrotidae | 98 | 1.99 | 11 | 1.04 | legged | male | heaviest |
| *Anolis* | *olssoni* | Polychrotidae | 45.65 | 1.66 | 1.6 | 0.20 | legged | male | mean |
| *Anolis* | *onca* | Polychrotidae | 67 | 1.83 | 7.5 | 0.88 | legged | female | heaviest |
| *Anolis* | *opalinus* | Polychrotidae | 47.98 | 1.68 | 2.2 | 0.34 | legged | male | mean |
| *Anolis* | *ortonii* | Polychrotidae | 43.97 | 1.64 | 2.1 | 0.32 | legged | unsexed | mean |
| *Anolis* | *oxylophus* | Polychrotidae | 69 | 1.84 | 5 | 0.70 | legged | male | mean |
| *Anolis* | *parvicirculatus* | Polychrotidae | 50 | 1.70 | 2.5 | 0.40 | legged | female | heaviest |
| *Anolis* | *peraccae* | Polychrotidae | 49.95 | 1.70 | 1.8 | 0.26 | legged | male | mean |
| *Anolis* | *phyllorhinus* | Polychrotidae | 81.38 | 1.91 | 11 | 1.04 | legged | male | mean |
| *Anolis* | *placidus* | Polychrotidae | 43.5 | 1.64 | 1.1 | 0.04 | legged | female | mean |
| *Anolis* | *polylepis* | Polychrotidae | 50.46 | 1.70 | 3 | 0.48 | legged | male | mean |
| *Anolis* | *poncensis* | Polychrotidae | 43.55 | 1.64 | 1.7 | 0.23 | legged | male | mean |
| *Anolis* | *princeps* | Polychrotidae | 117 | 2.07 | 22.9 | 1.36 | legged | male | mean |
| *Anolis* | *pulchellus* | Polychrotidae | 45.35 | 1.66 | 1.6 | 0.20 | legged | male | mean |
| *Anolis* | *punctatus* | Polychrotidae | 77.9 | 1.89 | 8.9 | 0.95 | legged | unsexed | mean |
| *Anolis* | *quercorum* | Polychrotidae | 40 | 1.60 | 1.5 | 0.18 | legged | male | mean |
| *Anolis* | *richardii* | Polychrotidae | 137 | 2.14 | 45 | 1.65 | legged | unsexed | heaviest |
| *Anolis* | *rodriguezi* | Polychrotidae | 37.5 | 1.57 | 1 | 0.00 | legged | unsexed | mean |
| *Anolis* | *roquet* | Polychrotidae | 53 | 1.72 | 1.7 | 0.23 | legged | unsexed | mean |
| *Anolis* | *sagrei* | Polychrotidae | 54.13 | 1.73 | 5.1 | 0.71 | legged | male | mean |
| *Anolis* | *semilineatus* | Polychrotidae | 41.25 | 1.62 | 1.5 | 0.18 | legged | male | mean |
| *Anolis* | *sericeus* | Polychrotidae | 42.84 | 1.63 | 1.6 | 0.20 | legged | male | mean |
| *Anolis* | *singularis* | Polychrotidae | 52 | 1.72 | 2.2 | 0.34 | legged | male | heaviest |
| *Anolis* | *stratulus* | Polychrotidae | 44.9 | 1.65 | 1.9 | 0.28 | legged | male | mean |
| *Anolis* | *subocularis* | Polychrotidae | 51.5 | 1.71 | 2.8 | 0.45 | legged | male | mean |
| *Anolis* | *taylori* | Polychrotidae | 72.9 | 1.86 | 6.4 | 0.81 | legged | male | mean |
| *Anolis* | *trachyderma* | Polychrotidae | 53.1 | 1.73 | 3.2 | 0.51 | legged | female | mean |
| *Anolis* | *transversalis* | Polychrotidae | 76.5 | 1.88 | 6.1 | 0.79 | legged | male | mean |
| *Anolis* | *tropidolepis* | Polychrotidae | 51.2 | 1.71 | 3.5 | 0.54 | legged | male | mean |
| *Anolis* | *tropidonotus* | Polychrotidae | 65 | 1.81 | 3 | 0.48 | legged | unsexed | heaviest |
| *Anolis* | *uniformis* | Polychrotidae | 33.5 | 1.53 | 1 | 0.00 | legged | unsexed | mean |
| *Anolis* | *valencienni* | Polychrotidae | 65.6 | 1.82 | 6.2 | 0.79 | legged | male | mean |

Name of data extractor (date): Elyssa Gelmann, 22 February 2012

QC reviewer (date): Kris Garber (4/9/12)

Sources:

1. USFWS. 1983. Culebra Island Giant Anole Recovery Plan. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/830128.pdf
2. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
3. Kessler, A.G.O. 2010. Status of the Culebra Island giant anole (*Anolis roosevelti*). Herpetological Conservation and biology, 5 (2): 223-232.
4. USFWS. 1977. Final Correction and Augmentation of Critical Habitat Reorganization. Available online at: <http://ecos.fws.gov/docs/federal_register/fr161.pdf>.
5. USFWS. 1977. Final Determination of Endangered Status and Critical Habitat for Giant Anole. Available online at: http://ecos.fws.gov/docs/federal\_register/fr146.pdf.
6. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Clemmys muhlenbergii* (Bog Turtle), northern population**

Listed status: threatened (1, p 1)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 3, 6)

Population size (most current estimate): no estimates; 350 “sites” in the Northern population (1, p 8)

Body weight (in g): 110 (2, p 1)

Locations known to occur: MD, DE, PA, NJ, NY, CT, MA (1, p 1 & 5)

MD counties: Baltimore, Carroll, Cecil, Harford

DE counties: New Castle

PA counties: Adams, Berks, Bucks, Chester, Crawford, Cumberland, Delaware, Franklin, Lancaster, Lebanon, Lehigh, Mercer, Monroe, Montgomery, Northampton, York

NJ counties: Atlantic, Burlington, Camden, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Salem, Somerset, Sussex, Union, Warren

NY counties: Albany, Columbia, Dutchess, Genessee, Monroe, Onondaga, Orange, Oswego, Putnam, Rensselaer, Rockland, Seneca, Sullivan, Ulster, Warren, Wayne, Westchester

CT counties: Fairfield, Litchfield

MA counties: Berkshire

Federal lands or Indian reservations species is known to occur:

West Point U.S. Military Academy (Army) (3)

Chattahoochee National Forest (Forest Service) (3)

Cherokee National Forest (Forest Service) (3)

Nantahala National Forest (Forest Service) (3)

Pisgah National Forest (Forest Service) (3)

Blue Ridge Parkway (NPS) (3)

Southern Nantahala Wilderness – Chattahoochee National Forest (Forest Service) (3)

Southern Nantahala Wilderness – Nantahala National Forest (Forest Service) (3)

Dates of Breeding Period: May-September (1, p 17)

Diet: terrestrial invertebrates (insects, spiders, slugs, earthworms), aquatic invertebrates (crayfish, snails, insects), plants, amphibians (frogs), reptiles, carrion (1, p 18-19)

Relevant EFED model(s): T-HERPS, KABAM

Habitat: Wetland habitats including dry, wet, and periodically flooded micro-habitats (1, p 12) Often interspersed with agricultural areas and livestock grazing (1, p 4, 13)

Habitat size (home range): 0.003-3.12 ha (1, p 16)

Elevation restriction (in m): sea level to 1500 (1, p 12)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

The Northern population is threatened. The southern population is listed as threatened due to similarity of appearance. This population occurs in GA, NC, SC, TN, VA (1, p 1)

Bog turtles hibernate in densely vegetated areas (1, p 15)

Diet is primarily insects (1, p 18)

Name of data extractor (date): Elyssa Gelmann, 13 March 2012

QC reviewer (date): Kris Garber (4/9/12)

Sources:

1. USFWS. 2001. Recovery Plan for the Bog Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/010515.pdf
2. Connecticut Department of Energy & Environmental Protection Bog Turtle Profile. Available online at: http://www.ct.gov/dep/cwp/view.asp?A=2723&Q=325976
3. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Crocodylus acutus* (American Crocodile)**

Listed status: threatened (2)

Designated critical habitat? yes (1, p 4-509)

Primary Constituent Elements: not defined in FR for designation of critical habitat (4)

Map of range/occurrences in recovery plan? yes (1, p 4-505)

Population size (most current estimate): 1,400 – 2,000 in 2005 (2, p 13028, column 1, last paragraph, 1st sentence)

Body weight (in g): 450,000 (estimated from body weight for American alligator; 3, p 2)

Hatchlings: 25 g (6)

Locations known to occur: Florida, southern coastal areas (1, p 4-505, 506)

Miami-Dade, Monroe, Collier, Lee, Broward Counties (1, p 4-505, 506)

Federal lands or Indian reservations species is known to occur:

Marjory Stoneman Douglas Wilderness – Everglades National Park (NPS) (5)

Dates of Breeding Period: Late February-March (1, p 4-509), young emerge May-June (86 day incubation) (1, p 4-510)

Diet:

juveniles: fish, crabs, snakes, small inverts (1, p 4-511)

adults: fish, crabs, snakes, turtles, birds, small mammals (1, p 4-511)

Relevant EFED model(s): KABAM, T-HERPS

Habitat: Mangrove swamps, mangrove-lined bays, creeks and inland swamps (1, p 4-507); Fresh and brackish water (1, p 5-508)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Outside of the US, this species is endangered

American Alligators are protected due to their similarity of appearance to the American Crocodile (3, p 2). Differences in appearance include the head shape and color (3, p 1), therefore body weight should be similar.

Name of data extractor (date): Elyssa Gelmann, 23 February 2012

QC reviewer (date): Kris Garber (4/9/12)

Sources:

1. USFWS. 1999. Multi-Species Recovery Plan for South Florida: American Crocodile. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/verobeach/MSRPPDFs/Croc.pdf
2. USFWS. 2007. Reclassification of the American Crocodile Distinct Population Segment in Florida from Endangered to Threatened: Final Rule. March 20, 2007. United States Fish and Wildlife Service. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2007-03-20/pdf/E7-5037.pdf#page=1
3. USFWS Species Profile: American Alligator. February 2008. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/endangered/esa-library/pdf/alligator.pdf
4. USFWS. 1976. Determination of Critical Habitat for American Crocodile, California Condor, Indiana Bat, and Florida manatee. Available online at: http://ecos.fws.gov/docs/federal\_register/fr115.pdf
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.
6. Cherkiss, Michael S., Holly E. Fling, Frank J. Mazzotti, Kenneth G. Rice. 2004. Counting and Capturing Crocodilians.  Wildlife Ecology and Conservation Department, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Document CIR1451. <http://edis.ifas.ufl.edu/pdffiles/UW/UW19800.pdf>

**Species (common name): *Crotalus willardi obscurus* (New Mexican Ridge-Nosed Rattlesnake)**

Listed status: threatened

Designated critical habitat? yes (1, p 5)

Primary Constituent Elements: not defined in FR for designation of critical habitat (4)

Map of range/occurrences in recovery plan? yes (1, p 6 & 8)

Population size (most current estimate): no census (1, p 18); 1985 estimate <500 individuals (1, p 20)

Length (in mm): 300-610 (2, p 1)

Body weight (in g): 85-113 (3)

Locations known to occur: southeastern AZ and southwestern NM (1, p 5) (also in Mexico)

NM: Hidalgo County, Animas and Peloncillo Mountains (2)

AZ: Cochise County, Peloncillo Mountains (2)

Federal lands or Indian reservations species is known to occur:

Coronado National Forest (Forest Service) (5)

Dates of Breeding Period: Summer (1, p 17-18)

Diet: small mammals, birds, lizards, snakes, arthropods (1, p 16)

Relevant EFED model(s): T-HERPS

Habitat: Mountains, Elevated Plateaus, Pine-oak vegetation (1, p 9)

Habitat size (home range): Not specified

Elevation restriction (in m): 1680-2700 above sea level (1, p 9; 2)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

One of 5 ridge nose rattlesnake (*C. willardi*) subspecies, distinguished by the absence of a white vertical line on the rostral or mental, and the absence of a prominent white flash-mark (1, p 3)

Lizards may be important to the diet of juvenile snakes (1, p 16)

Females mate in summer and give birth the following summer (August) (1, p 17-18).

5-yr review initiated in 2007

Source 3 was referenced in EFED’s Nation-wide Effects Determination for Chlorophacinone Relative to the Use of Rozol Prairie Dog Bait(see p. 72 of http://epa.gov/espp/litstatus/effects/chlorophacinone/attachment-I.pdf )

Name of data extractor (date): Elyssa Gelmann, 24 February 2012

QC reviewer (date): Kris Garber (4/10/12)

Sources:

1. USFWS. 1985. Recovery Plan for the New Mexican Ridge-Nosed Rattlesnake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/850322.pdf
2. USFWS. 2002. Arizona Ecological Services Field Office, General Species Information. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/southwest/es/arizona/Documents/Redbook/New%20Mexico%20Ridgenose%20Rattlesnake%20RB.pdf
3. San Diego Zoo. 2010. San Diego Zoo’s Animal Bytes: Rattlesnake. Available online at: http://www.sandiegozoo.org/animalbytes/t-rattlesnake.html (Accessed February 24, 2012).
4. USFWS. 1978. Listing of the New Mexican Ridge-nosed Rattlesnake as a Threatened Species with Critical Habitat. Available online at: http://ecos.fws.gov/docs/federal\_register/fr232.pdf
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Cyclura cornuta stejnegeri* (Mona Ground Iguana)**

Listed status: threatened (1, p 11)

Designated critical habitat? yes (1, p 11)

Primary Constituent Elements: not defined in available USFWS documentation (1, 3)

Map of range/occurrences in recovery plan? yes (1, p 2)

Population size (most current estimate): 2,000 (1, p 7)

Snout to Vent Length: not available

Body weight (in g): mean 4135 (based on similar species; 2, Appendix S1)

Locations known to occur: Mona Island, Puerto Rico (1, p 1)

Federal lands or Indian reservations species is known to occur: None (4)

Dates of Breeding Period: mid-June (mating) to November (eggs hatch) (1, p 5)

Diet: insects, broadleaf plants, fruits, land crabs (1, p 4)

Relevant EFED model(s): T-HERPS

Habitat: All of Mona Island, most common along major escarpments and cliffside talus slopes (1, p 7) Nesting: Coastal plain (1, p 5) semi-open areas within and around mahogany and pine plantations, in exposed patches of loose sandy soil (1, p 3)

Habitat size (home range): Not specified.

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Mona Island has been managed by the Puerto Rico Department of Natural Resources since 1973 (1, p 10)

Mona island is 5500 ha. (1, p 1)

Population estimate is from 1977 (1, p 7)

Weight is based on average weight of *Cyclura cornuta* (female) (2, Appendix S1). This species is assumed to be an appropriate surrogate because the Mona Ground Iguana has been considered a subspecies of *Cyclura cornuta* (1, p 1). This approach was used because no SVL was available with which to do a regression. Only Total length data were located in the recovery plan (1-1.3 m; 1 p 1).

Name of data extractor (date): Elyssa Gelmann, 23 February 2012

QC reviewer (date): Kris Garber (4/10/12)

Sources:

1. USFWS. 1984. Recovery Plan for the Mona Ground Iguana. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/840419b.pdf
2. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
3. USFWS. 1978. Final Determination of Threatened Status and Critical Habitat for the Mona Boa and Mona Ground Iguana. Not available online.
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Drymarchon corais couperi* (Eastern Indigo Snake)**

Listed status: threatened (1, p 4)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? no

Population size (most current estimate): unknown (2, p 8)

Snout to Vent Length (in mm): adult average 1800 m, maximum 2600 m (1, p 1)

Male average: 1580 (3, p 115)

Female average: 1380 (3, p 115)

Body weight (in g):

Male average: 2,200 (range 720-4,300) (3, p 115)

Female average: 1,500 (range 550-2,300) (3, p 115)

Locations known to occur: GA, FL, possibly AL (2, p 12-13)

AL counties: Baldwin, Coffee, Covington, Dale, Escambia, Geneva, Houston, Mobile, Washington (4)

FL counties: Alachua, Bay, Brevard, Broward, Calhoun, Charlotte, Citrus, Clay, Collier, Columbia, DeSoto, Dixie, Duval, Escambia, Franklin, Gadsden, Gilchrist, Glades, Gulf, Hamilton, Hardee, Hendry, Hernando, Highlands, Hillsborough, Holmes, Indian River, Jackson, Jefferson, Lafayette, Lake, Lee, Leon, Levy, Liberty, Madison, Manatee, Marion, Martin, Miami-Dade, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Putnam, Santa Rosa, Sarasota, Seminole, St. Johns, St. Lucie, Sumter, Suwannee, Taylor, Union, Volusia, Wakulla, Walton, Washington (4)

GA counties: Appling, Atkinson, Bacon, Berrien, Bryan, Bulloch, Camden, Charlton, Clinch, Coffee, Echols, Emanuel, Evans, Irwin, Jeff Davis, Lanier, Liberty, Long, Lowndes, McIntosh, Randolph, Tattnall, Telfair, Wayne, Wheeler (4)

Federal lands or Indian reservations species is known to occur:

Big Cypress Indian Reservation (Bureau of Indian Affairs) (5)

Brighton Indian Reservation (Bureau of Indian Affairs) (5)

Avon Park Air Force Bombing Range (5)

Cape Canaveral Air Force Station (5)

Eglin Air Force Base (5)

Moody Air Force Base (5)

Lake Ocklawaha (Army Corps of Engineers) (5)

Lake Seminole (Army Corps of Engineers) (5)

Fort Stewart (Army) (5)

Malabar Transmitter Annex (Army) (5)

Townsend Range (Marine Corps) (5)

National Space Technology Laboratories (NASA) (5)

Apalachicola National Forest (Forest Service) (5)

DeSoto National Forest (Forest Service) (5)

Ocala National Forest (Forest Service) (5)

Osceola National Forest (Forest Service) (5)

Biscayne National Park (NPS) (5)

Everglades National Park (NPS) (5)

Biscayne National Park – Open Water (NPS) (5)

Big Cypress National Preserve (NPS) (5)

Timucuan Ecological and Historic Preserve (NPS) (5)

Timucuan Ecological and Historic Preserve – Open Water (NPS) (5)

Canaveral National Seashore – Merritt Island National Wildlife Refuge – John F. Kennedy Space Center (NPS) (5)

Cedar Keys National Wildlife Refuge (FWS) (5)

Crocodile Lake National Wildlife Refuge (FWS) (5)

Florida Panther National Wildlife Refuge (FWS) (5)

Great White Heron National Wildlife Refuge (FWS) (5)

Great White Heron National Wildlife Refuge – Open Water (FWS) (5)

Lake Wales Ridge National Wildlife Refuge (FWS) (5)

Lower Suwannee National Wildlife Refuge (FWS) (5)

Lower Suwannee National Wildlife Refuge – Open Water (FWS) (5)

National Key Deer Refuge (FWS) (5)

National Key Deer Refuge – Open Water (FWS) (5)

National Key Deer Refuge – Great White Heron National Wildlife Refuge – Open Water (FWS) (5)

Okefenokee National Wildlife Refuge (FWS) (5)

Saint Marks National Wildlife Refuge (FWS) (5)

Ten Thousand Islands National Wildlife Refuge (FWS) (5)

Merritt Island National Wildlife Refuge – John F. Kennedy Space Center (FWS with NASA) (5)

Key West Naval Air Station (Navy) (5)

Kings Bay Naval Submarine Support Base (Navy) (5)

Saddlebunch Keys Naval Communication Unit (Navy) (5)

Stevens Lake Bombing Range (Navy) (5)

Whitehouse Field (Navy) (5)

Billies Bay Wilderness – Ocala National Forest (Forest Service) (5)

Juniper Prairie Wilderness – Ocala National Forest (Forest Service) (5)

J.N. "Ding" Darling Wilderness – J.N. "Ding" Darling National Wildlife Refuge (FWS) (5)

Okefenokee Wilderness – Okefenokee National Wildlife Refuge (FWS) (5)

Marjory Stoneman Douglas Wilderness – Everglades National Park (NPS) (5)

Marjory Stoneman Douglas Wilderness – Everglades National Park – Open Water (NPS) (5)

Dates of Breeding Period: No information (2, p 8)

Diet: fish, frogs, toads, snakes, lizards, turtles, turtle eggs, juvenile gopher tortoises, small alligators, birds, small mammals (6, p. 4-571)

Juveniles eat mostly invertebrates (6, p. 4-571)

Relevant EFED model(s): T-HERPS, KABAM

Habitat: variety of terrestrial and wetland habitats – pine flatwoods, scrubby flatwoods, high pine, dry prairie, tropical hardwood hammocks, edges of freshwater marshes, agricultural fields, coastal dunes, human-altered habitats, xeric sandhill (2, p 15) (1, p 4-5)

Habitat size (home range): Females 1.9-360 ha (4.75-885 acres), Males 1.6- 1550 ha (4-3,825 acres) (2, p 9)

Elevation restriction: None noted in available USFWS documentation (1, 2).

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Use burrows of gopher tortoise or other species for foraging, nesting, mating, and shelter. In habitats that lack gopher tortoises, eastern indigo snakes use root channels, hollow logs, stump holes and burrows of mammals (rodents, armadillos) and land crabs (2, p 15).

County level location data is from the FWS Species Profile due to a lack of detailed location information in other available USFWS documentation (1, 2). Supporting information:

AL: Four historical records available from three counties, including Coffee and Mobile (2, p 13)

FL: Low numbers in the FL panhandle; occur throughout peninsular FL; no recent records for the Keys (2, p 14)

GA: Recent (1995-2006) records for 25 of 41 surveyed GA counties. Widespread in the lower and middle Coastal Plain of southeastern and south-central GA along xeric sand ridges bordering the Althamaha, Canoochee, and Ohoopee rivers (2, p 14)

Name of data extractor (date): Elyssa Gelmann, 5 March 2012

QC reviewer (date): Kris Garber (4/10/12)

Sources:

1. USFWS. 1982. Recovery Plan for the Eastern Indigo Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/820422.pdf
2. USFWS. 2008. Eastern Indigo Snake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc1910.pdf
3. Hyslop, Natalie. 2007. Movements, habitat use, and survival of the threatened eastern indigo snake (*Drymarchon couperi*) in Georgia. PhD dissertation submitted to the graduate faculty of the University of Georgia.
4. USFWS Species Profile: Eastern Indigo Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C026
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.
6. USFWS. Multi-species recovery plan for South Florida. Available online at: http://www.fws.gov/verobeach/MSRPPDFs/EasternIndigoSnake.pdf

**Species (common name): *Epicrates inornatus* (Puerto Rican Boa)**

Listed status: endangered (1, p 6)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? No, but detailed maps in 5-yr review (2, 24-26)

Population size (most current estimate): no reliable estimates; at least 75 individuals (1978) (1, p 6)

Snout to Vent Length (in mm): 1800 – 2200 (1, p 1); 1369±351 (range 388-2050) (3, p 1)

Body weight (in g):

Range: 140–1662(3, p 1)

Mean: 952.1 ± 349.0 (3, p 1)

Locations known to occur: Puerto Rico (endemic) (1, p 2) most often encountered in the northern limestone karst belt of PR that extends from Carolina west to Aguaadilla (1, p 3)

Federal lands or Indian reservations species is known to occur: None (4)

Dates of Breeding Period: Unknown, most similar species mate February – April and offspring emerge in September – October (1, p 4)

Diet: birds, small mammals (rats, bats), lizards (1, p 3), carrion (5)

Small mammals (black rats, house mice, bats), lizards (anoles), birds (ground-doves, domestic fowl chicks), invertebrates (3, p 1)

Relevant EFED model(s): T-HERPS

Habitat: Wet montane, subtropical dry forest (1, p 2)

Wet montane forest, lowland wet forest, mangrove forest, wet limestone karst, offshore cays (3, p 1)

Habitat size (home range): 0.01-2.0 ha (138.9-18,380 m2) (2, p 9)

Elevation restriction: sea level to 400 m (1, p 2); sea level to 480 m (3, p 1)

Obligate relationships: None noted in available USFWS documentation (1, 2) Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

No change to listing status recommended in 5-yr review (2, 17)

Weight based on 47 individuals (3, p 1).

Species in this genus are noctournal (1, p 3)

Puerto Rican Boas hang from trees near caves to catch bats (1, p 4)

Name of data extractor (date): Elyssa Gelmann, 22 February 2012

QC reviewer (date): Kris Garber (4/11/12)

Sources:

1. USFWS. 1986. Recovery Plan for the Puerto Rican Boa. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/PR%20boa%20recov%20plan.pdf
2. USFWS. 2011. Puerto Rican Boa 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3849.pdf
3. Wiley, James W. 2003. Habitat association, size, Stomach Contents, and Reproductive Condition of Puerto Rican Boas (*Epicrates inornatus*). *Caribbean Journal of Science* 39(2):189-194.
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.
5. Rodríguez-Durán, A. 1996. Foraging ecology of the Puerto Rican boa (*Epicrates inornatus*): Bat predation, carrion feeding, and piracy. Journal of Herpetology 30 (4): 533 – 536.

**Species (common name): *Epicrates monensis granti* (Virgin Islands Tree Boa)**

Listed status: endangered

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? no

There is a map in the 5-yr review (2, p 10)

Population size (most current estimate): 1,300-1,500 in 2009 (2, p 18)

Snout to vent length (in mm):

reintroduced VI Females average: 862 (3, p 6-7)

native PR Females average: 785 (3, p 6-7)

maximum SVLs: Male 1112, Female 1066 (2, p 8)

Body weight (in g):

reintroduced VI Females average: 128 (3, p 6-7)

native PR Females average: 69.2 (3, p 6-7)

Locations known to occur: Puerto Rico, Virgin Islands (2, p 9)

Cayo Diablo, Cayo Ratones, Rio Grande, and Culebra Islands of Puerto Rico; Steven Key, St. Thomas, (2, p 4)

Tortola Island of the British Virgin Islands (2, p 6)

Federal lands or Indian reservations species is known to occur: None (4)

Dates of Breeding Period: Breeding season February- May, young emerge August-October (1, p 8)

Diet: mostly lizards (*Anolis cristatellus*), also small mammals and birds (1, p 6-7)

Relevant EFED model(s): T-HERPS

Habitat: Subtropical dry and moist forests (2, p 11)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1, 2).

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments: 5-yr review recommends downlisting to threatened (2, p 18)

Primarily feeds on lizards in trees (1, p 6)

Name of data extractor (date): Elyssa Gelmann, 22 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1986. Recovery Plan for the Virgin Islands Tree Boa. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/860327b.pdf
2. USFWS. 2009. Virgin Islands Tree Boa 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc2508.pdf
3. Tolson, Peter J. 2005. Reintroduction Evaluation and Habitat Assessments of the Virgin Islands boa, *Epicrates monensis granti,* to the U.S. Virgin Islands. Final Grant T-1 Report Submitted to USFWS. Available online at: http://ufdcimages.uflib.ufl.edu/UF/00/09/35/42/00001/BoaFinalReport.pdf
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Epicrates monensis monensis* (Mona Boa)**

Listed status: threatened (1, p 7)

Designated critical habitat? yes (1, p 7)

Primary Constituent Elements: not defined in available USFWS documentation (1, 3)

Map of range/occurrences in recovery plan? no

Population size (most current estimate): unknown (1, p 5)

Snout to vent length: none located

Body weight (in g):

Females 120-200 (2, p 1)

Males: 70-100 (2, p 1)

Locations known to occur: Mona Island, Puerto Rico (endemic subspecies) (1, p 1)

Federal lands or Indian reservations species is known to occur: None (4)

Dates of Breeding Period: unknown (1, p 4)

Diet: mostly unknown, small mammals (rats, mice and bats) and reptiles (*Anolis sp.)* likely (1, p 3)

Relevant EFED model(s): T-HERPS

Habitat: Forest, coastal plain, shrubs (1, p 3)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments: Five year review initiated in 2007, not yet published.

Mona Island is a protected natural reserve (1, p 6). Whole island is 5500 ha. (1, p 1).

Only 12 specimens have been collected (1, p 1). Nocturnal and other habits make them hard to observe (1, p 4).

Total length of one captured adult was 1039 mm, juveniles measure 300-1010 mm (1, p 1)

Broad distribution on Mona Island assumed but preferred habitat is not known (1, p 3)

Name of data extractor (date): Elyssa Gelmann, 22 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1984. Recovery Plan for the Mona Boa. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/840419a.pdf
2. World Association of Zoos and Aquariums (WAZA). Mona/Virgin Islands Boa. Accessed February 24, 2012. Available online at: <http://www.waza.org/en/zoo/choose-a-species/reptiles/snakes/epicrates-monensis>
3. USFWS. 1978. Final Determination of Threatened Status and Critical Habitat for the Mona Boa and Mona Ground Iguana. Not available online.

FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Eumeces egregius lividus* (Bluetail Mole Skink)**

Listed status: threatened (1, p 4-529)

Designated critical habitat? no (1, p 4-529)

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 4-529)

Population size (most current estimate): little information, known to occur in 23 locations in 2006 (2, p 3)

Snout to vent length (in mm): estimated 60-70 (1, p 4-529)

Body weight (in g): 3.7-6.8 (range estimated from regression equations for the Scincidae family from 3, p 222)

Locations known to occur: Lake Wales Ridge in Highlands, Polk, and Osceola counties in central FL (1, p 4-530)

Federal lands or Indian reservations species is known to occur:

Lake Wales Ridge National Wildlife Refuge (FWS) (4)

Dates of Breeding Period: mating in winter, 31-51 day egg incubation (1, p 4-530)

Diet: insects (roaches, crickets, spiders) (1, p 4-530)

Relevant EFED model(s): T-HERPS

Habitat: Xeric (dry) upland communities (1, p 4-530)

Habitat size (home range): Not specified

Elevation restriction: above 30 m (1, p 4-530)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Body weight (BW) is estimated from estimated snout to vent length (SVL) for *E. egregius lividus* and regression equations of body weight and SVL for the Scincidae family. A genus level regression was not performed because only two data points from the *Eumeces* genus were available. Two equations were used, the first derived using 177 data points including both legged and legless species and the second derived using a subset of 154 data points from only fully-legged species. Both equations were used in order to derive the most conservative body weight range. The equations (from 2) are below.

1. BW = 10^(3.029\*LOG(SVL)-4.821)

2. BW = 10^(3.229\*LOG(SVL)-5.125)

Name of data extractor (date): Elyssa Gelmann, 5 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1999. Multi-Species Recovery Plan for South Florida: Bluetail Mole Skink. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/verobeach/MSRPPDFs/BluetailMoleSkink.pdf
2. USFWS. 2007. Bluetail Mole Skink 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc1071.pdf
3. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Gambelia silus* (Blunt-nosed Leopard Lizard)**

Listed status: endangered (1, p 114)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 115), also in 5-yr review (2, p 11-12)

Population size (most current estimate): No estimates (1, p 117) (2, p 14)

Snout to vent length (in mm):

Males: 87-120 (1, p 113)

Females: 86-111 (1, p 113)

Body weight (in g):

Males: 31.8-37.4 (1, p 113)

Females: 20.6-29.3 (1, p 113)

Locations known to occur: San Joaquin Valley of central CA (endemic) (1, p 114)

CA counties: Merced, Madera, San Benito, Fresno, Kings, Kern, Tulare, San Luis Obispo, Santa Barbara, Ventura (2, p 11)

Federal lands or Indian reservations species is known to occur:

O'Neill Forebay (Bureau of Reclamation) (3)

Los Padres National Forest (Forest Service) (3)

Bitter Creek National Wildlife Refuge (FWS) (3)

Kern National Wildlife Refuge (FWS) (3)

Pixley National Wildlife Refuge (FWS) (3)

Naval Petroleum Reserve Number One (Navy) (3)

Naval Petroleum Reserve Number Two (Navy) (3)

Public Domain Land (BLM) (3)

Panoche Hills North Wilderness Study Area (BLM) (3)

Panoche Hills South Wilderness Study Area (BLM) (3)

Dates of Breeding Period: end of April-June, young hatch in July-September (1, p 116)

Diet: insects, lizards, plants (1, p 114)

Relevant EFED model(s): T-HERPS

Habitat: Open, sparsely vegetated areas of low relief on the valley floor and in surrounding foothills (1, p 118)

Habitat size (home range): Males 0.2-1.7 ha

Females 0.1-1.1 ha (1, p 117)

Elevation restriction: below 800 m (1, p 114)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments: 5-yr review notes declining population trends and does not recommend change in listing. (2, p 14 & 44)

This species’ diet is primarily insects (including grasshoppers, crickets and moths) and other lizards. Plant material is rarely eaten (1, p 114)

Name of data extractor (date): Elyssa Gelmann, 23 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1998. Recovery Plan for Upland Species of the San Joaquin Valley, Blunt-Nosed Leopard Lizard Chapter. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/980930a.pdf
2. USFWS. 2010. Blunt-nosed Leopard Lizard 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3209.pdf
3. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Gopherus agassizii* (Desert Tortoise), Mojave Desert population**

Listed status: threatened (1, p vii)

Designated critical habitat? yes (1, p vii)

Primary Constituent Elements: (4 p. 5822)

1. Space for individual end population growth, and for-normal behavior;

2. Food, water, or other nutritional or physiological requirements;

3. Cover or shelter,

4. Sites for breeding, reproduction, rearing of offspring; and

5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

Map of range/occurrences in recovery plan? yes (1, p 12)

Population size (most current estimate): approximately 300 counted in 2007 (1, p 9)

Body weight (in g): 3,600-6,800(1, p 4)

Locations known to occur: North and west of the Colorado River in the Mojave Desert of CA, NV, AZ, and southwestern UT; and in the Sonoran (Colorado) Desert in CA (1, p 4)

CA counties: San Bernardino (1, p 26), Riverside (1, p 29), Imperial, Inyo, Kern, Los Angeles, San Diego (3)

NV counties: Clark, Lincoln, Nye (1, p 27), Esmeralda (3)

AZ counties: Mohave (3)

UT counties: Washington (1, p 30)

Federal lands or Indian reservations species is known to occur:

Grand Canyon-Parashant National Monument (BLM) (5)

Lake Mead National Recreation Area (NPS) (5)

Lake Mead National Recreation Wilderness Study Area – Lake Mead National Recreation Area (NPS) (5)

Public Domain Land (BLM) (5)Grand Wash Cliffs Wilderness – Grand Canyon-Parashant National Monument (BLM) (5)

Beaver Dam Mountains Wilderness (BLM) (5)

Paiute Wilderness (BLM) (5)

Warm Springs Wilderness (BLM) (5)

Dates of Breeding Period: spring, summer, and fall (1, p 10)

Diet: terrestrial plants (1, p 4, 10)

Grasses, flowers of annuals (1, p 10)

Relevant EFED model(s): T-HERPS

Habitat: variety of habitats—creosote bush scrub, rocky slopes, blackbrush and juniper woodland (1, p vii)

Habitat size (home range): Variable; up to >80 ha for males; 400 ha (1.5 sq. mi) in lifetime, periodic forays of >7 miles at a time (1, p 10)

Elevation restriction: below sea level to 2,225 m (7,300 ft) (1, p vii)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

AZ south and east of Colorado River, Sonoran Desert—threatened due to Similarity of Appearance (1, p 5) and candidate for listing (2)

Declining population (1, p 7)

Most commonly occur in areas with gentle slopes, sandy-gravel soils and sparse cover (1, p vii)

Some county level location data is from the FWS Species Profile due to a lack of detailed location information in other available USFWS documentation (1)

Adults reach 20-38 cm carapace (upper shell) length (1, p 4)

Name of data extractor (date): Elyssa Gelmann, 12 March 2012

QC reviewer (date): Kris Garber (4/16/12)

Sources:

1. USFWS. 2011. Recovery Plan for the Mojave Population of the Desert Tortoise. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/RRP%20for%20the%20Mojave%20Desert%20Tortoise%20-%20May%202011\_1.pdf
2. USFWS. 2011. Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. United States Fish and Wildlife Service. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2011-10-26/pdf/2011-27122.pdf
3. USFWS Species Profile: Desert Tortoise. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C04L
4. USFWS. 1994. ETWP; Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. Available online at: http://ecos.fws.gov/docs/federal\_register/fr2519.pdf
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Gopherus morafkai* (Sonoran desert tortoise)**

Listed status: Not warranted

Designated critical habitat? no

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? Yes (2)

Population size (most current estimate): not available

Body weight (in g):11,000-23,000 (adult) (3)

Locations known to occur:

Arizona Counties: Cochise, Gila, Graham, La Paz, Maricopa, Mohave, Pima,

Pinal, Santa Cruz, Yavapai, Yuma (2)

Federal lands or Indian reservations species is known to occur:

Federal lands include BARRY M. GOLDWATER RANGE, BILL WILLIAMS RIVER NATIONAL WILDLIFE REFUGE, BUENOS AIRES NATIONAL WILDLIFE REFUGE, CABEZA PRIETA NATIONAL WILDLIFE REFUGE, CIBOLA NATIONAL WILDLIFE REFUGE, CORONADO NATIONAL FOREST, FLORENCE MILITARY RESERVATION, IMPERIAL NATIONAL WILDLIFE REFUGE, KOFA NATIONAL WILDLIFE REFUGE, LAKE HAVASA NATIONAL WILDLIFE REFUGE, LAKE MEAD NATIONAL RECREATION AREA, ORGAN PIPE CACTUS NATIONAL MONUMENT, PRESCOTT NATIONAL FOREST, SAGUARO NATIONAL PARK, TONTO NATIONAL FOREST, YUMA PROVING GROUND, and other lands managed by US BUREAU OF LAND MANAGEMENT (1, 2)Tribal lands include AK CHIN, COLORADO RIVER INDIAN TRIBE, FORT MCDOWELL YAVAPAI NATION, FORT MAJAVE INDIAN TRIBE, GILA RIVER INDIAN COMMUNITY, HULAPAI TRIBE, PASQUA YAQUI TRIBE, SALT RIVER PRIMA-MARICOPA INDIAN COMMUNITY, SAN CARLOS APACHE TRIBE, TOHONO OODHAM NATION (2)

Diet: grass, broadleaf plants, woody plants (2)

Relevant EFED model(s): T-HERPS

Habitat: desert scrub (2)

Oak-woodland habitat (rare) (2)

Intermountain valleys (2)

Elevation restriction: generally 155-1615 m, but up to 2,379 m (2)

Obligate relationships: None noted in available USFWS documentation. Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

60% of land where species occurs (in US) is owned by the federal government, 25% is owned by the state of Arizona, 10% are tribal lands, 5% is privately owned (2)

Species occurs most commonly on rocky, steep slopes and bajadas and in paloverde-mixed cacti (2)

Cryptogamic crusts (soil crusts with unique, microscopic association of flora and

fauna) are important components of the species habitat (2)

Intermountain valleys are used for dispersal (2)

Some observations have been made at higher elevations than provided above; however, the majority (95%) of observations in AZ occurred at elevations 275-1279 m (2).

Individuals spend the majority of their time in shelters. Burrows are constructed under a variety of structures (rocks, boulders, vegetation) and soils. Often use “packrat middens” (nests) for shelter. Shelters may or may not be altered by the tortoise. Availability of suitable shelter sites impacts population density (2).

This tortoise is diurnal (active during the day) (2)

Activity is influenced by rainfall. They are less active in the spring compared to the summer. Species is most active in late summer (2) but may be surface active in winter with air temperatures as low as 8°C (4).

Home range size 6.4-640 A.

199 different species of plants have been documented in the diet (2)

Consumes and stores large amounts of water for extended periods. (2)

Diet is represented by herbs (55.3 %), grasses (17.6 %), woody plants (22.1 %), and succulents, including fruits (5%) (2).

Known to forage on dry vegetation, *e.g*., in times of drought. (2)

These tortoises will also consume stones, bones, soil and mammal scat (2)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C07G
2. http://ecos.fws.gov/docs/candidate/assessments/2014/r2/C07G\_V01.pdf
3. http://animaldiversity.org/accounts/Gopherus\_agassizii/#0fd76752626d5b22d4a5125b0870f43b
4. Sullivan, B.K., R. Averill-Murray, K.O. Sullivan, J.R. Sullivan. E.A. Sullivan. 2014. Winter activity of the Sonoran desert tortoise (*Gopherus* morafkai) in central Arizona. Chelonian Conservation and Biology 13 (1): 114-119.

**Species (common name): *Gopherus polyphemus* (Gopher Tortoise), western population**

Listed status: threatened (1, executive summary)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 4)

Population size (most current estimate): Not specified

Body weight (in g): Adults 4,500 (3, p 1); 12,000 (5, p 100)

Hatchlings 26.5-41.0 (4, p 50)

Locations known to occur:

Western population: west of the Tombigbee and Mobile Rivers in AL, south MS and extreme southeastern LA (1, executive summary)

MS counties: Covington, Marion, Pearl River, Hancock, Jones, Lamar, Forrest, Perry, Stone, Harrison, Wayne, Greene, George, Jackson (1, p 4)

AL counties: Choctaw, Washington, Mobile (1, p 4)

LA counties: Washington, Tangipahoa, St. Tammany (1, p 4)

Federal lands or Indian reservations species is known to occur:

National Space Technology Laboratories (NASA) (6)

DeSoto National Forest (Forest Service) (6)

Bogue Chitto National Wildlife Refuge (FWS) (6)

Mississippi Sandhill Crane National Wildlife Refuge (FWS) (6)

Black Creek Wilderness – DeSoto National Forest (Forest Service) (6)

Dates of Breeding Period: February-September (1, p 6)

Diet: terrestrial plants (grasses, wild legumes), fruits (1, p 6)

Relevant EFED model(s): T-HERPS

Habitat: Droughty, deep sand ridges (1, executive summary); xeric communities, originally longleaf pine-scrub oak (1, p 2); may also be found along fence rows, field edges, power lines, and in pastures (1, p 3)

Habitat size (home range):

Males: 0.05-1.5 ha (0.14-3.56 acres), average 0.5 ha (1.16 acres) (1, p 7)

Females: 0.04-0.14 ha (0.10-0.35 acres), average 0.08 ha (0.20 acres) (1, p 7)

Elevation restriction: None noted in available USFWS documentation (1); “upland habitat” (1, p 2)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Only tortoise indigenous to the southeastern US (1, p 1)

The western population of this species is currently listed. The eastern population of this species (located in SC, GA, FL) is a candidate for listing (1, 2).

Major food items in diet include grass, grass-like plants and legumes (1, p 6)

Grasses in diet include: wiregrass (*Aristida stricta*), bluestem grasses (*Andropogon sp*.), crabgrass (*Digitaria sanguinalis*), panic grass (*Panicum sp.*), broad-leaved grasses (1 p 6).

Legumes consumed “extensively” by juveniles (1, p 6).

Fruit consumed includes: blackberry (*Rubus cunefolius*), sloeplum (*Prunus umbellata*), blueberry (*Vaccinium sp.*), maypop (*Passiflora lutea*), hawthorne (*Crataegus sp.*) (1, p 6)

Adult carapace length 15-37 cm, hatchling 4-5 cm (1, p 1)

Name of data extractor (date): Elyssa Gelmann, 12 March 2012

QC reviewer (date): Kris Garber (4/16/12)

Sources:

1. USFWS. 1990. Recovery Plan for the Gopher Tortoise. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/901226.pdf
2. USFWS. 2011. Review of Native Species That Are Candidates for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. United States Fish and Wildlife Service. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2011-10-26/pdf/2011-27122.pdf
3. South Carolina Department of Natural Resources, Gopher Tortoise Species Profile. Available online at: http://www.dnr.sc.gov/cwcs/pdf/GopherTortoise.pdf
4. Small, Christine R and Laurie Ann Macdonald. 2001. Reproduction and growth in relocated and resident gopher tortoises (*Gopherus polyphemus*) on reclaimed phosphate-mined lands. Florida Institute of Phosphate Research, Publication Number 03-105-145. Available online at: http://www1.fipr.state.fl.us/fipr/fipr1.nsf/129fc2ac92d337ca85256c5b00481502/144700e2adb3cf2d85256b30006a745c/$FILE/03-105-145Final.pdf
5. Kaczor, Sue A. and David C. Hartnett. 1990. Gopher tortoise (*Gopherus polyphemus*) effects on soils and vegetation in a Florida sandhill community. *American Midland Naturalist* 123:100-111.
6. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Gopherus polyphemus (*Gopher Tortoise (Eastern))**

Listed status: candidate

Designated critical habitat? No

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? No (county-level map available for western population but not eastern population)

Population size (most current estimate): not available

Body weight (in g): Adults 4,500 (2, p 1); 12,000 (4, p 100)

Hatchlings 26.5-41.0 (3, p 50)

Locations known to occur: Alabama, Florida, Georgia, South Carolina (1)

Federal lands or Indian reservations species is known to occur: (1)

ARCHIE CARR NATIONAL WILDLIFE REFUGE, ARTHUR R. MARSHALL LOXAHATCHEE NATIONAL WILDLIFE REFUGE, FLORIDA PANTHER NATIONAL WILDLIFE REFUGE, HOBE SOUND NATIONAL WILDLIFE REFUGE, ISLAND BAY NATIONAL WILDLIFE REFUGE J.N. 'DING' DARLING NATIONAL WILDLIFE REFUGE, LAKE WALES RIDGE NATIONAL WILDLIFE REFUGE, LAKE WOODRUFF NATIONAL WILDLIFE REFUGE, LOWER SUWANNEE NATIONAL WILDLIFE REFUGE, MERRITT ISLAND NATIONAL WILDLIFE REFUGE, OKEFENOKEE NATIONAL WILDLIFE REFUGE, PINE ISLAND NATIONAL WILDLIFE REFUGE, ST. JOHNS NATIONAL WILDLIFE REFUGE, ST. MARKS NATIONAL WILDLIFE REFUGE, ST. VINCENT NATIONAL WILDLIFE REFUGE, TEN THOUSAND ISLANDS NATIONAL WILDLIFE REFUGE

Diet: terrestrial plants (grasses, wild legumes), fruits (5, p 6)

Relevant EFED model(s): T-HERPS

Habitat: Droughty, deep sand ridges (5, executive summary); xeric communities, longleaf pine-scrub oak (5, p 2); may also be found along fence rows, field edges, power lines, and in pastures (5, p 3)

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Individuals in the western population of this species (located in LA, MS and Western AL) are listed as threatened (1)

Information for threatened population is used for this candidate species. Given their close geographic proximity, it is assumed that their diets, weights and habitats are similar.

As with other tortoises, the ability to construct and inhabit suitable burrows (*e.g*., in well-drained, sandy soils) is critical to population success. (5)

Name of data extractor (date): Kris Garber (5/14/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C044>
2. South Carolina Department of Natural Resources, Gopher Tortoise Species Profile. Available online at: http://www.dnr.sc.gov/cwcs/pdf/GopherTortoise.pdf
3. Small, Christine R and Laurie Ann Macdonald. 2001. Reproduction and growth in relocated and resident gopher tortoises (*Gopherus polyphemus*) on reclaimed phosphate-mined lands. Florida Institute of Phosphate Research, Publication Number 03-105-145. Available online at: <http://www1.fipr.state.fl.us/fipr/fipr1.nsf/129fc2ac92d337ca85256c5b00481502/144700e2adb3cf2d85256b30006a745c/$FILE/03-105-145Final.pdf>
4. Kaczor, Sue A. and David C. Hartnett. 1990. Gopher tortoise (*Gopherus polyphemus*) effects on soils and vegetation in a Florida sandhill community. *American Midland Naturalist* 123:100-111.
5. USFWS. 1990. Recovery Plan for the Gopher Tortoise. United States Fish and Wildlife Service. Available online at: <http://ecos.fws.gov/docs/recovery_plan/901226.pdf>

**Species (common name): *Graptemys flavimaculata* (Yellow-blotched Map Turtle)**

Listed status: threatened (1, p 1)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 3)

Population size (most current estimate): no estimates, generally declining (1, p 4)

Body weight (in g):

Males: average 460, range 200-900 (calculated using weight:length ratios, 2, p 642)

Females: average 700, range 230-1600 (calculated using weight:length ratios, 2, p 642)

Locations known to occur: MS: Leaf, Chickasawhay, Pascagoula (East & West), and lower Escatawpa Rivers; Tallahala and Red Creeks (1, p 2)

MS counties: Covington, Clarke, George, Jackson, Perry, Greene, Wayne, Jones, Forrest (1, p 2, 3)

Federal lands or Indian reservations species is known to occur:

DeSoto National Forest (Forest Service) (3)

Grand Bay National Wildlife Refuge (FWS) (3)

Dates of Breeding Period: mid-May to early August (1, p 2)

Diet: aquatic invertebrates (sponges, mollusks, insects), aquatic plants, algae (1, p 4)

Relevant EFED model(s): KABAM

Habitat: Rivers and large creeks, prefers moderate currents, abundant basking sites, and sandbars (1, p 2)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1).

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Endemic to the Pascagoula River of Mississippi (1, executive summary)

Carapace length males 8.8-12.1 cm, females 10.3-21.2 cm (1, p 1)

Weight:length ratios used for body weight estimation are from 19 individuals with shell disease belonging to 4 species of map turtles (2, p 642). No data from healthy turtles was available.

Name of data extractor (date): Elyssa Gelmann, 13 March 2012

QC reviewer (date): Kris Garber (4/16/12)

Sources:

1. USFWS. 1993. Recovery Plan for the Yellow-blotched Map Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/930315.pdf
2. Hernandez-Divers, SJ, et al. 2009. Investigation of shell disease in map turtles (*Graptemys spp.*). *Journal of Wildlife Diseases* 45(3):637-652. Available online at: http://www.jwildlifedis.org/content/45/3/637.full.pdf+html
3. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Graptemys oculifera* (Ringed Map Turtle)**

Listed status: threatened (1, 5)

Designated critical habitat? no (1)

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? N/A

Population size (most current estimate): no estimates, stable or declining (2, p 6)

Body weight (in g):

Males:average438, range 220-750

Females: average 788, range 400-1350 (calculated using weight:length ratios, 4, p 642)

Locations known to occur: Pearl River and its major tributaries in LA and MS (2, p 7)

LA counties: St. Tammany, Washington (1)

MS counties: Copiah, Hancock, Hinds, Lawrence, Leake, Madison, Marion, Neshoba, Pearl River, Rankin, Scott, Simpson (1, 5)

Federal lands or Indian reservations species is known to occur:

Bogue Chitto National Wildlife Refuge (FWS) (6)

Dates of Breeding Period: estimated June-August (3)

Diet: insects, snails, earthworms, aquatic plants, algae, aquatic invertebrates (3)

Relevant EFED model(s): T-HERPS, KABAM

Habitat: Rivers and adjacent white sand beaches with basking sites (brush, logs debris) (3, p 1)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1, 2).

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Juvenile and adult diets appear to be similar (3)

Diet includes: adult and larval caddisflies, dipteran flies and mayflies, damselflies, dragonfly nymphs, beetles, and chironomid fly larvae, snails, small nematodes, earthworms (3)

Males up to 10 cm length, females up to 18 cm length (1)

Weight:length ratios used for body weight estimation are from 19 individuals with shell disease belonging to 4 species of map turtles (4, p 642). No data from healthy turtles was available.

County level location data is from the FWS Species Profile due to a lack of detailed location information in other available USFWS documentation (2)

Name of data extractor (date): Elyssa Gelmann, 13 March 2012

QC reviewer (date): Kris Garber (4/16/12)

Sources:

1. USFWS Species Profile: Ringed Map Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C022
2. USFWS. 2010. Ringed Map Turtle 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3270.pdf
3. USACE. Ringed Map Turtle Species Profile. US Army Corps of Engineers, Engineer Research and Development Center, Environmental Laboratory. Available online at: http://el.erdc.usace.army.mil/emrrp/turtles/species/ringed.html
4. Hernandez-Divers, SJ, et al. 2009. Investigation of shell disease in map turtles (*Graptemys spp.*). *Journal of Wildlife Diseases* 45(3):637-652. Available online at: http://www.jwildlifedis.org/content/45/3/637.full.pdf+html
5. USFWS. 1988. Ringed Sawback Turtle Recovery Plan. Not available online.
6. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Kinosternon sonoriense longifemorale* (Sonoyta mud turtle)**

Listed status: candidate

Designated critical habitat? no

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? yes (1)

Population size (most current estimate): 105 (1)

Body weight (in g):88-263 (adult) (2)

Locations known to occur:

Arizona County: Pima (1)

Federal lands or Indian reservations species is known to occur:

Organ Pipe Cactus National Monument (National Park Service) (1)

Diet: aquatic plants, aquatic invertebrates, fish and other vertebrates (1)

Relevant EFED model(s): KABAM

Habitat: natural and artificial ponds (spring-fed) and streams (channels) (1)

Accessible riparian areas are used for basking, cover (vegetated areas), and nesting (generally vegetation-free areas) (1)

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

100% of the habitat of this species that is located in the US is owned by the National Park Service (1).

Majority of diet is represented by aquatic plants and invertebrates (1).

Body weight for this species could not be located. Value provided here is from another species within the genus (eastern mud turtle, *Kinosternon subrubrum subrubrum*) (2)

Name of data extractor (date): Kris Garber (5/14/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. <http://ecos.fws.gov/docs/candidate/assessments/2014/r2/C067_V01.pdf>
2. <http://www.virginiaherpetologicalsociety.com/reptiles/turtles/eastern-mud-turtle/eastern_mud_turtle.php>

**Species (common name): *Masticophis lateralis euryxanthus* (Alameda Whipsnake)**

Listed status: threatened (1, p v)

Designated critical habitat? yes

Primary Constituent Elements: (5 p. 58191)

1. *Scrub/shrub communities with a mosaic of open and closed canopy:* Scrub/shrub vegetation dominated bylow-to medium-stature woody shrubswith a mosaic of open and closedcanopy as characterized by the chamise,chamise-eastwood manzanita, chaparral whitethorn, and interior live oak shrub vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California ((Mayer and Laudenslayer 1988, pp. 28, 34), and California Wildlife Habitat Relationship System (CDFG 1998)), occurring at elevations from sea level to approximately 3,850 ft (1,170 m). Such scrub/shrub vegetation within these series forms a pattern of open and closed canopy used by the Alameda whipsnake for shelter from predators; temperature regulation, because it provides sunny and shady locations; prey-viewing opportunities; and nesting habitat and substrate. These features contribute to support a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds.

2. *Woodland or annual grassland plant communities contiguous to lands containing PCE 1:* Woodland or annual grassland vegetation series comprised of one or more of the following: Blue oak, coast live oak, California bay, California buckeye, and California annual grassland vegetation series (as identified in the Manual of California Vegetation (Sawyer and Keeler-Wolf 1995), A Guide to Wildlife Habitats of California (Mayer and Laudenslayer 1988), and California Wildlife Habitat Relationship System (CDFG 1998, pp. 28, 29, 118)) are PCE 2. This mosaic of vegetation is essential to the conservation of the Alameda whipsnake because it supports a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds, and provides opportunities for: (1) Foraging by allowing snakes to come in contact with and visualize, track, and capture prey (especially western fence lizards along with other prey such as skinks, frogs, birds); (2) short and long distance dispersal within, between, or to adjacent areas containing essential features (*i.e.*, PCE 1 or PCE 3); and (3) contact with other Alameda whipsnakes for mating and reproduction.

3. *Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and or PCE 2.* These areas are essential to the conservation of the Alameda whipsnake because they are used for retreats (shelter), hibernacula, foraging, and dispersal, and provide additional prey population support functions.

Map of range/occurrences in recovery plan? yes (1, p II-59, II-61)

Population size (most current estimate): unknown, declining (1, p I-6) (2, p 10)

Total length (in mm): 910-1220 (3, p 64308)

Snout to vent length (in mm): 690-930 (estimated using ratio of tail length:total length of *Masticophis flagellum* in 4, p 35)

Body weight (in g): 60-140 (estimated using a regression for *Masticophis flagellum* in 4, p 34)

Locations known to occur: California (1, p II-58) (2, p 10)

Alameda, Contra Costa, western San Joaquin, northern Santa Clara counties (1, p II-58) (2, p 10)

Federal lands or Indian reservations species is known to occur: None (6)

Dates of Breeding Period: late March-mid June (1, II-67)

Diet: reptiles (lizards, snakes), amphibians (frogs), birds (1, p II-68), small mammals, insects (2, p 5)

Relevant EFED model(s): T-HERPS

Habitat: Chaparral and Scrub communities and adjacent Grassland and Oak woodland/Savanna (1, p II-67, II-68)

Habitat size (home range): 1.9 to 8.7 ha (4.7 to 21.5 acres), average of 5.5 ha (13.6 acres) for males (1, II-67)

Elevation restriction: None noted in available USFWS documentation (1, 2).

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

There is a detailed life history document for this species in the SF Bay Endangered Species Assessments.

Also called the Alameda Striped Racer (1, p II-54)

Two subspecies exist, but only one is listed (1, p II-54)

The alameda whip snake appears to prefer lizard prey. The western fence lizard (*Sceloporus occidentalis*) is an important prey item. The alameda whip snake also consumes the western skink (1, p II-68, II-70) (2, p5).

Hibernation occurs from November-March (2, p 4)

Snout to vent length (SVL) is estimated from a tail length:total length ratio for *M.* *flagellum*, another whip snake species. No species-specific data were found for *M. lateralis euryxanthus*. The ratio was 0.240, the average of the female ratio of 0.236 and the male ratio of 0.243 (4, p 35).

Body weight (BW) is estimated from SVL using a regression equation for *M.* *flagellum*. No species-specific data or equations were found for *M. lateralis euryxanthus*. The equation is below (4, p 34).

BW = (0.00017\*SVL)^3.010

Name of data extractor (date): Elyssa Gelmann, 6 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 2002. Draft Recovery Plan for the Chaparral and Scrub Community Species East of San Francisco Bay, California. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/030407.pdf
2. USFWS. 2011. Alameda Whipsnake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3886.pdf
3. USFWS. 1997. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Callippe Silverspot Butterfly and the Behren's Silverspot Butterfly and Threatened Status for the Alameda Whipsnake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/federal\_register/fr3183.pdf
4. Kaufman, GA; Whitfield Gibbons, J. 1975. Weight-length relationships in thirteen species of snakes in the southeastern United States. *Herpetologica* 31:31-37.
5. USFWS. 2006. Designation of Critical Habitat for the Alameda Whipsnake; Final Rule. Available online at: http://www.gpo.gov/fdsys/pkg/FR-2006-10-02/pdf/06-8367.pdf#page=1
6. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Neoseps reynoldsi* (Sand Skink)**

Listed status: threatened (1, p 4-541)

Designated critical habitat? no (1, p 4-541)

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 4-541)

Population size (most current estimate): little is known, known to occur in 73 locations in 2006 (2, p 4-5)

Snout to vent length (in mm): 45-57 (2, p 6)

Body weight (in g): 1.5-3.5 (range estimated from regression equations for the Scincidae family from 3, p 222)

Locations known to occur: Florida – Highlands, Polk, Osceola, Orange, Lake, Marion, and Putnam Counties (1, p 4-541);

Lake Wales and Winger Haven Ridges in Highlands, Lake, and Polk counties (1, p 4-542)

Federal lands or Indian reservations species is known to occur:

Ocala National Forest (Forest Service) (4)

Lake Wales Ridge National Wildlife Refuge (FWS) (4)

Dates of Breeding Period: February-May mating, eggs hatch June-July (1, p 4-543)

Diet: arthropods (1, p 4-543)

Relevant EFED model(s): T-HERPS

Habitat: Xeric (dry) uplands, between high pine and scrub (1, p 4-542)

Habitat size (home range): No information available (1, p 4-543)

Elevation restriction: None noted in available USFWS documentation (1, 2).

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Diet is primarily beetle larvae and termites (*Prorhinotermes spp.*). Diet also includes spiders, larval ant lions, lepidopteran larvae, roaches and adult beetles (1, p 4-543).

Body weight (BW) is estimated from estimated snout to vent length (SVL) for *N. reynoldsi* and regression equations of body weight and SVL for the Scincidae family. A genus level regression was not performed because no data from the *Neoseps* genus were available. Two equations were used, the first derived using 177 data points including both legged and legless species and the second derived using a subset of 154 data points from only fully-legged species. Both equations were used in order to derive the most conservative body weight range. The equations (from 2) are below.

1. BW = 10^(3.029\*LOG(SVL)-4.821)

2. BW = 10^(3.229\*LOG(SVL)-5.125)

Name of data extractor (date): Elyssa Gelmann, 5 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1999. Multi-Species Recovery Plan for South Florida: Sand Skink. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/verobeach/MSRPPDFs/SandSkink.pdf
2. USFWS. 2007. Sand Skink 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc1072.pdf
3. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Nerodia clarkii taeniata* (Atlantic Salt Marsh Snake)**

Listed status: threatened (2, p 4-553)

Designated critical habitat? no (2, p 4-553)

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (2, p 4-553) (1, p 4)

Population size (most current estimate): unknown (3, p 5)

Total length (in mm): typically 650, maximum 820 (1, p 1)

Snout to vent length (in mm): typically 500, maximum 650 (estimated using ratio of tail length:total length of 3 other *Nerodia* species in 4, p 35)

Body weight (in g): typically 70-100, maximum 150-200(estimated using regressions for 3 other *Nerodia* species 4, p 34)

Locations known to occur: Florida – Brevard, Volusia, and Indian River Counties (2, p 4-556)

Federal lands or Indian reservations species is known to occur: None (5)

Dates of Breeding Period: August-October (2, p 4-558) (1, p 6)

Diet: fish, amphibians (frogs) (1, p 6)

Relevant EFED model(s): KABAM

Habitat: coastal salt marshes and mangrove swamps, brackish to full strength seawater (2, p 4-553)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1, 2, 3)

Obligate relationships: None noted in available USFWS documentation (1, 2, 3). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Primarily feeds on small fish. Eats small frogs when available (1, p 6).

Snout to vent length (SVL) is estimated from tail length:total length ratios for 3 other *Nerodia* species: *N. erythrogaster*, *N. sipedon*, and *N. taxispilota*. No species-specific data were found for *N. clarkii taeniata*. The ratios are below (4, p 35).

*N. erythrogaster* female 0.178 male 0.222 mean 0.200

*N. sipedon* female 0.218 male 0.257 mean 0.238

*N. taxispilota* female 0.227 male 0.265 mean 0.246

A range for body weight (BW) is estimated from SVL using regression equations for 3 other *Nerodia* species: *N. erythrogaster*, *N. sipedon*, and *N. taxispilota*. No species-specific data or equations were found for *N. clarkii taeniata*. The equations are below (4, p 34).

*N. erythrogaster* BW = (0.0038\*SVL)^3.07

*N. sipedon* BW = (0.0040\*SVL)^3.15

*N. taxispilota* BW = (0.0050\*SVL)^3.13

Name of data extractor (date): Elyssa Gelmann, 5 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1993. Recovery Plan for the Atlantic Salt Marsh Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/931215.pdf
2. USFWS. 1999. Multi-Species Recovery Plan for South Florida: Atlantic Salt Marsh Snake. United States Fish and Wildlife Service. Available online at: http://www.fws.gov/verobeach/MSRPPDFs/ASMSnake.pdf
3. USFWS. 2008. Atlantic Salt Marsh Snake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc1885.pdf
4. Kaufman, GA; Whitfield Gibbons, J. 1975. Weight-length relationships in thirteen species of snakes in the southeastern United States. *Herpetologica* 31:31-37.
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Nerodia erythrogaster neglecta* (Copperbelly Water Snake), Northern DPS**

Listed status: threatened (1, p iv)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 8, 9)

Population size (most current estimate): 113 ± 27 in 2007 in MI and OH (2, p 5)

Snout to vent length (in mm): Males 450-800; Females 450-1050 (1, p 16, Figure 10); Males rarely > 750 (1, p 15)

Neonates 250-270 (1, p 14)

Body weight (in g): Males 50-750; Females 25-950 (1, p 16, Figure 9); Males rarely >300 (1, p 15)

Neonates 5-6 (1, p 14)

Locations known to occur: MI – Hillsdale County, OH – Williams County, IN – Steuben County (1, p 7, 9)

Federal lands or Indian reservations species is known to occur: None (3)

Isolated populations in south-central MI, northeastern IN, and northwestern OH (1, p 9)

Dates of Breeding Period: Spring (1, p 13)

Diet: fish, amphibians (tadpoles, frogs, and toads), aquatic invertebrates (crayfish) (1, p 17)

Relevant EFED model(s): T-HERPS, KABAM

Habitat: Wetlands and Forested upland matrix or seasonal Wetlands (1, p iv)

Predominantly found in shallow wetlands (1, p iv)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1, 2)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-year review recommends up-listing to endangered (2, p 9)

This species has two distinct population segments (DPS); the southern DPS is not listed as threatened or endangered (1, p 7)

Hibernate from Late October to Late April (1, p 13)

Species will eat terrestrial-phase frogs and toads (when wetlands dry out) and will scavenge large dead fish (1, p 17)

Name of data extractor (date): Elyssa Gelmann, 5 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 2008. Recovery Plan for the Northern Population Segment of the Copperbelly Water Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/081223.pdf
2. USFWS. 2010. Copperbelly Water Snake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3234.pdf
3. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Pituophis melanoleucus lodingi* (Black pine snake)**

Listed status: proposed (threatened)

Designated critical habitat? proposed

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? no

Population size (most current estimate): not available

Body weight (in g): 200 g (juvenile) to 1,000 g (adult), based on *P. ruthveni* (2)

Locations known to occur: Alabama Counties: Clarke, Mobile, Washington,

Mississippi Counties: Covington, Forrest, George, Greene, Harrison, Jackson, Jones, Lamar, Marion, Perry, Stone, Wayne (1)

Historical range includes additional counties

Federal lands or Indian reservations species is known to occur:

DeSoto National Forest (1)

Diet: mammals (rodents, rabbits), birds (1)

Habitat: fire-dependent long leaf pine forests (1)

Riparian areas, hardwood forests (1)

Relevant EFED model(s): T-HERPS

Elevation restriction: not available

Obligate relationships: None noted in available USFWS documentation. Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

79% of habitat is on federal lands, 2% on state lands, 18% on private lands (1)

Active from March-September (1)

Active during the day (1)

Will eat carrion (1)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): Catherine Aubee (7/23/15, 8/5/15)

Sources:

1. <http://ecos.fws.gov/docs/candidate/assessments/2013/r4/C029_V01.pdf>
2. Himes, J.G., L.M. Hardy, D.C. Rudolph, and S.J. Burgdorf. 2002. Growth rates and mortality of the Louisiana pine snake (*Pituophis ruthveni*). Journal of Herpetology 36 (4): 686-687. <http://www.bioone.org/doi/pdf/10.1670/0022-1511%282002%29036%5B0683%3AGRAMOT%5D2.0.CO%3B2>

Species (common name): *Pituophis ruthveni* (Louisiana pine snake)

Listed status: candidate

Designated critical habitat? no

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? yes (county-level)

Population size (most current estimate): not available

Body weight (in g): 200 g (juvenile) to 1,000 g (adult) (2)

Locations known to occur: Louisiana Counties: Bienville, Natchitoches, Sabine, Vernon

Texas Counties: Angelina, Cherokee, Jasper, Nacogdoches, Newton, Shelby, Wood (1)

Additional counties in historical range

Federal lands or Indian reservations species is known to occur:

Kisatchie and Angelina National Forests and U.S. Department of Defense (DOD) lands at Fort Polk, Louisiana (1)

Diet: primary prey is the Bairds pocket gopher (*Geomys breviceps*), also eats other small mammals and turtle eggs (1)

Relevant EFED model(s): T-HERPS

Habitat: fire-dependent long leaf and short leaf pine forest (1)

Use burrows of bairds pocket gopher (1)

Elevation restriction: not available

Obligate relationships: Because this species depends upon the Bairds pocket gopher for its diet and habitat, it is assumed that the Louisiana pine snake is obligate to this species of gopher.

Comments:

54% of land is publicly owned, 46% private (1)

Snakes choose their habitats based on the abundance and distribution of Bairds pocket gopher (1)

Average home range: 33.2 ha, range: 6.5 - 108 ha (1)

Most active March-May and September-November (1)

Species also known to consume other species of mammals (eastern moles *(Scalopus aquaticus*),

cotton rats (*Sigmodon hispidus*), deer mice (*Peromyscus* sp.), harvest mice (*Reithrodontomys* sp.), and turtle (probably *Trachemys scripta*) eggs (1)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. <http://ecos.fws.gov/docs/candidate/assessments/2014/r4/C02C_V01.pdf>
2. Himes, J.G., L.M. Hardy, D.C. Rudolph, and S.J. Burgdorf. 2002. Growth rates and mortality of the Louisiana pine snake (*Pituophis ruthveni*). Journal of Herpetology 36 (4): 686-687. <http://www.bioone.org/doi/pdf/10.1670/0022-1511%282002%29036%5B0683%3AGRAMOT%5D2.0.CO%3B2>

**Species (common name): *Pseudemys alabamensis* (Alabama Red-belly Turtle)**

Listed status: endangered (1, p 1)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 2)

Population size (most current estimate): unknown, believed to be declining (1, p 3)

Body weight (in g): Adult 2380-5900 (estimated using a regression equation for another *Pseudemys* species from 4, p 355)

Hatchling: mean 11.7 (3, p 66)

Locations known to occur: AL – Baldwin and Mobile Counties (Mobile Bay Drainage) (1, p 1); MS – Harrison and Jackson Counties (2)

Federal lands or Indian reservations species is known to occur:

Gulf Islands National Seashore – Open Water (NPS) (5)

Gulf Islands Wilderness – Gulf Islands National Seashore (NPS) (5)

Mississippi Sandhill Crane National Wildlife Refuge (FWS) (5)

Dates of Breeding Period: spring-summer (1, p 3-4)

Diet: aquatic plants (1, p 1, 3)

Relevant EFED model(s): KABAM

Habitat: Streams, Lakes, Sloughs (1, p 1)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-yr review initiated in 2007

Adult carapace length 33 cm (1, p 1)

Adult female carapace length (n=31) 25.9-35.8 cm, mean 31.9 cm (3, p 69)

Hatchling carapace length: mean 3.91 cm (3, p 66)

Body weight is estimated using a regression equation based on data from the Plymouth Red-bellied turtle (*P. rubriventris bangsi*, carapace length 26-32 cm) due to lack of species specific information for *P. alabamensis*. The equation relates body weight in g (BW) to length in mm (L) from measurements on 18 Plymouth red-belly turtles (4, p 355-356). The equation is: BW = 4.4\*10-4\*L2.79 (4, p 355). Using this equation and the carapace length range from (3), the BW range is 2380-5900 g. Using this equation, the mean BW for hatchlings would be 12.2 g based on the lengths from (3, p 66). This is close to the measured mean of 11.7 g, lending confidence to the use of the equation for this species.

County level location data for MI is from the FWS Species Profile due to a lack of detailed location information in other available USFWS documentation (1).

Name of data extractor (date): Elyssa Gelmann, 13 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1990. Recovery Plan for the Alabama Red-bellied Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/900108.pdf
2. USFWS Species Profile: Alabama Red-bellied Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C01W
3. Nelson, David H., Gabriel J. Langford, Joel A. Borden, and William M. Turner. 2009. Reproductive and hatchling ecology of the Alabama red-bellied cooter (*Pseudemys alabamensis*): Implications for conservation and management. *Cheldonian Conservation and Biology* 8(1):66-73.
4. Graham, Terry E. 1971. Growth rate of the red-bellied turtle, *Chrysemys rubriventris*, at Plymouth, Massachusetts. *American Society of Ichthyologists and Herpetologists* 1971(2):353-356.

FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Pseudemys rubriventris bangsi* (Plymouth Red-Bellied Turtle)**

Listed status: endangered (1, exec sum)

Designated critical habitat? yes (1, exec sum)

Primary Constituent Elements: not defined in FR for designation of critical habitat (5)

Map of range/occurrences in recovery plan? yes (1, p 4, 6, 11) and in 5-yr review (2, p 13)

Population size (most current estimate): 400-600 breeding age individuals (2, p 12)

Body weight (in g): 4,500 (3, p 1, 1st sentence)

Mature males: 2450-2700 (4, p 355)

Mature females: 3450-4900 (4, p 355)

Lowest measured, age unknown: 15.2 (4, p 355)

Locations known to occur: Plymouth County, MA (1, exec sum)

Federal lands or Indian reservations species is known to occur: None (6)

Dates of Breeding Period: late May to early July (1, p 17)

Diet: aquatic plants (1, exec sum), aquatic invertebrates (including crayfish) (3, p 2) (4, p 354)

Relevant EFED model(s): KABAM

Habitat: Freshwater Ponds and Rivers & on land within 100 m (1, exec sum & p 2) (2, p 12)

Habitat size (home range): within 100 m of pond or river habitat (1, p 2)

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-yr review recommends keeping the species listed as endangered but changing it to a DPS.

Adult carapace length 26-32 cm (1, p 1)

Hatchling carapace length 2.87-3.59 cm (4, p 354)

Body weights from (4) are ranges based on measurements of 3 males and 5 females; “mature” was defined as the size at which sex could be determined, which was >220 mm carapace length (4, p 354). This paper also calculated a regression relating body weight in g (BW) to length in mm (L) from measurements on 18 turtles (4, p 355-356). The equation is: BW = 4.4\*10-4\*L2.79 (4, p 355). Using this equation and the carapace length range from (1), the BW range is 2400-4300 g. If the equation holds for hatchlings, the BW range would be 5-10 g based on the lengths from (4, p 354).

Diet includes milfoil (*Myriophyllum sp.*) (3, p 2) and *Sagittaria* (4, p 354)

Species is referred to as Northern Red-Bellied Cooter, Plymouth Red-Bellied Turtle, and Plymouth Red-Bellied Cooter

Name of data extractor (date): Elyssa Gelmann, 24 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1994. Recovery Plan for the Plymouth Redbelly Turtle, Second Revision. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/940506b.pdf
2. USFWS. 2007. Northern Red-bellied Cooter 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc1109.pdf
3. MA NHESP. 2008. Northern Red-bellied Cooter Species Profile. Massachusetts Division of Fisheries and Wildlife Natural Heritage & Endangered Species Program. Available online at: http://www.mass.gov/dfwele/dfw/nhesp/species\_info/nhfacts/pseudemys\_rubriventris.pdf
4. Graham, Terry E. 1971. Growth rate of the red-bellied turtle, *Chrysemys rubriventris*, at Plymouth, Massachusetts. *American Society of Ichthyologists and Herpetologists* 1971(2):353-356.
5. USFWS. 1980. ETWP; Listing as Endangered With Critical Habitat for the Plymouth Red- Bellied Turtle in Massachusetts. Available online at: http://ecos.fws.gov/docs/federal\_register/fr398.pdf

FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Sistrurus catenatus* (Eastern Massasauga rattlesnake)**

Listed status: candidate

Designated critical habitat? no

Primary Constituent Elements: not applicable

Map of range/occurrences in recovery plan? no

Population size (most current estimate): specific numbers not available, but identified as small and particularly sensitive to adult mortality and female survival to reproduction (2)

Body weight (in g): 8 g – 13 g (neonate) (4), 130 g – 430 g (adult) (4, 5)

Locations known to occur: (2)

Iowa counties: Black Hawk, Bremer, Buchanan, Chickasaw, Clinton, Louisa,

Muscatine, Scott

Illinois Counties: Bond, Clinton, Cook, Fayette, Knox, Lake, Madison, Piatt, Warren, Will, Indiana Counties: Allen, Carroll, Elkhart, Fulton, Kosciusko, Lagrange, La Porte, Marshall, Noble, Porter, Pulaski, Steuben, St. Joseph, Tippecanoe,

Michigan Counties: Alcona, Allegan, Alpena, Arenac, Barry, Berrien, Calhoun, Cass, Cheboygan, Clinton, Crawford, Eaton, Genesee, Grand, Traverse, Hillsdale, Iosco, Jackson, Kalamazoo, Kalkaska, Kent, Lake, Lapeer, Lenawee, Livingston, Mackinac, Macomb, Manistee, Mason, Midland, Missaukee, Montcalm, Muskegon, Newaygo, Oakland, Presque Isle, Roscommon, Saginaw, St. Joseph, Van Buren, Washtenaw, Wayne

Minnesota Counties: Houston, Wabasha, Winona

New York Counties: Genesee, Onondaga

Ohio Counties: Ashtabula, Champaign, Clark, Erie, Fairfield, Greene, Licking, Montgomery,

Trumbull, Warren, Wayne, Wyandot

Pennsylvania Counties: Butler, Mercer, Venango

Wisconsin Counties: Buffalo, Crawford, Jackson, Juneau, La Crosse, Monroe, Pepin, Rock,

Trempealeau, Walworth, Wood

Additional counties in historical range not included here

Federal lands or Indian reservations species is known to occur:

NECEDAH NATIONAL WILDLIFE REFUGE, UPPER MISSISSIPPI RIVER NATIONAL WILDLIFE AND FISH REFUGE, other lands managed by US ARMY CORPS OF ENGINEERS (1, 2)

Diet: primarily eat rodents (mice, voles, shrews), frogs, snakes (3, 6)

Relevant EFED model(s): T-HERPS

Habitat: shallow wetland, adjacent upland habitat (2)

Elevation restriction: none

Obligate relationships: Crayfish burrows are required for hibernacula (2)

Comments:

59% of range occurs on public lands (2)

Wetland habitats include: peat lands, marshes, sedge meadows, and swamp forest (2)

Crayfish burrows are used as hibernacula (2)

Cranberry farming overlaps with habitat in WI (2)

Upland habitats include: open savannas, prairies, wet open woodlands, and old fields (2)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C03P
2. http://ecos.fws.gov/docs/candidate/assessments/2013/r3/C03P\_V01.pdf
3. <http://www.fws.gov/midwest/endangered/reptiles/eama/eama-fct-sht.html>
4. Aldridge, R.D., B.C. Jellen, M.C. Allender, M.J. Dreslik, D.B. Shepard, J.M. Cox, and C.A. Phillips. 2008. Reproductive biology of the Massasauga (*Sistrurus catenatus*) from south-central Illinois. In W.K. Hayes, K.R. Beaman, M.D. Cardwell, and S.P. Bush (eds.). The Biology of Rattlesnakes. Loma Linda University Press, Loma Linda, CA: 403-412.
5. Jellen, B.C., D.B. Shepard, M.J. Dreslik, and C.A. Phillips. 2007. Male movement and body size affect mate acquisition in the Eastern Massasauga (*Sistrurus catenatus*). Journal of Herpetology 41 (3): 451-457.
6. Shepard, D.B., C.A. Phillips, M.J. Dreslik, and B.C. Jellen. 2004. Prey preference and diet of neonate Eastern Massasaugas (*Sistrurus c. catenatus*). American Midland Naturalist 152: 360-368,

**Species (common name): *Sphaerodactylus micropithecus* (Monito Gecko)**

Listed status: endangered (1, p 6)

Designated critical habitat? yes (1, p 6)

Primary Constituent Elements: (4 p. 46092)

1. Cover. The habitat for the Monito gecko must provide sufficient cover to, hide from predators and from unfavorable environmental conditions.

2. Disturbance. The habitat must be spared from extreme disturbance, such as from bombing practice as was proposed in the past. This is not being considered at present.

3. Predators. The habitat must be free from introduced predators, such as the black rat.

Map of range/occurrences in recovery plan? no

Population size (most current estimate): unknown; 24 individuals reported in one survey (1, p 4)

Snout to vent length (in mm): 17-36 (1, p 1)

Body weight (in g): 0.15-0.77(estimated using a regression of 8 *Sphaerodactylus* species from 2, Appendix S1)

Locations known to occur: Isla Monito, Puerto Rico (1, p 2)

Federal lands or Indian reservations species is known to occur: None (5)

Dates of Breeding Period: between March and November (1, p 4)

Diet: arthropods, gastropods (3, p 330, 333)

Relevant EFED model(s): T-HERPS

Habitat: under rocks and vegetation (1, p 3)

Habitat size (home range): Not specified

Elevation restriction: Highest point on Isla Monito is 66 m above sea level (1, p 2)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-yr review initiated in 2007

Diet information is based on a surrogate species because there is no information on *S. micropithecus* diet in the available USFWS documentation or located in open literature. The surrogate species *S. vincenti* is of a similar size, <1 g with a maximum SVL of 40 mm and is found on St. Vincent, West Indies (3, p 330). Eleven orders of arthropods and one gastropod were found in the stomach of 32 individuals. Arthropods included: Arachnida (Araneae, Acari), Crustacea (Isopoda), and Insecta (Blattoidea, Coleoptera, Collembola, Dermaptera, Diptera, Homoptera, Hymenoptera, Lepidoptera) (3, p 333)

Body weight (BW) is estimated from snout to vent length (SVL) for *S. micropithecus* and regressions of body weight and SVL data of 8 other species in the *Sphaerodactylus* genus. The calculated equation and data (from 2, Appendix S1) are below (R2 = 0.815).

BW = 10^(2.178\*LOG(SVL)-3.500)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Genus | Species | Family | SVL (mm) | Log SVL | weight (g) | Log weight | limbs | sex | mass measure |
| *Sphaerodactylus* | *argivus* | Gekkonidae | 22.5 | 1.35 | 0.3 | -0.52 | legged | unsexed | mean |
| *Sphaerodactylus* | *ariasae* | Gekkonidae | 17.9 | 1.25 | 0.1 | -1.00 | legged | unsexed | heaviest |
| *Sphaerodactylus* | *cinereus* | Gekkonidae | 37 | 1.57 | 1 | 0.00 | legged | unsexed | heaviest |
| *Sphaerodactylus* | *macrolepis* | Gekkonidae | 35 | 1.54 | 0.5 | -0.30 | legged | unsexed | heaviest |
| *Sphaerodactylus* | *nicholsi* | Gekkonidae | 20 | 1.30 | 0.3 | -0.52 | legged | unsexed | mean |
| *Sphaerodactylus* | *notatus* | Gekkonidae | 30 | 1.48 | 0.5 | -0.30 | legged | unsexed | heaviest |
| *Sphaerodactylus* | *parthenopion* | Gekkonidae | 18 | 1.26 | 0.2 | -0.70 | legged | unsexed | heaviest |
| *Sphaerodactylus* | *vincenti* | Gekkonidae | 27.05 | 1.43 | 0.5 | -0.30 | legged | female | mean |

Name of data extractor (date): Elyssa Gelmann, 23 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1986. Recovery Plan for the Monito Gecko. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/860327a.pdf
2. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
3. Steinberg, David S., Sylvia D. Powell, Robert Powell, John S. Parmerlee Jr., and Robert W. Henderson. 2007. Population densities, water-loss rates, and diets of *Sphaerodactylus vincenti* on St. Vincent, West Indies.
4. USFWS. 1982. Listing with Endangered Status & Critical Habitat for Monito Gecko. Available online at: http://ecos.fws.gov/docs/federal\_register/fr638.pdf
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Sternotherus depressus* (Flattened Musk Turtle)**

Listed status: threatened (1, p 1)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 2)

Population size (most current estimate): no estimates, found at <half of 125 sites sampled (1, p 1); 118 turtles trapped at Smith Lake, 2004 (2, p 14)

Body weight (in g): range: 26-143, mean 92

Males: 26-138, mean 87

Females: 46-143, mean 98 (2, summary of data on p 9, 10, 12, 13, 14)

Locations known to occur: AL – Winston, Walker, Tuscaloosa, Cullman, Blount, and Jefferson Counties (upper Black Warrior River system) (1, p 1, 2)

Federal lands or Indian reservations species is known to occur:

William B. Bankhead National Forest (Forest Service) (3)

Dates of Breeding Period: May-July (2, p 5)

Diet: aquatic invertebrates (mollusks, benthic organisms) (1, p 5) (2, p 5)

Relevant EFED model(s): KABAM

Habitat: Streams, Lake margins (1, p 3); spend most of their time in benthic habitats (1, p 5)

Optimum habitat includes creeks and small rivers with vegetated areas with depth of 3 - 600 cm (1, p 3)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

5-yr review initiated in 2009

Name of data extractor (date): Elyssa Gelmann, 13 March 2012

QC reviewer (date): Kris Garber (4/16/12)

Sources:

1. USFWS. 1990. Recovery Plan for the Flattened Musk Turtle. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/900226.pdf
2. Rogers, Sherry R.H. and Ken R. Marion. 2004. Assessment of the Population Status of the Flattened Musk Turtle (*Sternotherus depressus*) in the Sipsey Fork and Brushy Creek Branches of Lewis Smith Lake, Alabama. University of Alabama. Report to AL Power and Light Co, & The Nature Conservancy. Available online at: http://www.alabamapower.com/hydro/warrior\_application/Volume\_09\_WR9/FMT\_Lake\_Site\_Assessment.pdf
3. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

Species (common name): *Thamnophis eques megalops* (Northern Mexican gartersnake)

Listed status: Threatened

Designated critical habitat? Yes

Primary Constituent Elements: (taken directly from 3)

(1) Aquatic or riparian habitat that includes:

a. Perennial or spatially intermittent streams of low to moderate gradient that possess appropriate amounts of inchannel pools, off-channel pools, or backwater habitat, and that possess a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of processing sediment loads; or

b. Lentic wetlands such as livestock tanks, springs, and cienegas; and

c. Shoreline habitat with adequate organic and inorganic structural complexity to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities (e.g., boulders, rocks, organic debris such as downed trees or logs, debris jams, small mammal burrows, or leaf litter); and

d. Aquatic habitat with characteristics that support a native amphibian prey base, such as salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally present at levels that do not affect survival of any age class of the northern Mexican gartersnake or the maintenance of prey populations.

(2) Adequate terrestrial space (600 ft (182.9 m) lateral extent to either side of bank adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation (extended inactivity).

(3) A prey base consisting of viable populations of native amphibian and native fish species.

(4) An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Lithobates* *catesbeianus*), and/or crayfish (*Orconectes virilis, Procambarus clarki,* etc.), or occurrence of these nonnative species at low enough levels such that recruitment of northern Mexican gartersnakes and maintenance of viable native fish or soft-rayed, nonnative fish populations (prey) is still occurring.

Map of range/occurrences in recovery plan? no

Population size (most current estimate): not available

Body weight (in g): 0.95 – 4.3 g (neonate) (5) to 104 g (adult male, snout-vent length 605 mm) (6), based on survey data forMexican gartersnake, *T. eques*

Locations known to occur: Arizona, New Mexico (2)

Federal lands or Indian reservations species is known to occur: AGUA FRIA NATIONAL MONUMENT, BILL WILLIAMS RIVER NATIONAL WILDLIFE REFUGE, BUENOS AIRES NATIONAL WILDLIFE REFUGE, CORONADO NATIONAL FOREST, FORT HUACHUCA (4), GILA BOX RIPARIAN NATIONAL CONSERVATION AREA, LAS CIENEGAS NATIONAL CONSERVATION AREA, SAN BERNARDINO NATIONAL WILDLIFE REFUGE, SAN PEDRO RIVER NATIONAL CONSERVATION AREA (2)

Diet: primarily frogs (adults and tadpoles) (1)

Also: fish, toads, earthworms, mice, lizards, salamanders, snakes, leeches (1)

Relevant EFED model(s): KABAM, T-HERPS

Habitat: riparian, terrestrial and aquatic habitats (1)

Small, isolated wetlands, including cienegas (mid-elevation wetlands with highly organic, basic or alkaline soils) and protected backwaters and beaver ponds (1)

River riparian woodlands and forests (1)

May disperse over grasslands (1)

Elevation restriction: 40 to 2,590 m (1)

Obligate relationships: None noted in available USFWS documentation (1). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Terrestrial areas are used for hibernation, gestation, seeking mates and dispersal (1)

Size of home range: 1.7-10.4 acres (mean: 6.2 a) (1).

Forage for prey along water, catching prey from aquatic and terrestrial areas (1)

There are 5 viable populations in the US (1)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): C atherine Aubee (7/24/15, 8/5/15)

Sources:

1. <http://www.gpo.gov/fdsys/pkg/FR-2014-07-08/pdf/2014-14615.pdf>
2. <http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C04Q>
3. <http://www.gpo.gov/fdsys/pkg/FR-2013-07-10/pdf/2013-16520.pdf>
4. USFWS. 2014. Biological and Conference Opinion on the Programmatic and Biological Assessment for Ongoing and Future Military Operations and Activities at Fort Huachuca, Arizona. Revised May 16, 2014. Consultation no. 22410-2013-F-0247.
5. Manjarrez, J., and E. San-Roman-Apolonio. 2015. Timing of birth and body condition in neonates of two gartersnake species from Central Mexico. Herpetologica 71 (1): 12-18.
6. Rosen, P.C., J.E. Wallace, and C.R. Schwalbe. 2001. Resurvey of the Mexican garter snake (*Thamnophis eques*) in southeastern Arizona. Technical report. Available online at <http://www.researchgate.net/publication/268505030_Resurvey_of_the_Mexican_garter_snake_%28Thamnophis_eques%29_in_southeastern_Arizona>. Last accessed August 3, 2015.

**Species (common name): *Thamnophis gigas* (Giant Garter Snake)**

Listed status: threatened (1, p iv)

Designated critical habitat? no (2, p 1)

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 2, 8)

Population size (most current estimate): 1,500 (1, p 14)

Snout to vent length (in mm):

Males average 665-700, maximum 820

Females average 820-887, maximum 1080

Body weight (in g):

Males up to 289, average 140-160 (1, p 15)

Females up to 785, average 332-433 (1, p 15)

Locations known to occur: CA Central Valley (1, p 1) – Butte, Colusa, Contra Costa, Fresno, Glenn, Merced, Placer, Sacramento, San Joaquin, Solano, Sutter, Yolo, Yuba (2, p 4, 5, 6, 8, 15)

Federal lands or Indian reservations species is known to occur:

Colusa National Wildlife Refuge (FWS) (4)

Delevan National Wildlife Refuge (FWS) (4)

Sacramento National Wildlife Refuge (FWS) (4)

San Luis National Wildlife Refuge (FWS) (4)

Stone Lakes National Wildlife Refuge (FWS) (4)

Sutter National Wildlife Refuge (FWS) (4)

Butte Sink Wildlife Management Area (FWS) (4)

Grasslands Wildlife Management Area (FWS) (4)

Willow Creek-Lurline Wildlife Management Area (FWS) (4)

Dates of Breeding Period: March-April, young born July-September (2, p 3)

Diet: fish, aquatic amphibians (1, p 12)

Relevant EFED model(s): KABAM

Habitat: Wetlands – agricultural wetlands (rice fields in the Sacramento Valley), irrigation and drainage canals, sloughs, ponds, small lakes, streams, managed marsh areas, adjacent uplands (1, p iv)

Habitat size (home range): average 9-55 ha (23-131 acres) (1, p 14)

Elevation restriction: 0-122 m (1, p 9)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

Endemic to Central Valley of California (1, p 1)

Population estimate is from surveys of different areas from 1993-1997(1, p 14)

Predominant prey items include carp (*Cyprinus carpio*), mosquito fish, bullfrogs (*Rana catesbeiana*) (1, p 12)

No complete list of counties in USFWS documentation, CA counties listed on species profile website not mentioned in other resources (1, 2) include: Alameda, Amador, Calaveras, El Dorado, Kern, Kings, Lake, Madera, Mariposa, Napa, Nevada, San Luis Obispo, Santa Clara, Santa Cruz, Stanislaus, Tehama, Tulare, Tuolumne

Name of data extractor (date): Elyssa Gelmann, 6 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1999. Draft Recovery Plan for the Giant Garter Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/990702b.pdf
2. USFWS. 2006. Giant Garter Snake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc778.pdf
3. USFWS Species Profile: Giant Garter Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=C057
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

Species (common name): *Thamnophis rufipunctatus* (Narrow-headed garter snake)

Listed status: Threatened

Designated critical habitat? Yes

Primary Constituent Elements: (taken directly from 2)

(1) Stream habitat, which includes:

a. Perennial or spatially intermittent streams with sand, cobble, and boulder substrate and low or moderate amounts of fine sediment and substrate embeddedness, and that possess appropriate amounts of pool, riffle, and run habitat to sustain native fish populations;

b. A natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of processing sediment loads;

c. Shoreline habitat with adequate organic and inorganic structural complexity (e.g., boulders, cobble bars, vegetation, and organic debris such as downed trees or logs, debris jams), with appropriate amounts of shrub- and sapling-sized plants to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities; and

d. Aquatic habitat with no pollutants or, if pollutants are present, levels that do not affect survival of any age class of the narrow-headed gartersnake or the maintenance of prey populations.

(2) Adequate terrestrial space (600 ft, 182.9 m) lateral extent to either side of bank adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation.

(3) A prey base consisting of viable populations of native fish species or soft-rayed, nonnative fish species.

(4) An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Lithobates catesbeianus*), and/or crayfish (*Orconectes virilis, Procambarus clarki,* etc.), or occurrence of these nonnative species at low enough levels such that recruitment of narrow-headed gartersnakes and maintenance of viable native fish or soft-rayed, nonnative fish populations (prey) is still occurring.

Map of range/occurrences in recovery plan? no

Population size (most current estimate): not available

Body weight (in g): up to 150 g (males) or 350 g (females) (3)

Locations known to occur: AZ, NM (1)

Federal lands or Indian reservations species is known to occur: Gila National Forest, Apache-Sitgreaves National Forest, Buenos Aires National Wildlife Refuge; status on tribal land is uncertain (1)

Diet: fish (primary prey), amphibians (frogs, salamanders, tadpoles) (1)

Relevant EFED model(s): KABAM, T-HERPS

Habitat: streams, shores, adjacent upland habitat (1)

Elevation restriction: 701 to 2,430 m (1)

Obligate relationships: None noted in available USFWS documentation. Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

One of the most aquatic of the garter snakes (1)

Upland habitat is used for hibernation (1)

Active from March – November (1)

Name of data extractor (date): Kris Garber (5/18/15)

QC reviewer (date): Catherine Aubee (7/24/15)

Sources:

1. <http://www.gpo.gov/fdsys/pkg/FR-2014-07-08/pdf/2014-14615.pdf>
2. <http://www.gpo.gov/fdsys/pkg/FR-2013-07-10/pdf/2013-16520.pdf>
3. Hibbits, T.J., C.W. Painter, and A.T. Holycross. 2009. Ecology of a population of the narrow-headed garter snake (*Thamnophis rufipunctatus*) in New Mexico: Catastrophoc decline of a river specialist. The Southwestern Naturalist 54 (4): 461-467,

**Species (common name): *Thamnophis sirtalis tetrataenia* (San Francisco Garter Snake)**

Listed status: endangered (1, p 1)

Designated critical habitat? no

Primary Constituent Elements: Not applicable

Map of range/occurrences in recovery plan? yes (1, p 11)

Population size (most current estimate): unknown, declining (2, p 5, 9)

Total length (in mm): 460-1310 (1, p 2) (3, p 1)

Body weight (in g): Female 227 (3, p 1)

Males weigh less than half of female weight (3, p 1)

Locations known to occur: CA – San Mateo County (San Francisco Peninsula) (1, p 1)

Federal lands or Indian reservations species is known to occur:

Golden Gate National Recreation Area (NPS) (4)

Dates of Breeding Period: Spring and fall, concentrated in March; birth of young in July-August (1, p 7-8)

Diet: amphibians (frogs, newts), fish, small mammals (1, p 7)

Relevant EFED model(s): T-HERPS, KABAM

Habitat: Wetlands, ponds, lakes, sloughs; edge of water vegetation used for cover and basking (1, p 9)

Habitat size (home range): Unknown, likely <10.7 km (1, p 8)

Elevation restriction: None noted in available USFWS documentation (1, 2)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

There is a detailed life history document for this species in the SF Bay Endangered Species Assessments.

Endemic to the San Francisco Peninsula (1, p 1)

Diet includes red-legged frogs (*Rana aurora*), pacific tree frogs (*Hyla regilla*), immature California newts (*Taricha torosa*), recently metamorphosed western toads (*Bufo boreas*), threespine stickleback (*Gasterosteus aculeatus*) and mosquito fish (*Gambusia affinis*) (1, p 7). Small mammals may be occasionally eaten (1, p 7).

SFGS under 500 mm snout-to-vent length (SVL) require Pacific tree frogs in various stages of metamorphosis, whereas individuals over 500 mm SVL can consume Pacific tree frog, California red-legged frogs, and bullfrog tadpoles and adults (2, p 12).

Name of data extractor (date): Elyssa Gelmann, 6 March 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1985. Recovery Plan for the San Francisco Garter Snake. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/850911.pdf
2. USFWS. 2006. San Francisco Garter Snake 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc774.pdf
3. Woodland Park Zoo. San Francisco Garter Snake Fact Sheet. Available online at: http://www.zoo.org/sslpage.aspx?pid=1941
4. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

**Species (common name): *Uma inornata* (Coachella Valley Fringe-Toed Lizard)**

Listed status: threatened (1, p 1)

Designated critical habitat? yes (1, p 2; 2, p 30)

Primary Constituent Elements: not defined in FR for designation of critical habitat (4)

Map of range/occurrences in recovery plan? yes (1, p 3)

Population size (most current estimate): Unknown, large fluctuations (2, p 33-34)

Snout to vent length (in mm):

Males: 70-120 (1, p 5)

Females: 65-99 (1, p 5)

Maximum adult value: 124 (3, Appendix S1)

Body weight (in g):

Males: 9.8-17 (estimated based on data in 3, Appendix S1)

Females: 9.1-14 (estimated based on data in 3, Appendix S1)

Maximum 17.3 (3, Appendix S1)

Locations known to occur: CA – Riverside County (Coachella Valley) CA (1, p 1)

Federal lands or Indian reservations species is known to occur:

Agua Caliente Indian Reservation (Bureau of Indian Affairs) (5)

Cabazon Indian Reservation (Bureau of Indian Affairs) (5)

Torres-Martinez Indian Reservation (Bureau of Indian Affairs) (5)

Coachella Valley National Wildlife Refuge (FWS) (5)

Public Domain Land (BLM) (5)

Santa Rosa Wilderness (BLM) (5)

San Gorgonio Wilderness (BLM) (5)

San Jacinto Wilderness – San Bernardino National Forest (Forest Service) (5)

Dates of Breeding Period: late April to mid August (1, p 8)

Diet: insects, reptiles (lizards), leaves, flowers (1, p 9)

Relevant EFED model(s): T-HERPS

Habitat: wind-blown sandy habitat on the Coachella valley floor (1, p 1 & 11)

Habitat size (home range): Not specified

Elevation restriction: None noted in available USFWS documentation (1, 2)

Obligate relationships: None noted in available USFWS documentation (1, 2). Reviewer believes that there are no obvious obligate relationships related to diet (species is opportunistic) or habitat.

Comments:

No listing status change recommended in 5-yr review (2, p 41)

Body weight (BW) range estimates calculated based on snout-to-vent length (SVL) range reported in USFWS Recovery Plan (1, p 5) and ratio of measured BW:SVL reported in 3, Appendix S1 (17.3 g:124 mm).

Name of data extractor (date): Elyssa Gelmann, 23 February 2012

QC reviewer (date): Kris Garber (4/13/12)

Sources:

1. USFWS. 1985. Recovery Plan for the Coachella Valley Fringe-Toed Lizard. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/recovery\_plan/850911b.pdf
2. USFWS. 2010. Coachella Valley Fringe-Toed lizard 5-Year Review. United States Fish and Wildlife Service. Available online at: http://ecos.fws.gov/docs/five\_year\_review/doc3562.pdf
3. Meiri, S. 2010. Length-weight allometries in lizards. *Journal of Zoology* 281:218-226.
4. USFWS. 1980. ETWP: Listing as Threatened with Critical Habitat for the Coachella Valley Fringe-Toed Lizard. Available online at: http://ecos.fws.gov/docs/federal\_register/fr476.pdf
5. FESTF. 2012. Coincidence of ESA-listed species with federal lands and proximity to outer boundary. FIFRA Endangered Species Task Force. Data submitted to EPA March 2012.

1. Species listed due to similarity of appearance are not biologically endangered or threatened and are not subject to Section 7 consultation. [↑](#footnote-ref-1)