

# PROMOTING AND PROTECTING BIOLOGICAL DIVERSITY

In Alabama's Forests Through  
Sustainable Forestry Initiative®  
(SFI) Standards

**Species Information Sheets for  
G1, G2, Threatened and  
Endangered Species with Forest  
Operation Recommendations**



**SUSTAINABLE  
FORESTRY  
INITIATIVE  
ALABAMA**

SFI-01116





# Introduction

As good stewards of the land and forest, Sustainable Forestry Initiative (SFI) certified organizations believe forest landowners share an important stewardship responsibility and commitment to society. They recognize the importance of maintaining working forests. They support sustainable forestry on forestland they manage and promote sustainable forestry on other lands. They support efforts to safeguard private property rights and help private landowners manage forestland sustainably.

Certified SFI companies commit to SFI Standards and a forest management concept that ensures sustaining Alabama's forests from one generation to another. Based on guiding principles, SFI Standards promote sustainable forestry. Standards focus on maintaining or advancing biological diversity at the stand and landscape level across a diversity of forest and vegetation cover types and successional stages including the conservation of forest plants and animals, aquatic species, threatened and endangered species, Forests with Exceptional Conservation Value, old-growth forests, and ecologically important sites. Certified organizations take special caution to ensure forests are managed to protect wildlife habitat and conserve biological diversity.

NatureServe, an organization that works with over 60 governmental and non-governmental programs in North America, collects, analyzes, and delivers biodiversity knowledge that informs conservation action. NatureServe developed a range-wide conservation status ranking system for all species. Using the NatureServe ranking system along with species information from the Alabama Natural Heritage Program, a list of species was developed for special considerations for forest management plans. The Alabama SFI Committee and certified SFI companies also safeguards species listed by the U.S. Endangered Species Act (ESA) when developing forest management plans.

# Ranks Defined

| Rank      | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GX</b> | <b>Presumed Extinct (species)</b> — Not located despite intensive searches and virtually no likelihood of rediscovery.<br><b>Presumed Eliminated (ecosystems, i.e., ecological communities and systems)</b> — Eliminated throughout its range, due to loss of key dominant and characteristic taxa and/or elimination of the sites and ecological processes on which the type depends.                                                                                                                            |
| <b>GH</b> | <b>Possibly Extinct (species) or Possibly Eliminated (ecosystems)</b> — Known from only historical occurrences but still some hope of rediscovery. Examples of evidence include (1) that a species has not been documented in approximately 20–40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is extinct or eliminated throughout its range. |
| <b>G1</b> | <b>Critically Imperiled</b> — At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.                                                                                                                                                                                                                                                                                                       |
| <b>G2</b> | <b>Imperiled</b> — At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.                                                                                                                                                                                                                                                                                                                                           |
| <b>G3</b> | <b>Vulnerable</b> — At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.                                                                                                                                                                                                                                                                                                         |
| <b>G4</b> | <b>Apparently Secure</b> — At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.                                                                                                                                                                                                                                                            |
| <b>G5</b> | <b>Secure</b> — At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.                                                                                                                                                                                                                                                                                                                              |

Under the Endangered Species Act (ESA), plant and animal species may be listed as either endangered or threatened. Endangered means a species is in danger of extinction throughout all or a significant portion of its range. Threatened means a species is likely to become endangered within the foreseeable future.

The following species are categorized as G1 or G2 species by NatureServe or threatened (T) or endangered (E) by the U. S. Fish and Wildlife Service. SFI certified organizations give these species considerations when developing forest management plans. Information about the status, life history, and conservation of each species is available in the fact sheet.

# Mitchell's Satyr Butterfly

*Neonympha mitchellii mitchellii*

ENDANGERED



## IDENTIFICATION

Mitchell's satyr (*Neonympha mitchellii mitchellii*, pronounced say-ter) is a dark, chocolate brown, medium-sized butterfly with a wing-span that ranges from 1.5 to 1.75 inches. The underside of the forewing and hindwing contains a row of four to five black, yellow-ringed ocelli, or eyespots, with the central three eyespots on the hindwing being the largest. Two orange bands encircle the eyespots. Mature larvae are pale green with pale, longitudinal stripes and a bifurcate tail.

## DISTRIBUTION

### BY COUNTY:

**Known or believed to occur in Bibb, Greene, Hale, Perry and Tuscaloosa counties.**

## LIFE HISTORY

Mitchell's Satyr's is the only insect in Alabama provided protection under the Endangered Species Act. Mitchell's Satyr was first "discovered" in Alabama on June 23, 2000 by Dr. Jeffrey Glassberg, President of the North American Butterfly Association, and his wife in Bibb County. Prior to their discovery, the nearest known population was over 500 miles away in North Carolina. Further north, the species is known to occur in Michigan, Indiana and Virginia. In Alabama, the preferred habitats are wetlands highly associated with long-term beaver activity. The species has also been documented in 3 Mississippi counties since the discovery in Alabama. Butterfly enthusiasts are hopeful that the discoveries in Alabama and Mississippi may indicate that the species is more common in the southeast than once thought. Additional field work is necessary to either confirm or deny this thought.

## FORESTRY CONSIDERATIONS



Abiding by Alabama's Best Management Practices for Forestry should limit most negative impacts of forest harvesting activities as most of the habitat (wet meadows dominated by herbaceous ground covers including sedges and grasses) can result from beaver activity. The biggest threat to the continued survival of this species is habitat loss and modification of the occupied wetland habitats for agriculture and development. Alteration of occupied habitats should be discouraged as this could lead to invasion by exotic species which could make the wetland unsuitable for satyr occupation. Prescribed fire should not be discouraged as it can be a benefit if conducted periodically.

# Red Knot

*Calidrus canutus*

**THREATENED**



## IDENTIFICATION

Red Knots are a chunky, medium-sized shorebird about 9–10 inches in length. They are the 2nd largest member of the sandpiper genus *Calidris*. Their breeding plumage is mottled gray on top with a cinnamon to rusty red face, throat, and is easily identifiable in flight due to its size, white wing bar and gray rump and tail. Wingspan is approximately 20 inches. The red knot breeds in the tundra and arctic regions of Canada, Europe, and Russia. Winters are spent in coastal regions around the world situated from 50° N to 58° S. They have one of the longest migration routes of any bird. Some individuals fly more than 9,300 miles twice a year to reach their breeding or wintering grounds. The rufa subspecies present in Alabama winters from the southern tip of South America north to coastal regions of Texas to North Carolina. It breeds in the tundra of the central Canadian Arctic.

## LIFE HISTORY

Life history and ecology studies indicate this species feeds on spiders, arthropods, and larvae while on the breeding grounds. Wintering and migration diet consists of a variety of hard-shelled snails, mollusks and small crabs that are ingested whole and crushed with their muscular stomach/gizzard. The Red Knot was listed as threatened under the Endangered Species Act of 1973 on January 12, 2015. Threatened species are species that are likely to become endangered in the future. Endangered species are those that are in danger of becoming extinct. In Alabama, Red Knots are most commonly seen in small numbers in the coastal areas of Dauphin Island or the Fort Morgan area.

## DISTRIBUTION

**BY COUNTY:**  
**Baldwin and Mobile**

## FORESTRY CONSIDERATIONS

The lack of trees in red knot habitat rightfully implies that forest management activities would be highly unusual. Adhering to Alabama's Best Management Practices for Forestry on lands adjacent to red knot habitat would be critical if forest management activities are conducted on or adjacent to the highly sensitive habitat red knots inhabit in Alabama.



# Piping Plover

*Charadrius melodus*

THREATENED



## IDENTIFICATION

The Piping Plover (*Charadrius melodus*) is a small shore bird about 7 inches long with a wingspan up to 15 inches. It has a sand-colored upper side and a white underside.

Breeding plumage includes a single black breast band, black bar across the forehead, orange legs, and the bill is both orange and black. During the late summer or early autumn, the birds lose the black bands, the legs fade from orange to pale yellow, and the bill turns from orange and black to mostly black. Adult Piping Plovers can arrive on wintering grounds with partial breeding plumage remaining.

## DISTRIBUTION

**BY COUNTY:**  
**Baldwin and Mobile**  
**Beaches**

## LIFE HISTORY

Breeding populations are known from the Atlantic coastal regions of North Carolina north to Newfoundland, a northern great plains population, and a Great Lakes population. This species was originally listed as a threatened species on 12-11-1985. The Great Lakes population is now listed as endangered while the Northern Great Plains and Atlantic coastal populations are still listed as threatened.

Piping Plovers winter along the Atlantic and Gulf coastal regions from North Carolina around to Texas and into Mexico as well as the Bahamas and West Indies. They may migrate to their wintering grounds as early as July. Recovery plans for each of the three populations recognize that continued availability of sufficient habitat during migration and wintering periods is critical for the survival of this species. Piping Plovers spend about two-thirds of their annual life cycle either in migration or on wintering grounds. Progress towards recovery, attained primarily through intensive protections designed to increase productivity on the breeding grounds, would quickly be diminished or reversed by even small decreases in survival rates or fecundity that may be due to stress experienced during migration and wintering periods.

## FORESTRY CONSIDERATIONS



These birds are affected by human disturbance but are unlikely to be impacted by forestry activities.

# Eastern Black Rail

*Laterallus jamaicensis*

THREATENED



## IDENTIFICATION

The Eastern Black Rail (*Laterallus jamaicensis*) is North America's smallest rail species. Much of the breast, neck and head are pale to dark gray in color with varying amounts of chestnut brown on the back, rump and tail. The eyes are red in color. It is very secretive and relies heavily on dense marsh vegetation in salt, brackish, and freshwater wetlands in the eastern United States, Mexico, Brazil, Central America, and the Caribbean. Quite capable of moving quickly through dense vegetation but will take short flights to escape if needed. Feeds on a multitude of invertebrates and seeds.

## LIFE HISTORY

One of four subspecies, the Eastern Black Rail was listed as a threatened species and provided protection under the Endangered Species Act on November 9, 2020. Information regarding population dynamics and structure is limited due to little research and knowledge of the species. Although it is migratory, scientific literature suggests that some individuals may be found in Alabama's coastal marsh areas of Baldwin and Mobile counties year-round.

Habitat changes, including dredging, draining, filling, burning and urban development are some of the most impactful ecological stressors to this species.

## DISTRIBUTION

**BY COUNTY:**  
**Baldwin and Mobile**

## FORESTRY CONSIDERATIONS



These birds are affected by human disturbance but are unlikely to be impacted by forestry activities.

# Wood Stork

*Mycteria americana*

THREATENED



## IDENTIFICATION

Wood Storks (*Mycteria americana*) are large wading birds approximately 3 ½ feet in height with a wingspan of over 5 feet. They are distinguished by a dark unfeathered head and neck, a white body, a black tail and wing tips. Like most other wading birds, wood storks feed on small fish in shallow freshwater wetlands. They use tall cypresses near the water for colonial nest sites. They occasionally visit Alabama's swamps to forage, but no longer are known to nest in the state. In Alabama, they are most commonly seen in and around "catfish ponds" of the west central black belt region.



## LIFE HISTORY

They were originally listed as an endangered species on 2-28-1984 but their status was changed to threatened on 6-30-2014. The reclassification was approved because the number of nesting pairs averaged more than 6,000 for at least the three previous years. Delisting could occur if productivity criteria established in the recovery plan are met. One of the criteria is the number of nesting pairs remains above 10,000 for at least five consecutive years.

## DISTRIBUTION

### BY COUNTY:

**Sighted in Autauga, Baldwin, Barbour, Bullock, Chilton, Choctaw, Clarke, Colbert, Conecuh, Covington, Crenshaw, Dallas, Elmore, Escambia, Geneva, Greene, Hale, Henry, Houston, Lauderdale, Lawrence, Limestone, Lowndes, Macon, Madison, Marengo, Mobile, Monroe, Montgomery, Morgan, Perry, Russell, Shelby, Sumter, Washington and Wilcox.**

## FORESTRY CONSIDERATIONS



Forestry operations in Alabama complying with Alabama's Best Management Practices for Forestry should not affect wood storks. If nesting should resume here, appropriate care should be given to protect the nest sites and the tall cypresses the storks favor.

# Red-cockaded Woodpecker

*Dryobates borealis*

THREATENED



## IDENTIFICATION

The Red-cockaded Woodpecker (*Dryobates borealis*) is a small 7–8” black and white woodpecker with no easily visible red. It is distinguished from other black and white woodpeckers by its large white cheek patch and zebra striped or ladder back. Other small Alabama woodpeckers have either an unstriped white back, a black eye-stripe or red on the head. During the breeding season, males may have a small red streak on each side of its black cap that is very difficult to see in the field. This red streak is referred to as a cockade. The Red-cockaded Woodpecker is the only Alabama woodpecker that inhabits living pine trees, drilling a hole approximately 3 inches in diameter through the sapwood and into the heart of the tree. They also peck out resin wells, half-dollar sized wounds which bleed resin onto the tree trunk. The resin encrusted tree stem is often easier to identify than the bird. It resembles a large wax candle, easily seen in open woods the bird inhabits.

## LIFE HISTORY

The resin on active trees is clear or amber in color. On inactive trees, it appears gray or has an “icing” appearance. Other woodpeckers and some animals use abandoned Red-cockaded Woodpecker dens, but often enlarge the entrance. Red-cockaded Woodpecker live in small groups in a one to ten-acre area called a cluster or colony. They pry off loose bark and feed on mites, insects, and larvae underneath, rather than drilling into dead wood like other woodpeckers.

The Red-cockaded Woodpecker was listed as an endangered species on October 13, 1970. Downlisting from endangered to threatened occurred on November 25, 2024.

## DISTRIBUTION

**Red-cockaded Woodpeckers can occur anywhere in the state where there is old pine timber in open stands.**

### BY COUNTY:

**Baldwin, Bibb, Calhoun, Chilton, Clay, Cleburne, Conecuh, Coosa, Covington, Dallas, Escambia, Geneva, Hale, Lawrence, Macon, Marshall, Perry, Pickens, Russell, Talladega, Tallapoosa, Tuscaloosa and Winston.**

# Red-cockaded Woodpecker

*CONTINUED*

THREATENED



## MANAGEMENT

Management for Red-cockaded Woodpeckers involves more of an ecosystem approach. Restoration of good quality habitat through an intensive burning program and silviculture practices are critical for Red-cockaded Woodpeckers. Old-growth pine stands with a low basal area (45–75 square feet per acre) and little to no midstory is essential habitat. Midstory components (particularly hardwoods) should be removed initially with hand tools (chainsaws and brushhooks) to minimize the impact on native vegetation. Once these components have been removed, the reintroduction of frequent fire becomes critical in creating and maintaining suitable habitat. Fire should be used in a manner as to mimic the historical accounts of fire in Red-cockaded Woodpecker habitat. This would include both cool season and growing season burns. Creating and maintaining a habitat with a park-like appearance in both nesting and foraging areas is essential in the management of Red-cockaded Woodpeckers.

Two management practices that have proven successful on federal lands have been the use of artificial cavities and population augmentation. Artificial cavities have been successful by creating nesting and roosting opportunities in otherwise unsuitable habitat. This has proven critical in the survival of small populations where suitable nesting habitat has been lacking. Translocation of juvenile birds from one population to another has also proven to aid in the survival of small populations. The translocation of birds allows for increased genetic diversity in these small populations and for the introduction of birds into expanded suitable habitat. Although these two management strategies have proven successful, they are only successful where good quality habitat exists.

**Text Credit:** Threatened and Endangered Species of Alabama: A Guide to Assist with Forestry Activities, Second Edition, USFWS

## FORESTRY CONSIDERATIONS



Since Red-cockaded Woodpeckers require large, old (at least 65 years) pines to nest in, they don't occur in many places. When an RCW tree is suspected, an experienced biologist should determine if the site is active. Leave den trees and surrounding areas intact until determination is made. Biologists believe that foraging stands of fairly large pines are necessary for successful management for the woodpecker. Logging or other activity near the den trees during the breeding or brood rearing season may disturb them enough to cause them to abandon the site or to be unsuccessful in raising the young. Contact the U.S. Fish & Wildlife Service or the Alabama Department of Conservation and Natural Resources with questions concerning the detection and protection of Red-cockaded Woodpeckers.

Photo Credit: Eric Spadgenske, Daphne Office of U.S. Fish and Wildlife Service

# Dusky Gopher Frog

*Rana sevosa*

G1  
ENDANGERED



## IDENTIFICATION

The dusky gopher frog (*Rana sevosa*) is a medium sized, stocky, frog with a total body length up to 34". Its back is covered with warts and dark spots and ranges in coloration from black to brown or gray. A thick ridge of skin extends down the back behind each eye. Undersides are typically white in color with some yellowing of the inside of the legs and adjacent belly area. The male emits a distinctive "snoring" sound that may be heard up to 0.3 miles. A unique defense mechanism includes inflating its body and excreting a bitter, milky fluid from warty glands located on its back.

## DISTRIBUTION

**Historically found in Mobile County but may be present in Choctaw and Washington counties.**

## LIFE HISTORY

Dusky gopher frogs are only known to occur in a few locations in southeast Mississippi but were historically found in Mobile County, Alabama. This species hasn't been documented in Mobile County in more than 80 years. Research is currently being conducted to investigate their absence or presence. They are highly terrestrial and primarily occur in well-managed longleaf pine habitat. They spend their days in tortoise burrows, stump holes and other underground refugia and emerge at night to feed on insects and other small animals. Breeding typically occurs in February and March in isolated, fishless, ephemeral ponds. Reproduction is very limited in years when ephemeral breeding ponds dry before metamorphosis.

The dusky gopher frog was listed as endangered by the U.S. Fish and Wildlife Service in 2001. Management efforts focusing on maintenance of an open canopy with a well-developed herbaceous layer of native grasses and vegetation is critical. Prescribed fire, especially growing season burns, is a highly effective tool to provide good habitat.

## FORESTRY CONSIDERATIONS



Maintenance of open longleaf pine uplands along with ephemeral, fishless ponds through prescribed burning is the most cost-effective form of management. Seasonality of prescribed burns is extremely important, avoiding burns when the frogs are moving to the breeding ponds if at all possible. Gopher tortoises also respond well to prescribed burning. Their burrows are highly utilized by gopher frogs as refuge areas. Excluding heavy equipment from a 12-foot buffer zone around tortoise burrows minimizes the risk of collapsing and destroying the underground burrow. Avoid mechanical site preparation, as well as stump removal, in forestry operations.

# Gopher Frog

*Lithobates capito*

G2 G3



## IDENTIFICATION

The gopher frog (*Lithobates capito*) is a medium sized, stocky, frog with a total body length up to 2.5–3.5". Its back is covered with warts and dark spots and ranges in coloration from light to dark brown. A thick ridge of skin extends down the back behind each eye. Undersides are typically white in color with some yellowing of the inside of the legs and adjacent belly area. The male emits a distinctive "snoring" sound that may be heard up to 0.3 miles. A unique defense mechanism includes inflating its body and excreting a bitter, milky fluid from warty glands located on its back.

## DISTRIBUTION

**Current distribution is thought to be limited to Bullock, Covington and Escambia counties. Historical distribution also included Barbour, Coffee and Shelby counties.**

## LIFE HISTORY

Gopher frogs were historically found in Barbour, Coffee, Covington, Escambia, and Shelby counties. Recent sightings have been limited to the Conecuh National Forest in Covington and Escambia counties. Recent population restoration efforts have been undertaken by the State Lands Division in Bullock County. Research is currently being conducted on Conecuh National Forest to assess population status and basic life history requirements. They are highly terrestrial and primarily occur in well-managed longleaf pine habitat. They spend their days in tortoise burrows, stump holes and other underground refugia and emerge at night to feed on insects and other small animals. Breeding typically occurs in fishless, ephemeral ponds during February and March. Reproduction is very limited in years when ephemeral breeding ponds dry before metamorphosis.

Management efforts focusing on maintenance of an open canopy with a well-developed herbaceous layer of native grasses and vegetation is critical. Prescribed fire, especially growing season burns, is a highly effective tool to provide good habitat.

## FORESTRY CONSIDERATIONS

Maintenance of open longleaf pine uplands along with ephemeral, fishless ponds through prescribed burning is the most cost-effective form of management. Gopher tortoises also respond well to this form of management and their burrows are highly utilized by gopher frogs as refugia. Excluding heavy equipment from a 12-foot buffer zone around tortoise burrows minimizes the risk of collapsing and destroying the underground refugia. Mechanical site preparation, as well as stump removal, should be avoided in forestry operations in areas of known gopher frog populations. Herbicide use should follow label directions.



# Pale Salamander

*Gyrinophilus palleucus palleucus*

G2

G3

THREATENED 2



## IDENTIFICATION

The Pale Salamander, also known as a Tennessee Cave Salamander (*Gyrinophilus palleucus palleucus*), grows from 4.0 to 7.5 inches in length, has a wide head, small eyes, no eyelids and bright red feathery external gills. Body coloration is generally a pale, fleshy pink with a high degree of translucency.

## LIFE HISTORY

Pale Salamanders generally inhabit caves with streams or various types of pools that may be isolated by receding water. Clear, sediment free water is important. Sinkholes provide a source of detritus inflow to the cave system and have been recognized as an important habitat component that sustains large invertebrate populations as prey items. This species has occasionally been found outside of caves but this is thought to be a result of high water flow. Movement is limited and specimens are typically found under rocks in the water.

## DISTRIBUTION

**Dr. Matthew Niemiller stated that collections in caves in the Crow Creek drainage system of the lower Tennessee River in Jackson County have exhibited the distinctions associated with this subspecies. Other specimens collected in Colbert, Dekalb, Jackson, Limestone, Madison, Marshall counties appear to be intergrades of this species and a closely related subspecies (*Gyrinophilus palleucus necturoides*).**

## FORESTRY CONSIDERATIONS



Habitat modification from logging and other operations that lead to erosion, sedimentation, damage to the site, or loss of canopy may be harmful to the salamander. Removal of too many trees in the canopy above the underground cave system may expose the site to excessive drying. Following established guidelines outlined in Alabama's Best Management Practices for Forestry should protect water quality and habitat conditions. Follow label directions when using forestry herbicides.

# Reticulated Flatwoods Salamander

*Ambystoma bishopi*

G2



## IDENTIFICATION

The reticulated flatwoods salamander (*Ambystoma bishopi*) is a long, slender terrestrial salamander that grows up to about 5 inches in length. The dorsal surface has thin gray lines forming a net-like pattern on a darkish black body. The ventral or underside has small white flecks on a dark background that give it a “salt and pepper” look.

## LIFE HISTORY

It is a burrowing salamander that spends most of their lives underground or in the leaf litter beneath longleaf pine and wiregrass in seasonally wet pine flatwoods and savannas. Soils are typically poorly drained sand that leads to seasonal ponds and depressions. Mature salamanders inhabit upland areas until moving to seasonal wetlands to breed from October to January during wet weather. Eggs must be completely inundated with water for development to occur.

Habitat loss from changes in silviculture, agricultural conversion, commercial development and fire suppression are the most serious threats to reticulated flatwoods salamander populations.

## DISTRIBUTION

**Reticulated flatwoods salamanders were documented as recently as 1980 and 1981 in Covington and Houston counties, respectively but are now thought to be extirpated in Alabama. Extensive surveys were conducted during the early 1990's with no sightings. Historically, they were known to occur in the southern tier of counties from Houston County to Mobile County. Their current range is thought to be parts of north Florida and southwest Georgia, west of the Apalachicola-Flint rivers.**

## FORESTRY CONSIDERATIONS



If reticulated flatwoods salamanders are found on a site, limited logging or other forestry activity is still possible, but consultation with the U.S. Fish and Wildlife Service (USFWS) may be necessary to guide future management.

# Red Hills Salamander

*Phaeognathus hubrichti*

G2  
THREATENED



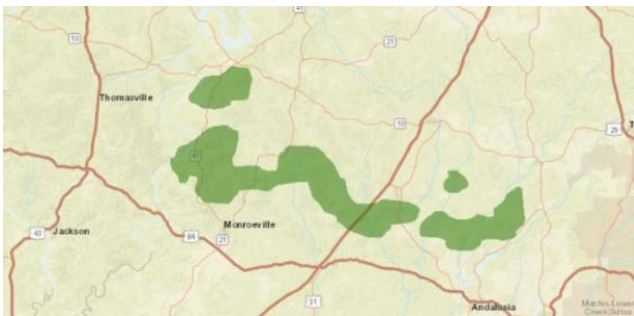
## IDENTIFICATION

The Red Hills salamander (*Phaeognathus hubrichti*) has few easily recognized distinguishing characteristics. It is best found by recognizing potential habitat and searching for burrows rather than salamanders. It is a relatively large, lungless salamander, growing up to 10 inches with a dark brown tail and body. It spends almost all its time in its burrow on shady steep bluff sites, coming to the mouth on warm, humid nights to feed on invertebrate prey. Shady, moist conditions on the bluffs where the salamander lives are critical to its survival. Loss of shade and cover leads to drying by sunlight and wind, and negatively impacts both the salamander and its food.

## LIFE HISTORY

It was designated as a threatened species on January 3, 1977 and was designated as the "Official Alabama State Amphibian" in 2000 after a campaign led by the third graders at Fairhope Elementary School. Primary threats include a restricted range, loss of habitat, a low reproductive rate, and a limited capability to disperse. Alabama's Forever Wild Land Trust and the Nature Conservancy have purchased some of the habitat occupied by the Red Hills salamander as a means of protecting populations.

## DISTRIBUTION



The Red Hills salamander is found only in a narrow belt of Alabama associated with two siltstone formations called the Tallahatta and the Hatchetigbee. The salamander's range is bounded on the east by the Conecuh River and on the west by the Alabama River. There are estimated to be less than 55,000 acres of red hills salamander habitat left in the world, all in Alabama. Portions of Butler, Clarke, Conecuh, Covington, Crenshaw, Monroe, Pike, and Wilcox counties contain this entire 55,000 acres.

## FORESTRY CONSIDERATIONS

Mechanical damage from logging and other operations that lead to either erosion, damage to the site, or loss of canopy is harmful to the salamander. Removal of too many trees in the canopy on and immediately above the slopes on which these animals occur expose the site to excessive drying. Removal of trees just above the slope can lead to windthrow on the slope, creating gaps in the canopy that lead to drying of the site. Knowledgeable biologists should investigate areas known or suspected to contain red hills salamanders before forestry operations begin.

If Red Hills salamanders are found on a site, limited logging or other forestry activity is still possible, but consultation with the U.S. Fish and Wildlife Service (USFWS) may be necessary to guide future management. Habitat conservation plans have been formulated for some private lands in Alabama that permit some operations while affording protection for the salamander. The addendum following this page was developed through efforts by the USFWS and landowners actively engaged in Red Hills Salamander management.



# Red Hills Salamander

## CONTINUED

G2  
THREATENED



## RHS HABITAT

The following information was provided by the USFWS as an addendum for landowners and managers to consider when working in Red Hills Salamander habitat. Distinguishing characteristics of RHS habitat are as follows:

1. **Optimal Habitat** — forested with naturally occurring mixed pine/hardwood and hardwood cover types; steep (>27 degree, as displayed by a clinometer) ravine slopes and bluffsides within the Tallahatta or Hatchetigbee formations; forests dominated by mature or maturing hardwood trees; usually moist, loamy topsoil; siltstone outcroppings readily detectable; all slope aspects.
2. **Moderately Suitable Habitat** — forested with naturally occurring mixed pine/hardwood or hardwood cover types; steep (18 to 27 degree, as displayed by a clinometer) ravine slopes and bluffsides within the Tallahatta or Hatchetigbee formations; forest dominated by mature or maturing hardwood trees; all slope aspects; siltstone outcroppings may or may not be present.
3. **Marginally Suitable Habitat** — forested with naturally occurring mixed hardwood pine and pine/hardwood types; moderately steep (<18 degree, as displayed by a clinometer) slopes within the Tallahatta or Hatchetigbee formations; all slope aspects; siltstone outcroppings may or may not be present.

## MANAGEMENT PRACTICES

The following are Best Management Practices as developed by the USFWS for landowners that have signed an agreement to actively manage for Red Hills Salamanders where appropriate. These guidelines are not mandatory for all landowners within the range but compliance would enhance efforts to restore/maintain habitat and lead to population increases that might possibly result in the delisting of the species.

1. Only limited, single tree, select harvests of pine shall occur on Optimal and Moderately Suitable RHS habitats. Within Optimal and Moderately Suitable habitats, sites shall be maintained with at least 90 percent overstory forest canopy cover as measured where 10 percent or less of the sunlight reaches the forest floor during midday (i.e., 12:00 pm).
2. No harvesting of hardwoods is authorized within Optimal or Moderately Suitable habitats.
3. Group selection, clear cutting, site preparation (chemical or mechanical), prescribed burning, and artificial regeneration are not authorized within Optimal or Moderately Suitable habitats.
4. The Landowner shall establish and maintain forested buffer zones (a minimum of 50 feet in width) around all areas delineated as Optimal or Moderately Suitable habitat, which may include habitat that is Marginally Suitable to Unsuitable in order to adequately buffer Optimal and Moderately Suitable habitats. At least a 50 percent overstory forest canopy shall be maintained within the buffer zone.
5. The Landowner will prohibit the use of chemical pesticides and herbicides within the buffer areas surrounding Optimal and Moderately suitable habitats.
6. The Landowner will clearly mark or otherwise delineate the 50-foot buffers before any timber is harvested within the buffer zones. Individual trees to be removed from within the buffers will be marked and removed in such a way so as to minimize damage to the buffer. Harvest within the buffer may occur approximately every 15 years; however, a minimum of 50 percent canopy cover (as measured where 50 percent or less of the sunlight reaches the forest floor during midday, i.e., 12:00 pm) will be retained in the buffer at all times.

# Red Hills Salamander

## CONTINUED

G2  
THREATENED



### MANAGEMENT CONT.

7. No vehicular equipment typically used in association with timber harvesting will be permitted within Optimal habitats. Pine trees will be felled and limbs will be removed by operators using hand-held saws on site. Logs will be pulled from Optimal habitat by cable on equipment located in adjacent Moderately Suitable, Marginally Suitable, or Unsuitable habitat.

8. Within Marginally Suitable habitats, normal forest management practices (clearcutting, selective tree harvest, chemical and mechanical site preparation, reforestation, and prescribed burning) will occur except where the Marginally Suitable habitat is a buffer zone to Optimal or Moderately Suitable habitat, in which case buffer restrictions, as discussed above under condition 4–6, will apply.

9. Within Marginally Suitable habitats some areas are delineated as streamside management zones (SMZ's). Timber harvests within SMZs will also be conducted in the manner described under condition 4–6, above, for habitat buffers.

10. Note that RHS may be incidentally taken in all habitats during the removal of pest or disease infested pine trees. These trees will be removed when necessary to prevent infection of healthy trees, following the conditions 1–8, above, as appropriate.

11. In the case of a natural disaster (hurricane, tornado, wildfire), salvage timber operations will be conducted in all habitats in a manner as mutually agreed upon by the Landowner and the Daphne Ecological Services Office of the U.S. Fish and Wildlife Service.

12. Existing access roads will be used to the extent possible. In some instances new access road construction may be necessary through RHS habitat. Any new roads in habitat will be planned and constructed in a manner that is the least damaging to RHS habitat as possible and are in compliance with Alabama's Best Management Practices for Forestry.

13. The Landowner shall ensure that all its employees and contractors attend (or have attended) Service-approved training on RHS ecology and conservation and the requirements and conditions of this Permit and details of the HCP before any timber is removed from the Project area. The training will include but not be limited to: training the employees to recognize Optimal, Moderately Suitable, and Marginally Suitable RHS habitat, properly establish buffers, properly mark timber within buffers, and encouraging their involvement monitoring.

14. The Landowner shall continue to develop and implement a GIS program to track habitat conditions based upon geology and forest conditions. The Landowner shall incorporate the requirements of this agreement into its existing mapping and GIS programs. The Landowner shall provide maps or GIS shapefiles depicting all Optimal, Moderately Suitable, and Marginally Suitable RHS habitat per reporting requirements outlined in 15 a., below.

15. The Landowner personnel that will be classifying RHS habitat for purposes of implementation of this agreement (including, but not limited to, marking of timber to be harvested in RHS habitat, establishing appropriate buffers, and location of roads) shall complete the training described in 13., above, prior to initiation or participation in these activities.

15a. The Landowner will monitor the area using up-to-date aerial photography, GIS coverages, and field observation and verification. Maps showing acres and locations of RHS habitat, as well as documentation of trends in habitat and overall forest structure, will be produced. Joint assessment of the habitat by the Landowner and U.S. Fish and Wildlife Service personnel is encouraged. Include the updated information produced pursuant 15, above. These maps will include habitat locations and recent forest management activities.

# Black Pine Snake

*Pituophis melanoleucus lodingi*

THREATENED



## IDENTIFICATION

The black pinesnake (*Pituophis melanoleucus lodingi*) is a large dark brown to black non-poisonous snake. It may have a few white scales scattered over its body or display a trace of pattern. It has a small head, moderately stout body, short tail, and can grow up to 74 inches in length. There are two other black snakes, the black racer and eastern indigo snake, which occur within its range. The black pinesnake can be identified by its keeled body scales, the other two black snakes have smooth body scales. It occurs in southwest Alabama with specimens having only been documented in Mobile, Clarke, and Washington counties.

## HABITAT

Black pinesnakes adapted to the upland longleaf pine ecosystem. Xeric, fire maintained longleaf pine forests having sandy, well-drained soils are preferred. Other pine species providing this same type of forest structure may provide suitable habitat as well. Hilltops and ridges with open canopy, limited mid-story, and dense herbaceous ground cover are ideal. It does not use riparian areas, hardwood forest, or other closed canopy forest types (pine plantation) very often. This species spends the majority of its time underground. It utilizes rotted or burned out pine stump holes, particularly the root channels, as refuge. It will occasionally utilize gopher tortoise burrows. The main prey items are small rodents, small birds, and sometimes bird eggs.

## IMPORTANCE

The black pinesnake was listed as Threatened under the Endangered Species Act, effective November 5, 2015. The final rule for the black pinesnake has been published with section 4(d) exceptions (see below). On March 11, 2015, the US Fish and Wildlife Service published a proposed rule to designate Critical Habitat for the black pinesnake. The black pinesnake has been a species of concern since 1982. Threatened species are those that are likely to become endangered in the future. Endangered species are those that are in danger of becoming extinct.

The US Fish and Wildlife Service found that the black pinesnake warranted listing as a threatened species because of past and continuing loss, degradation, and fragmentation of habitat in association with silviculture, urbanization, and fire suppression. Population declines are also attributed to road mortality and intentional killing of snakes by individuals. These factors, combined with the snake's low reproductive rate, are believed to threaten the species long term viability.

## DISTRIBUTION

**BY COUNTY:**  
**Known or thought to occur in**  
**Choctaw, Clarke, Mobile, and**  
**Washington**

# Black Pine Snake

## CONTINUED

THREATENED



## ENDANGERED SPECIES ACT 4(d) RULE

The provision in the 4(d) rule states that all purposeful take is prohibited within the range of the black pinesnake. The 4(d) rule exempts from the general prohibitions in 50 C.F.R. 17.31, 32 take incidental to the following activities when conducted within habitats currently or historically occupied by the black pinesnake:

- Prescribed burning, including all fire break establishment and maintenance actions, as well as actions taken to control wildfires.
- Herbicide application for invasive plant species control, site-preparation, and mid-story and understory woody vegetation control. All exempted herbicide applications must be conducted in a manner consistent with Federal law, including Environmental Protection Agency label restrictions; applicable State laws; and herbicide application guidelines as prescribed by herbicide manufacturers.
- All forest management activities that maintain lands in a forested condition, except for:
  - (a) Conversion of longleaf-pine-dominated forests (>51 percent longleaf in the over story) to other forest cover types or land uses.
  - (b) those activities causing significant subsurface disturbance, including, but not limited to, shearing, wind-rowing, stumping, disking (except during fire break creation or maintenance), root-raking, and bedding.
- Herbicide treatments, prescribed burning, and normal forest management activities.

All of the activities listed above should be conducted in a manner to maintain connectivity of suitable black pinesnake habitats, allowing dispersal and migration between larger forest stands; to minimize ground and subsurface disturbance by conducting harvests during drier periods when the ground is not saturated, by using low-pressure tires, or both; and to leave stumps, dead standing snags, and woody debris.

We believe these actions and activities, while they may have some minimal level of mortality, harm, or disturbance to the black pinesnake, are not expected to adversely affect the subspecies' conservation and recovery efforts. They would have a net beneficial effect on the subspecies.

Nothing in the 4(d) rule would change in any way the recovery planning provisions of section 4(f) of the Act and consultation requirements under section 7 of the Act or the ability of the Service to enter into partnerships for the management and protection of the black pinesnake.

*Text taken directly from the Federal Register.* For additional information please visit the US Fish and Wildlife Service or Alabama Department of Conservation and Natural Resources websites:

<https://www.fws.gov/species/black-pine-snake-pituophis-melanoleucus-lodingi>

<https://www.outdooralabama.com/non-venomous-snakes/black-pine-snake>

## FORESTRY CONSIDERATIONS



Habitat destruction and modification is a primary reason for the decline of the black pinesnake. Acreage of fire maintained longleaf pine ecosystems has declined significantly over the past decades. Recently, longleaf pine restoration has been increasing in the south, possibly at a rate able to keep up with overall forest loss. The conversion of longleaf pine forest to highly stocked pine plantation often reduces the quality and suitability of a site for black pinesnake. Site preparation for pine plantations often involves clearing of downed logs that reduces above ground refuge for black pine snakes. Removal of stumps interferes with the development of stump holes and root channels that are highly utilized for refuge. Heavy use of certain forestry herbicides often leaves the site with few native warm season grasses and forbs; what generally comes back is dog fennel and other weeds. Fire suppression has allowed for changes in the understory to occur. The understory of fire suppressed pine stands will often have increased hardwood mid-story and limited herbaceous ground cover. When managing longleaf pine forest lands within the range of the black pinesnake these factors need to be considered. Wise planning can allow for conservation of the black pinesnake and accomplishment of timber management objectives.

# Eastern Indigo Snake

*Drymarchon couperi*

THREATENED



## IDENTIFICATION

The Eastern indigo snake (*Drymarchon couperi*) is a large glossy blue-black non-poisonous snake reaching lengths of up to 9 feet. It is the longest snake native to the United States. It is a solid color with an occasional orange, pink white or reddish area under the chin, which may extend to the throat and cheeks. It is sometimes confused with the similar black racer or the black pine snake, but is much stockier than the slender racer, which has a white chin patch and the black pine snake, which has no chin patch and keeled rather than smooth scales.

## DISTRIBUTION

**There are no recent records of occurrence for the indigo snake in Alabama outside of Conecuh National Forest. Counties in which indigo snakes were historically known to occur include Baldwin, Bullock, Conecuh, Covington, Escambia, Geneva, Mobile and Washington.**

## LIFE HISTORY

Indigos are active during the day during much of the year and prey on small mammals, lizards, birds, frogs, toads, and other snakes. They are immune to the venom of all North American poisonous snakes and readily eat them. Indigos use a variety of habitats during the year, but are almost always associated with gopher tortoises and the sandy ridges they inhabit. Indigos often share the gopher's den during hot or cold weather. Indigos are relatively docile and slow moving, probably contributing to their decline.

The Eastern indigo snake was designated as a threatened species and provided protection under the Endangered Species Act on 3-3-1978. Capturing specimens for the pet trade industry and loss of habitat were two factors reported as reasons for its population decline and listing as a threatened species. An ongoing reintroduction program has resulted in approximately 100 young indigo snakes being released on the Conecuh National Forest. Sightings are rare but U. S. Forest Service and project personnel have seen evidence of survival and reproduction. Conservationists are hopeful these efforts and ongoing interest in longleaf pine restoration will result in increased Eastern indigo snake populations.

## FORESTRY CONSIDERATIONS



Forestry operations are not likely to directly affect indigo snakes, unless woods workers are tempted to kill such a large, slow-moving snake or collapse the entrance of a gopher tortoise burrow causing occupants to be entombed. Research indicates that heavy equipment may cause burrow collapse when operated within 13 feet of the entrance. Conversion of woodlands to other uses or habitat types may negatively impact indigo populations. Loss of gopher tortoise habitat and, subsequently, gopher tortoises would likely negatively impact indigo snakes. Prescribed fire is highly beneficial to the Eastern indigo snake and many other species that utilize open pine stands in Alabama's lower coastal plain.

# Southern Hognose Snake

*Heterodon simus*

G2



## IDENTIFICATION

Southern hognose snakes (*Heterodon simus*) grow to about 24" in length and are generally heavy-bodied. A distinguishing characteristic of all hognose snakes is their pointed, upturned snouts. Southern hognose snakes are always gray, tan, or reddish in color (never black) with a series of dark brown blotches down the center of the back and alternating smaller blotches along the sides. The southern hognose has a dark stripe running between its eye and the corner of its mouth. They are known to put on threat displays that include neck spreading, hissing or playing dead when approached by potential predators.

The two species can be distinguished by examining the underside of the tail and belly. The underside of the tail of a southern hognose snake has similar coloration as the belly. The underside of the tail of an eastern hognose snake is lighter than the belly.

## LIFE HISTORY

Southern hognose snakes spend most of their time underground and feed extensively on toads. They have enlarged rear teeth that are used to puncture the skin of inflated toads to make them easier to swallow.

Southern hognose snakes are declining throughout their distribution, but still occur in parts of southern Georgia, South Carolina, and Florida, and may persist in very low numbers in Alabama. The last confirmed sighting in Mississippi was in 1981. The last confirmed sighting of a specimen in Alabama was in 1975. Eastern hognose snakes are far more common and have been documented statewide.

## DISTRIBUTION

### BY COUNTY:

**Baldwin, Calhoun, Covington,  
Escambia, Tallapoosa, Shelby**

## FORESTRY CONSIDERATIONS

Pre-harvest planning should include considerations regarding location of roads, skid trails, and other mechanical operations in areas of known southern hognose populations. Site prep operations such as shearing, piling and stumping may also cause damage to underground refugia. Herbicide use should be carefully considered and applied as outlined on the label.



# Mimic Glass Lizard

*Ophisaurus mimicus*

G2



## IDENTIFICATION

Glass lizards are long, slender, legless lizards that superficially resemble snakes. Unlike snakes, glass lizards have moveable eyelids, external ear openings, and inflexible jaws. Alabama has 3 species of glass lizards with the mimic glass lizard being the smallest, growing to lengths up to 26".

## DISTRIBUTION

**Specimens have been collected in Baldwin, Covington and Mobile counties.**

## LIFE HISTORY

Life history and ecology of glass lizards is seldom studied. As a result, information is limited in the scientific literature. Like all reptiles, glass lizards are cold blooded. Most feeding activity has been documented during daylight hours and specimens have been collected in all months except for January and February.

Distribution is limited to the lower coastal plain from southeastern North Carolina to the Pearl River in Mississippi. Alabama specimens have been collected in Baldwin, Mobile and Covington counties. The most recent specimen was documented in 2006 as part of a "drift fence" study within the Conecuh National Forest in Covington County in 2006. It is presently thought to be uncommon or rare in most areas within its range.

Studies seem to indicate they prefer dry habitats associated with longleaf pine flatwoods with a grassy understory. This habitat has nearly disappeared over the past century but efforts through several organizations and agencies are focusing on re-establishment of longleaf pine forests. Diet is probably made up mostly of insects, spiders, and other invertebrates. Glass lizards have a tail that "shatters" when grabbed by a predator that allows it to escape while the predator is distracted by a wriggling tail. Its tail will regrow over a period of a few months to a year.

## FORESTRY CONSIDERATIONS



Limited life history and ecology information makes it difficult to recommend specific forest harvesting considerations. Site prep operations such as shearing, piling and stumping may cause damage to underground refugia. If a specimen is seen, leave it alone and allow it to leave the area. Pre-harvest planning should include considerations regarding locations of roads, skid trails, and other mechanical operations in areas of known mimic glass lizard populations.

# Gopher Tortoise

*Gopherus polyphemus*

THREATENED



## IDENTIFICATION

A dry land turtle, the gopher tortoise (*Gopherus polyphemus*) has a high, domed shell up to 15 inches in length. They have stubby, elephant-like hind feet and flattened front feet with large toenails for digging. They may live to be 80 years old or older and are considered a keystone species, which means its presence is required for the health of its ecosystem.

## DISTRIBUTION

**Gopher tortoises were listed as a threatened species on 7-7-87 and afforded protection under the Endangered Species Act in Alabama counties west of the Mobile and Tombigbee Rivers and in Mississippi and Louisiana. They are protected in the rest of Alabama by regulation 220-2-.92. Counties in which they are federally protected include Choctaw, Washington, and Mobile. Other counties in which they occur are Baldwin, Barbour, Bullock, Butler, Clarke, Crenshaw, Coffee, Conecuh, Covington, Dale, Escambia, Geneva, Henry, Houston, Monroe, Montgomery, Pike, Sumter and Wilcox.**

## LIFE HISTORY

Gopher tortoises favor dry, sandy ridges with open stands of longleaf pine, turkey oak and other scrub oaks. They also frequent open areas around road shoulders, food plots, and rights-of-way with well-drained sandy soil. They dig long sloping burrows up to 30 feet long, extending to 9 feet below the surface. Burrows typically have a characteristic mousehole shape, with a flat bottom and rounded arched top and sides, much like the gopher itself. The dens are shelter for the gopher tortoise as well as a multitude of other sandhill residents, including the indigo snake and the Eastern diamondback rattlesnake.

They feed on grasses and other plant material near the ground. Feeding trails are often visible leading from the den's sandy apron to foraging areas. Eggs are laid in or near the den apron in May, June, and July and hatch in about 80–100 days. Young tortoises are about the size of silver dollars. The nest is very vulnerable to predation by crows, raccoons, opossums, foxes, skunks and other animals. Below you can see a Gopher Tortoise burrow.



## FORESTRY CONSIDERATIONS



Disking permanent openings in the fall and winter will stimulate early successional plant species preferred by gopher tortoises. Thin mature pine stands frequently and prescribe burn on a 2 to 3-year rotation. Convert sites capable of growing longleaf pine after the final timber harvest. Stock loblolly and slash pine plantations with 300 or fewer trees per acre. To avoid collapsing a tortoise burrow and entombing any resident animals, heavy equipment should not be operated within 13 feet of the entrance.

Photo Credit: Alan Cressler

Burrow Photo Credit: Ericha Shelton-Nix, ADCNR

# Alabama Beach Mouse

*Peromyscus polionotus  
ammobates*

ENDANGERED



## IDENTIFICATION

The Alabama Beach Mouse (*Peromyscus polionotus ammobates*) and the Perdido Key Beach Mouse (*Peromyscus polionotus trissylepsis*) have haired tails, relatively large ears and protuberant eyes. Their body is about 3 inches long with pale gray coloration above a white abdomen that blends well with the sandy soils and dune vegetation of their habitat.



## LIFE HISTORY

They are nocturnal herbivores that feed primarily on the seeds of sea oats and beach grass. When these seeds are scarce, especially in the late winter or early spring, beach mice may consume invertebrates or fruiting bodies of sea rocket.

Both species were provided protection as an endangered species on 6-6-85. The decline of these mice has been attributed to the impact of coastal development, recreational activity, and tropical storms on its fragile coastline habitat. They survive in a very limited amount of shoreline habitat in Baldwin County. Critical habitat was designated for both species and includes coastal tracts located from the tip of Fort Morgan to the west end of Perdido Key.

## DISTRIBUTION

**The mice are found only in Baldwin County on coastal dunes from Mobile Bay to Perdido Bay and on the west end of Perdido Key.**

## FORESTRY CONSIDERATIONS

These mice are found on beach dunes and in pine areas adjacent to the dunes. It is unlikely that forestry operations would occur in beach mouse habitat but care should be taken if such operations are planned and conducted. Forestry operations could impact beach mouse populations and habitat quality.





# Common Forest Management/Harvesting Concerns Regarding Bats Protected by the Endangered Species Act

Alabama has 16 species of bats, all of them are insectivores and 3 of them are protected by the Endangered Species Act.

Suitable habitat typically has:

1. a water source
2. herbaceous vegetation
3. roost sites that vary depending on the species.

Each of the 3 threatened or endangered species share some common concerns when developing forest harvesting activity plans.

There are 4 major considerations when planning and conducting harvesting operations in Alabama woodlands within the range of threatened or endangered bat species:

1. Maintain streamside management zones as required by Alabama's Best Management Practices for Forestry.
2. Provide a buffer zone around cave entrances.
3. Allow snags and large trees with basal openings to remain standing unless they provide a safety risk.
4. Feller buncher operators or anyone engaged in felling operations should cease activities if a large number of bats are seen leaving a tree. Contact the U. S. Fish and Wildlife Service or the Department of Conservation and Natural Resources to determine if the site is a possible hibernaculum or maternity roost.

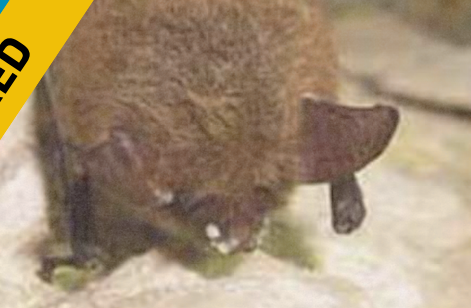
# Northern Long Eared Bat

*Myotis septentrionalis*

G2

G3

ENDANGERED



## IDENTIFICATION

A medium sized bat (*Myotis septentrionalis*) with a body length of 3 to 3.75 inches and a wingspan of 9 to 10 inches. The bat's fur is dark to medium brown on the back and pale to tawny on the underside. This species of bat is easily distinguished from other species of *Myotis* by its long ears. During the winter these bats hibernate in caves and mines, called hibernacula. The hibernacula have constant temperature, high humidity, and no air currents. The bats hibernate in small crevices and cracks. During the summer, these bats prefer large tracts of mixed pine/hardwood to roost singly or in colonies. They roost under the bark of trees, in cavities, or in crevices of live or dead trees. Snags with exfoliating bark are especially important. They will also roost in caves or mines during the summer. It is uncommon for this species of bat to roost in human structures. Northern long-eared bats were previously listed as threatened under the Endangered Species Act but were upgraded to endangered status on March 31, 2023.

## WHITE-NOSE SYNDROME

Northern long-eared bat populations have declined sharply, up to 99%, across a large portion of its range. The decline is being caused by white-nose syndrome, a disease caused by the fungus *Pseudogymnoascus destructans* that affects hibernating bats. The disease is named for the white fungus that appears on the muzzle and other parts of the bat. The fungus has caused significant mortality and was first documented in New York in 2006. Currently, it has spread west as far as Missouri and spread south to Mississippi and Alabama. Alabama has fourteen counties with infected hibernacula. White-nose syndrome causes bats to behave strangely during the winter months, they will fly out during the middle of the day or cluster at the entrance of the cave/mine. The disease is estimated to have killed over 5.5 million bats in the United States and Canada. White-nose syndrome has been confirmed in the following species of bats: big brown bat, Eastern small-footed bat, gray bat (endangered), Indiana bat (endangered), little brown bat, Northern long-eared bat (threatened), and the tri-colored bat.

## DISTRIBUTION

### All Counties in Alabama

Counties with Bat Hibernacula where the Fungus *Pseudogymnoascus destructans* has been Found or White-nose Syndrome has been Confirmed: Bibb, Blount, Calhoun, Colbert, Dekalb, Franklin, Jackson, Jefferson, Lawrence, Limestone, Madison, Marshall, Morgan, Shelby

## FORESTRY CONSIDERATIONS



Monoculture pine stands are generally characterized as poor bat habitat but protecting hibernacula and maternity roost sites within plantations is very important. If roosting bats are found during harvest or site clearing activities, protect the tree and area around it until a determination of the bat species is made. Areas containing northern long-eared bat roost sites should be managed to ensure an adequate number of roost trees, and sufficient wooded area within the bat's home range to support the colony. Northern long-eared bats can be adversely affected by forestry operations if their roost sites are disturbed or if wooded corridors that provide them with cover on nightly flights between roosting and feeding sites are removed. Protect hibernacula that are inhabited by bats and leave a buffer of undisturbed vegetation around the entrance. Wooded corridors between roost sites and feeding areas should also be protected. The use of herbicides and insecticides in areas adjacent to foraging and roost sites should be carefully controlled and monitored for unanticipated adverse effects. Consult with the U. S. Fish and Wildlife Service or the Alabama Department of Conservation and Natural Resources if forestry operations are planned within 0.25 miles of a known hibernaculum.

# Grey Bat

*Myotis grisescens*

ENDANGERED



## IDENTIFICATION

The gray bat (*Myotis grisescens*) is one of the largest bats in its genus with a body length of 3.5 to 4.5 inches and a wing span of 11–12 inches. The bat's fur is uniform in color, often gray or brown, this helps to distinguish it from other species of *Myotis*.

These bats live solely in caves located in limestone karst habitats. They do not inhabit abandoned barns, attics, or other structures as do other species of bats. Gray bats use warm caves in the summer where they establish maternal and bachelor colonies. In the winter they relocate and hibernate in a few small cold caves. The largest colonies of gray bats are located in northeast Alabama around the Lake Guntersville area. Gray bats are insect eaters and often hunt and feed over water. Preferred summer caves are typically close to a lake or river to allow for easy access to foraging habitat.

## Life History

The gray bat was federally listed as an endangered species by the U.S. Fish and Wildlife Service on 4-28-1976. The recovery plan for gray bats indicates that the most important hibernacula should be protected through agreements with property owners or outright acquisition by conservation agencies. Sauta Cave, the most important summer cave for gray bats, located in northeast Alabama was purchased by the U. S. Fish and Wildlife Service and is permanently managed for the benefit of this species. These bats are also susceptible to white-nose syndrome but they appear to be more resistant to the virus than other species such as Northern long-eared bats.

## DISTRIBUTION

**The Natural Heritage Section of the Alabama Department of Conservation and Natural Resources database indicates that gray bats have been documented in the following counties: Bibb, Blount, Calhoun, Cleburne, Colbert, Conecuh, Covington, Cullman, DeKalb, Etowah, Jackson, Jefferson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan, Shelby, Tuscaloosa and Winston. The U. S. Fish and Wildlife Service believes they also may inhabit Cherokee, Chilton, Clay, Coosa, Escambia, Franklin, Hale, Marion, St. Clair and Talladega counties.**

## FORESTRY CONSIDERATIONS



Gray bats can be adversely affected by forestry operations if their roost sites are disturbed or if wooded corridors that provide them with cover on nightly flights between roosting and feeding sites are removed. Protect caves inhabited by gray bats by leaving a buffer of undisturbed forest around their entrances. Wooded travel corridors between roosting and foraging sites should also be protected. The use of herbicides and pesticides in areas adjacent to foraging and roost sites should be carefully controlled and monitored for unanticipated adverse effects. Landowners and managers should have a basic understanding of the Endangered Species Act of 1973 and potential impacts of forestry activities on gray bat populations and habitats.

# Indiana Bat

*Myotis sodalis*

G2  
ENDANGERED



## IDENTIFICATION

The Indiana bat (*Myotis sodalis*) has fur ranging from nearly black to chestnut on its back with lighter gray or cinnamon fur on the belly. Individual hairs have dark bases with lighter tips. It is one of the smallest bats in the genus *Myotis*, weighing about a quarter ounce and being 1–2 inches long. Its wingspan is about 9.5–10.5 inches. They hibernate in large clusters, primarily in caves and mines during the winter. For hibernation, they require cool, humid caves with steady temperatures under 50 degrees Fahrenheit, but above freezing. There are very few caves that meet these requirements within the species range. They disperse from hibernation caves in the spring and form separate male and female/juvenile colonies. Females form maternal colonies that roost under loose bark of trees, usually near water or at the edges of forested areas. Males roost alone or in small groups. Research in Alabama suggests that large pine snags with exfoliating bark are frequently used as roost sites.

## Life History

The Indiana bat was federally listed as an Endangered species on 3-11-1967. A recovery plan has been developed and focused efforts on hibernaculum and summer roost site protection. These bats are also susceptible to white-nose syndrome which has caused significant mortality in Northern long-eared bats.

## DISTRIBUTION

**Indiana bats are presently known to occur in Blount, Jackson, Lawrence, Morgan and Shelby counties in Alabama, but can possibly occur in any county in the top third of the state.**

## FORESTRY CONSIDERATIONS



The greatest threat forestry activities pose is disturbance of hibernating colonies in roost caves. A buffer area of undisturbed forest should be maintained around the entrances of hibernation caves. If roosting bats are found during harvest or site clearing activities, protect the tree and area around it until a determination of the bat species is made. Areas containing Indiana bat roost sites should be managed to ensure an adequate number of roost trees, and sufficient wooded area within the bat's home range to support the colony. Maintaining forested buffers around streams, roads, and strips that connect larger patches of forest is important. Retain snags with exfoliating bark unless it causes safety or fire concerns. The use of herbicides and pesticides in areas adjacent to foraging and roost sites should be carefully controlled and monitored for unanticipated adverse effects. Landowners and managers should have a basic understanding of the Endangered Species Act of 1973 and potential impacts of forestry activities on Indiana bat populations and habitats.

# Aquatic Turtles and Salamanders



**Ala. Red-bellied Turtle** *Pseudemys alabamensis*

(E, G1)

Baldwin, Mobile

**Barbour's Map Turtle** *Graptemys barbouri*

(G2)

Geneva

**Black Warrior Waterdog** *Necturus alabamensis*

(E, G1)

Blount, Marshall, Tuscaloosa, Walker, Winston

**Escambia Map Turtle** *Graptemys ernsti*

(G2)

Coffee, Conecuh, Covington, Escambia, Geneva

**Pictured Above:**

**Flattened Musk Turtle**

*Sternotherus depressus*

(T, G1)

Blount, Cullman, Fayette, Jefferson, Tuscaloosa, Walker, Winston

## FORESTRY CONSIDERATIONS



Sedimentation from any activity including, agriculture, mining, and forestry can negatively impact habitat of aquatic salamanders and turtles. Read and adhere to label directions when using any herbicides on property adjacent to potential habitat. Following established guidelines outlined in Alabama's Best Management Practices for Forestry should protect water quality and habitat conditions.

# Crayfish



**Pictured Above:**

**Alabama Cave Crayfish** *Cambarus jonesi*  
(G2)  
Colbert, Lauderdale, Limestone, Madison, Morgan

**Banded Mudbug** *Lacunicambarus freudensteini*  
(G1)  
Baldwin, Mobile

**Blackbarred Crayfish** *Cambarus unestami*  
(G2)  
DeKalb, Jackson

**Capillaceous Crayfish** *Procambarus capillatus*  
(G2)  
Conecuh, Escambia, Monroe

**Escambia Crayfish** *Procambarus escambiensis*  
(G2)  
Baldwin, Escambia

**Fireback Crayfish** *Cambarus pyronotus*  
(G2)  
Russell

**Flint River Crayfish** *Faxonius cooperi*  
(G1)  
Madison

**Lacon Exit Cave Crayfish** *Cambarus laconensis*  
(G1)  
Morgan

**Phantom Cave Crayfish** *Cambarus pecki*  
(G1G2)  
Colbert, Lauderdale, Morgan

**Shelta Cave Crayfish** *Orconectes sheltae*  
(G1)  
Madison

**Slenderclaw Crayfish** *Cambarus cracens*  
(E, G1)  
DeKalb, Marshall

**Speckled Burrowing Crayfish** *Creaserinus danielae*  
(G2)  
Mobile

**Sweet Home Alabama Cave Crayfish** *Cambarus speleocoopi*  
(G1)  
Marshall

**Tennessee Bottlebrush Crayfish** *Barbicambarus simmonsii*  
(G1G2)  
Lauderdale

**Twisted Dwarf Crayfish** *Cambarellus rotatus*  
(G1)  
Hale, Greene, Marengo

**White Spring Cave Crayfish** *Cambarus veitchorum*  
(G1)  
Limestone

## FORESTRY CONSIDERATIONS



There are approximately 98 species of crayfish in Alabama. Sixteen of the species are listed as G1, G2, threatened or endangered. The most significant danger to protected crayfish from forestry practices is sedimentation. Pay particular attention to bridge and road construction that might lead to erosion or create fish passage barriers. Leave wide buffer strips adjacent to streams when cutting timber on steep slopes. Avoid spraying pesticides near waterways. The best way to avoid negative impact on fish is to follow closely Alabama's Best Management Practices for Forestry.

# Sea Turtles



Pictured Above: **Kemp's Ridley Sea Turtle**  
(*Lepidochelys kempii*) hatchling at Bon Secour  
National Wildlife Refuge (E)

## IDENTIFICATION

Seven species of sea turtles exist worldwide, 5 of them known or believed to utilize Alabama coastal waters and beaches are afforded protection by the Endangered Species Act. They vary in size and weight with the leatherback being the largest — reaching lengths of 4 to 8 feet and weights of 500 to 2000 pounds. Three (loggerhead, Kemp's ridley, and green) of the seven species of sea turtles that exist worldwide are known to nest at Bon Secour National Wildlife Refuge in Baldwin and Mobile counties. Loggerheads are the most common sea turtle found nesting on Alabama beaches. Sea turtles come ashore May–August to lay eggs that will hatch July–October.



**Hawksbill Sea Turtle**  
*Eretmochelys imbricata*  
(E)



**Leatherback Sea Turtle**  
*Dermochelys coriacea*  
(E, G2)



**Green Sea Turtles**  
*Chelonia mydas*  
(E)



**Loggerhead Sea Turtle** (*Caretta caretta*) with  
transmitter attached.  
(E)

## DISTRIBUTION

**Gulf coast beaches located in Baldwin and Mobile counties.**

## FORESTRY CONSIDERATIONS



Forestry activities should not impact sea turtle populations or habitat. Baby sea turtles may be disoriented by light when hatching.

# Fish



**Alabama Cavefish** *Speoplatyrhinus poulsoni*

(E, G1)

Colbert, Lauderdale

**Alabama Shad** *Alosa alabamiae*

(G2G3)

Bibb, Choctaw, Covington, Dale, Dallas, Escambia, Geneva, Houston, Marengo, Monroe, Perry, Shelby, Sumter, Wilcox

**Alabama Sturgeon** *Scaphirhynchus suttkusi*

(E, G1)

Autauga, Baldwin, Bibb, Clarke, Dallas, Elmore, Escambia, Greene, Lowndes, Mobile, Monroe, Montgomery, Perry, Sumter, Washington, Wilcox

**Ashy Darter** *Etheostoma cinereum*

(G2G3)

Lauderdale

**Bankhead Darter** *Percina sipsi*

(G1)

Lawrence, Winston

**Blackmouth Shiner** *Notropis melanostomus*

(G2)

Baldwin

**Blotchside Logperch** *Percina burtoni*

(G2G3)

Jackson

**Blue Shiner** *Cyprinella caerulea*

(T, G2G3)

Bibb, Calhoun, Cherokee, Clay, Cleburne, Coosa, Dekalb, Jefferson, Shelby, Talladega

**Blueface Darter** *Etheostoma sp. cf. zonistium*

(G1)

Franklin

**Bluestripe Shiner** *Cyprinella callitaenia*

(G2G3)

Barbour, Chambers, Henry, Houston, Lee, Randolph, Russell

**Boulder Darter** *Etheostoma wapiti*

(E, G1)

Limestone, Lauderdale

**Cahaba Shiner** *Notropis cahabae*

(E, G2)

Bibb, Blount, Chilton, Etowah, Jefferson, Marshall, Perry, Shelby, St. Clair, Tuscaloosa, Walker

**Coal Darter** *Percina brevicauda*

(G2)

Blount, Jefferson, Shelby

**Coldwater Darter** *Etheostoma ditrema*

(G1G2)

Calhoun, Cherokee, Etowah, Shelby, Talladega

**Goldline Darter** *Percina aurolineata*

(T, G2)

Bibb, Chilton, Jefferson, Perry, Shelby, Tuscaloosa

**Gulf Sturgeon** *Acipenser oxyrinchus desotoi*

(T)

Baldwin, Choctaw, Clarke, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Houston, Mobile, Monroe, Washington

**Halloween Darter** *Percina crypta*

(G2)

Russell

**Holiday Darter** *Etheostoma brevirostrum*

(G2)

Calhoun, Cleburne

# Fish

## CONTINUED



**Palezone Shiner** *Notropis albizonatus*  
(E, G1)  
Jackson, Madison, Marshall

**Pygmy Sculpin** *Cottus paulus*  
(T, G1)  
Calhoun

**Rush Darter** *Etheostoma phytophilum*  
(E, G1)  
Blount, Cullman, Etowah, Franklin, Jefferson,  
Lawrence, Marshall, St. Clair, Walker, Winston

**Sipsey Darter** *Etheostoma sp. cf. bellator "A"*  
(G2)  
Winston

**Pictured Above:**  
**Slackwater Darter** *Etheostoma boschungii*  
(T, G1)  
Lauderdale, Limestone, Madison

**Snail Darter** *Percina tanasi*  
(G2,G3)  
Madison, Marshall

**Spotfin Chub** *Erimonax monachus*  
(T, G2)  
Colbert, Lauderdale

**Spring Pygmy Sunfish** *Elassoma alabamae*  
(T, G1)  
Lauderdale, Limestone, Madison

**Stippled Studfish** *Fundulus bifax*  
(G2G3)  
Coosa, Elmore, Tallapoosa

**Trispot Darter** *Etheostoma trisella*  
(T, G1)  
Blount, Calhoun, Cherokee, Etowah, Jefferson,  
St. Clair

**Tuscumbia Darter** *Etheostoma Tuscumbia*  
(G2)  
Colbert, Lauderdale, Lawrence, Limestone, Madison,  
Morgan

**Vermillion Darter** *Etheostoma chermocki*  
(E, G1)  
Blount, Jefferson

**Warrior Darter** *Etheostoma Bellator*  
(G2)  
Blount, Cullman, Jefferson, Lawrence, Winston

**Watercress Darter** *Etheostoma nuchale*  
(E, G1)  
Jefferson

## FORESTRY CONSIDERATIONS



Thirty-two fish species are listed as G1, G2, threatened or endangered species in Alabama. Most occur in north Alabama rivers and streams. The most significant danger to protected fish from forestry practices is sedimentation that smothers fish eggs and habitat. Pay particular attention to bridge and road construction that might lead to erosion or create fish passage barriers. Leave wide buffer strips adjacent to streams when cutting timber on steep slopes. Avoid spraying pesticides near waterways. The best way to avoid negative impact on fish is to follow closely Alabama's Best Management Practices for Forestry

# Invertebrates: Mussels



**Alabama Lampmussel** (*Lampsilis virescens*)

(E, G1)

Colbert, Jackson, Lauderdale, Madison, Marshall

**Alabama Mocassinshell** (*Medionidus acutiossimus*)

(T, G2)

Bibb, Blount, Chilton, Dallas, Elmore, Etowah, Fayette, Greene, Hale, Jefferson, Lamar, Lawrence, Marengo, Marion, Marshall, Perry, Pickens, Shelby, St. Clair, Sumter, Tuscaloosa, Walker, Winston

**Alabama Pearlshell** (*Margaritifera marianae*)

(E, G1)

Conecuh, Crenshaw, Escambia, Monroe, Wilcox

**Alabama Spike** (*Elliptio arca*)

(G2G3)

Greene, Lamar, Pickens, Winston

**Canoe Creek Clubshell** (*Pleurobema athearni*)

(E, G1)

Blount, Etowah, Jefferson, St. Clair

**Chipola Slabshell** (*Elliptio chipolaensis*)

(T, G1)

Geneva, Houston

**Choctaw Bean** (*Obovaria choctawensis*)

(E, G2G3)

Barbour, Bullock, Butler, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Lowndes, Monroe, Montgomery, Pike

**Coosa Creekshell** (*Villosa umbrans*)

(G1)

Calhoun, Clay, Cleburne, Talladega

**Coosa Mocassinshell** (*Medionidus parvulus*)

(E, G1)

Blount, Calhoun, Cherokee, Clay, Cleburne, Coosa, Elmore, Etowah, Jefferson, Shelby, St. Clair, Talladega, Tallapoosa

**Crackling Pearlymussel** (*Hemistena lata*)

(E, G1)

Limestone

**Cumberland Bean** (*Villosa trabalis*)

(E)

Jackson

**Cumberland Monkeyface** (*Theliderma intermedia*)

(E, G1)

Colbert, Jackson, Lauderdale

**Cumberlandian Combshell** (*Epioblasma brevidens*)

(E, G1)

Colbert, Franklin, Lauderdale

**Dark Pigtoe** (*Pleurobema furvum*)

(E)

Blount, Cullman, Fayette, Franklin, Jefferson, Lawrence, Marion, Morgan, Tuscaloosa, Walker, Winston

**Delicate Spike** (*Elliptio arctata*)

(G2G3Q)

Barbour, Blount, Cherokee, Coffee, Dale, Dekalb, Geneva, Greene, Jefferson, Pickens, Pike, Shelby, Tuscaloosa, Winston

**Dromedary Pearlymussel** (*Dromus dromas*)

(E, G1)

Colbert, Franklin, Lauderdale

**Fanshell** (*Cyprogenia stegaria*)

(E, G1)

Colbert, Lauderdale

**Finelined Pocketbook** (*Hamiota altilis*)

(T, G2G3)

Autauga, Bibb, Blount, Bullock, Calhoun, Chambers, Cherokee, Chilton, Clay, Cleburne, Coosa, Dallas, Dekalb, Elmore, Etowah, Jefferson, Lee, Macon, Perry, Randolph, Russell, Shelby, St. Clair, Talladega, Tallapoosa, Tuscaloosa

# Invertebrates: Mussels *CONTINUED*



**Finerayed Pigtoe** (*Fusconaia cuneolus*)

(E, G1)

Jackson, Limestone, Madison, Marshall

**Flatwoods Creekshell** (*Strophitus williamsi*)

(G2)

Barbour, Bullock, Butler, Coffee, Dale, Geneva, Pike

**Fluted Elephantear** (*Elliptio mcmichaeli*)

(G2G3)

Barbour, Coffee, Dale, Geneva, Henry, Houston, Pike

**Fluted Kidneyshell** (*Ptychobranhus subtentum*)

(E, G2)

Limestone

**Fuzzy Pigtoe** (*Pleurobema strodeanum*)

(T, G2G3)

Barbour, Bullock, Butler, Coffee, Conecuh, Covington, Crenshaw, Dale, Escambia, Geneva, Henry, Houston, Lowndes, Monroe, Montgomery, Pike

**Georgia Pigtoe** (*Pleurobema hanleyianum*)

(E, G1)

Blount, Cherokee, Clay, Coosa, Etowah, Jefferson, St. Clair, Tallapoosa

**Gulf Lilliput** (*Toxolasma sp. 1*)

(G2)

Barbour, Bullock, Conecuh, Covington, Crenshaw, Geneva, Pike

**Gulf Mocassinshell** (*Medionidus penicillatus*)

(E, G2)

Geneva, Houston

**Inflated Spike** (*Elliptio purpurella*)

(G2)

Houston

**Littlewing Pearlymussel** (*Pegias fabula*)

(G1)

Lauderdale, Limestone

**Longsolid** (*Fusconaia subrotunda*)

(T)

Colbert, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan

**Narrow Pigtoe** (*Fusconaia escambia*)

(T, G1G2)

Bullock, Butler, Coffee, Conecuh, Covington, Crenshaw, Escambia, Lowndes, Monroe, Montgomery, Pike

**Orangenacre Mucket** (*Hamiota perovalis*)

(T, G1)

Autauga, Bibb, Blount, Chilton, Choctaw, Conecuh, Dallas, Etowah, Fayette, Franklin, Greene, Hale, Jefferson, Lamar, Lawrence, Lowndes, Marion, Marshall, Monroe, Perry, Pickens, Shelby, St. Clair, Sumter, Tuscaloosa, Walker, Wilcox, Winston

**Orangefoot Pimpleback** (*Plethobasus cooperianus*)

(G1)

Colbert, Jackson, Lauderdale, Limestone, Marshall

**Oval Pigtoe** (*Pleurobema pyriforme*)

(E, G2)

Geneva, Houston

**Ovate Clubshell** (*Pleurobema perovatum*)

(E, G1)

Bibb, Blount, Bullock, Calhoun, Chambers, Cherokee, Chilton, Choctaw, Clay, Cleburne, Coosa, Cullman, Dallas, Dekalb, Elmore, Etowah, Fayette, Franklin, Greene, Hale, Jefferson, Lamar, Lawrence, Lee, Macon, Marengo, Marion, Marshall, Monroe, Morgan, Perry, Pickens, Russell, Shelby, St. Clair, Sumter, Talladega, Tallapoosa, Tuscaloosa, Walker, Wilcox, Winston

# Invertebrates: Mussels CONTINUED



**Oyster Mussel** (*Epioblasma capsaeformis*)

(E, G1)

Colbert, Franklin, Jackson, Madison, Marshall

**Pale Lilliput** (*Toxolasma cylindrellus*)

(E, G1)

Jackson, Madison, Marshall

**Pink Mucket** (*Lampsilis abrupta*)

(E, G1G2)

Colbert, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan

**Purple Bankclimber** (*Elliptoideus sloatianus*)

(T, G2)

Chambers, Lee

**Purple Bean** (*Villosa perpurpurea*)

(E)

Jackson, Madison

**Pyramid Pigtoe** (*Pleurobema rubrum*)

(G2G3)

Jackson, Lauderdale, Limestone, Madison, Morgan

**Rabbitsfoot** (*Quadrula cylindrica* ssp. *cylindrica*)

(T)

Colbert, Franklin, Jackson, Lauderdale, Madison, Marshall

**Rayed Creekshell** (*Strophitus radiatus*)

(G2G3)

Dallas, Perry, Sumter, Tuscaloosa, Wilcox

**Rayed Kidneyshell** (*Ptychobranhus foremanianus*)

(G1)

Jefferson, Shelby

**Ring Pink** (*Obovaria retusa*)

(G1)

Colbert, Lauderdale

**Rough Pigtoe** (*Pleurobema plenum*)

(G1)

Colbert, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison, Marshall, Morgan

**Round Ebonyshell** (*Reginaia rotulata*)

(E, G1)

Butler, Conecuh, Covington, Crenshaw, Escambia, Lowndes, Monroe

**Round Hickorynut** (*Obovaria subrotunda*)

(T)

Jackson, Madison, Marshall

**Sheepnose** (*Plethobasus cyphus*)

(E)

Colbert, Lauderdale, Madison, Marshall, Morgan

**Shiny Pigtoe** (*Fusconaia cor*)

(E, G1)

Colbert, Jackson, Lauderdale, Madison, Marshall

**Shinyrayed Pocketbook** (*Hamiota subangulata*)

(E, G2)

Geneva, Houston, Lee, Russell

**Slabside Pearlymussel** (*Pleuonaia dolabelloides*)

(E, G2)

Colbert, Franklin, Jackson, Limestone, Madison, Marshall

**Snuffbox** (*Epioblasma triquetra*)

(E)

Jackson, Limestone, Madison, Marshall, Morgan

**Pictured Above: Southern Clubshell** (*Pleurobema decisum*)

(E, G2)

Autauga, Baldwin, Bibb, Blount, Bullock, Butler, Calhoun, Cherokee, Chilton, Choctaw, Clarke, Clay, Cleburne, Conecuh, Coosa, Crenshaw, Dallas, Dekalb, Elmore, Escambia, Etowah, Fayette, Franklin, Greene, Hale, Jefferson, Lamar, Lee, Lowndes, Macon, Marengo, Marion, Mobile, Monroe, Montgomery, Perry, Pickens, Russell, Shelby, St. Clair, Sumter, Talladega, Tallapoosa, Tuscaloosa, Washington, Wilcox, Winston

**Southern Combshell** (*Epioblasma penita*)

(E, G1)

Bibb, Lamar

**Southern Elktoe** (*Alasmidonta triangulata*)

(G1)

Russell

# Invertebrates: Mussels CONTINUED



**Southern Kidneyshell** (*Ptychobranthus jonesi*)  
(E, G1)  
Barbour, Bullock, Butler, Coffee, Conecuh,  
Covington, Crenshaw, Dale, Escambia, Geneva,  
Henry, Houston, Lowndes, Monroe, Montgomery,  
Pike

**Southern Pigtoe** (*Pleurobema georgianum*)  
(E, G1)  
Blount, Calhoun, Cherokee, Chilton, Clay, Cleburne,  
Coosa, Dekalb, Elmore, Etowah, Jefferson, Randolph,  
Shelby, St. Clair, Talladega, Tallapoosa

**Southern Purple Lilliput** (*Toxolasma corvunculus*)  
(G1)  
Calhoun, Clay, Coosa, Dallas, Greene, Jefferson, Lee,  
Lowndes, Macon, Monroe, Montgomery, Perry,  
Shelby, Sumter, Tallapoosa, Wilcox

**Southern Sandshell** (*Hamiota australis*)  
(T, G2G3)  
Barbour, Bullock, Butler, Coffee, Conecuh,  
Covington, Crenshaw, Dale, Escambia, Geneva,  
Henry, Houston, Lowndes, Monroe, Montgomery,  
Pike

**Spectaclecase** (*Cumberlandia monodonta*)  
(E)  
Colbert, Lauderdale, Lawrence, Limestone, Madison,  
Marshall, Morgan

**Tapered Pigtoe** (*Fusconaia burkei*)  
(T, G2G3)  
Barbour, Bullock, Coffee, Covington, Crenshaw, Dale,  
Geneva, Henry, Houston, Pike

**Tennessee Clubshell** (*Pleurobema oviforme*)  
(G2G3)  
Jackson, Madison, Marshall

**Tennessee Pigtoe** (*Pleurobema barnesiana*)  
(G2G3)  
Franklin, Jackson, Madison

**Triangular Kidneyshell** (*Ptychobranthus greeni*)  
(E, G1)  
Bibb, Blount, Calhoun, Cherokee, Chilton, Clay,  
Cleburne, Coosa, Elmore, Etowah, Fayette, Franklin,  
Jefferson, Lawrence, Marshall, Shelby, St. Clair,  
Talladega, Tallapoosa, Tuscaloosa, Walker, Winston

**Warrior Pigtoe** (*Pleurobema rubellum*)  
(G1)  
Fayette, Lawrence, Tuscaloosa, Winston

**White Wartyback** (*Plethobasus cicatricosus*)  
(E, G1)  
Colbert, Lauderdale

## FORESTRY CONSIDERATIONS



There are 67 species of freshwater mussels listed as a G1, G2, threatened or endangered species in Alabama. Like the fishes, preserving water quality and streambed habitat can best protect them from the effects of forestry operations. Closely following guidelines in Alabama's Best Management Practices for Forestry will help ensure minimal impacts to freshwater invertebrates and their habitat.

# Invertebrates: Aquatic Snails



**Acute Elimia** (*Elimia acuta*)

(G2)  
Madison

**Ample Elimia** (*Elimia ampla*)

(G1)  
Bibb, Shelby

**Angled Marstonia** (*Marstonia angulobasis*)

(G1)  
Jackson, Madison, Marshall

**Anthony's Riversnail** (*Athearnia anthonyi*)

(E, G1)  
DeKalb, Jackson, Limestone, Madison, Morgan

**Armored Snail** (*Pyrgulopsis pachyta*)

(E, G1)  
Limestone, Madison

**Auger Elimia** (*Elimia teretria*)

(G1)  
Calhoun

**Black Mudalia** (*Elimia melanoides*)

(G2)  
Blount, Jefferson, Walker

**Broken Hornsnail** (*Pleurocera postelli*)

(G2)  
Colbert, Franklin, Jackson, Lauderdale, Lawrence, Morgan

**Brooch Elimia** (*Elimia broccata*)

(G1)  
Calhoun

**Cahaba Pebblesnail** (*Clappia cahabensis*)

(G1)  
Bibb, Shelby

**Caper Elimia** (*Elimia olivula*)

(G1Q)  
Montgomery

**Cobble Elimia** (*Elimia vanuxemiana*)

(G1)  
Etowah

**Pictured Above:**

**Cockle Elimia** (*Elimia cochliaris*)

(G1)  
Bibb

**Compact Elimia** (*Elimia showalteri*)

(G1)  
Bibb, Shelby

**Coosa Pyrg** (*Marstonia hershleri*)

(G1)  
Elmore

**Corpulent Hornsnail** (*Pleurocera corpulenta*)

(G1)  
Jackson

**Cylinder Elimia** (*Elimia cylindracea*)

(G2)  
Choctaw, Sumter

**Cylindrical Lioplax** (*Lioplax cyclostomaformis*)

(E, G1)  
Bibb, Jefferson, Shelby, Talladega, Tuscaloosa

**Domed Ancyloid** (*Rhodacmea elatior*)

(G1)  
Bibb, Shelby

**Engraved Elimia** (*Elimia perstriata*)

(G1)  
Jackson, Lawrence, Madison

**Fanshell** (*Cyprogenia stegaria*)

(E)  
Colbert, Lauderdale

**Fire Elimia** (*Elimia exusta*)

(G2)  
Conecuh, Escambia

**Flat Pebblesnail** (*Lepyrium showalteri*)

(E, G1)  
Bibb, Jefferson, Shelby, Tuscaloosa

**Flaxen Elimia** (*Elimia boykiniana*)

(G2)  
Chambers, Houston, Lee

# Invertebrates: Aquatic Snails

## CONTINUED



**Gladiator Elimia** (*Elimia hydei*)

(G2)

Blount, Greene, Hale, Jefferson, Tuscaloosa, Walker

**Golden Pebblesnail** (*Somatogyrus aureus*)

(G1)

Lauderdale

**Gulf Coast Pebblesnail** (*Somatogyrus walkerianus*)

(G2G3)

Conecuh, Covington, Lee

**Hispid Elimia** (*Elimia comma*)

(G2)

Blount, Etowah, Winston

**Interrupted Rocksnail** (*Leptoxis foremani*)

(E, G1)

Cherokee, Elmore, Etowah

**Lacey Elimia** (*Elimia renetella*)

(T, G1)

Clay, Talladega

**Latticed Elimia** (*Elimia mihalcikae*)

(G1)

Calhoun

**Lily Shoals Elimia** (*Elimia annettae*)

(G1)

Bibb, Shelby

**Manitou Cavesnail** (*Antrorbis breweri*)

(G1)

Dekalb

**Moss Pyrg** (*Marstonia scalariformis*)

(G1)

Colbert, Lauderdale, Limestone, Madison

**Mud Elimia** (*Elimia alabamensis*)

(G1)

Chilton

**Pictured Above:**

**Muddy Rocksnail** (*Lithasia salebrosa*)

(G2G3)

Colbert, Lauderdale

**Noble Hornsnail** (*Pleurocera nobilis*)

(G2)

Jackson, Limestone, Madison, Marshall, Morgan

**Nodulose Coosa River Snail** (*Elimia lachryma*)

(G1)

Autauga, Clarke, Dallas, Lowndes, Shelby, Talladega, Wilcox

**Oblong Rocksnail** (*Leptoxis compacta*)

(G1)

Shelby

**Opaque Pebblesnail** (*Somatogyrus tennesseensis*)

(G1)

Lauderdale

**Painted Rocksnail** (*Leptoxis taeniata*)

Calhoun, Chilton, Etowah, Shelby, St. Clair, Talladega (T, G1)

**Plicate Rocksnail** (*Leptoxis plicata*)

(E, G1)

Blount, Jefferson, Walker

**Princess Elimia** (*Elimia bellacrenata*)

(G1)

Shelby

**Prune Elimia** (*Elimia chiltonensis*)

(G2)

Chilton, Coosa, Shelby, St. Clair

**Puzzle Elimia** (*Elimia varians*)

(G1G2Q)

Bibb

# Invertebrates: Aquatic Snails

## CONTINUED



**Rolling Pebblesnail** (*Somatogyrus strengi*)

(G1)

Colbert, Jackson, Limestone, Madison, Morgan

**Rough Hornsnail** (*Pleurocera foremani*)

(E, G1)

Chilton, Coosa, Elmore, Shelby, Talladega

**Round Ebonyshell** (*Reginaia rotulata*)

(E)

Butler, Conecuh, Covington, Crenshaw, Escambia, Lowndes, Monroe

**Round-rib Elimia** (*Elimia nassula*)

(G1)

Colbert, Lawrence, Morgan

**Round Rocksnail** (*Leptoxis ampla*)

(T, G2)

Bibb, Chilton, Jefferson, Shelby, Tuscaloosa

**Salt Spring Hydrobe** (*Pseudotryonia grahamae*)

(G1)

Clarke

**Shortspire Hornsnail** (*Pleurocera curta*)

(G2)

Lauderdale

**Skirted Hornsnail** (*Pleurocera pyrenella*)

(G2)

Bibb, Limestone, Madison, Shelby, Tuscaloosa

**Slender Campeloma** (*Campeloma decampi*)

(E, G1)

Lauderdale, Limestone, Madison

**Slowwater Elimia** (*Elimia interveniens*)

(G2)

Colbert, Lauderdale

**Spotted Rocksnail** (*Leptoxis picta*)

(G2)

Autauga, Bibb, Clarke, Dallas, Lowndes, Monroe, Perry, Wilcox

**Spring Elimia** (*Elimia pybasi*)

(G2)

Colbert, Franklin, Jackson, Lauderdale, Lawrence, Limestone, Madison

**Squat Elimia** (*Elimia variata*)

(G2Q)

Bibb, Shelby

**Sulcate Hornsnail** (*Pleurocera trochiformis*)

(G2)

Lauderdale, Madison

**Tulotoma Snail** (*Tulotoma magnifica*)

(T, G2)

Autauga, Calhoun, Clarke, Coosa, Dallas, Elmore, Lowndes, Monroe, Montgomery, Shelby, St. Clair, Talladega, Wilcox

**Upland Hornsnail** (*Pleurocera showalteri*)

(G2Q)

Shelby, St. Clair, Talladega

**Walnut Elimia** (*Elimia bullula*)

(G1)

Calhoun, Cleburne, Coosa, Shelby, Talladega

**Warty Rocksnail** (*Lithasia lima*)

(G2)

Lauderdale

**Wicker Ancylid** (*Rhodacmea filose*)

(G1)

Talladega

## FORESTRY CONSIDERATIONS



There are 64 aquatic snails listed as a G1, G2, threatened or endangered species in Alabama. Like the fishes, preserving water quality and streambed habitat can best protect them from the effects of forestry operations. Closely following guidelines in Alabama's Best Management Practices for Forestry will help ensure minimal impacts to freshwater invertebrates and their habitat.

# Invertebrates: Terrestrial Snails & Shrimp



## Terrestrial Snails

**Alabama Mantleslug** (*Philomycus sellatus*)  
(G2G3)  
Jackson

**Alabama Shagreen** (*Inflectarius smithi*)  
(G2)  
Jackson, Madison

**Alabama Slitmouth** (*Stenotrema exodon*)  
(G2)  
DeKalb, Jackson, Madison

**Alabama Tigersnail** (*Anguispira alabama*)  
(G2)  
Jackson, Madison

**Blade Dome** (*Ventridens monodon*)  
(G2)  
Butler

**Blind Glyph** (*Glyphyalinia pecki*)  
(G1G2)  
Jefferson

**Carrot Glass** (*Dryachloa dauca*)  
(G2)  
\*\*Need counties\*\*

**Channelled Disc** (*Discus clappi*)  
(G1)  
Madison

**Crowned Supercoil** (*Paravitrea tiara*)  
(G1G2)  
\*\*Need counties\*\*

**Danby Globelet** (*Mesodon trossulus*)  
(G1)  
\*\*Need counties \*\*

**Diurnal Ambersnail** (*Catinella aprica*)  
(G2)  
\*\*Need counties \*\*

**Grand Bladetooth** (*Patera sargentiana*)  
(G2)  
Jackson, Lawrence, Madison

**Gray Supercoil** (*Paravitrea bidens*)  
(G1)  
\*\*Need counties \*\*

**Saltmarsh Ambersnail** (*Succinea paralia*)  
(G2)  
\*\*Need counties\*\*

**Sharp Supercoil** (*Paravitrea toma*)  
(G1)  
\*\*Need counties \*\*

**Stone Glyph** (*Glyphyalinia latebricola*)  
(G2)  
Jackson

**Talladega Slitmouth** (*Stenotrema brevipila*)  
(G2)  
Cherokee, Cleburne

**Tight-gapped Shagreen** (*Inflectarius approximans*)  
(G2)  
Hale

**Translucent Supercoil** (*Paravitrea pilsbryana*)  
(G2)  
\*\*Need counties \*\*

**Urban Ambersnail** (*Succinea urbana*)  
(G2G3)  
\*\*Need counties\*\*

**Variable Supercoil** (*Paravitrea variabilis*)  
(G2G3)  
\*\*Need counties\*\*

**Weedpatch Ambersnail** (*Catinella pugilator*)  
(G1G2)  
\*\*Need counties\*\*

## Shrimp

### Pictured Above:

**Alabama Cave Shrimp** (*Palaemonias alabamae*)

(E, G2G3)

Jackson, Limestone, Madison, Marshall, Morgan

## FORESTRY CONSIDERATIONS



There are 22 terrestrial snails and 1 shrimp listed as a G1, G2, threatened or endangered species in Alabama. Like the fishes, preserving water quality and streambed habitat can best protect them from the effects of forestry operations. Closely following guidelines in Alabama's Best Management Practices for Forestry will help ensure minimal impacts to freshwater invertebrates and their habitat.

# Conclusion

The U. S. Fish and Wildlife Service and the Alabama Division of Wildlife and Freshwater Fisheries share conservation, management and enforcement responsibilities for many of the species outlined in this document through laws such as the Endangered Species Act and regulations promulgated by the Alabama Department of Conservation and Natural Resources. Direct specific questions regarding conservation of these species to:

## U. S. Fish and Wildlife Service

Alabama Ecological Services Office  
1208 Main Street B  
Daphne, AL 36526  
[www.fws.gov/office/alabama-ecological-services](http://www.fws.gov/office/alabama-ecological-services)  
251-441-5181

## Alabama Division of Wildlife and Freshwater Fisheries

64 North Union Street  
Montgomery, AL 36130  
[www.outdooralabama.com](http://www.outdooralabama.com)  
Administrative Office: 334-242-3465  
Wildlife Section: 334-242-3469  
Fisheries Section: 334-242-3471  
Enforcement Section: 334-242-3467

This document was originally prepared by and for Alabama Forestry Commission personnel and adapted for use by the Alabama Sustainable Forestry Initiative State Implementation Committee.

### Project partners:

Alabama Cooperative Extension System, Alabama Forestry Association, Alabama Forestry Commission, Alabama Forestry Foundation, Alabama SFI Implementation Committee, Alabama Wildlife and Freshwater Fisheries, and Auburn University College of Forestry, Wildlife, and the Environment.

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