Amphibian and Reptile Inventory of the Cahaba River National Wildlife Refuge

A Report Prepared for the

United States Fish and Wildlife Service

By the

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July 2010

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Cover Photos:

Upper left: Fowler's toad (*Anaxyrus fowleri*)
Upper right: red salamander (*Pseudotriton ruber*)
Center: Cahaba River
Lower left: five-lined skink (*Plestiodon fasciatus*)
Bottom center: eastern box turtle (*Terrapene carolina*)
Bottom right: black kingsnake (*Lampropeltis getula nigra*)

All photos ©James C. Godwin

This report should be cited as: Godwin, James C. 2010. Amphibian and Reptile Inventory of the Cahaba River National Wildlife Refuge. Alabama Natural Heritage Program, Auburn University, AL. Unpublished report for the U.S. Fish and Wildlife Service. 125 pp. + Appendix.

Table of Contents

Introduction 6
A Note on the Taxonomy of Amphibians and Reptiles 12
Methods 12
Terrestrial Sampling 13
Aquatic Sampling 16
Other Sampling 16
Results 16
Museum Records 16
Field Surveys 16
Species and Natural Communities 20
Species Occurrence by Community Type and Frequency of Occurrence (FoO) 22
A. Dry-mesic Communities 22
B. Mesic Communities 23
C. Wet-mesic Communities 26
D. Hydric Communities 27
Species Accounts 28
Bufo fowleri (Anaxyrus fowleri), Fowler's toad 28
Acris crepitans, northern cricket frog 30
Acris gryllus, southern cricket frog 32
Hyla chrysoscelis, Cope's gray treefrog 34
Hyla cinerea, green treefrog 36
Pseudacris brachyphona, mountain chorus frog 37
Pseudacris crucifer, spring peeper 39
Gastrophryne carolinensis, eastern narrow-mouthed toad 41
Rana catesbeiana (*Lithobates catesbeianus*), American bullfrog 43
Rana clamitans (*Lithobates clamitans*), bronze frog 45
Rana sphenocephala (*Lithobates sphenocephalus*), southern leopard frog 47
Ambystoma maculatum, spotted salamander 49
Desmognathus conanti, spotted dusky salamander 51
Desmognathus monticola, seal salamander 53
Eurycea cirrigera, southern two-lined salamander 54
Eurycea guttolineata, three-lined salamander 55
Plethodon glutinosus, northern slimy salamander 57
Plethodon ventralis, southern zigzag salamander 59
Plethodon websteri, Webster's salamander 61
Pseudotriton ruber, red salamander 63
Notophthalmus viridescens, eastern newt 65
Graptemys geographica, northern map turtle 67
Graptemys nigrinoda, black-knobbed sawback, black-knobbed map turtle 69
Graptemys pulchra, Alabama map turtle 71
Pseudemys concinna, river cooter 73
Terrapene carolina, eastern box turtle 75
Trachemys scripta, pond slider 77
Sternotherus minor peltifer, stripe-necked musk turtle 79

Apalone spinifera, spiny softshell 81
Sceloporus undulatus, eastern fence lizard 83
Anolis carolinensis, green anole 85
Eumeces fasciatus (*Plestiodon fasciatus*), common five-lined skink 87
Eumeces laticeps (*Plestiodon laticeps*), broad-headed skink 89
Scincella lateralis, little brown skink 91
Cnemidophorus sexlineatus (*Aspidoscelis sexlineata*), six-lined racerunner 93
Coluber constrictor, North American racer 95
Lampropeltis getula nigra, common kingsnake 97
Elaphe obsoleta (*Pantherophis spiloides*), gray ratsnake 99
Opheodrys aestivus, rough greensnake 101
Carphophis amoenus, eastern worm snake 103
Diadophis punctatus, ring-necked snake 105
Nerodia sipedon pleuralis, midland watersnake 107
Regina septimvittata, queensnake 109
Storeria dekayi, Dekay's brownsnake 110
Storeria occipitomaculata, red-bellied snake 112
Thamnophis sirtalis, eastern garter snake 114
Heterodon platirhinos, eastern hog-nosed snake 116
Agkistrodon contortrix, copperhead 118
Agkistrodon piscivorous, cottonmouth 120
Crotalus horridus, timber rattlesnake 122
Management Recommendations 124
Acknowledgements 124
Literature Cited 125

List of Tables

Table 1. A listing of species potential to the Cahaba River National Wildlife Refuge based on those documented from Bibb County, species with specimens from the Auburn University Herpetological Museum (AUM), and those documented during the inventory. 6

Table 2. Species documented from the Cahaba River National Wildlife Refuge and listed by class, order, family, and species, and method of sampling. 16

Table 3. Number of species documented on the Cahaba River National Wildlife Refuge with coverboard transects, drift fences, and observations. 19

Table 4. Amphibian and reptile species – natural and anthropogenic community associations on the Cahaba River National Wildlife Refuge. 20

List of Figures

Figure 1. Map of the natural and anthropogenic community types of the Cahaba River National Wildlife Refuge as identified and mapped by Schotz (2007). 11

Figure 2. Example of a drift fence array used during the amphibian and reptile inventory of the Cahaba River National Wildlife Refuge.. 13

Figure 3. Examples of cover boards used during the amphibian and reptile inventory of the Cahaba River National Wildlife Refuge.. 14

Figure 4. Distribution of drift fence arrays and cover board transects on the Cahaba River National Wildlife Refuge with each individual trap site indicated by alphanumeric code. 15

Figure 5. Accumulation curves plotting number of new species added per sampling event for each of the three sampling methods and for the combined total number of species.. 19

Introduction

Established in 2002 the Cahaba River National Wildlife Refuge (CRNWR) is one of the newest in the refuge system. Located in Bibb County, AL CRNWR encompasses approximately 3,414 acres and includes an approximate 5 mile reach of the Cahaba River. Bibb County is transected by the Fall Line and thus contains both coastal plain and upland physiographic representation. This physiographic complexity is the underlying basis for the amphibian and reptile diversity of the county, but the Cahaba River National Wildlife Refuge, being of limited size and overlying upland geology, is unlikely to have habitat suitable for species with a coastal plain affinity. Nonetheless, the potential list of species to be found on the CRNWR includes 20 frogs and toads, 17 salamanders, 1 alligator, 11 lizards, 32 snakes, and 14 turtles (Table 1), a total of 95 species. Compilation of this list is based upon examination of range maps in Mount (1975) and Conant and Collins (1998).

Table 1. A listing of species potential to the Cahaba River National Wildlife Refuge based on those documented from Bibb County, species with specimens from the Auburn University Herpetological Museum (AUM), and those documented during the inventory.

Scientific name	Common name	AUM Record	Documented
	Anura - Frogs & Toads		
Bufonidae	**True toads**		
Bufo fowleri	Fowler's toad	x	x
Bufo quercicus	oak toad	x	
Bufo terrestris	southern toad	x	
Hylidae	**Treefrogs**		
Acris crepitans	northern cricket frog		x
Acris gryllus	southern cricket frog		x
Hyla avivoca	bird-voiced treefrog	x	
Hyla chrysoscelis	Cope's gray treefrog	x	x
Hyla cinerea	green treefrog	x	x
Hyla femoralis	pine woods treefrog		
Hyla gratiosa	barking treefrog	x	
Hyla squirella	squirrel treefrog	x	
Pseudacris crucifer	spring peeper	x	x
Pseudacris brachyphona	mountain chorus frog	x	x
Pseudacris feriarum	upland chorus frog	x	
Pseudacris ornata	ornate chorus frog	x	
Microhylidae	**Microhylid frogs and toads**		
Gastrophryne carolinensis	eastern narrowmouth toad	x	x
Ranidae	**True frogs**		
Rana catesbeiana	bullfrog	x	x
Rana clamitans	green frog	x	x

Rana sphenocephala	southern leopard frog	x	x
Scaphiopodidae	**North American spadefoot toads**		
Scaphiopus holbrooki	eastern spadefoot toad	x	
	Caudata - Salamanders		
Ambystomatidae	**Mole salamanders**		
Ambystoma maculatum	spotted salamander	x	x
Ambystoma opacum	marbled salamander	x	
Ambystoma talpoideum	mole salamander		
Ambystoma tigrinum	tiger salamander	x	
Plethodontidae	**Lungless salamanders**		
Desmognathus conanti	spotted dusky salamander	x	x
Desmognathus monticola	seal salamander	x	x
Eurycea cirrigera	southern two-lined salamander	x	x
Eurycea guttolineata	longtail salamander	x	x
Gyrinophilus porphyriticus	spring salamander	x	
Hemidactylum scutatum	four-toed salamander	x	
Plethodon glutinosus complex	slimy salamander	x	x
Plethodon websteri	Webster's salamander	x	x
Plethodon ventralis	southern zigzag salamander		x
Pseudotriton ruber	red salamander	x	x
Proteidae	**Mudpuppies and waterdogs**		
Necturus sp.	waterdog		
Salamandridae	**Newts**		
Notophthalmus viridescens	eastern newt	x	x
Sirenidae	**Sirens**		
Siren intermedia	lesser siren		
	Crocodylia – crocodilians		
Alligatoridae	**Alligator**		
Alligator mississippiensis	American alligator		
	Squamata – lizards and snakes		
Anguidae	**Glass lizards**		
Ophisaurus attentuatus	slender glass lizard		
Ophisaurus ventralis	eastern glass lizard		
Phrynosomatidae	**Spiny lizards**		
Sceloporus undulatus	eastern fence lizard	x	x

Polychrotidae	**Anoles**		
Anolis carolinensis	green anole		x
Scincidae	**Skinks**		
Eumeces anthracinus	coal skink	x	
Eumeces egregius	mole skink	x	
Eumeces fasciatus	common five-lined skink	x	x
Eumeces inexpectatus	southeastern five-lined skink	x	x
Eumeces laticeps	broadhead skink	x	x
Scincella lateralis	ground skink	x	x
Teiidae	**Whiptails, racerunners**		
Cnemidophorus sexlineatus	six-lined racerunner		x
Colubridae	**Harmless egg-laying snakes**		
Cemophora coccinea	scarlet snake	x	
Coluber constrictor	eastern racer	x	x
Elaphe guttata	corn snake		
Elaphe obsoleta	gray rat snake	x	x
Lampropeltis calligaster	mole snake	x	
Lampropeltis getula	kingsnake	x	x
Lampropeltis triangulum	scarlet kingsnake	x	
Masticophis flagellum	coachwhip	x	
Opheodrys aestivus	rough green snake		x
Pituophis melanoleucus	northern pine snake		
Tantilla coronata	southeastern crowned snake	x	
Dipsadidae	**Slender rear-fanged snakes**		
Carphophis amoenus	worm snake		x
Diadophis punctatus	ringneck snake	x	x
Natricidae	**Harmless live-bearing snakes**		
Nerodia erythrogaster	yellowbelly water snake	x	
Nerodia rhombifer	diamondback water snake		
Nerodia sipedon	midland water snake	x	x
Regina rigida	glossy crayfish snake	x	
Regina septemvittata	queen snake		x
Storeria dekayi	brown snake	x	x
Storeria occipitomaculata	redbelly snake	x	x
Thamnophis sauritus	eastern ribbonsnake		
Thamnophis sirtalis	common garter snake	x	x
Virginia striatula	rough earth snake		
Virginia valeriae	smooth earth snake	x	
Xenodontidae	**Robust rear-fanged snakes**		
Farancia abacura	mud snake		

Farancia erytrogramma	rainbow snake		
Hetorodon platirhinos	eastern hognose snake	x	x
Elapidae	**Coral snakes**		
Micrurus fulvius	eastern coral snake	x	
Crotalidae	**Pitvipers**		
Agkistrodon contortrix	copperhead	x	x
Agkistrodon piscivorous	cottonmouth		x
Crotalus horridus	timber rattlesnake		x
Sistrurus miliarius	pigmy rattlesnake		
	Chelonia – Turtles		
Chelydridae	**Snapping turtles**		
Chelydra serpentina	common snapping turtle		x
Macrochelys temmincki	alligator snapping turtle	x	
Emydidae	**Box and water turtles**		
Deirochelys reticularia	chicken turtle		
Graptemys geographica	northern map turtle	x	x
Graptemys nigrinoda	black-knobbed map turtle	x	x
Graptemys pulchra	Alabama map turtle		x
Pseudemys concinna	river cooter	x	x
Trachemys scripta	pond slider		x
Terrapene carolina	eastern box turtle		x
Kinosternidae	**Mud and musk turtles**		
Kinosternon subrubrum	eastern mud turtle	x	
Sternotherus minor	stripeneck musk turtle	x	x
Sternotherus odoratus	common musk turtle		
Trionychidae	**Softshell turtles**		
Apalone mutica	smooth softshell	x	
Apalone spinifer	spiny softshell	x	x

The objective of the inventory is to provide as complete a list as possible of the species present on the CRNWR, where they occur, and their habitat associations. This body of information will establish baseline data which may be used to document faunal shifts following any future land management actions.

In a previous study five natural and anthropogenic communities of significant acreage were identified (Schotz, 2007) (Figure 1) and delineated within the refuge boundary and these communities were placed into one of four general categories: mesic, dry-mesic, and wet-mesic, plus the anthropogenic forest plantations. The identified communities will serve as the framework upon which sampling will be based and are as follows:

Mesic communities

Upland Mixed Forest

Quercus prinus – Carya spp. *– Quercus velutina* / *Vaccinium arboreum* / *Iris verna* var. *smalliana* Forest

[Translated Name: Chestnut Oak – Hickory species – Black Oak / Tree Sparkleberry / Dwarf Vernal Iris Forest]

(Common Name: Lower Piedmont Chestnut Oak Forest)

Dry-mesic community

Interior Longleaf Pine Woodland

Pinus palustris – Pinus echinata – (*Pinus virginiana*) / *Quercus marilandica –* (*Quercus prinus*) / *Vaccinium pallidum* Woodland

[Translated Name: Longleaf Pine – Shortleaf Pine – (Virginia Pine) / Blackjack Oak – (Chestnut Oak) / Lowbush Blueberry Woodland]

(Common Name: Montane Longleaf Pine Woodland)

Wet-mesic communities

Bottomland and Floodplain Forests

Fagus grandifolia – Quercus alba / *Kalmia latifolia – Rhododendron canescens – Symplocos tinctoria* Forest

[Translated Name: Beech – White Oak / Mountain Laurel – Hoary Azalea – Horse Sugar Forest]

(Common Name: White Oak – Beech Small Stream Floodplain Forest)

Forest Plantations

Pinus taeda Planted Forest

[Translated Name: Loblolly Pine Planted Forest]

(Common Name: Loblolly Pine Plantation)

Pinus palustris Planted Forest

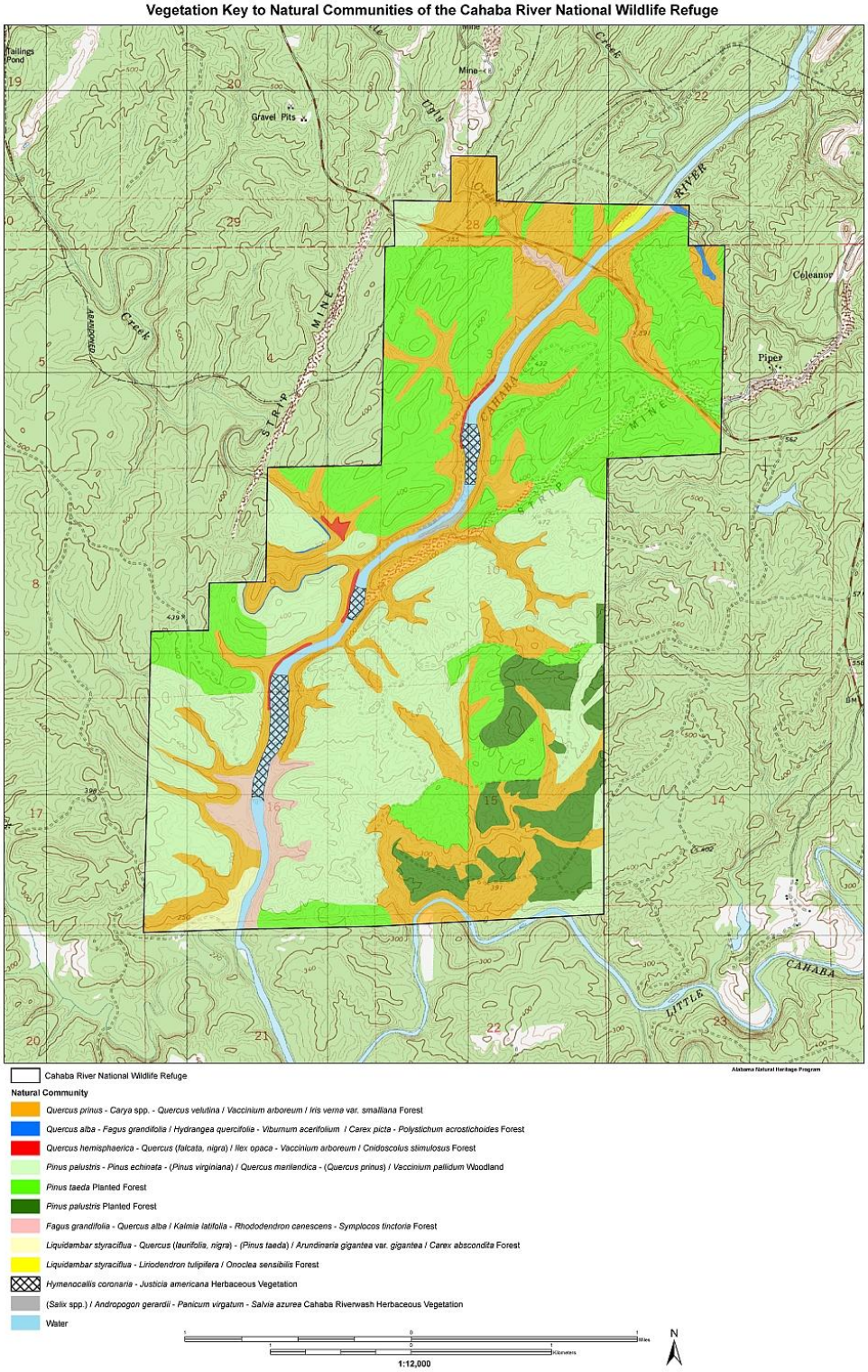
[Translated Name: Longleaf Pine Planted Forest]

(Common Name: Longleaf Pine Plantation).

Four additional community types have been identified but the extent of coverage on the refuge is small and less emphasis will be devoted to these. The communities of limited acreage are:

1) *Quercus alba – Fagus grandifolia* / *Hydrangea quercifolia – Viburnum acerifolium* / *Carex picta – Polystichum acrostichoides* Forest
2) *Quercus hemisphaerica – Quercus* (*falcata, nigra*) / *Ilex opaca – Vaccinium arboreum* / *Cnidoscolus stimulosus* Forest
3) *Liquidambar styraciflua – Quercus* (*laurifolia, nigra*) – (*Pinus taeda*) / *Arundinaria gigantea* var. *gigantea* / *Carex abscondita* Forest
4) *Liquidambar styraciflua – Liriodendron tulipifera* / *Onoclea sensibilis* Forest.

Figure 1. Map of the natural and anthropogenic community types of the Cahaba River National Wildlife Refuge as identified and mapped by Schotz (2007).



A Note on the Taxonomy of Amphibians and Reptiles

Amphibian and reptile taxonomy at the level of species and higher categories has been undergoing revision as researchers have been applying molecular tools to these groups. Both new scientific and common names have been introduced into the literature but not all have been widely accepted within the herpetological community. To add to the confusion are two competing lists of standard common and scientific names, one originating from the Center for North American Herpetology (CNAH) (Collins and Taggart, 2009) and the other compiled by the Society for the Study of Amphibians and Reptiles (SSAR) (Crother, (ed.) 2008). For the purposes of this report scientific names used will follow, for the most part, those found in Mount (1975) and Conant and Collins (1998) as these names will be more recognizable to resource managers and biologists outside of the herpetological community. Alternative names which are gaining acceptance will be provided in the **Species Account** section. Common names follow those given by the SSAR list. Appendix 1 lists and compares previous and current scientific names and common name nomenclature from the CNAH and SSAR lists.

Methods

Drift fence arrays and coverboard transects were selected as two primary techniques for sampling. Advantages with the use of drift fences and coverboards are that, once installed, they are continuously in use capturing animals under all types of activity periods and times of day. The important requirement is the regular checking by the investigator. Coverboards provide an artificial refugium without inhibiting the movement of animals, thus mortality of sampled animals is not an issue. Disadvantages of drift fences and coverboards are the need to purchase or acquire materials, time and personnel needed for construction and placement of trap arrays, time and personnel needed to dismantle and remove traps, and the inability to efficiently move traps thus limiting overall sampling coverage of an area. Once in place drift fences must be regularly checked to avoid and/or reduce mortality of trapped animals.

An alternative sampling technique is through plot sampling. With this method plots are randomly selected from a grid overlay on a base map with each sampling point consisting of a plot array. Each plot array includes five circular plots with a central plot coinciding with the GIS selected point and four additional plots, one at each cardinal direction located around this plot. To sample a plot logs, rocks, and other structural items are overturned, and leaf litter is raked in search of amphibians and reptiles. Advantages to plot sampling include minimal equipment needs and the ability to adjust sampling to fit the terrain. Disadvantages are that plot sampling is labor and time intensive, sampling will be affected by weather conditions, i.e. severe storms will disrupt sampling, and species may be missed due to inability of investigators to sample during a peak period of animal activity.

With either method investigators must be well-versed in field identification. Species lists and overall observed frequencies of occurrence should be comparable regardless of sampling technique employed as common species will be encountered frequently and less common species less frequently.

Terrestrial Sampling

Drift fence arrays (Figure 2) and cover board transects (Figure 3) were two of the three means used to sample terrestrial species. Each drift fence array consisted of a central box trap and four 50' arms of silt fencing running 90° to the adjacent arms. Five funnel traps were spaced along each arm with two pair on either side of the fence and equally spaced along the length; the fifth was at the distal terminus. Two drift fence arrays were placed within each of the five major community types listed in the Introduction. Community types of limited acreage did not receive drift fence arrays. Sampling sites for drift fence arrays were selected by determining latitude and longitude within the core of the community type for placement, then once established the latitude and longitude of each array was recorded as the drift fence array location selected was unlikely to be placed at the exact pre-selected point. Location of drift fence arrays and cover board transects on the refuge is illustrated in Figure 4.

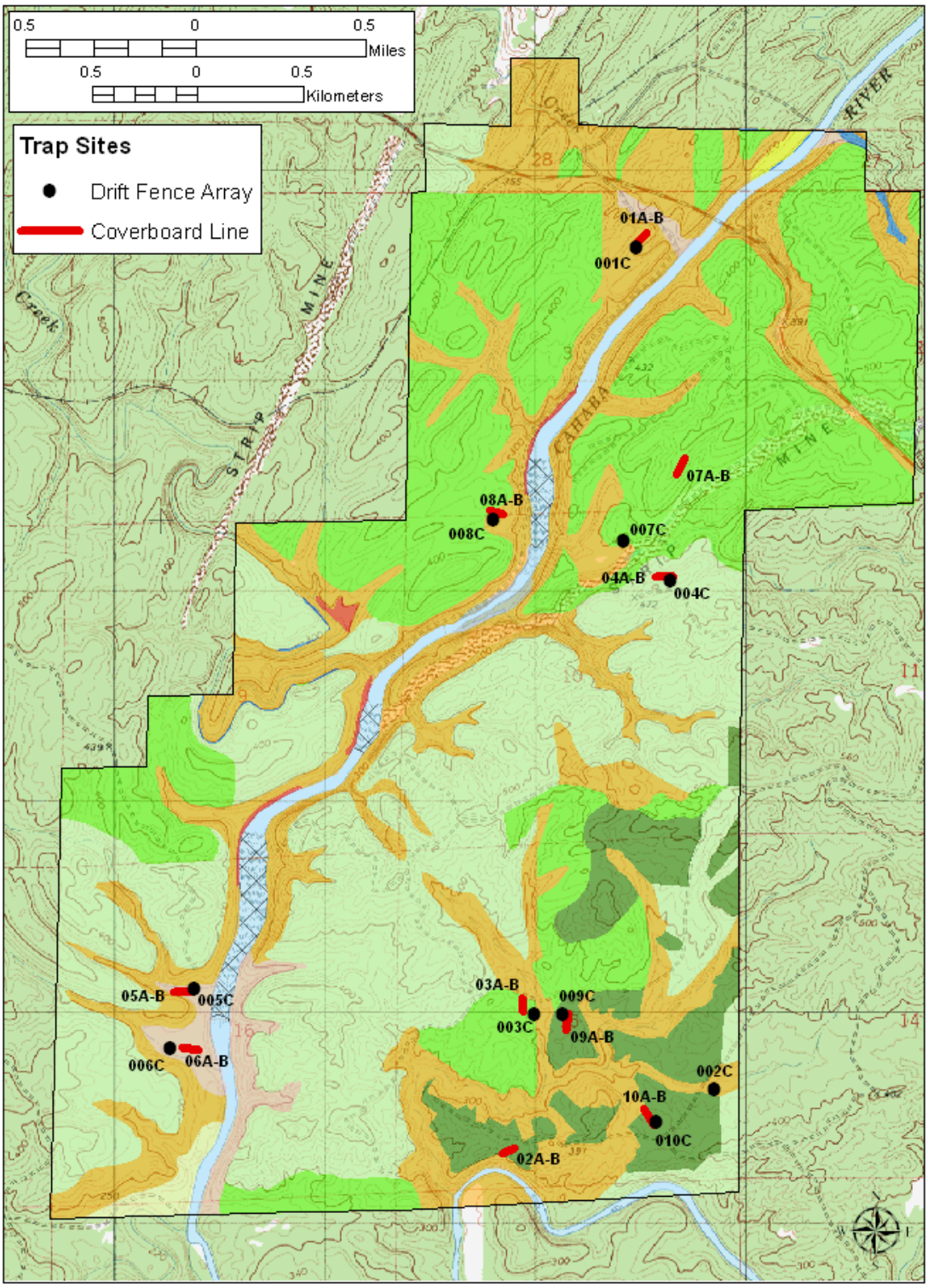
Figure 2. Example of a drift fence array used during the amphibian and reptile inventory of the Cahaba River National Wildlife Refuge.

Companion cover board transects were placed in each of the five predominant community types; a cover board transect consisted of 10 cover boards spaced at 10 m intervals with each board being approximately 25 x 25 cm and cut from weathered roofing tin. End points of each transect were recorded with a GPS for mapping purposes. Cover boards were placed in mid-winter to allow time to settle onto the forest floor.

Figure 3. Examples of cover boards used during the amphibian and reptile inventory of the Cahaba River National Wildlife Refuge.

In addition to the cover board transect, natural objects such as logs and rocks were overturned to search for amphibians and reptiles, and animals were noted while traveling between drift fence and cover board sites, and during other times while on the refuge.

Figure 4. Distribution of drift fence arrays and cover board transects on the Cahaba River National Wildlife Refuge with each individual trap site indicated by alphanumeric code. A-B = cover board transect; C = drift fence array.



Aquatic Sampling

Approximately 5 stream miles of main stem Cahaba River run roughly north to south through the refuge. Several approaches were used for the sampling of the riverine habitat. Baited hoop nets and hoop nets with leads were set for freshwater turtles. In shallow waters pyramid-style crayfish traps were set and baited to capture smaller turtles in the river and mine tailings pit.

Other Sampling

As the rarer species often go undetected with the aforementioned sampling techniques, a two day bioblitz was organized and held in late March 2009.

Results

Museum Records

A search of HerpNet (http://herpnet.org/) for specimens from Bibb County, AL, returned 254 museum records of which 252 were from the Auburn University Museum (AUM); no records were found for any amphibian or reptile specimens having been collected from within the boundaries of the Cahaba River National Wildlife Refuge.

Field Surveys

A total of 49 species (51% of the potentials list) were documented within the refuge boundary and includes 11 frogs and toads (4 families), 10 salamanders (3 families), seven turtles (3 families), six lizards (4 families), and 15 snakes (5 families). Table 2 is a listing of the species documented from the refuge during this inventory with type of collection technique (coverboard, drift fence, observational).

Table 2. Species documented from the Cahaba River National Wildlife Refuge and listed by class, order, family, and species, and method of sampling (CB = coverboard transect; DF = drift fence; OBS = observational).

	Class Amphibia **Order Anura**			
Family Bufonidae		**CB**	**DF**	**OBS**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad		x	x
Family Hylidae				
Acris crepitans	northern cricket frog			x
Acris gryllus	southern cricket frog		x	x
Hyla chrysoscelis	Cope's gray treefrog		x	x
Hyla cinerea	green treefrog			x
Pseudacris brachyphona	mountain chorus frog			x
Pseudacris crucifer	spring peeper			x

		CB	DF	OBS
Family Microhylidae				
Gastrophryne carolinensis	eastern narrow-mouthed toad		x	x
Family Ranidae				
Rana (*Lithobates*) *catesbeiana*	American bullfrog			x
Rana (*Lithobates*) *clamitans*	bronze frog		x	x
Rana (*Lithobates*) *sphenocephala*	southern leopard frog		x	x
	Order Caudata			
Family Ambystomatidae				
Ambystoma maculatum	spotted salamander		x	x
Family Plethodontidae				
Desmognathus conanti	spotted dusky salamander			x
Desmognathus monticola	seal salamander			x
Eurycea cirrigera	southern two-lined salamander			x
Eurycea guttolineata	three-lined salamander			x
Plethodon glutinosus	northern slimy salamander	x	x	x
Plethodon ventralis	southern zigzag salamander		x	x
Plethodon websteri	Webster's salamander	x	x	x
Pseudotriton ruber	red salamander		x	
Family Salamandridae				
Notophthalmus viridescens	eastern newt			x
	Class Chelonia			
Family Emydidae				
Graptemys geographica	northern map turtle			x
Graptemys nigrinoda	black-knobbed sawback			x
Graptemys pulchra	Alabama map turtle			x
Pseudemys concinna	river cooter			x
Terrapene carolina	eastern box turtle		x	x
Trachemys scripta	pond slider			x
Family Kinosternidae				
Sternotherus minor peltifer	stripe-necked musk turtle			x
Family Trionychidae				
Apalone spinifera	spiny softshell			x
	Class Reptilia			
	Order Squamata			
Family Iguanidae				
Sceloporus undulatus	eastern fence lizard	x	x	x

		CB	DF	OBS
Family Polychrotidae				
Anolis carolinensis	green anole	x	x	x
Family Scincidae				
Eumeces (*Plestiodon*) *fasciatus*	common five-lined skink		x	x
Eumeces (*Plestiodon*) *laticeps*	broad-headed skink			x
Scincella lateralis	little brown skink	x	x	x
Family Teiidae				
Cnemidophorus (*Aspidoscelis*) *sexlineatus*	six-lined racerunner		x	
Family Colubridae				
Coluber constrictor	North American racer		x	x
Lampropeltis getula niger	eastern black kingsnake	x		x
Elaphe obsoleta	gray ratsnake		x	x
Opheodrys aestivus	rough greensnake			x
Family Dipsadidae				
Carphophis amoenus	eastern worm snake	x		
Diadophis punctatus	ring-necked snake	x		x
Family Natricidae				
Nerodia sipedon pleuralis	midland watersnake			x
Regina septimvittata	queensnake			x
Storeria dekayi	Dekay's brownsnake	x		
Storeria occipitomaculata	red-bellied snake	x	x	
Thamnophis sirtalis	eastern garter snake		x	
Family Xenodontidae				
Heterodon platirhinos	eastern hog-nosed snake		x	x
Family Crotalidae				
Agkistrodon contortrix	copperhead		x	x
Agkistrodon piscivorous	cottonmouth			x
Crotalus horridus	timber rattlesnake	x	x	x

The coverboard transects were the least productive but did yield one species, *Carphophis amoenus*, not collected by other means. A total of 13 species were found beneath coverboards. Drift fence captures yielded 26 species, with three not being collected either through coverboards or observations. These four were *Pseudotriton ruber*, *Cnemidophorous sexlineatus*, and *Storeria dekayi*. Forty-five species, with 16 documented only with this technique, were noted through observations, including hand-collecting, binocular surveys of turtles, and aural surveys of calling frogs (Table 3).

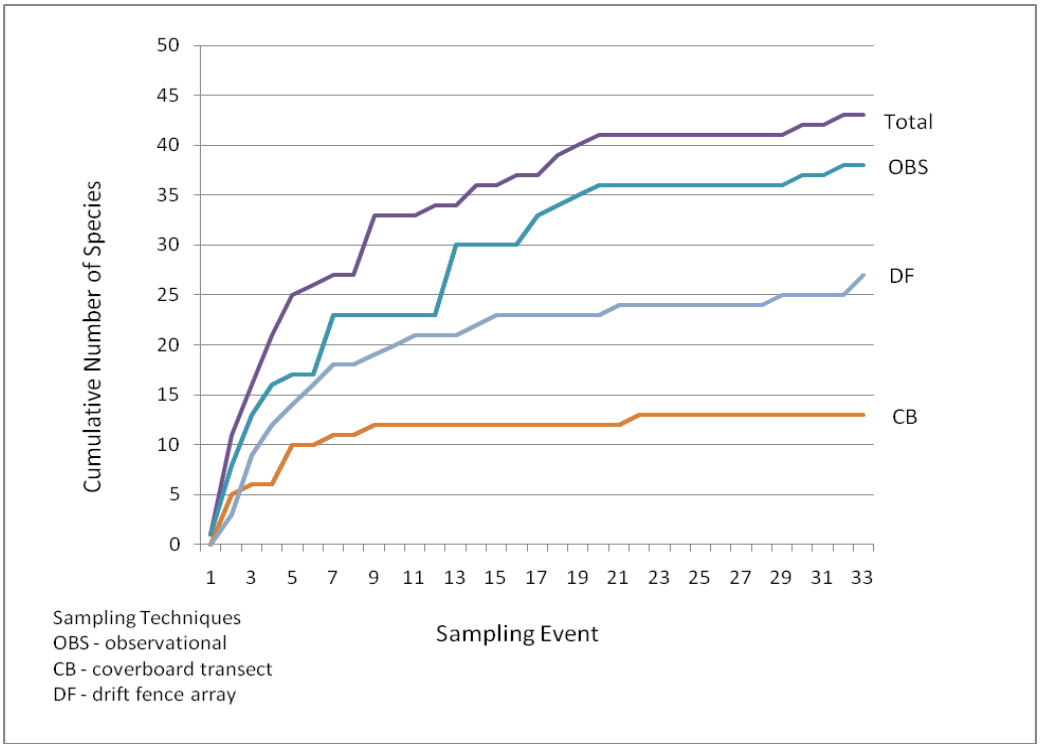
Table 3. Number of species documented on the Cahaba River National Wildlife Refuge with coverboard transects, drift fences, and observations.

Sampling technique	Number of species	Number of species unique to this sampling method
coverboard transect	13	1
drift fence	27	3
observational	49*	16

*includes bioblitz observations.

The cumulative number of new species was plotted for each sampling event to gauge the effectiveness of sampling; observational results obtained during the bioblitz were excluded from this analysis. Each sampling method reached a plateau after several months of inventory effort. The fact that the curves of each method leveled indicates that most of the species that should have been documented were found during surveys (Figure 5). Additional rare, secretive, or difficult-to-collect species will undoubtedly be added to the list but in general the accumulation curves should not change.

Figure 5. Accumulation curves plotting number of new species added per sampling event for each of the three sampling methods and for the combined total number of species. OBS total excludes bioblitz observations but new species recorded during the bioblitz are included under Total.



Species and Natural Communities

Amphibians and reptiles were collected from six terrestrial communities, four natural and two anthropogenic, and the river. Highest diversity (27 species) was noted from the Lower Piedmont Chestnut Oak Forest, while the Sand Laurel Oak Upland Forest was the least specious with only 5 species. Total acreage of these community types on the refuge would also factor into these results as the LPCOF has extensive coverage while the SLOUP includes substantially less acreage. The second most diverse community, of anthropogenic origin, was the Loblolly Pine Plantation (19 species). White Oak – Beech Small Stream Floodplain Forest had 16 species, Montane Longleaf Pine Woodland 12 species, while 13 species were documented from the Longleaf Pine Plantation, the second anthropogenic community type. Nine species were associated exclusively or nearly so, with the river; female turtles would use available suitable riparian habitat for nesting (Table 4).

Table 4. Amphibian and reptile species – natural and anthropogenic community associations on the Cahaba River National Wildlife Refuge.

Species	Montane Longleaf Pine Woodland	Lower Piedmont Chestnut Oak Forest	Loblolly Pine Plantation	Longleaf Pine Plantation	White Oak – Beech Small Stream Floodplain Forest	Sand Laurel Oak Upland Forest	River
Frogs & Toads							
Bufo fowleri	x	x	x	x	x		
Acris crepitans	x						
Acris gryllus		x	x				
Hyla chrysoscelis	x	x		x			
Hyla cinerea	x	x					
Pseudacris brachyphona	x	x	x	x			
Pseudacris crucifer				x			
Rana catesbeiana		x	x				
Rana clamitans		x	x	x			
Rana sphenocephala		x	x		x		
Gastrophryne carolinensis				x			
Salamanders							
Ambystoma maculatum		x	x				
Desmognathus conanti		x					
Eurycea guttolineata		x			x		
Plethodon glutinosus	x	x	x	x	x	x	
Plethodon ventralis					x		
Plethodon websteri		x	x	x	x		
Pseudotriton ruber					x		
Notophthalmus viridescens		x					

Turtles							
Apalone spinifer							x
Graptemys geographica							x
Graptemys nigrinoda							x
Graptemys pulchra							x
Pseudemys concinna							x
Terrapene carolina	x	x	x	x	x		
Trachemys scripta							x
Sternotherus minor							x
Lizards							
Anolis carolinensis	x	x	x		x	x	
Cnemidophorus sexlineatus			x				
Eumeces fasciatus					x		
Sceloporus undulatus		x	x				
Scincella lateralis	x	x	x		x	x	
Snakes							
Carphophis amoenus		x					
Coluber constrictor	x	x	x				
Diadophis punctatus		x	x		x		
Elaphe obsoleta		x					
Heterodon platirhinos			x	x			
Lampropeltis getula niger		x		x			
Nerodia sipedon							x
Opheodrys aestivus		x					
Storeria dekayi				x			
Storeria occipitomaculata	x	x	x				
Thamnophis sirtalis		x					
Agkistrodon contortrix	x	x			x		
Agkistrodon piscivorous							x
Crotalus horridus			x		x		
Total per community	12	27	19	12	14	3	8

Species Occurrence by Community Type and Frequency of Occurrence (FoO)

A. Dry-mesic Communities

Interior Longleaf Pine Woodland – (synonyms: Montane Longleaf Pine Forest)

Pinus palustris – Pinus echinata – (*Pinus virginiana*) / *Quercus marilandica* – (*Quercus prinus*) / *Vaccinium pallidum* Woodland	
Translated Name	Longleaf Pine – Shortleaf Pine – (Virginia Pine) / Blackjack Oak – (Chestnut Oak) / Lowbush Blueberry Woodland
Common Name	Montane Longleaf Pine Woodland

Frogs and Toads		**FoO**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad	0.35
Acris crepitans	northern cricket frog	0.05
Hyla chrysoscelis	Cope's gray treefrog	0.05
Hyla cinerea	green treefrog	0.05
Pseudacris brachyphona	mountain chorus frog	0.10
Salamanders		
Plethodon glutinosus	northern slimy salamander	0.05
Turtles		
Terrapene carolina	eastern box turtle	0.05
Lizards		
Anolis carolinensis	green anole	0.05
Scincella lateralis	little brown skink	0.10
Snakes		
Coluber constrictor	North American racer	0.05
Storeria occipitomaculata	red-bellied snake	0.05
Agkistrodon contortrix	copperhead	0.05

Fowler's toad was the most commonly observed species of the Interior Longleaf Pine Woodland. Presence of the six species of anurans indicates adequate embedded breeding sites within this community. No specific management recommendations are needed as this herpetofaunal suite is composed of primarily generalist species.

B. Mesic Communities

Upland Mixed Forest – (synonyms: pine-oak-hickory forest, southern mixed hardwoods)

Quercus prinus – Carya spp. – *Quercus velutina* / *Vaccinium arboreum* / *Iris verna* var. *smalliana* Forest	
Translated Name	Chestnut Oak – Hickory species – Black Oak / Tree Sparkleberry / Dwarf Vernal Iris Forest
Common Name	Lower Piedmont Chestnut Oak Forest

Frogs and Toads		**FoO**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad	0.05
Acris gryllus	southern cricket frog	0.04
Hyla chrysoscelis	Cope's gray treefrog	0.02
Hyla cinerea	green treefrog	0.01
Pseudacris brachyphona	mountain chorus frog	0.03
Rana (*Lithobates*) *catesbeiana*	American bullfrog	0.02
Rana (*Lithobates*) *clamitans*	bronze frog	0.09
Rana (*Lithobates*) *sphenocephala*	southern leopard frog	0.02
Salamanders		
Ambystoma maculatum	spotted salamander	0.03
Desmognathus conanti	spotted dusky salamander	0.01
Eurycea guttolineata	three-lined salamander	0.02
Notophthalmus viridescens	eastern newt	0.01
Plethodon glutinosus	northern slimy salamander	0.16
Plethodon websteri	Webster's salamander	0.12
Turtles		
Terrapene carolina	eastern box turtle	0.04
Lizards		
Anolis carolinensis	green anole	0.03
Sceloporus undulatus	eastern fence lizard	0.07
Scincella lateralis	little brown skink	0.08
Snakes		
Carphophis amoenus	eastern wormsnake	0.02
Coluber constrictor	North American racer	0.05
Diadophis punctatus	ring-necked snake	0.03
Elaphe obsoleta	gray ratsnake	0.02
Lampropeltis getula niger	black kingsnake	0.01
Opheodrys aestivus	rough greensnake	0.01
Storeria occipitomaculata	red-bellied snake	0.02
Thamnophis sirtalis	eastern garter snake	0.01
Agkistrodon contortrix	copperhead	0.02

Herpetofauna of the CRNWR is well represented in the UMF community. The two most abundant species (*Plethodon glutinosus* and *Plethodon websteri*) are both forest-dwelling,

woodland salamanders and their presence indicates stable mesic forest conditions with a well-developed forest floor of leaf litter. No specific management regarding the amphibian and reptile species is given although this community should not receive drastic restoration, if any.

Sand Laurel Oak Upland Forest

Quercus hemisphaerica – Quercus (*falcata, nigra*) / *Ilex opaca – Vaccinium arboreum* / *Cnidoscolus stimulosus* Forest	
Translated Name	Upland Laurel Oak – Oak (Southern Red, Water) / American Holly – Tree Sparkleberry / Tread-Softly Forest
Common Name	Sand Laurel Oak Upland Forest

Salamanders		**FoO**
Plethodon glutinosus	northern slimy salamander	0.20
Lizards		
Anolis carolinensis	green anole	0.20
Eumeces fasciatus	common five-lined skink	0.20
Sceloporus undulatus	eastern fence lizard	0.20
Scincella lateralis	little brown skink	0.20

Few species were recorded from this community type and its coverage on the refuge is small. The five recorded species are common and no management is needed.

Forest Plantations – (synonyms: planted forest, pine plantation).

Pinus taeda Planted Forest	
Translated Name	Loblolly Pine Planted Forest
Common Name	Loblolly Pine Plantation

Frogs and Toads		**FoO**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad	0.09
Acris gryllus	southern cricket frog	0.02
Pseudacris brachyphona	mountain chorus frog	0.05
Rana (*Lithobates*) *catesbeiana*	American bullfrog	0.02
Rana (*Lithobates*) *clamitans*	bronze frog	0.05
Rana (*Lithobates*) *sphenocephala*	southern leopard frog	0.02
Salamanders		
Ambystoma maculatum	spotted salamander	0.07
Plethodon glutinosus	northern slimy salamander	0.11
Plethodon websteri	Webster’s salamander	0.02
Turtles		
Terrapene carolina	eastern box turtle	0.07

Lizards		
Anolis carolinensis	green anole	0.07
Cnemidophorus (*Aspidoscelis*) *sexlineatus*	six-lined racerunner	0.02
Sceloporus undulatus	eastern fence lizard	0.11
Scincella lateralis	little brown skink	0.09
Snakes		
Coluber constrictor	North American racer	0.02
Crotalus horridus	timber rattlesnake	0.05
Diadophis punctatus	ring-necked snake	0.05
Heterodon platirhinos	eastern hognose snake	0.02
Storeria occipitomaculata	red-bellied snake	0.02

The amphibian and reptile diversity of this anthropogenic community would be due to an early successional stage, open spaces (presence of *Cnemidophorus sexlineatus*), and a mix of hardwood species. The monocultural plots of loblolly pine were less diverse, thus the richness of this community was found in the more heterogeneous sites. As the loblolly pine plantations are restored a shift in the herpetofaunal community should be seen. Herpetofaunal species observed tend to be generalists and common, thus no management recommendations are needed.

Pinus palustris Planted Forest	
Translated Name	Longleaf Pine Planted Forest
Common Name	Longleaf Pine Plantation

Frogs and Toads		**FoO**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad	0.36
Gastrophryne carolinensis	eastern narrow-mouthed toad	0.09
Hyla chrysoscelis	Cope's gray treefrog	0.06
Pseudacris brachyphona	mountain chorus frog	0.09
Pseudacris crucifer	spring peeper	0.03
Rana (*Lithobates*) *clamitans*	bronze frog	0.03
Salamanders		
Plethodon glutinosus	northern slimy salamander	0.09
Plethodon websteri	Webster's salamander	0.03
Turtles		
Terrapene carolina	eastern box turtle	0.09
Snakes		
Diadophis punctatus	ring-neck snake	0.03
Heterodon platirhinos	eastern hognose snake	0.03
Lampropeltis getula niger	black kingsnake	0.03
Storeria dekayi	Dekay's brownsnake	0.03

This anthropogenic community was in a very early successional stage with the most open canopy, and thus higher solar insolation, of any of the communities. Amphibians documented were along ecotones or at embedded pools. The interior of this community was often too hot and

dry for amphibians. As ecological restoration proceeds a shift in the herpetofauna should be noted.

C. Wet-mesic Communities

Bottomland and Floodplain Forests – (synonyms: bottomland hardwoods, river bottoms, seasonally flooded basins or flats, second bottom, levee forest, river terrace).

Fagus grandifolia – Quercus alba / *Kalmia latifolia – Rhododendron canescens – Symplocos tinctoria* Forest	
Translated Name	Beech – White Oak / Mountain Laurel – Hoary Azalea – Horse Sugar Forest
Common Name	White Oak – Beech Small Stream Floodplain Forest

Frogs and Toads		**FoO**
Bufo (*Anaxyrus*) *fowleri*	Fowler's toad	0.05
Rana (*Lithobates*) *sphenocephala*	southern leopard frog	0.07
Salamanders		
Eurycea guttolineata	three-lined salamander	0.02
Plethodon glutinosus	northern slimy salamander	0.12
Plethodon ventralis	southern zigzag salamander	0.02
Plethodon websteri	Webster's salamander	0.05
Pseudotriton ruber	red salamander	0.02
Turtles		
Terrapene carolina	eastern box turtle	0.02
Lizards		
Anolis carolinensis	green anole	0.12
Eumeces fasciatus	common five-lined skink	0.07
Scincella lateralis	little brown skink	0.07
Snakes		
Carphophis amoenus	eastern wormsnake	0.02
Diadophis punctatus	ring-necked snake	0.15
Nerodia sipedon pleuralis	midland watersnake	0.02
Agkistrodon contortrix	copperhead	0.02
Crotalus horridus	timber rattlesnake	0.05

The Bottomland and Floodplain Forest host a relatively diverse herpetofaunal community. Salamander fauna includes both strictly terrestrial, forest floor-dwelling species, and those that have an aquatic larval stage. This is a relatively stable community as evidenced by the dominance of hardwood species. Little, if any, ecological management is recommended.

D. Hydric Communities

River

Turtles		**FoO**
Apalone spinifera	spiny softshell	0.02
Graptemys geographica	northern map turtle	0.01
Graptemys nigrinoda	black-knobbed sawback	0.01
Graptemys pulchra	Alabama map turtle	0.18
Pseudemys concinna	river cooter	0.72
Sternotherus minor peltifer	stripe-necked musk turtle	0.01
Trachemys scripta	pond slider	0.03
Snakes		
Nerodia sipedon pleuralis	midland watersnake	0.01
Agkistrodon piscivorous	cottonmouth	0.01

No management is recommended pertaining to the river other than to maintain the integrity of the channel, logs for bask sites, shoals, beds of aquatic vegetation, and riparian zone. Any enhancement of the molluscan fauna, both gastropods and unionids, will be beneficial to the turtle fauna. Snake killers should be arrested and prosecuted.

Species Accounts

Bufo fowleri (Anaxyrus fowleri)
Fowler's toad

Fowler's toad is a common, wide-ranging species that occupies a variety of habitats. Breeding takes place in the summer and the long string of eggs may be laid in nearly any type of water body from small ponds to riverine shallows. Adults are terrestrial and easily identified by their chubby appearance, dry skin, and presence of large parotid glands located anterio-dorsally. The call of the male is a short, nasally trill. The gray throat of males is a diagnostic character for sexual determination of individuals.

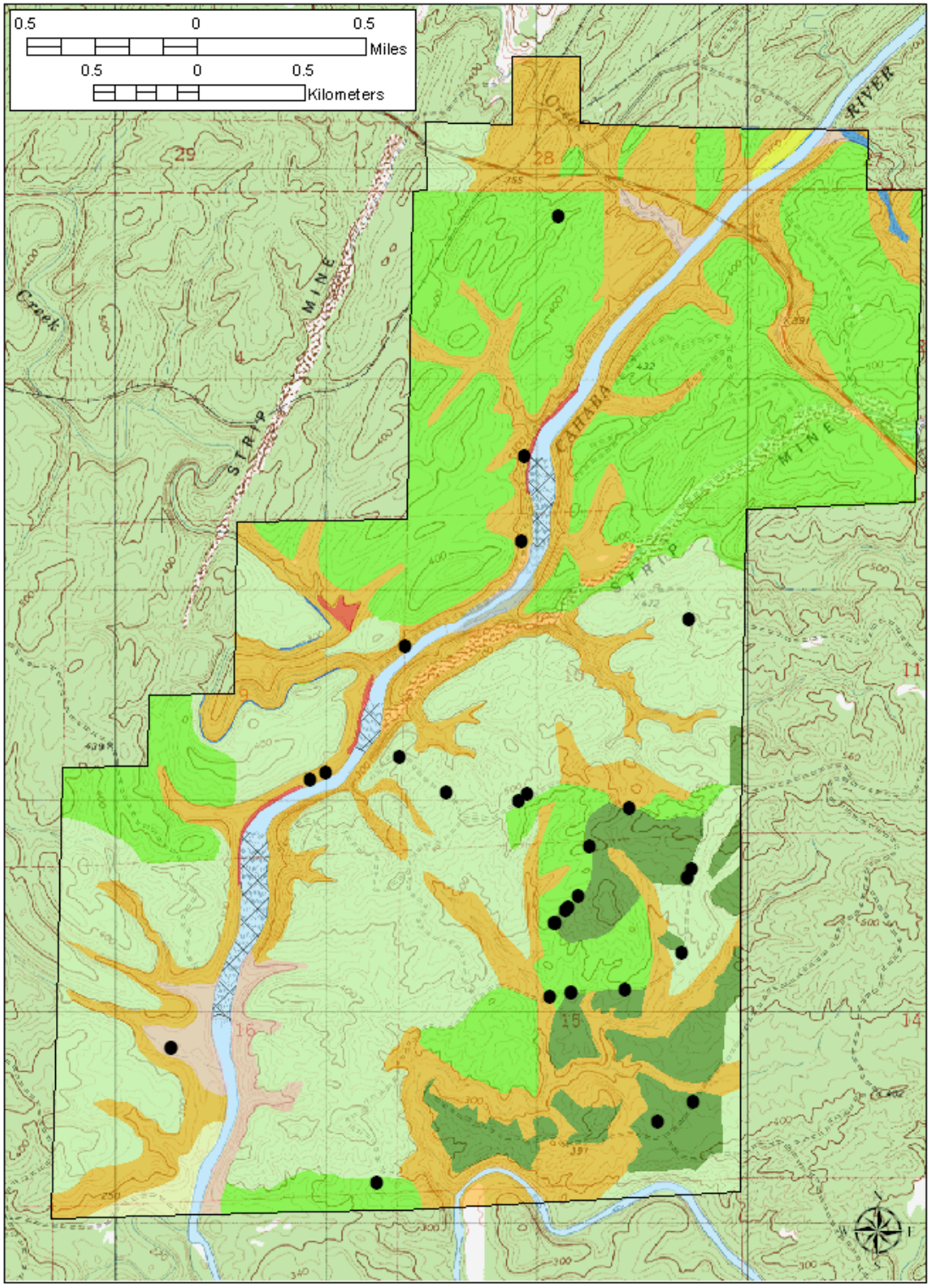
Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; wide-ranging and common species.

Male Fowler's toad on the left and female on the right; note the larger body size of the female. Coloration of Fowler's toads is quite variable and not sexually dimorphic. In this instance the female is of more typical coloration and pattern than the male.

Fowler's toad (*Bufo fowleri*) observations on the Cahaba River National Wildlife Refuge.



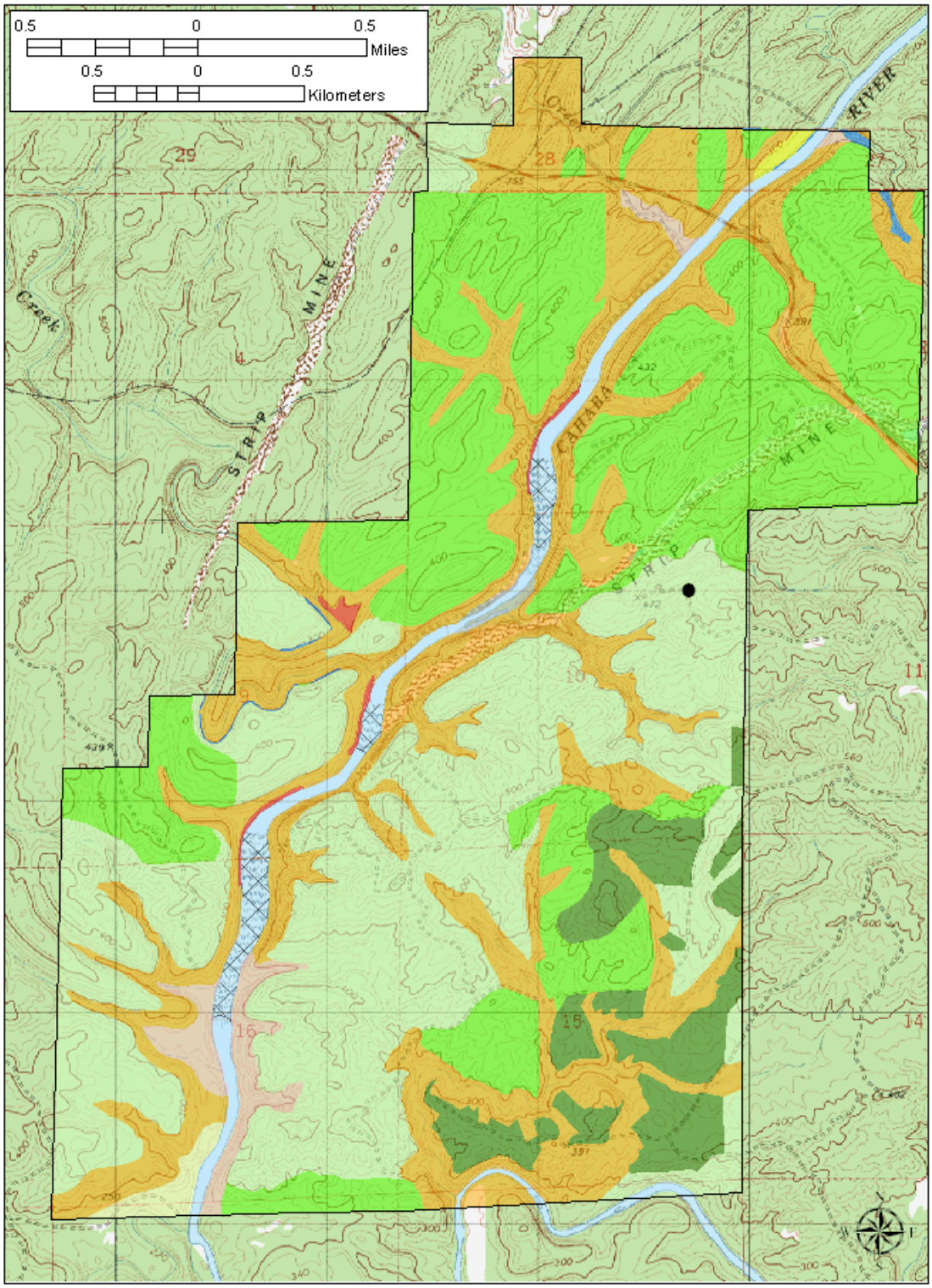
Acris crepitans
northern cricket frog

Acris crepitans is often common along stream margins and pond edges. This is a small summer-breeding frog reaching a maximum length of 35 mm. Dorsal coloration ranges from gray to dark brown and the dorsal surface tends to be warty, more so than in *Acris gryllus*. The thigh stripe, if present, has a ragged edge. The call is a clicking, repetitive, "gik, gik, gik,…". The call of *A. crepitans* is virtually indistinguishable from that of *A. gryllus* except for having a more rapid rate of repetition.

Habitat association (ponds within):
Montane Longleaf Pine Woodland

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Northern cricket frog (*Acris crepitans*) observations on the Cahaba River National Wildlife Refuge.



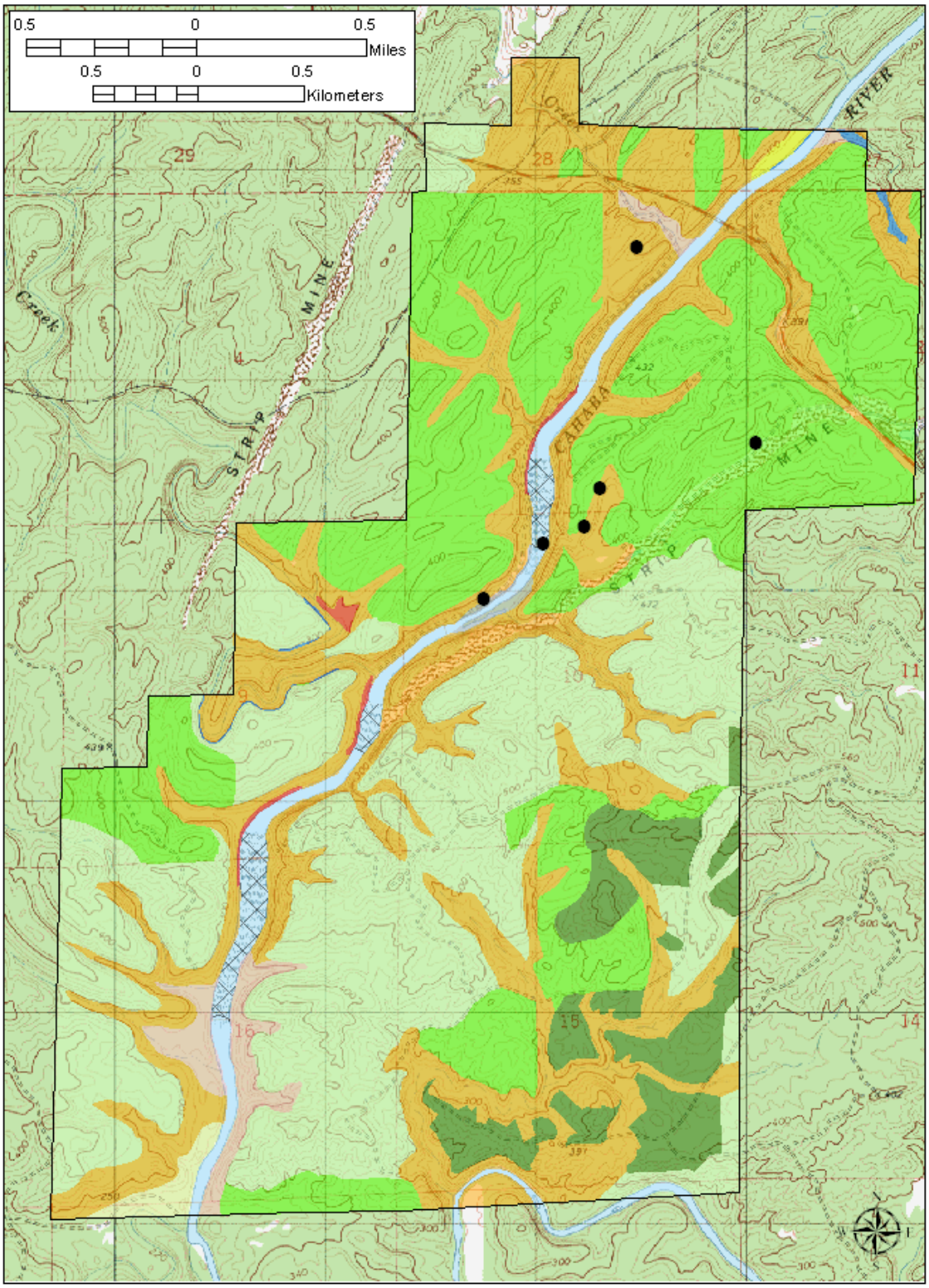
Acris gryllus
southern cricket frog

Two species of cricket frogs occur in Alabama, the northern cricket frog (*Acris crepitans*) and the southern cricket frog (*Acris gryllus*) and the species may be difficult to identify. All cricket frogs examined on the Cahaba River National Wildlife Refuge have been considered to be *A. gryllus* based on post-femoral patterns (Mount 1975, pg. 35, Fig. 20). Cricket frogs are small and occupy edges of ponds and streams, often escaping into the water when disturbed. A summer breeder, males give a characteristic repeated, single-note, clicking call while along shore lines or on floating vegetation.

Habitat associations (ponds or streams within):
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Southern cricket frog (*Acris gryllus*) observations on the Cahaba River National Wildlife Refuge.



Hyla chrysoscelis
Cope's gray treefrog

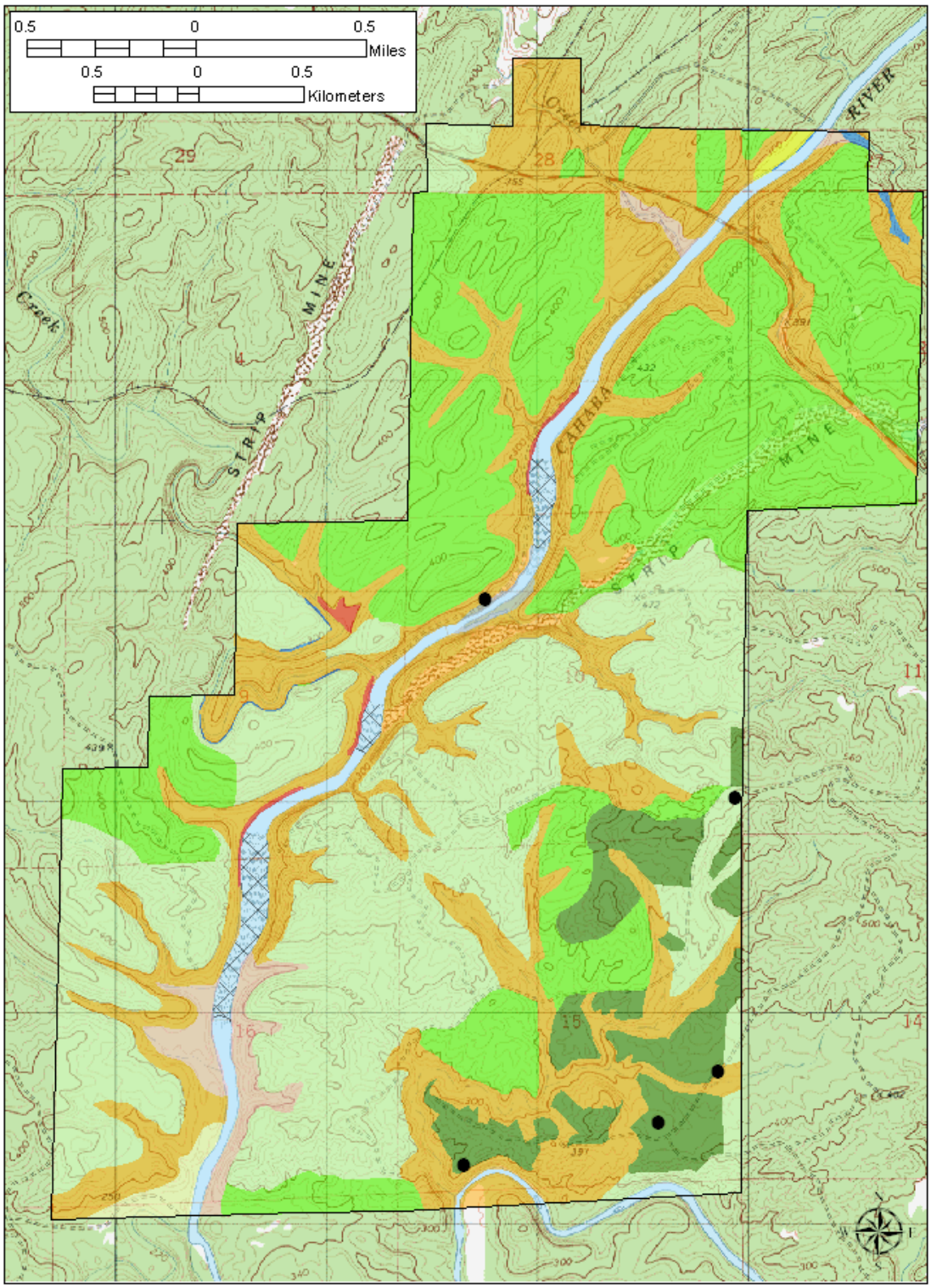
Cope's gray treefrog is an arboreal species with a summer-breeding activity period. As with other treefrogs this species has expanded toe pads that facilitate its arboreal activity. *H. chrysoscelis* has a light-gray dorsum mottled with darker gray splotches and post-femoral yellow spots typically covered by the lower leg when resting. Males possess a darker throat pouch than females and the call is a short, explosive trill. Temporary ponds to semi-permanent pools are utilized as breeding sites.

Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Longleaf Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Cope's gray treefrog (*Hyla chrysoscelis*) observations on the Cahaba River National Wildlife Refuge.



Hyla cinerea
green treefrog

As their name implies green treefrogs are primarily green; a conspicuous white to yellowish lateral line runs from beneath the tip of the snout along the side of the body to the rear legs. This is one of the larger treefrogs and a summer breeder that uses ponds and pools for egg deposition. Male *H. cinerea* have darker throats than females and the call is a single nasally "quank" repeated at a one to two second interval.

Habitat association:
Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

No map available: Documented during bioblitz but locality not provided.

Pseudacris brachyphona
mountain chorus frog

Pseudacris brachyphona is a winter-breeding amphibian with the breeding season typically beginning in late November or December and extending into April. This small terrestrial frog breeds in temporary pools often in flooded ruts. The call is a raspy "wrink, wrink, wrink". Outside of the breeding period *P. brachyphona* is seldom seen.

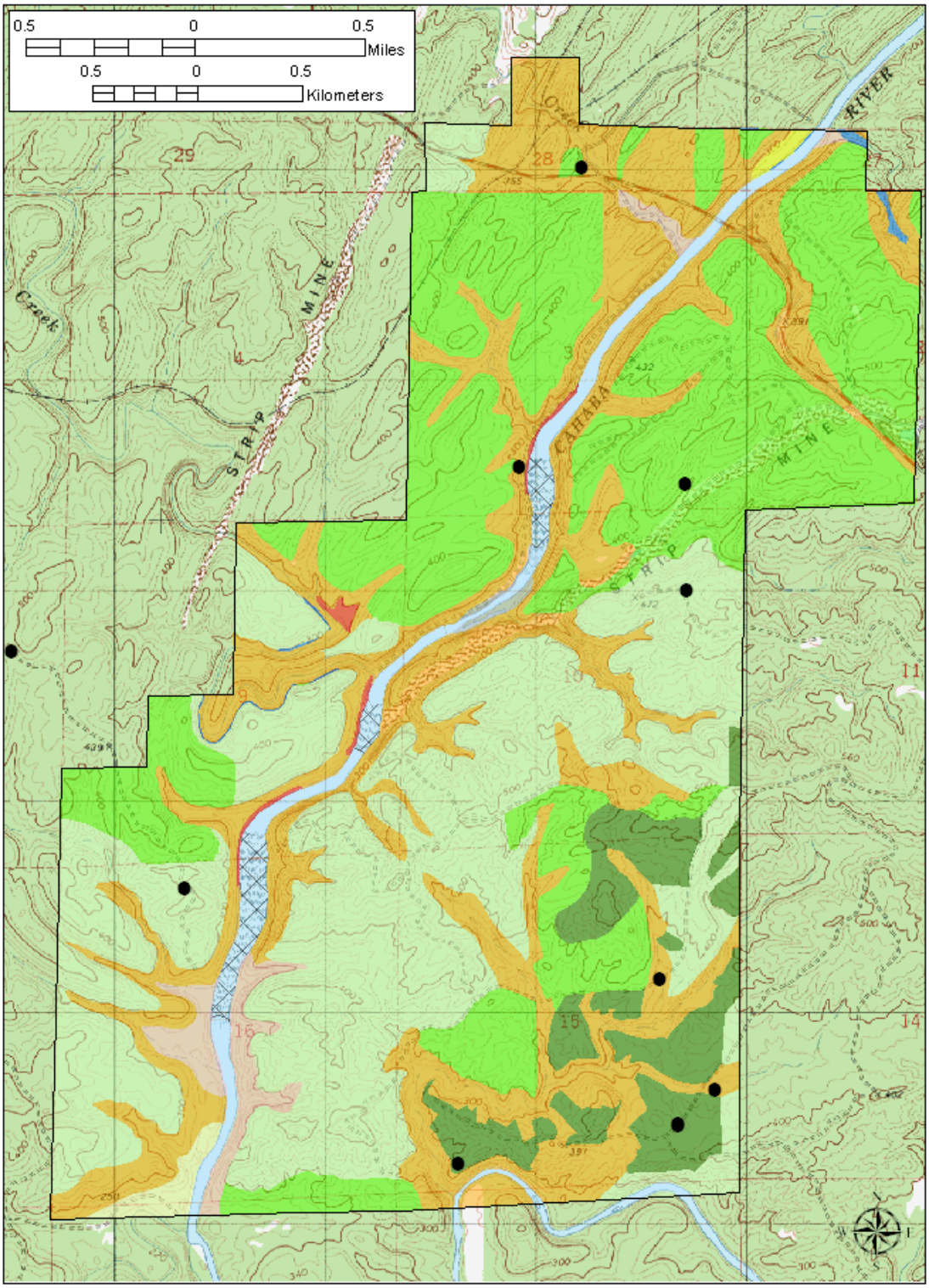
Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation

Management recommendations: None; wide-ranging and common species.

Examples of the mountain chorus frog, both males.

Mountain chorus frog (*Pseudacris brachyphona*) observations on the Cahaba River National Wildlife Refuge.



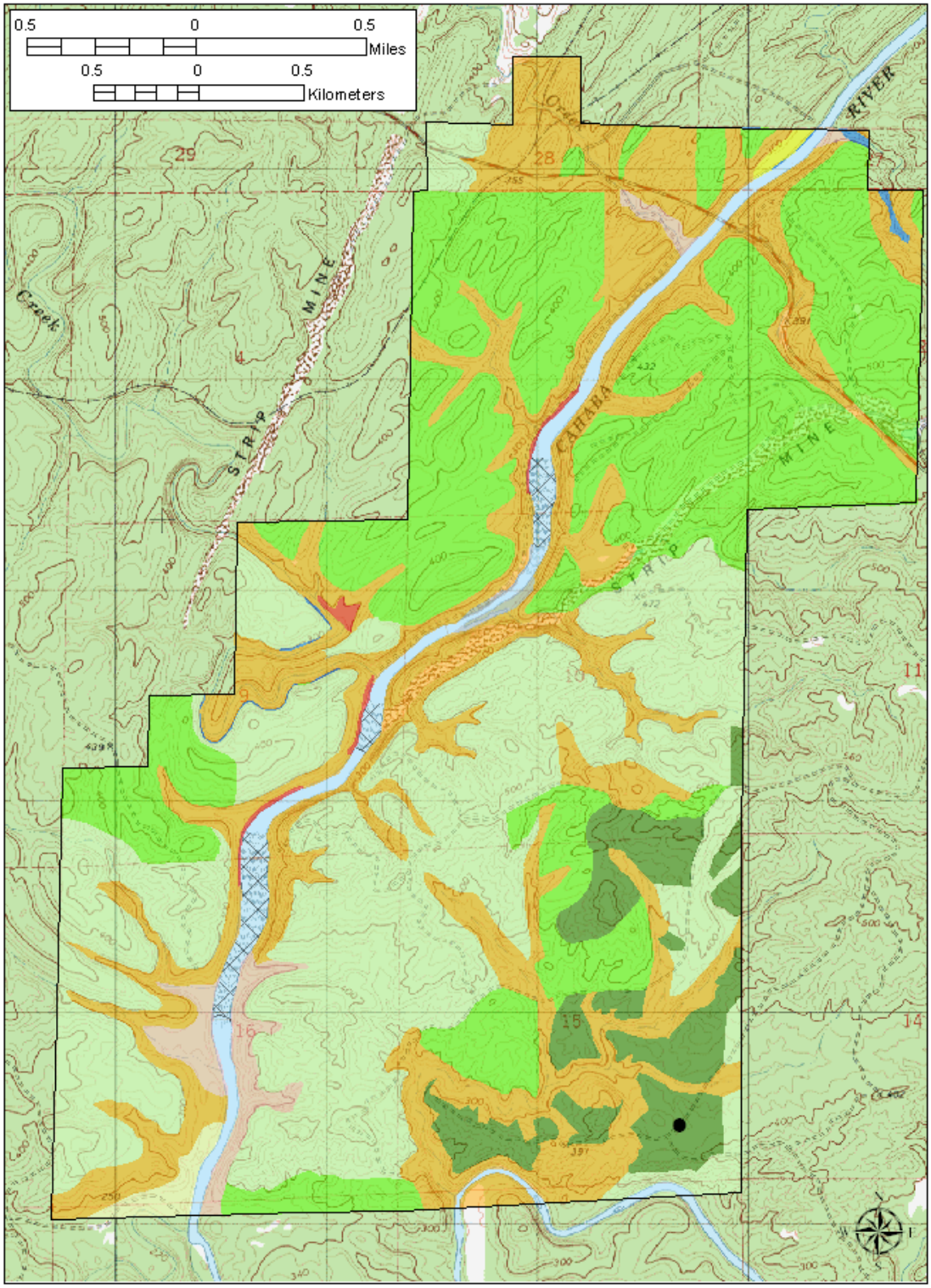
Pseudacris crucifer
spring peeper

The spring peeper is another winter-breeding amphibian, often found at temporary or semi-permanent pools alongside *P. brachyphona*. Call of male *P. crucifer* is a high-pitched whistle or peep with a slight slur at the end, and is normally given while the male is perched in low vegetation or in a clump of grass. *P. crucifer* is a small frog and identifiable by the dark X-shaped mark on the dorsum; ground color of the frog is a tan or light brown.

Habitat association:
Longleaf Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Spring peeper (*Pseudacris crucifer*) observations on the Cahaba River National Wildlife Refuge.



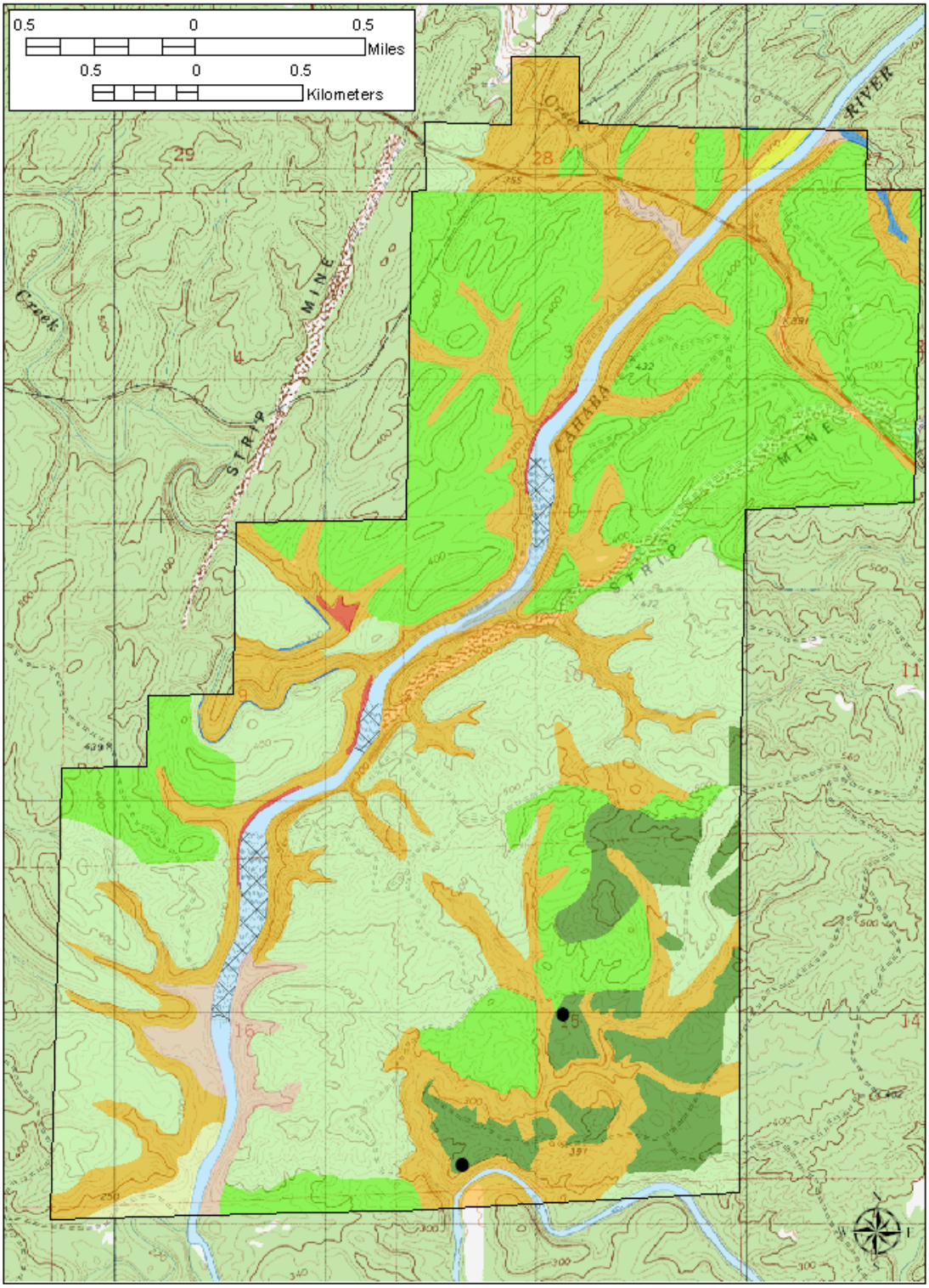
Gastrophryne carolinensis
eastern narrow-mouthed toad

The eastern narrow-mouth toad is an odd little frog with variable dullish coloration, a pudgy body, pointed snout, and a roll of loose skin behind the head. *G. carolinensis*, being a burrower, is seldom encountered outside of the summer breeding season. Males call with a high-pitched, nasally, drawn-out, "waaaahhh" while concealed within grass clumps or debris; breeding sites range from flooded ruts and pools to ponds and lakes.

Habitat association:
Longleaf Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Eastern narrow-mouthed toad (*Gastrophryne carolinensis*) observations on the Cahaba River National Wildlife Refuge.



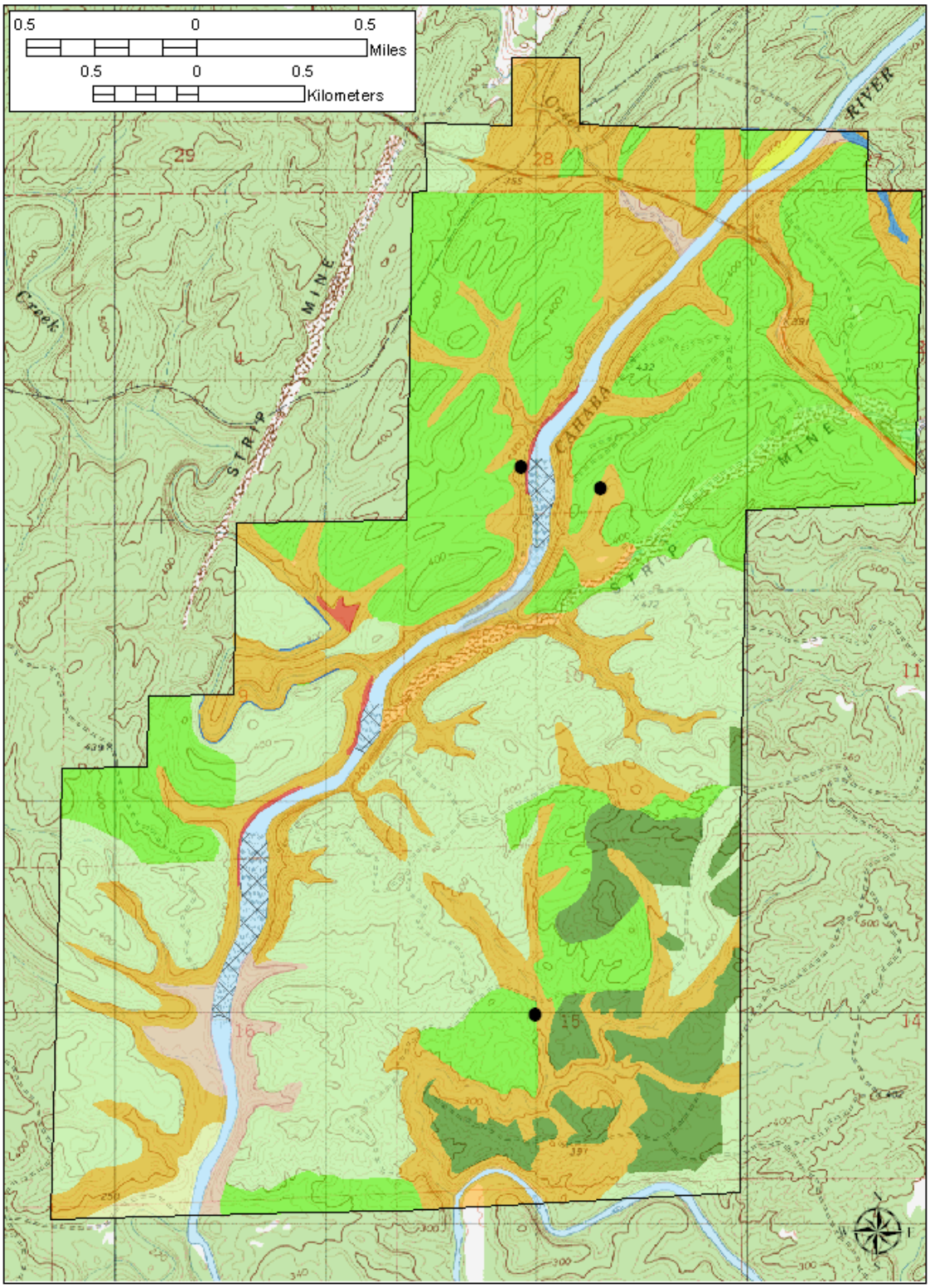
***Rana catesbeiana* (*Lithobates catesbeianus*)**
American bullfrog

The American bullfrog is one of the largest frogs of North America, ranges throughout Alabama, and is found in a variety of habitats. *R. catesbeiana* tends to be brownish to greenish in coloration with dark, obscure markings. Bullfrogs are often commonly seen around water bodies during the warmer months of the year.

Habitat association:
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

American bullfrog *Rana catesbeiana* (*Lithobates catesbeianus*) observations on the Cahaba River National Wildlife Refuge.



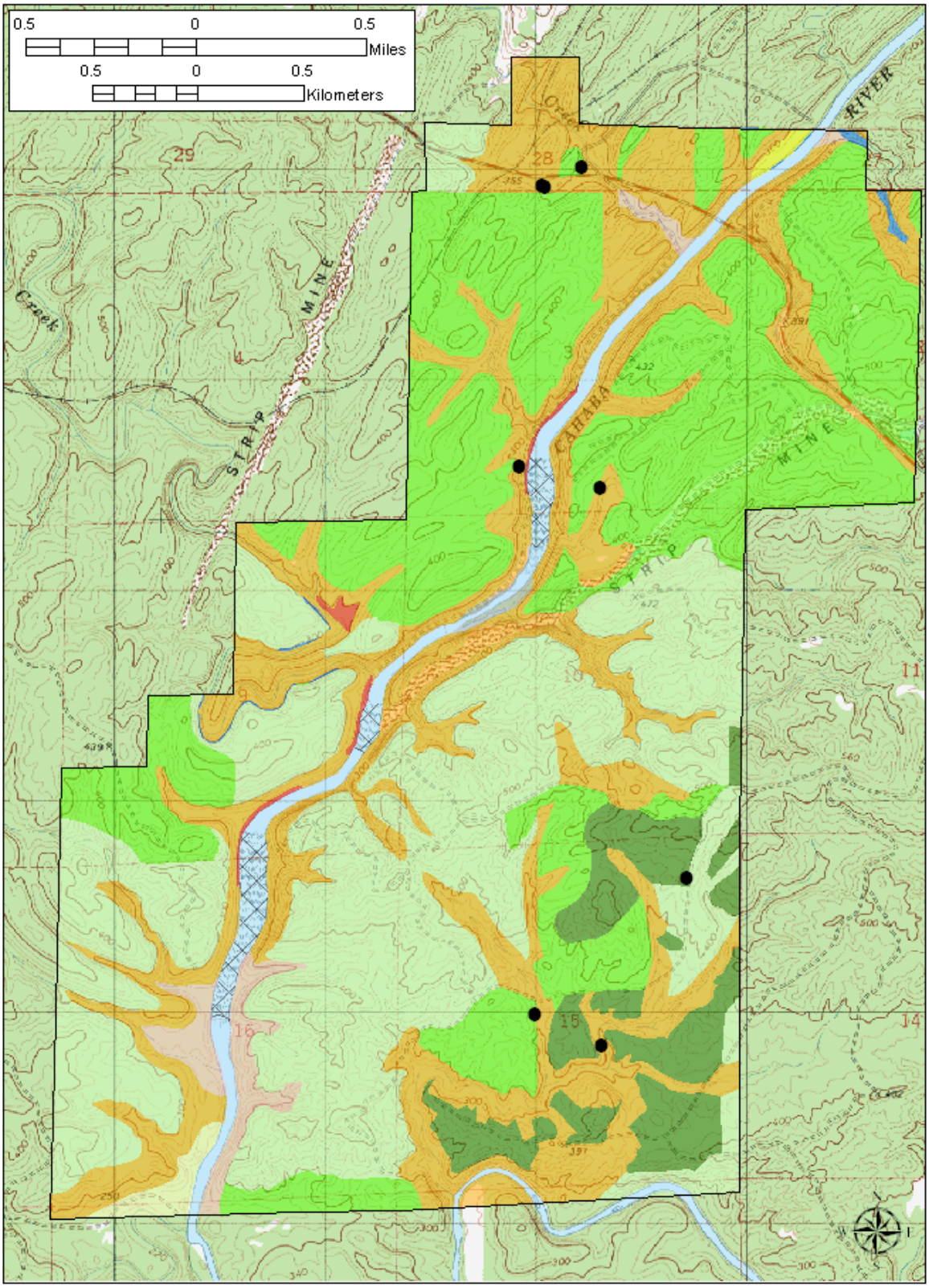
***Rana clamitans* (*Lithobates clamitans*)**
bronze frog

Rana clamitans superficially resembles *R. catesbeiana* in shape and coloration but is smaller and possesses dorsolateral ridges, a fold of skin running along the side of the frog from behind the eye to the rear legs. Bronze frogs are a frog of the smaller streams and riverine tributaries of the river. The call of the male of this summer-breeding species is an explosive "twang".

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation

Management recommendations: Maintain or improve water quality of lower order streams; common species.



Bronze frog *Rana clamitans* (*Lithobates clamitans*) observations on the Cahaba River National Wildlife Refuge.

***Rana sphenocephala* (*Lithobates sphenocephalus*)**
southern leopard frog

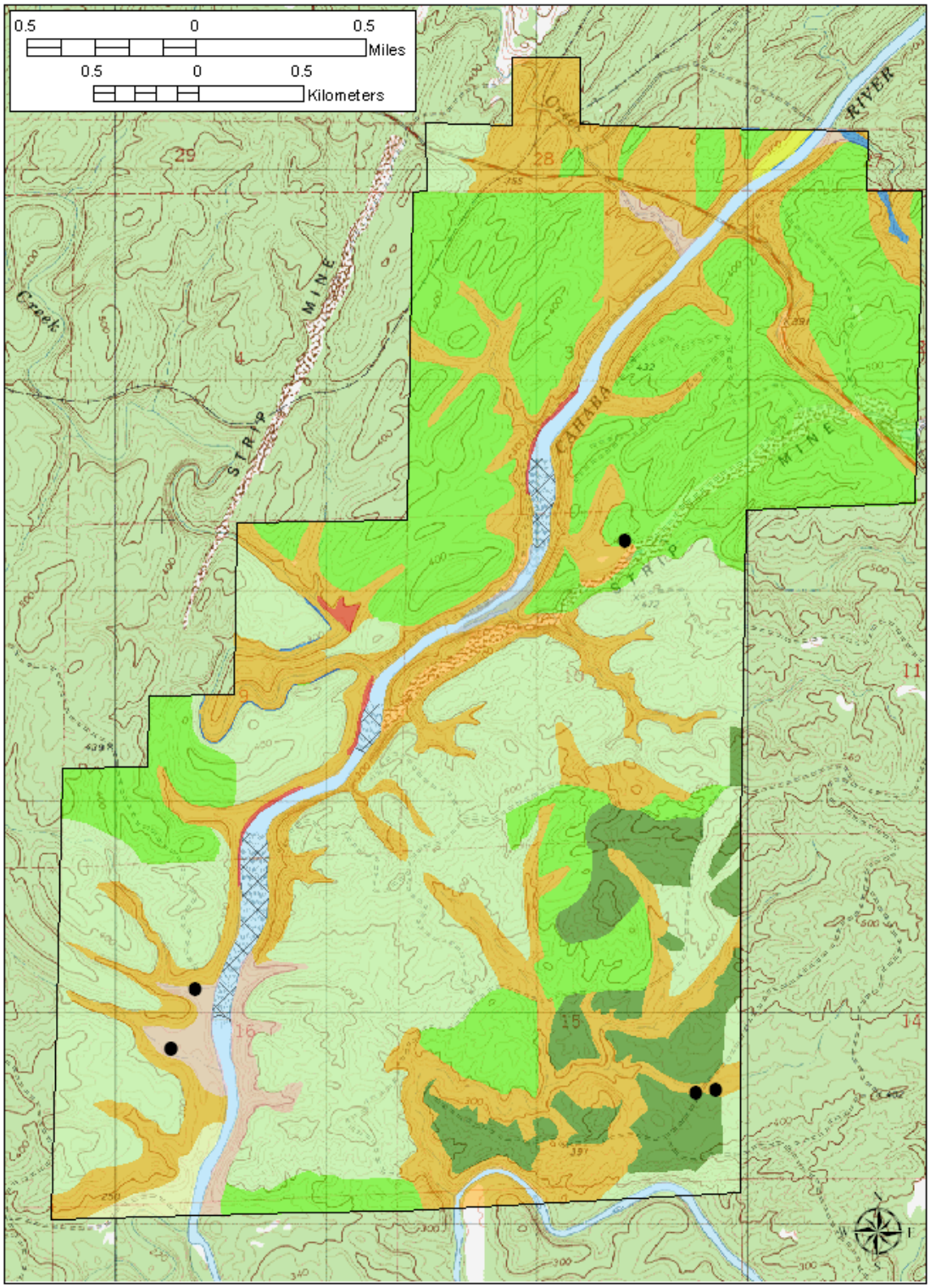
The southern leopard frog is common throughout the southeastern United States. This frog breeds in permanent to semi-permanent pools and ponds during the late winter to early spring; the call of the male is a low "chuckle". Outside of the breeding season leopard frogs may be seen inhabiting ecotonal pond edges and small streams and tributaries. *R. sphenocephala* is a medium-sized spotted frog with dorsolateral ridges; ground coloration is tan to light brown.

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; wide-ranging and common species.

Southern leopard frog *Rana sphenocephala* (*Lithobates sphenocephala*) observations on the Cahaba River National Wildlife Refuge.



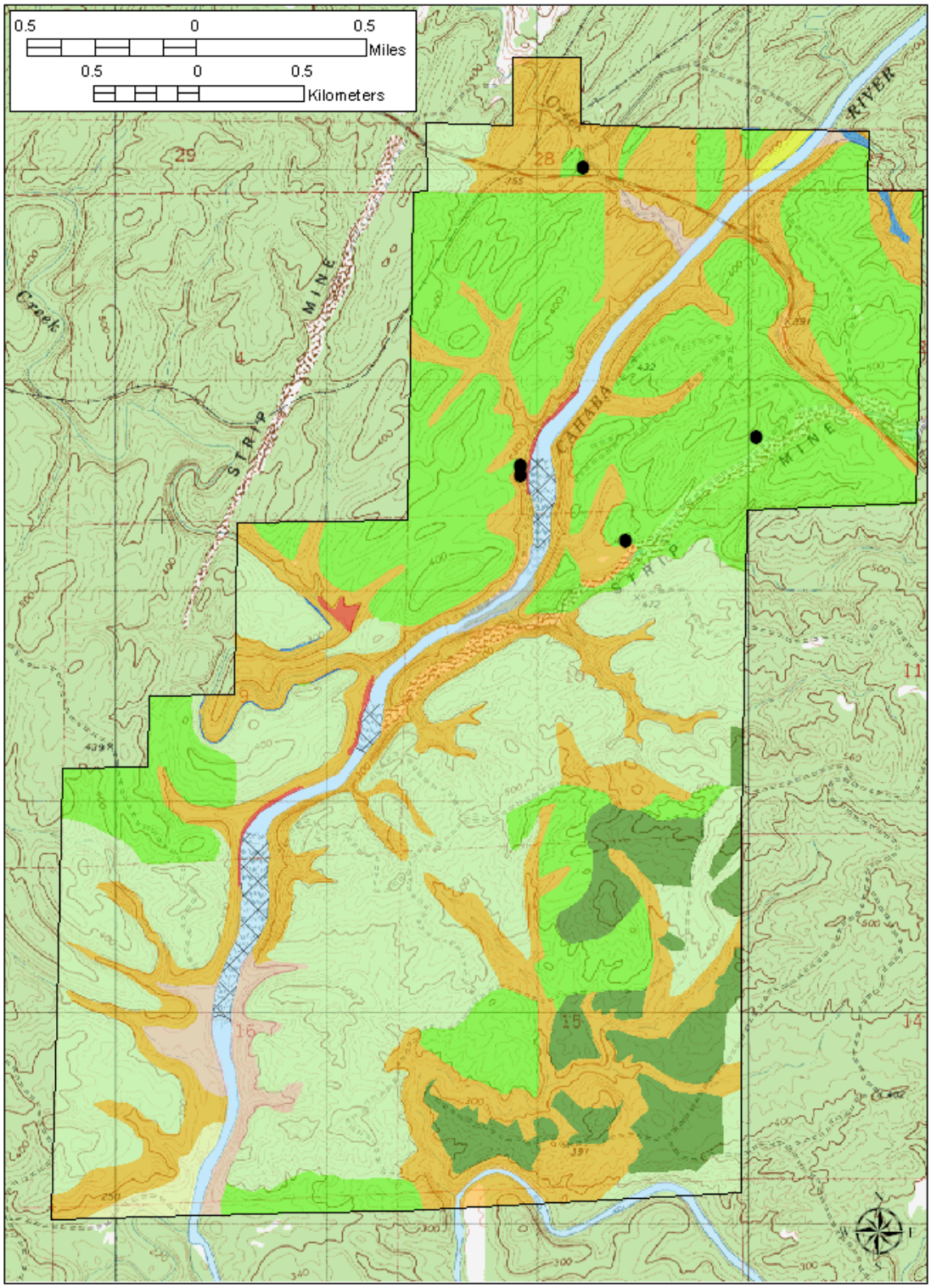
Ambystoma maculatum
spotted salamander

Ambysotma maculatum is a distinctive salamander having typically two rows of large yellow to orange spots along the back. Overall coloration of adults is dark gray to black. Spotted salamanders breed from December to February and egg masses are large, firm, globular, and often attached to stems or twigs in ephemeral ponds and pools. *A. maculatum* ranges throughout the eastern United States.

Habitat associations:
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation

Management recommendations: None; wide-ranging and common species.

Spotted salamander (*Ambystoma maculatum*) observations on the Cahaba River National Wildlife Refuge.



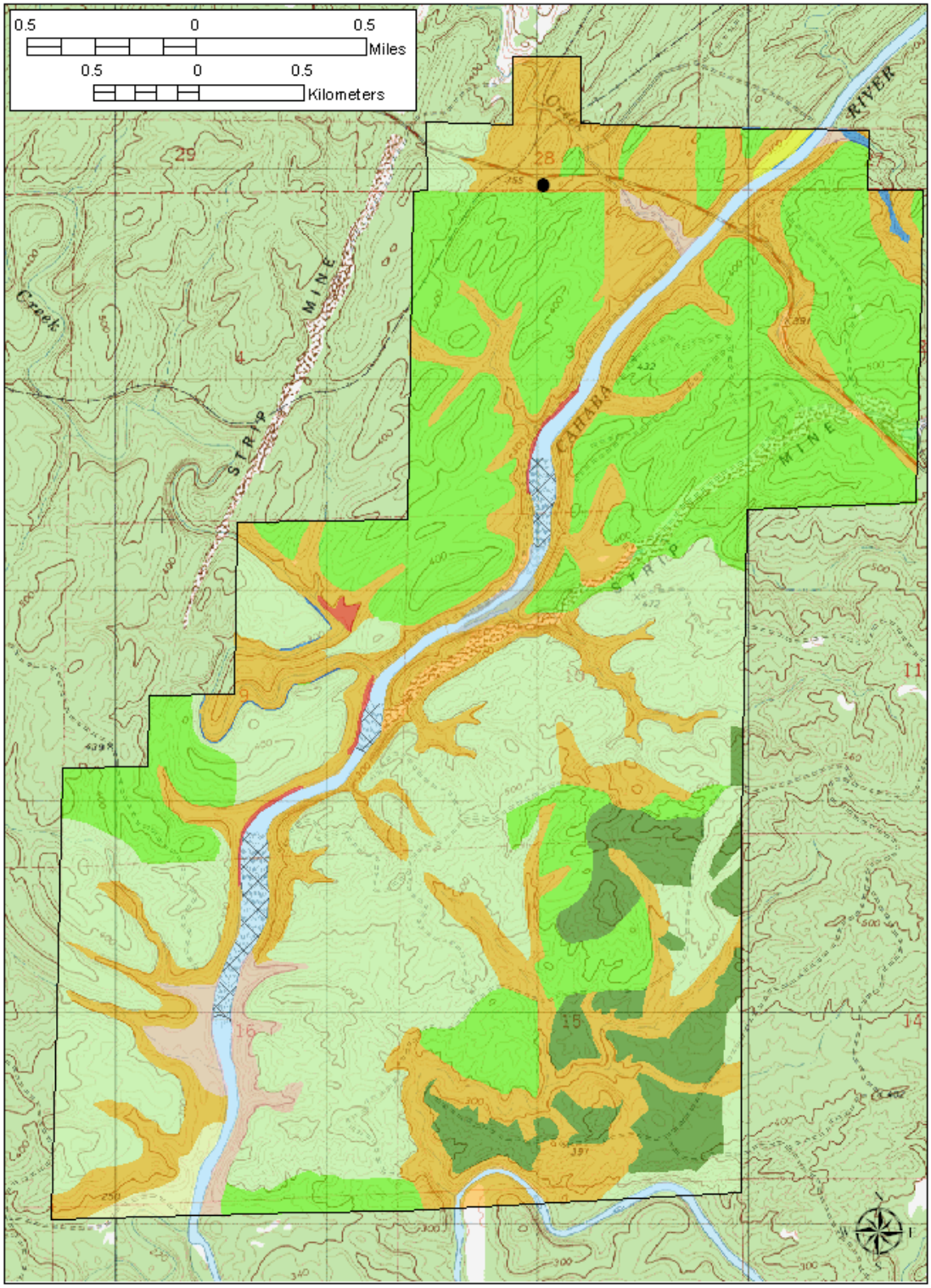
Desmognathus conanti
spotted dusky salamander

Dusky salamanders as a rule tend to be difficult to identify as general coloration tends to be a muted tan, brown, or gray with no distinctive pattern. *D. conanti* generally has six to eight pair of golden or reddish-golden spots that may be separate or fused. The venter is mottled with black and white flecks. This is a semi-aquatic salamander of streams; larvae are aquatic. Range of the spotted dusky salamander is the southeastern United States.

Habitat association:
Lower Piedmont Chestnut Oak Forest

Management recommendations: Maintain or improve water quality of lower order streams; common species.

Spotted dusky salamander (*Desmognathus conanti*) observations on the Cahaba River National Wildlife Refuge.



Desmognathus monticola
seal salamander

The seal salamander has a primarily Appalachian Mountain chain distribution the terminus of which is in central Alabama. Like the spotted dusky salamander the seal salamander is non-descript but more strongly patterned on the dorsum with black or dark brown markings. The overall coloration is tan, gray, or light brown. *D. monticola* usually has a sharp separation between the dorsal and ventral coloration. Larvae are aquatic while adults are semi-aquatic, occupying margins of small streams and creeks.

Habitat association: Recorded during bioblitz, exact locality and habitat unreported.

Management recommendations: Maintain or improve water quality of lower order streams; common species.

No map available: Documented during bioblitz and documentation locality not provided.

Eurycea cirrigera
southern two-lined salamander

The southern two-lined salamander ranges throughout the southeastern United States. This is a small colorful salamander with a yellowish to golden dorsum and a pair of black parallel stripes running the length of the body. Space between the stripes is dotted with small black spots. *E. cirrigera* is a semi-aquatic to terrestrial species as an adult. Aquatic larvae live in small streams and woodland pools.

Habitat association: Recorded during bioblitz, exact locality and habitat unreported.

Management recommendations: Maintain or improve water quality of lower order streams; common species.

No map available: Documented during bioblitz and documentation locality not provided.

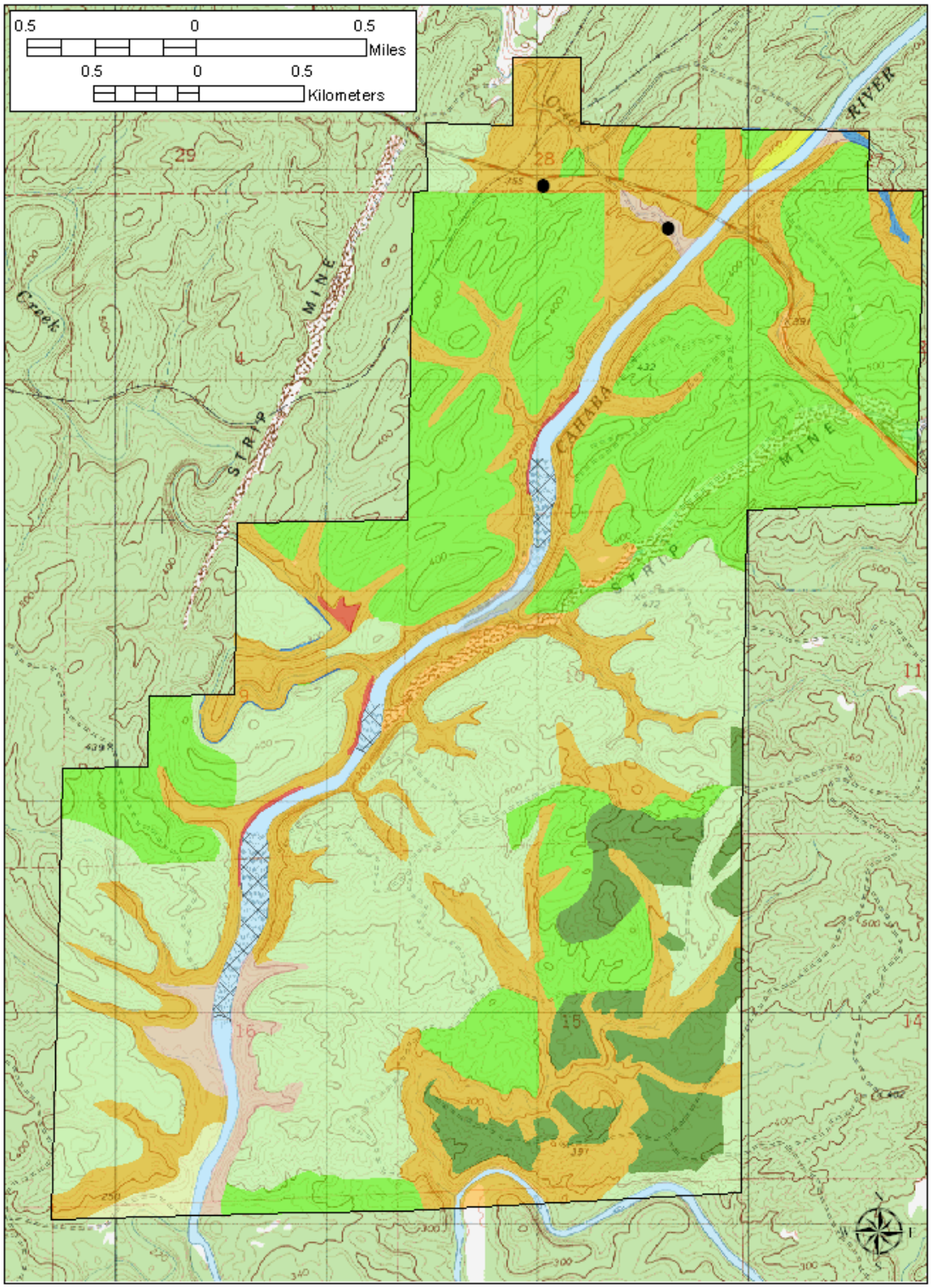
Eurycea guttolineata
three-lined salamander

Eurycea guttolineata is similar to *E. cirrigera* in occupancy of habitats, both adult and larval, and in general appearance. The three-lined salamander differs from the two-lined salamander in having a third central black stripe on the dorsum, and a longer tail. The sides of the three-lined salamander are black with this coloration continuing on to the tail, and the ground color tends to be more yellow and less golden.

Habitat associations:
Lower Piedmont Chestnut Oak Forest
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: Maintain or improve water quality of lower order streams; common species.

Three-lined salamander (*Eurycea guttolineata*) observations on the Cahaba River National Wildlife Refuge.



Plethodon glutinosus
northern slimy salamander

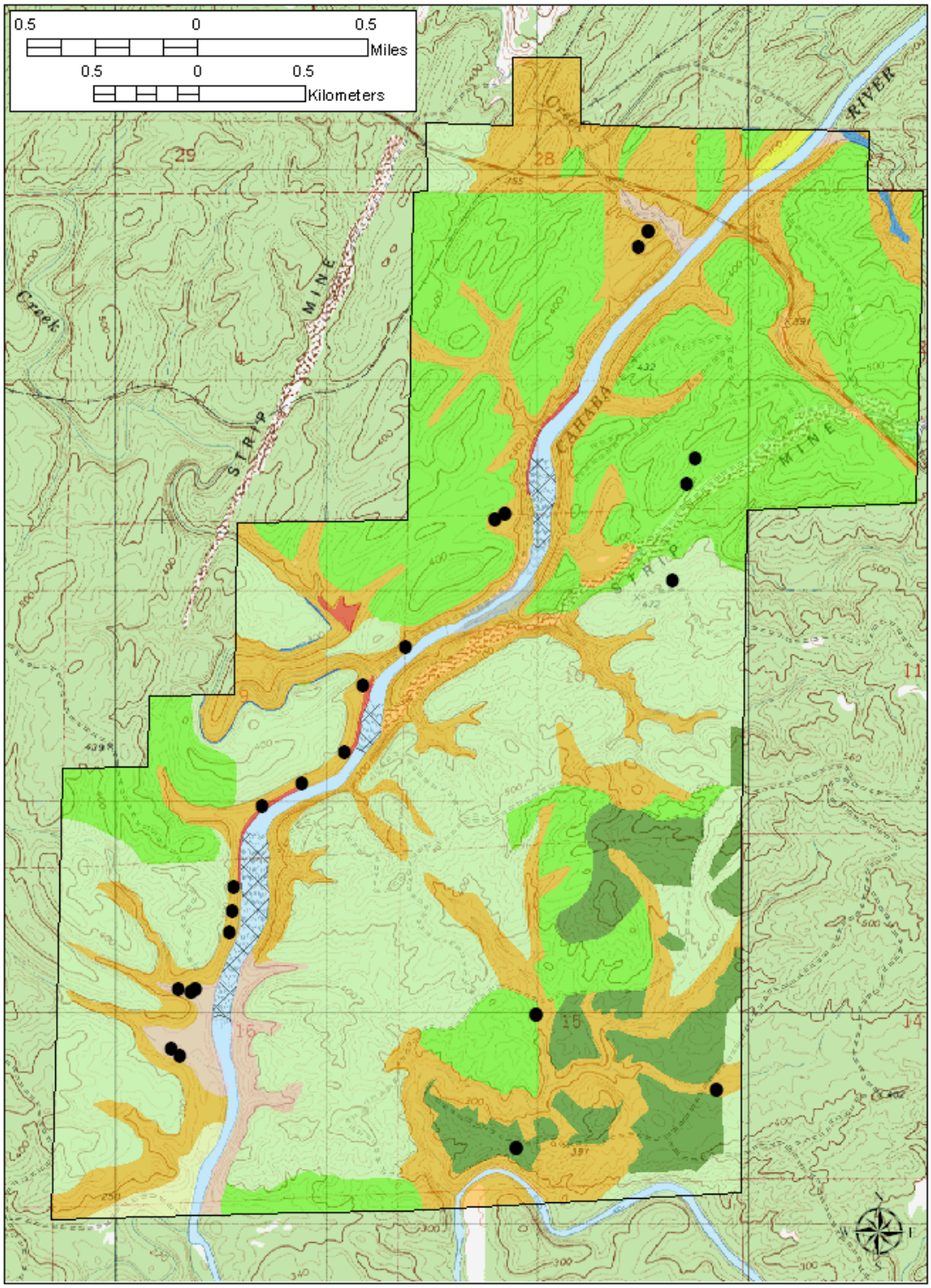
Plethodon glutinosus is perhaps the most common woodland salamander of the southeastern United States. This species is easily recognizable being black with an overall scattering of small white spots. A captured slimy salamander held in the hand will leave a sticky mucous secretion on the hands of the captor. Slimy salamanders are completely terrestrial with larvae undergoing direct development in the eggs.

Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation
White Oak – Beech Small Stream Floodplain Forest
Sand Laurel Oak Upland Forest

Management recommendations: None; common species.

Northern slimy salamander (*Plethodon glutinosus*) observations on the Cahaba River National Wildlife Refuge.



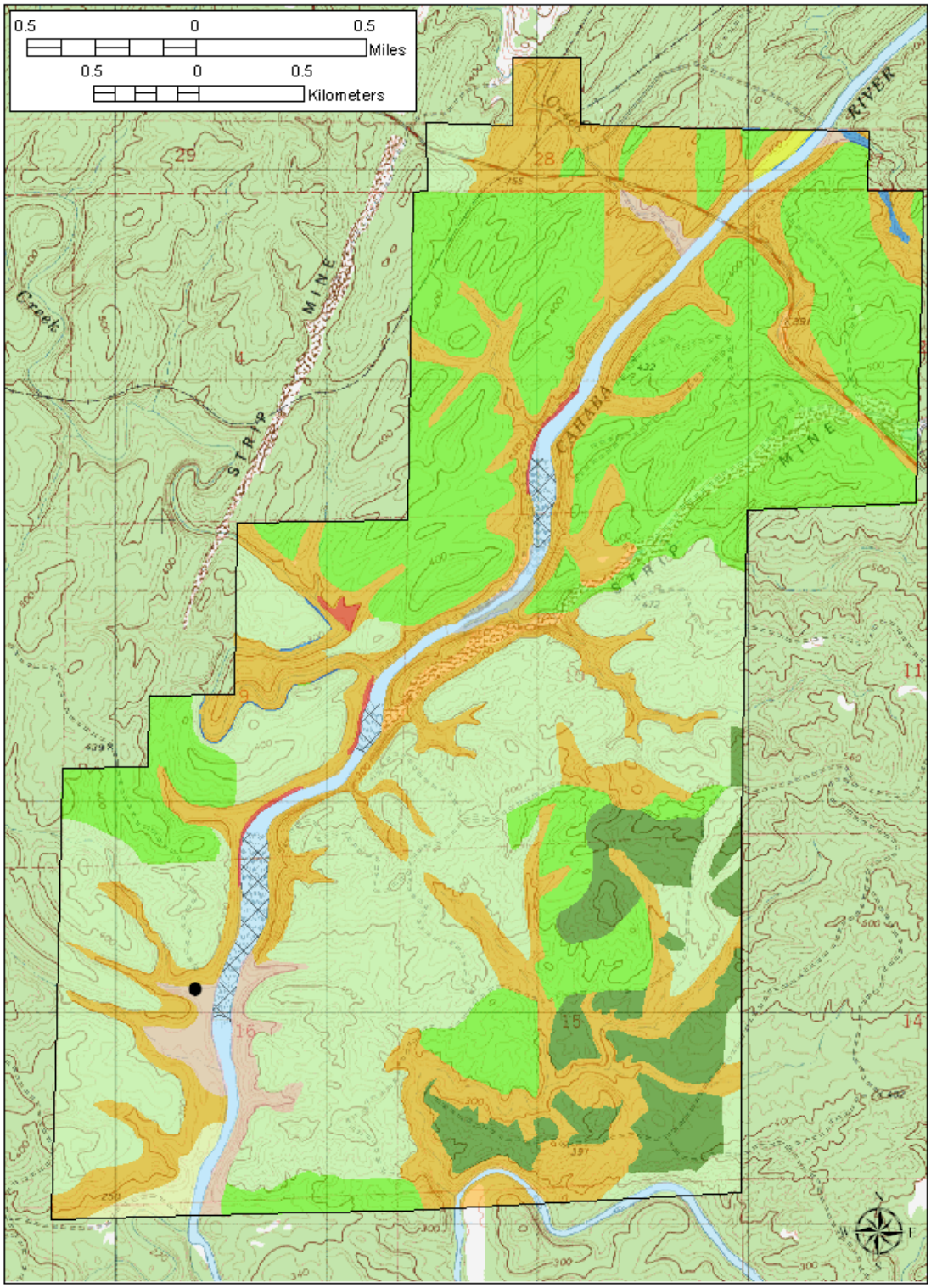
Plethodon ventralis
southern zigzag salamander

The southern zigzag salamander is a terrestrial woodland species and larvae develop directly within the egg. *Plethodon ventralis* has a grayish body and may be unicolor or with a reddish mid-dorsal, even-edged stripe. Only two individuals have been collected at the Cahaba River National Wildlife Refuge and both lacked the dorsal stripe.

Habitat association:
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None.

Southern zigzag salamander (*Plethodon ventralis*) observations on the Cahaba River National Wildlife Refuge.



Plethodon websteri
Webster's salamander

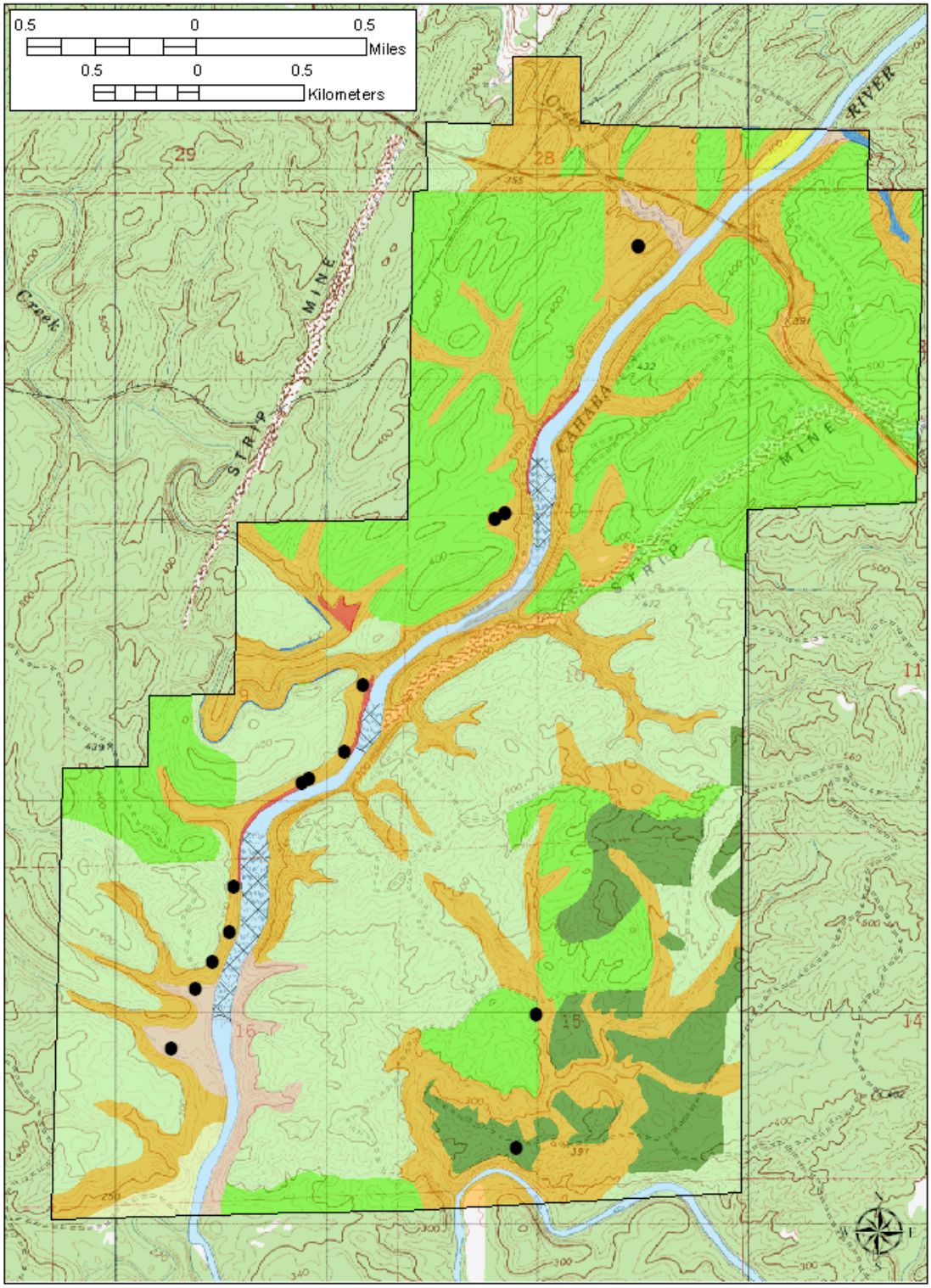
Plethodon websteri is similar in appearance to *P. ventralis* in size and coloration except that the reddish-dorsal stripe has an uneven edge. Webster's salamander is another terrestrial, woodland species in which the larvae undergo direct development in the egg. During the early spring this is one of the most commonly encountered species of the mesic hardwood forests.

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; common species.

Webster's salamander (*Plethodon websteri*) observations on the Cahaba River National Wildlife Refuge.



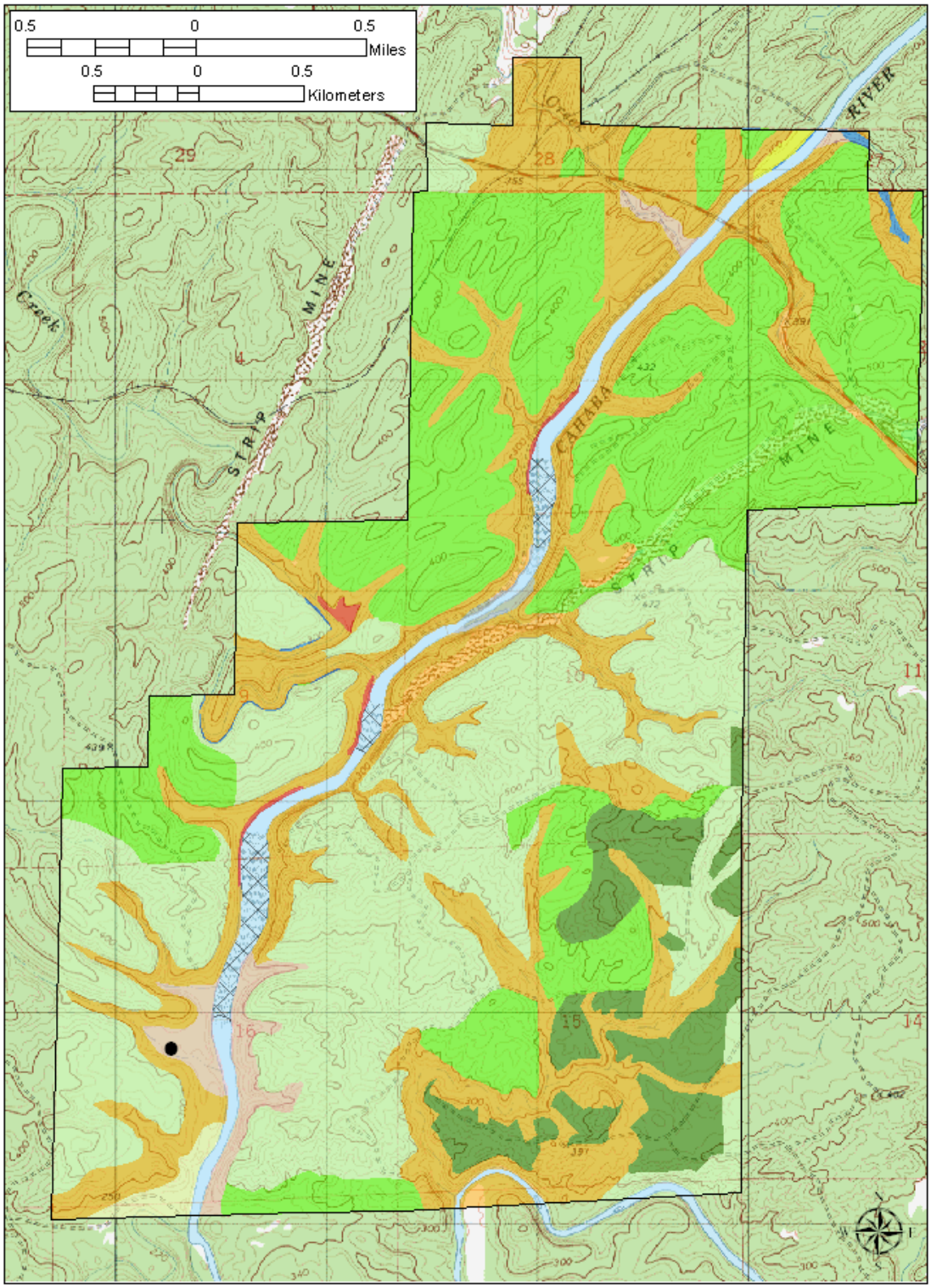
Pseudotriton ruber
red salamander

The red salamander is a medium-sized salamander of lowland swampy areas and stream runs. Larvae are aquatic with the adults being semi-aquatic to terrestrial but remaining near a water source. *Pseudotriton ruber* is red in overall coloration with a covering of small black spots.

Habitat association:
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: Maintain or improve water quality of lower order streams; common species.

Red salamander (*Pseudotriton ruber*) observations on the Cahaba River National Wildlife Refuge.



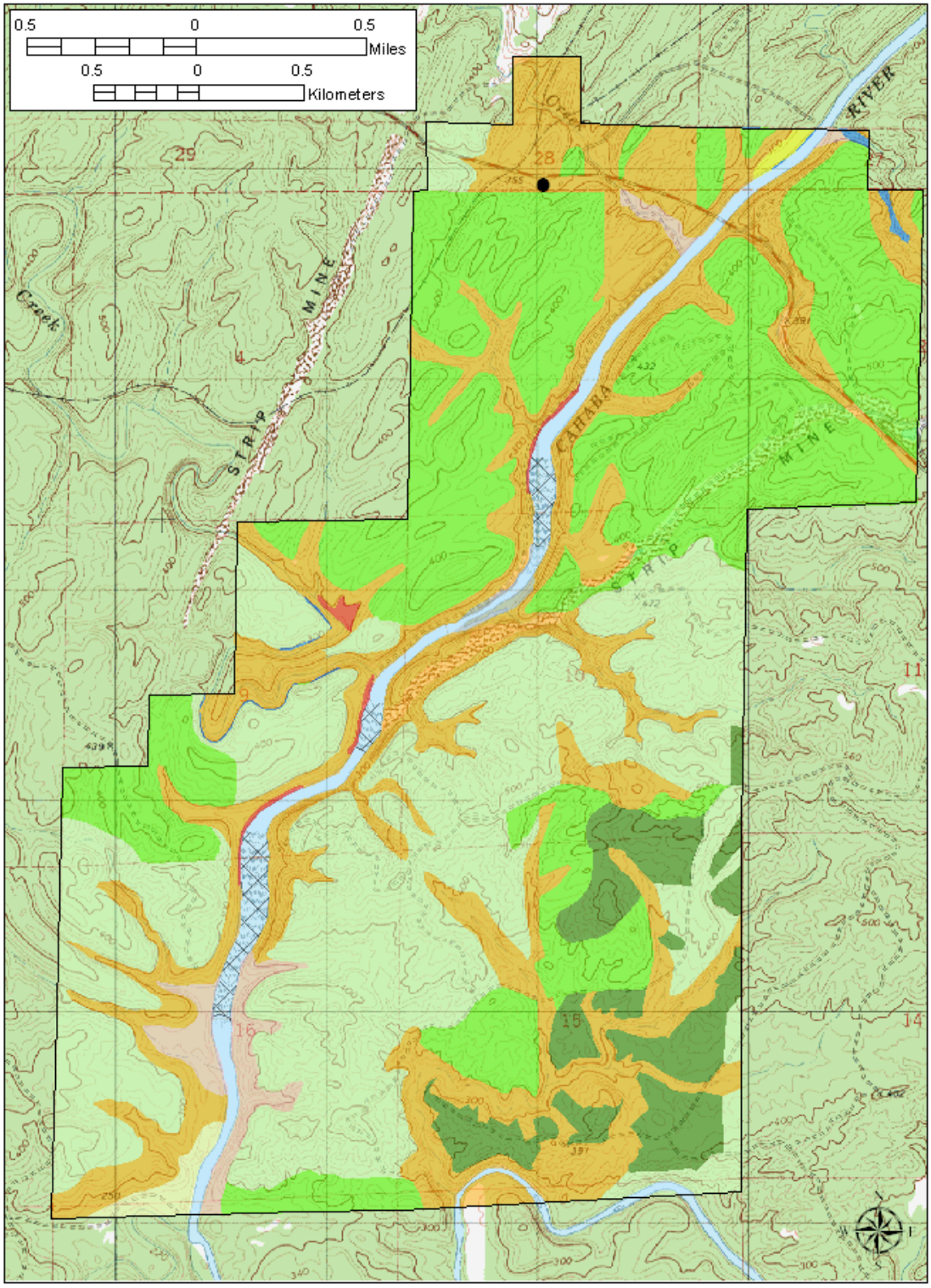
Notophthalmus viridescens
eastern newt

Notophthalmus viridescens is unique with its bimodal life cycle. Adults are aquatic inhabiting permanent pools and ponds as are larvae, but between the larval and adult stage is an intervening terrestrial mode termed the eft stage. During the eft stage the immature newt assumes a terrestrial life style for a period of one or two years but as it approaches maturity it returns to the water. Adult newts and efts possess noxious skin secretions that protect them from predators.

Habitat association:
Lower Piedmont Chestnut Oak Forest (pond)

Management recommendations: None; wide-ranging and common species although not widespread on refuge.

Eastern newt (*Notophthalmus viridescens*) observations on the Cahaba River National Wildlife Refuge.



Graptemys geographica
northern map turtle

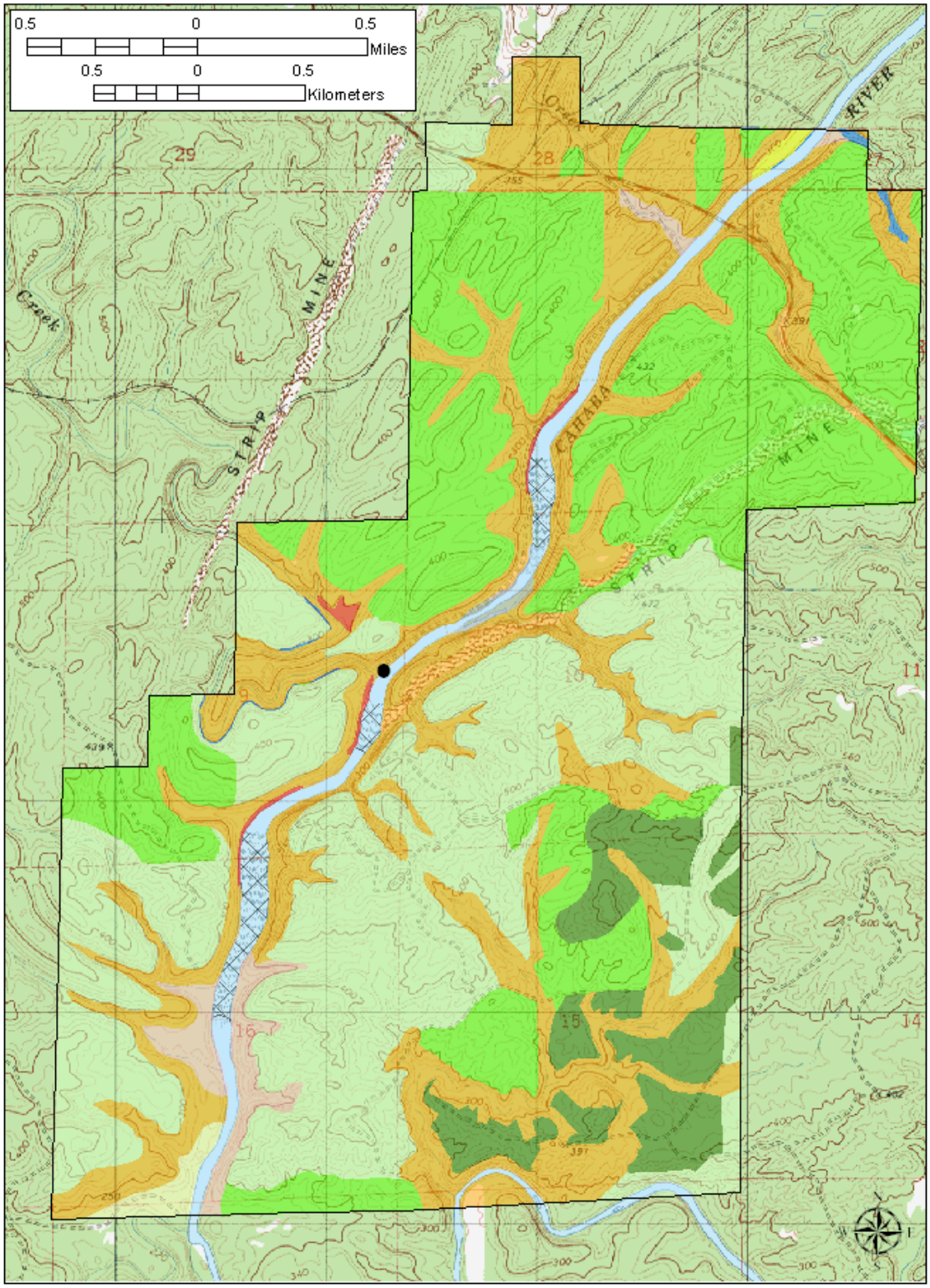
G. geographica is a species with a wide distribution throughout the northern and central states. In Alabama the northern map turtle occurs above the Fall Line and reaches its most southerly distribution in the Cahaba River. Females are considerably larger than males, with a maximum carapace length of 27 cm as opposed to 16 cm, plus the head of females attain an enlarged aspect. Aquatic snails are a preferred food item but other invertebrates such as crayfish and insects are consumed. Carapace and skin color is olive green and the shell has a reticulation of fine yellow lines. The head is patterned with numerous yellow stripes and a prominent post-orbital blotch.

With the presence of *G. geographica*, this region of the Cahaba River is of interest in that three species of map turtles co-occur.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Common map turtle (*Graptemys geographica*) observations on the Cahaba River National Wildlife Refuge.



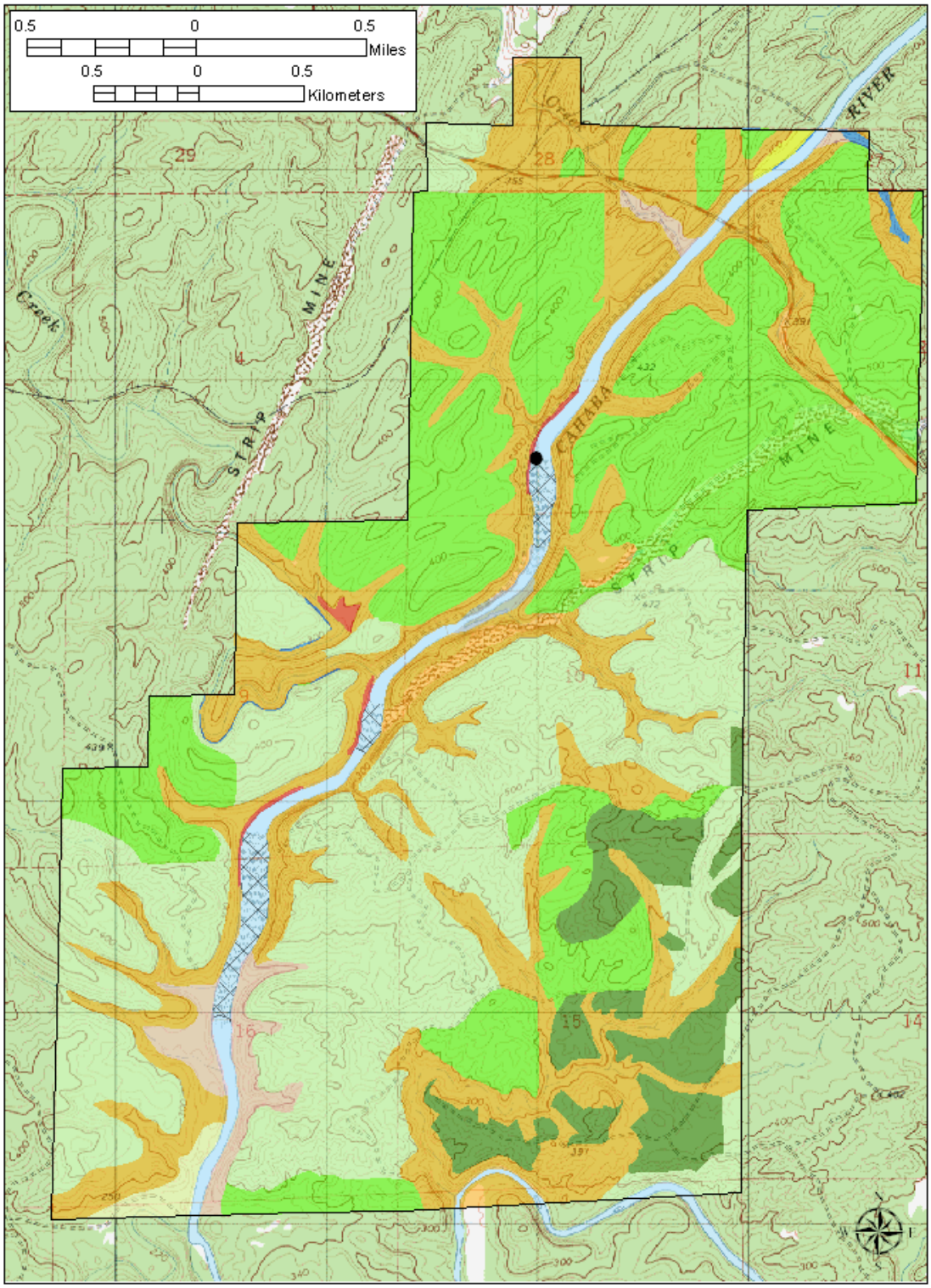
Graptemys nigrinoda
black-knobbed sawback, black-knobbed map turtle

G. nigrinoda, a Mobile Basin endemic, ranges from the Mobile-Tensaw Delta northward up the Tombigbee River into Mississippi, throughout the Alabama River, the Black Warrior, Cahaba, Coosa, and Tallapoosa rivers. The turtle is most common below the Fall Line and the occurrence of the species on the Refuge represents its most upstream known extent on the Cahaba River. Sexual dimorphism is pronounced with females attaining a size nearly twice that of males. The common name is derived from the presence of prominent vertebral spines most notable in juveniles and males. Aquatic insects and other invertebrates make up the diet of this species.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Back-knobbed sawback (*Graptemys nigrinoda nigrinoda*) observations on the Cahaba River National Wildlife Refuge.



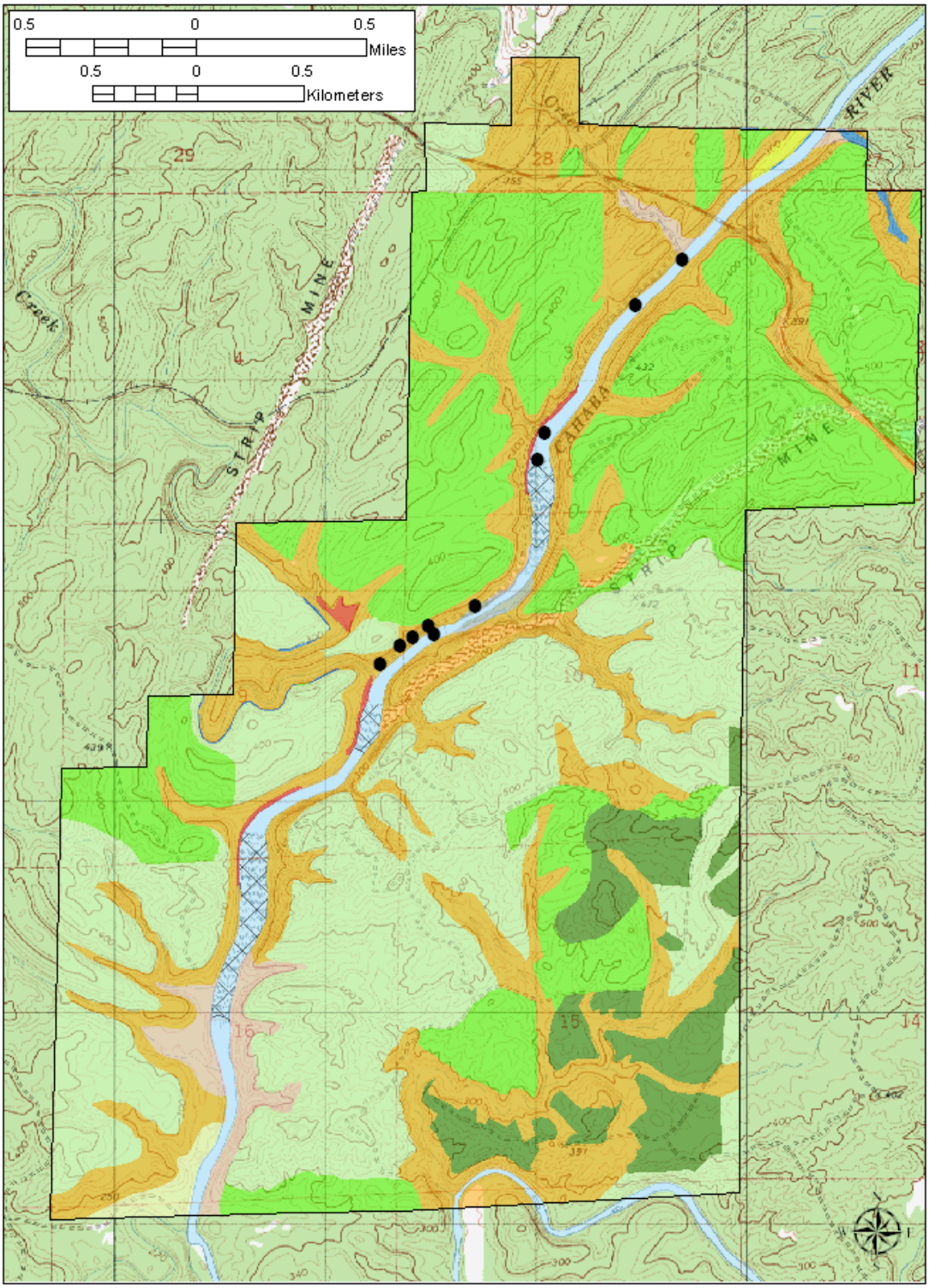
Graptemys pulchra
Alabama map turtle

The Alabama map turtle is another Mobile Basin endemic with a range that mimics that of the black-knobbed sawback with the exception that this species ranges much further upstream of the Fall Line. *G. pulchra* is a member of the broad-headed, or megacephalic, species of map turtles in which the female's head is conspicuously enlarged as the mandibular and maxillary crushing surfaces of the jaws are adapted to feeding upon mollusks. Mature females may be twice the size of mature males. Females specialize in feeding on mollusks while males consume a wider variety of invertebrate prey. Both Alabama map turtles and black-knobbed sawbacks are noted for their proclivity to basking.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Alabama map turtle (*Graptemys pulchra*) observations on the Cahaba River National Wildlife Refuge.



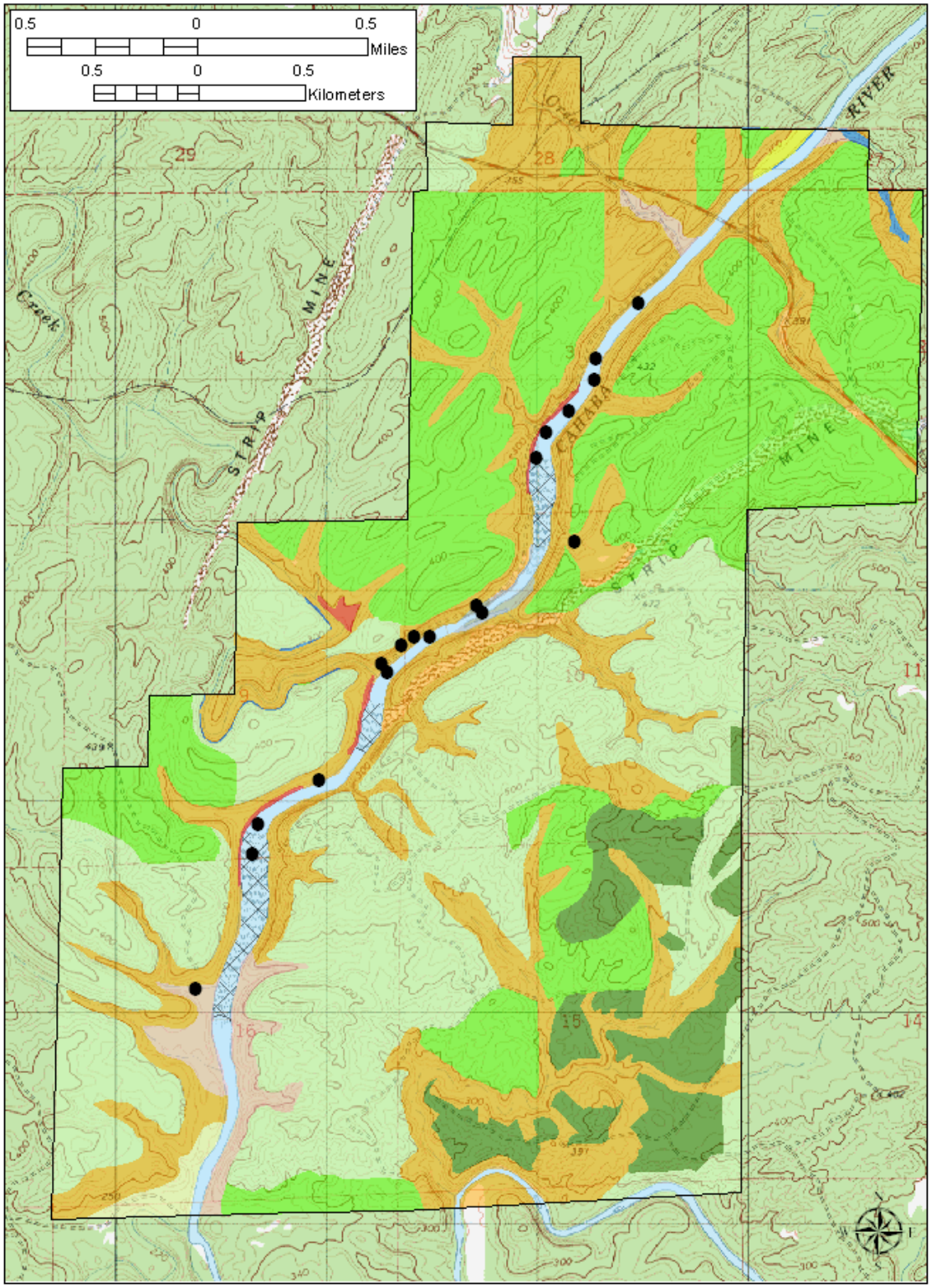
Pseudemys concinna
river cooter

As the common name indicates, the river cooter is a turtle of flowing streams and rivers throughout the southeastern United States. The river cooter, with a maximum carapace length of nearly 40 cm, is the largest species of turtle to be seen basking on logs and rocks of the Cahaba River. Sexual dimorphism is evident but not extreme with females attaining a larger size than males; foreclaws of males become extremely elongate. Adult turtles are herbivorous while young turtles are omnivores.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

River cooter (*Pseudemys concinna*) observations on the Cahaba River National Wildlife Refuge.



Terrapene carolina
eastern box turtle

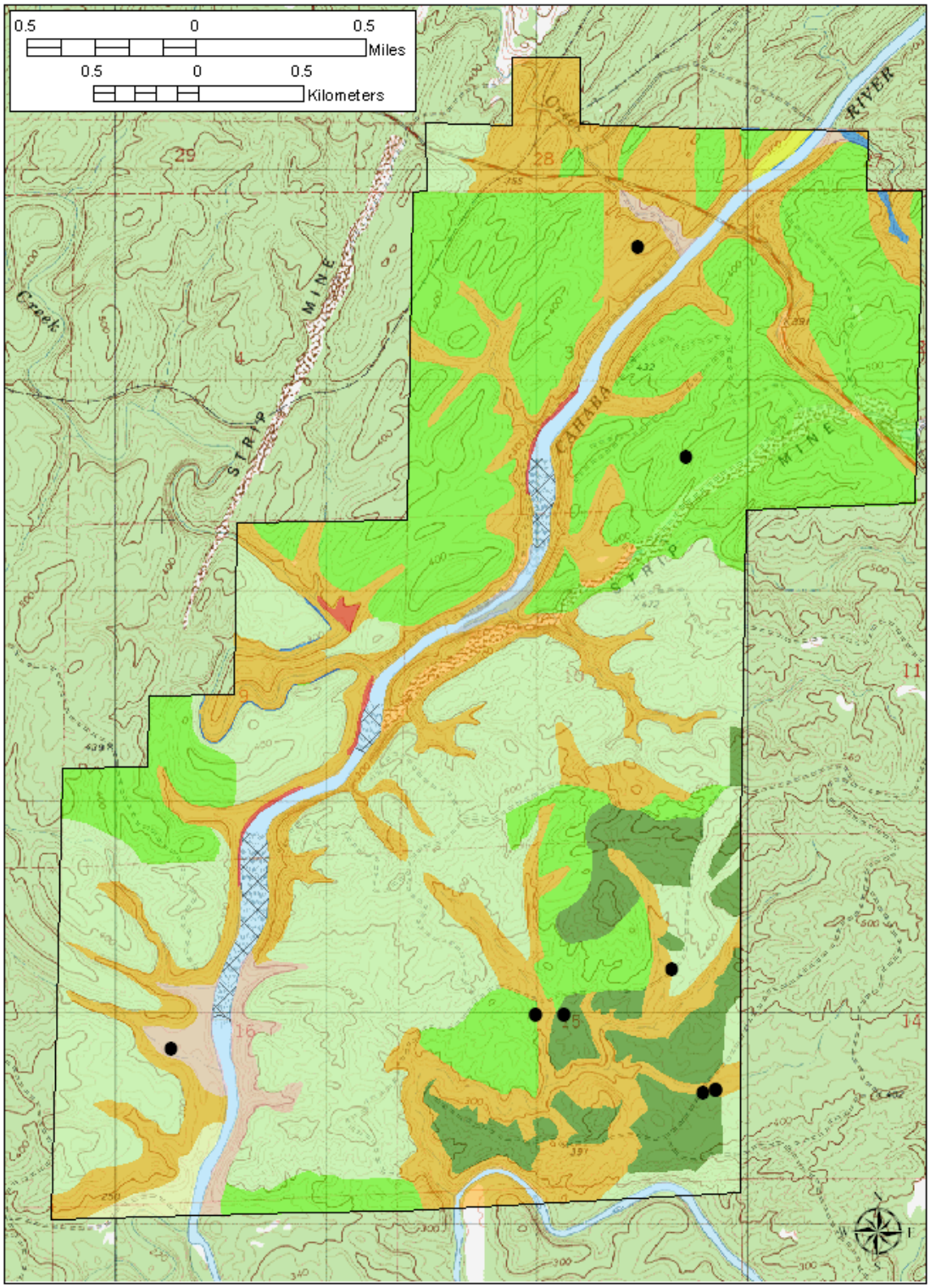
The eastern box turtle is a terrestrial, omnivorous species that inhabits a variety of habitats and ranges throughout the eastern United States. While most turtles have a rigid plastron the box turtle is unusual in having a hinged plastron that allows full closure of the shell for protection.

Habitat association:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation
White Oak – Beech Small Stream Floodplain Forest
Montane Longleaf Pine Woodland

Management recommendations: None; common species.

Eastern box turtle (*Terrapene carolina*) observations on the Cahaba River National Wildlife Refuge.



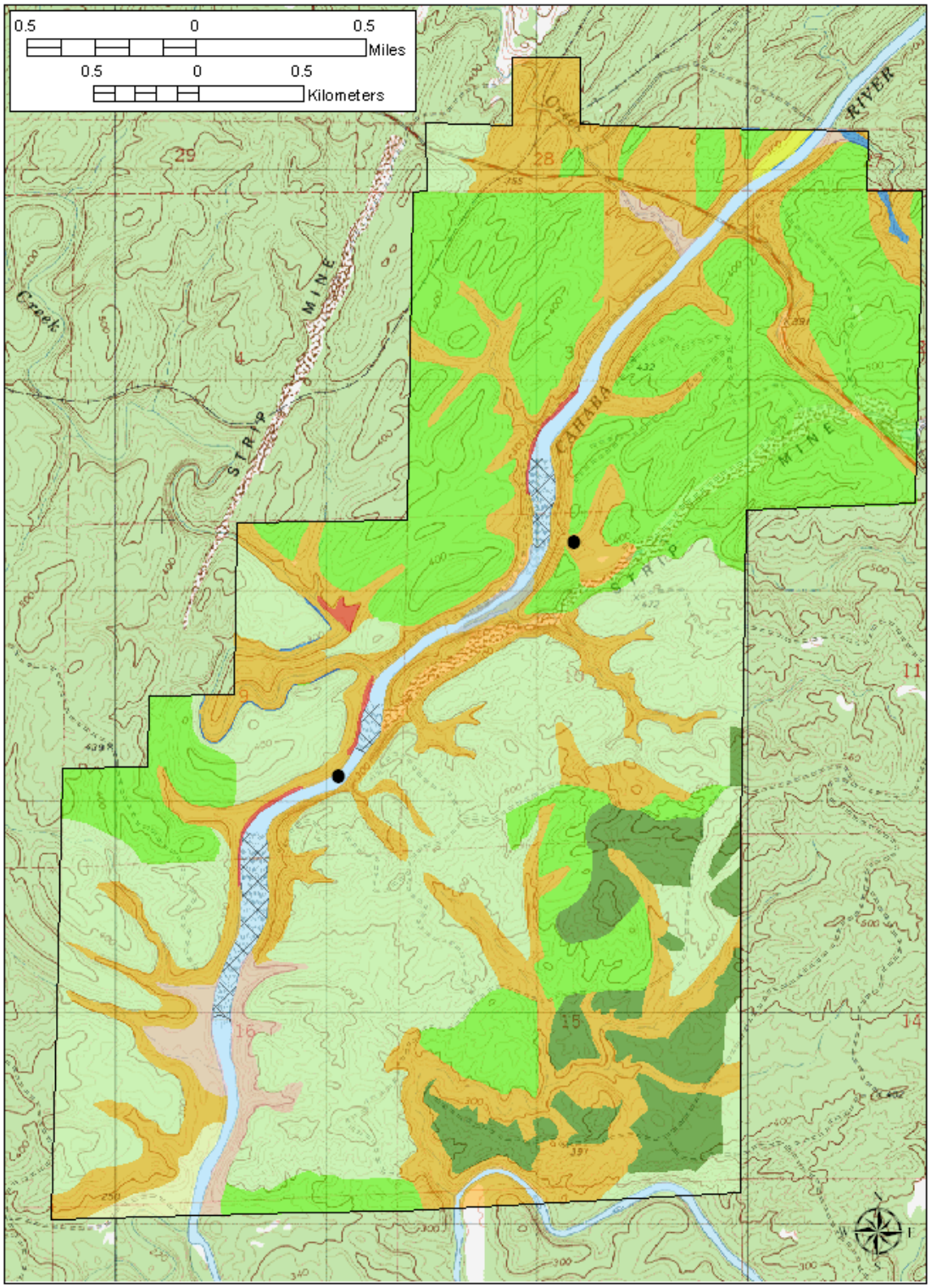
Trachemys scripta
pond slider

The native range of the pond slider is across the eastern United States west through Texas and south of Iowa, but now the species has become established across North America through the pet trade. The individuals documented from the Refuge are considered to be native. The pond slider is a generalist species, omnivorous and inhabiting both still and flowing water systems. Males tend to be smaller than females; mature males possess elongate foreclaws.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Pond slider (*Trachemys scripta*) observations on the Cahaba River National Wildlife Refuge.



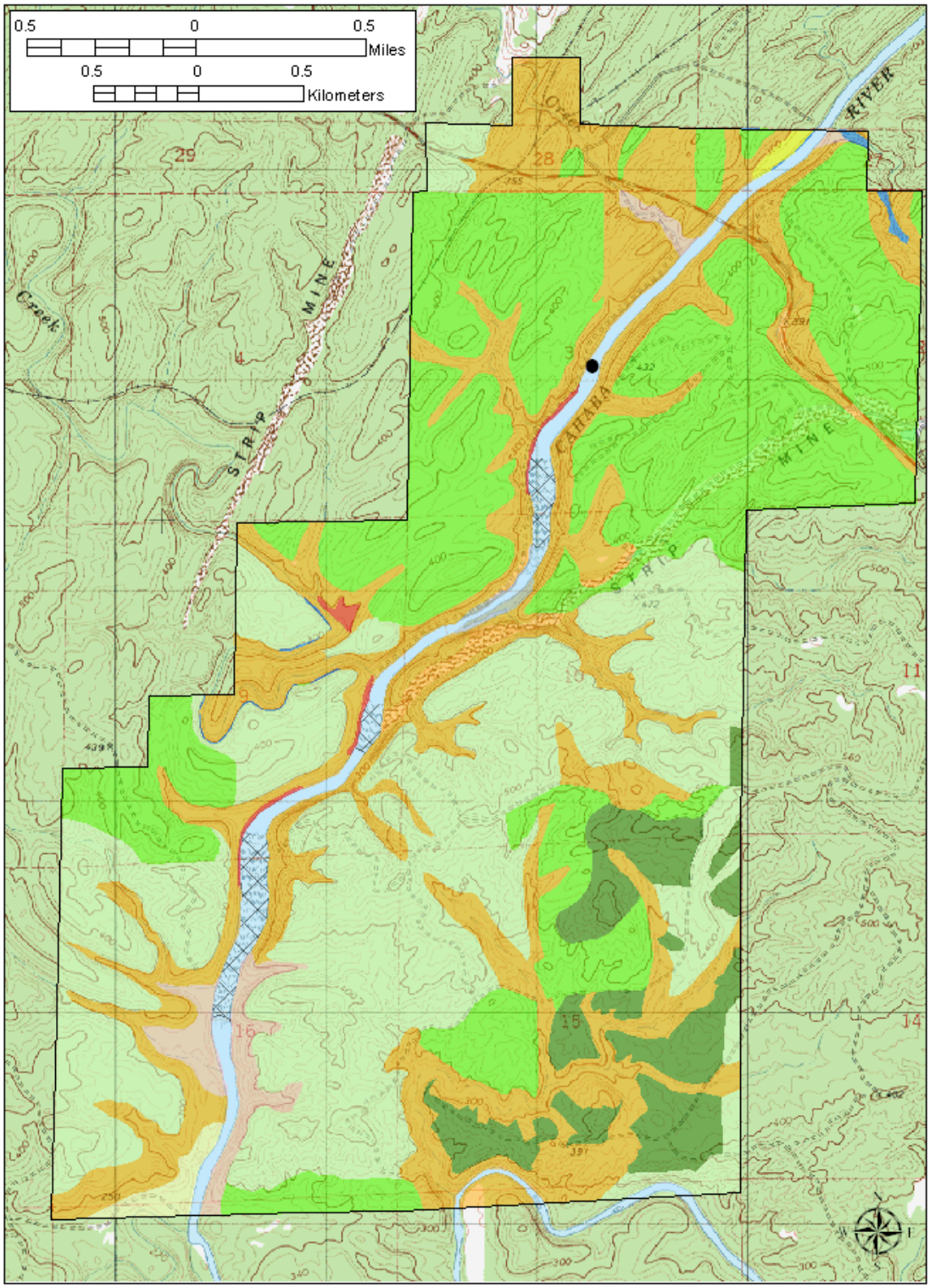
Sternotherus minor peltifer
stripe-necked musk turtle

S. minor is a riverine turtle of the southeastern United States. Adults are small reaching a maximum carapace size of only 12 – 14 cm. Freshwater mollusks are the preferred prey but other invertebrate groups are also consumed.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Stripe-necked musk turtle (*Sternotherus minor peltifer*) observations on the Cahaba River National Wildlife Refuge.



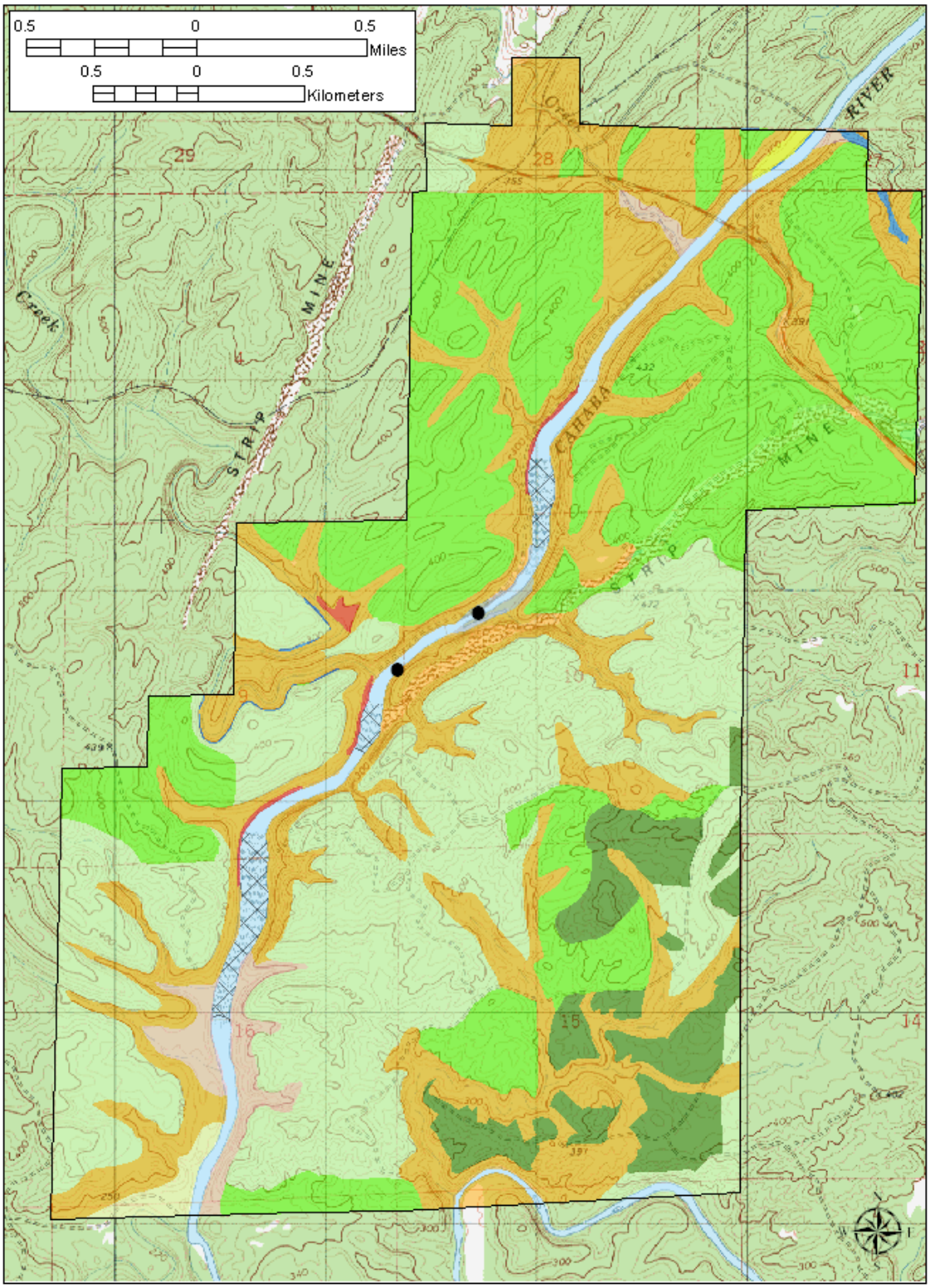
Apalone spinifera
spiny softshell

Softshell turtles are unlikely to be confused with any other turtle since they are unique in having a flexible, leathery shell lacking the horny scutes that cover the carapace and plastron of other species. Softshells also have very long necks and elongate tubular nostrils. The shell is round to rounded and extremely flattened. Adult females may be up to 0.5 m in carapace length. Mature males, smaller in size than females, retain juvenile coloration. Spiny softshell turtles are carnivorous, consuming a wide variety of invertebrate and smaller vertebrate prey. They range throughout the eastern and Midwestern United States.

Habitat association: river

Management recommendations: Maintain integrity of river and riparian habitats.

Spiny softshell (*Apalone spinifer*) observations on the Cahaba River National Wildlife Refuge.



Sceloporus undulatus
eastern fence lizard

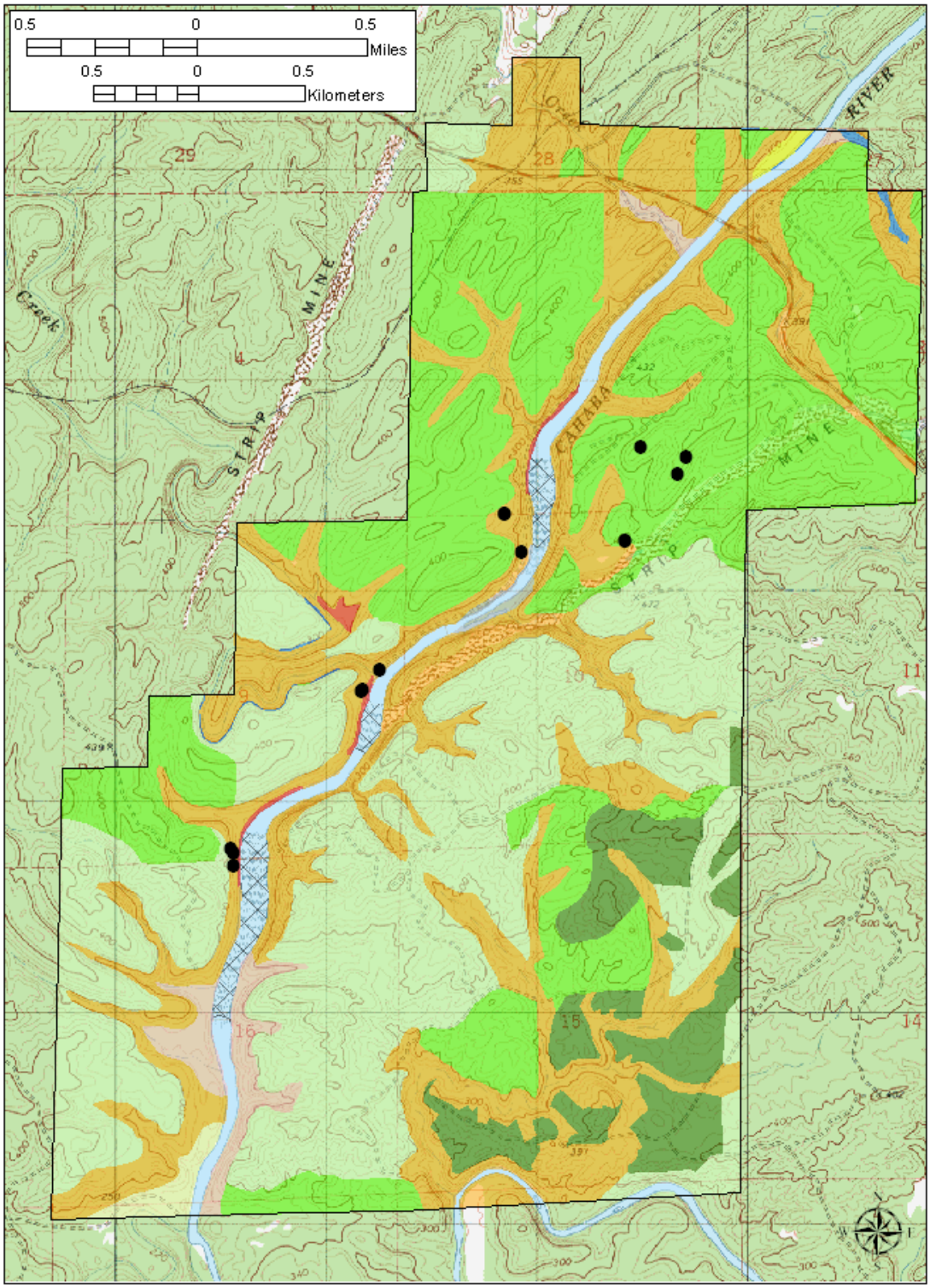
The eastern fence lizard is a common species of forests of the eastern and southwestern United States. A medium-sized lizard, *Sceloporus undulatus* prefers open woodlands, rocky outcrops, and other areas with exposed bask sites. During breeding season males may be identified by their bright blue chins and ventro-lateral patches that are displayed in territorial disputes and mating. Females have more prominent wavy lines than males and lack the blue ventral coloration.

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Sand Laurel Oak Upland Forest

Management recommendations: None; common species.

Eastern fence lizard (*Sceloporus undulatus*) observations on the Cahaba River National Wildlife Refuge.



Anolis carolinensis
green anole

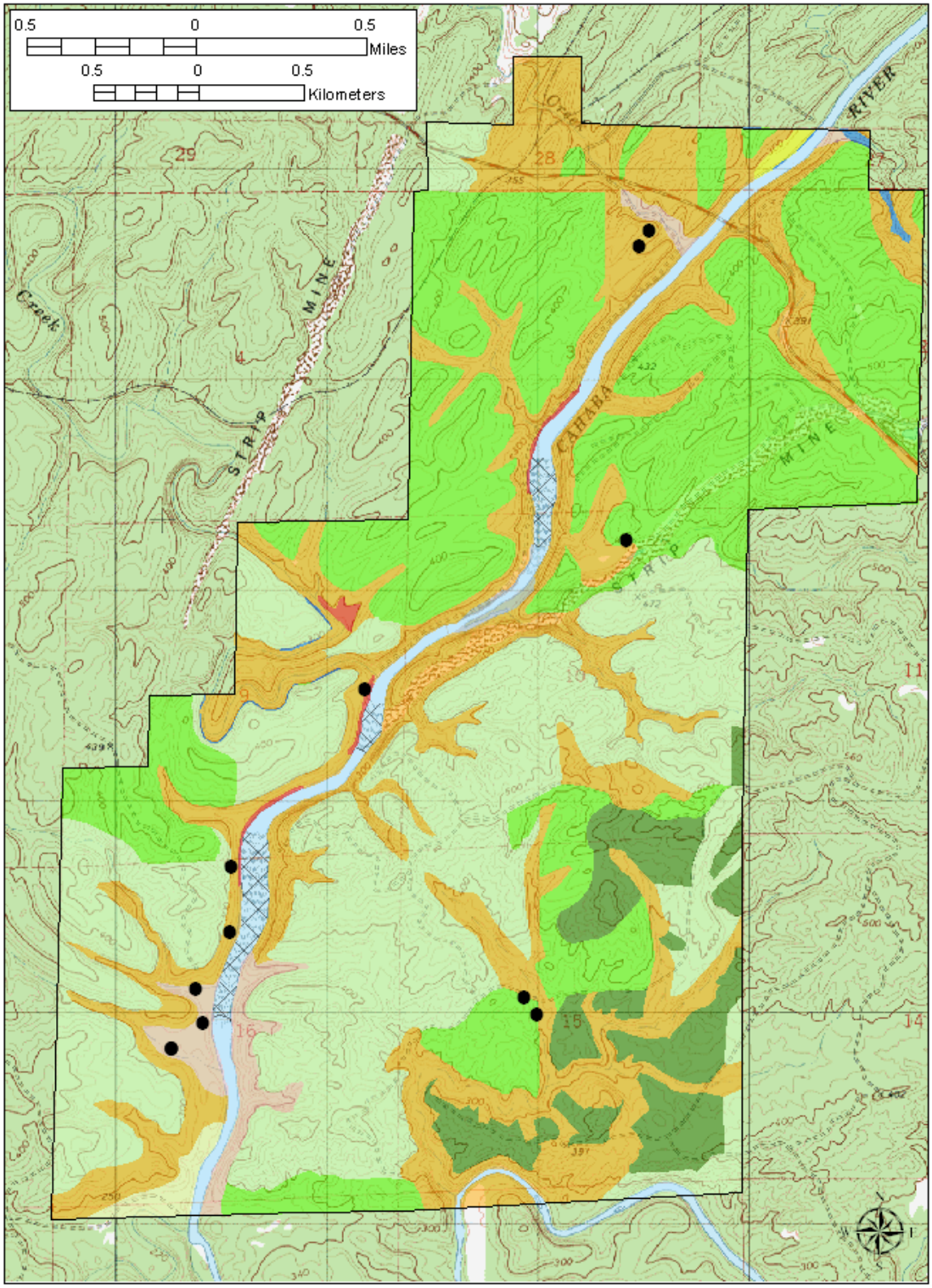
Anolis carolinensis is a slim, medium-sized, arboreal lizard that has the ability to change color from shades of dark brown to bright green. Males possess a large, colorful, reddish dewlap below the lower jaw that they present during territorial and mating displays. The range of the green anole is the southeastern United States. Toes are expanded into elongate pads that facilitate climbing.

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Montane longleaf pine woodland
Sand Laurel Oak Upland Forest
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; common species.

Green anole (*Anolis carolinensis*) observations on the Cahaba River National Wildlife Refuge.



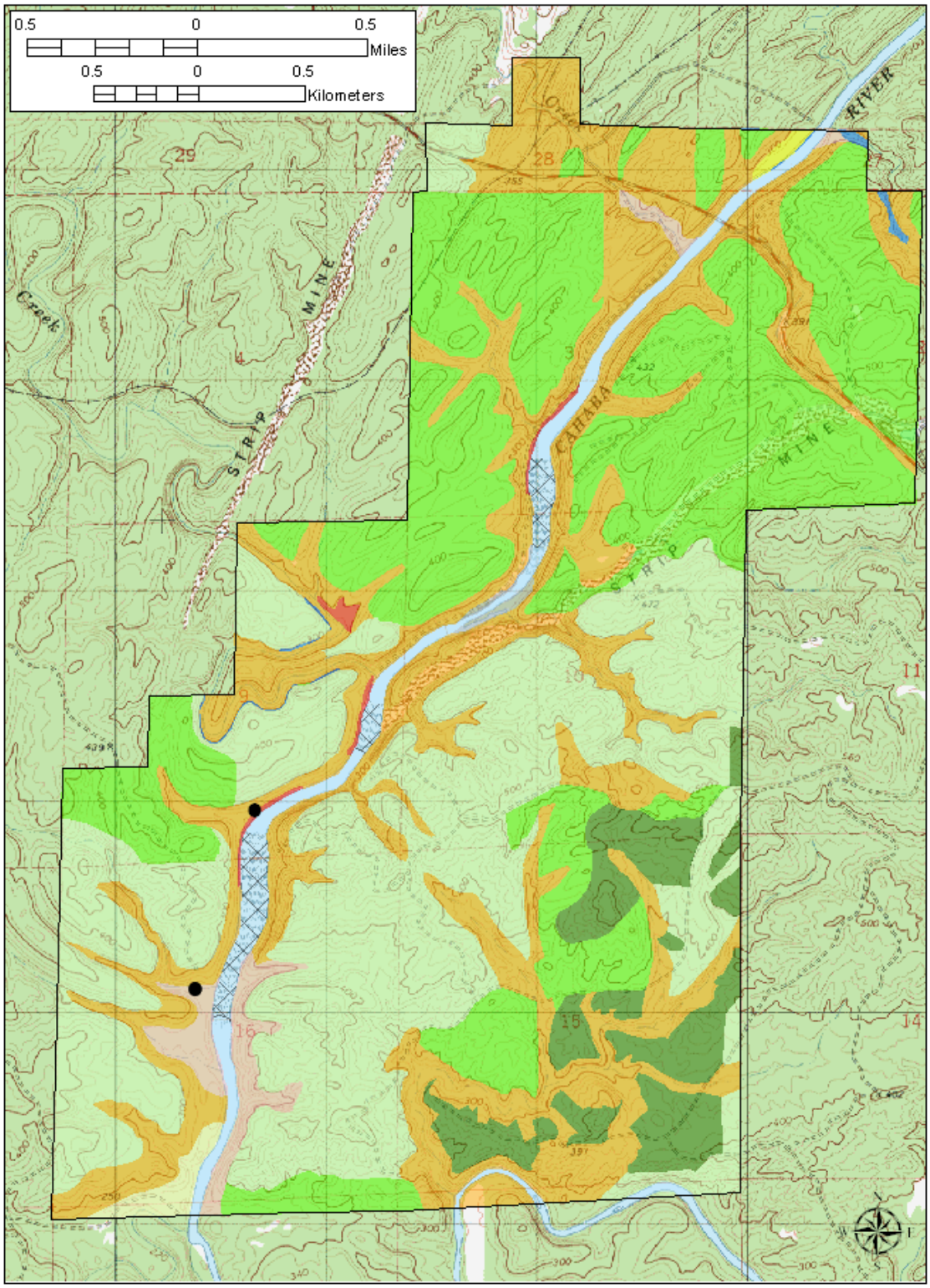
***Eumeces fasciatus* (*Plestiodon fasciatus*)**
common five-lined skink

Common five-lined skink ranges across the eastern United States, and inhabits a variety of mesic forest habitats. Females and juveniles have a bluish-black body with five light stripes that run the length of the body. Males lose the striping and become a uniformly tannish color. During breeding season the head of the males becomes swollen and reddish. Tails of the juveniles are bright blue and easily break off.

Habitat association:
Sand Laurel Oak Upland Forest
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Common five-lined skink (*Eumeces fasciatus*) observations on the Cahaba River National Wildlife Refuge.



***Eumeces laticeps* (*Plestiodon laticeps*)**
broad-headed skink

Eumeces laticeps is a large lizard of the southeastern United States; in many regions it has been given the common name of "scorpion". The broad-headed skink is similar in appearance to the common five-lined skink in color, pattern, and sexual dimorphism, only the broad-headed is much larger. The enlarged head of the adult males has provided the species with the common name.

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

No map available: Documented during bioblitz and documentation locality not provided.

Scincella lateralis
little brown skink

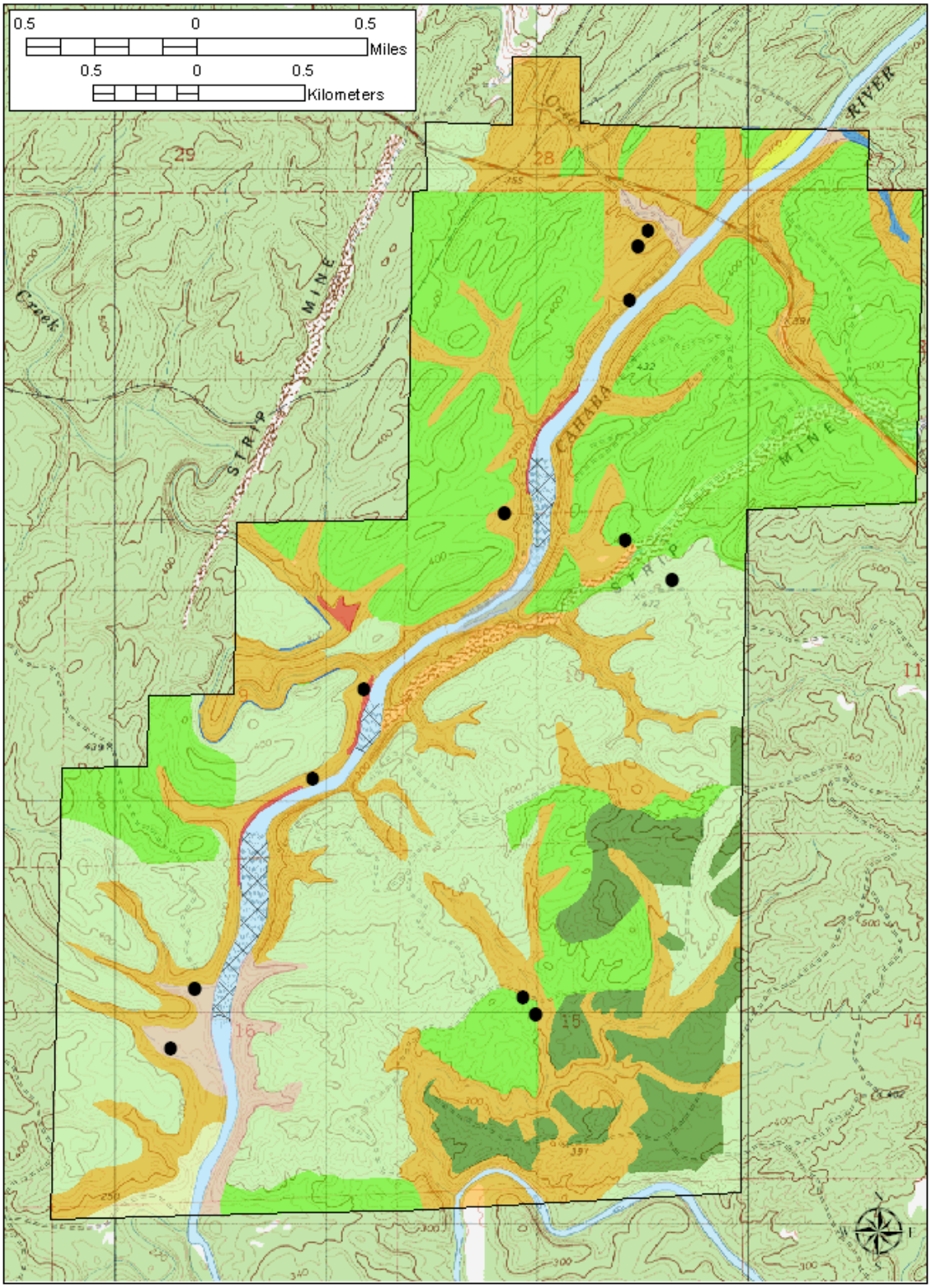
Scincella lateralis is a small, brown, elongate terrestrial to semi-fossorial lizard of southern woodlands. The presence of this skink in a forest setting is often detected by the sound it makes while scurrying through leaf litter. In coloration the dorsum is a brown-bronze and a darker lateral band runs between the diminutive fore and rear legs.

Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
White Oak – Beech Small Stream Floodplain Forest
Sand Laurel Oak Upland Forest

Management recommendations: None; common species.

Little brown skink (*Scincella lateralis*) observations on the Cahaba River National Wildlife Refuge.



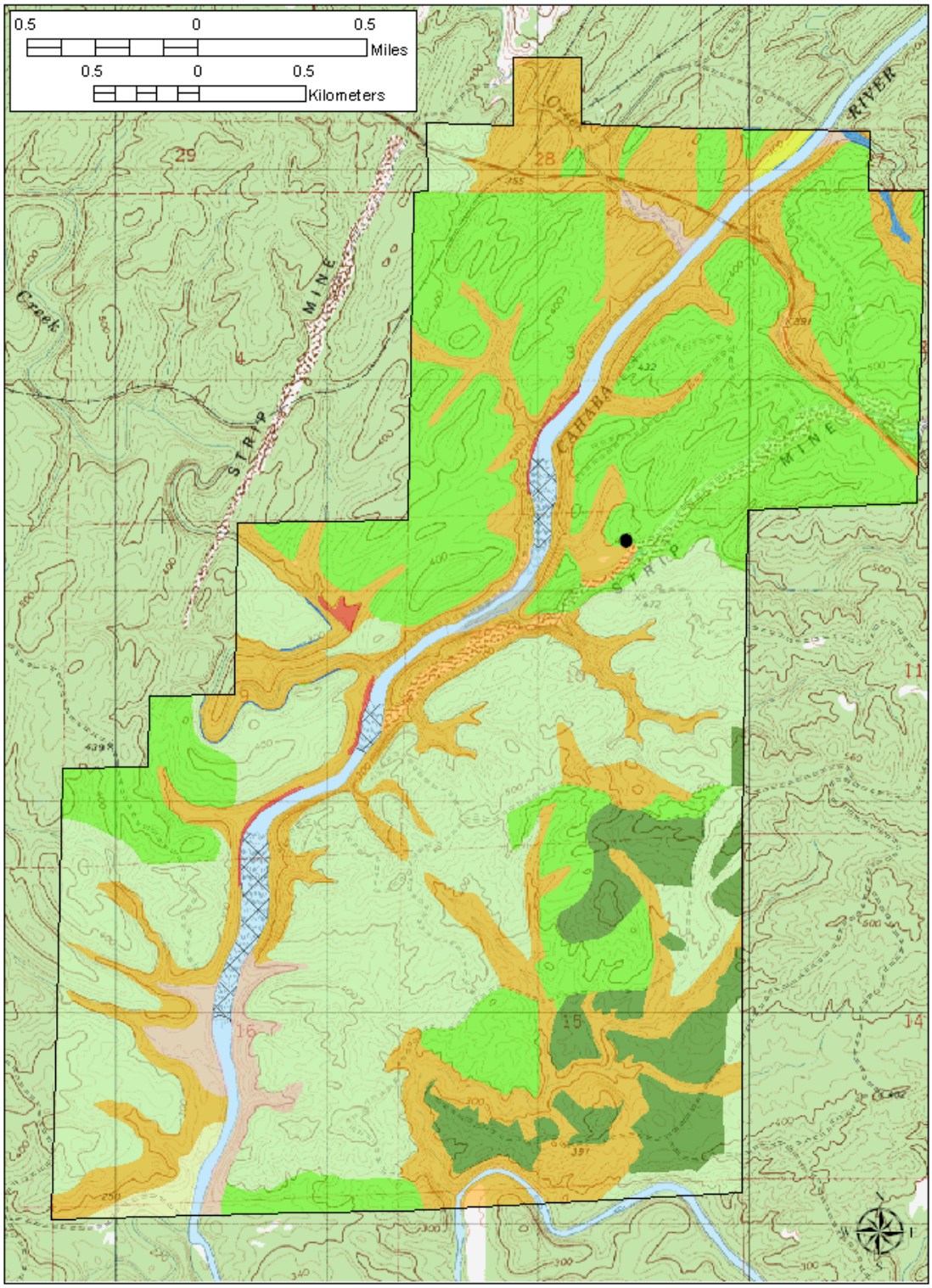
***Cnemidophorus sexlineatus* (*Aspidoscelis sexlineata*)**
six-lined racerunner

The six-lined racerunner is the eastern representative of a much larger group of desert-adapted species. *Cnemidophorus sexlineatus* inhabits drier areas with open patches as it has a higher optimum temperature than most lizards. This is one of the fastest lizards and often all that is seen of it is a blur across the ground. The six-lined racerunner, when foraging, moves with a quick, jerky motion, frequently testing the surroundings with tongue flicks.

Habitat association:
Loblolly Pine Plantation (clearing)

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Six-lined racerunner (*Cnemidophorus sexlineatus*) observations on the Cahaba River National Wildlife Refuge.



Coluber constrictor
North American racer

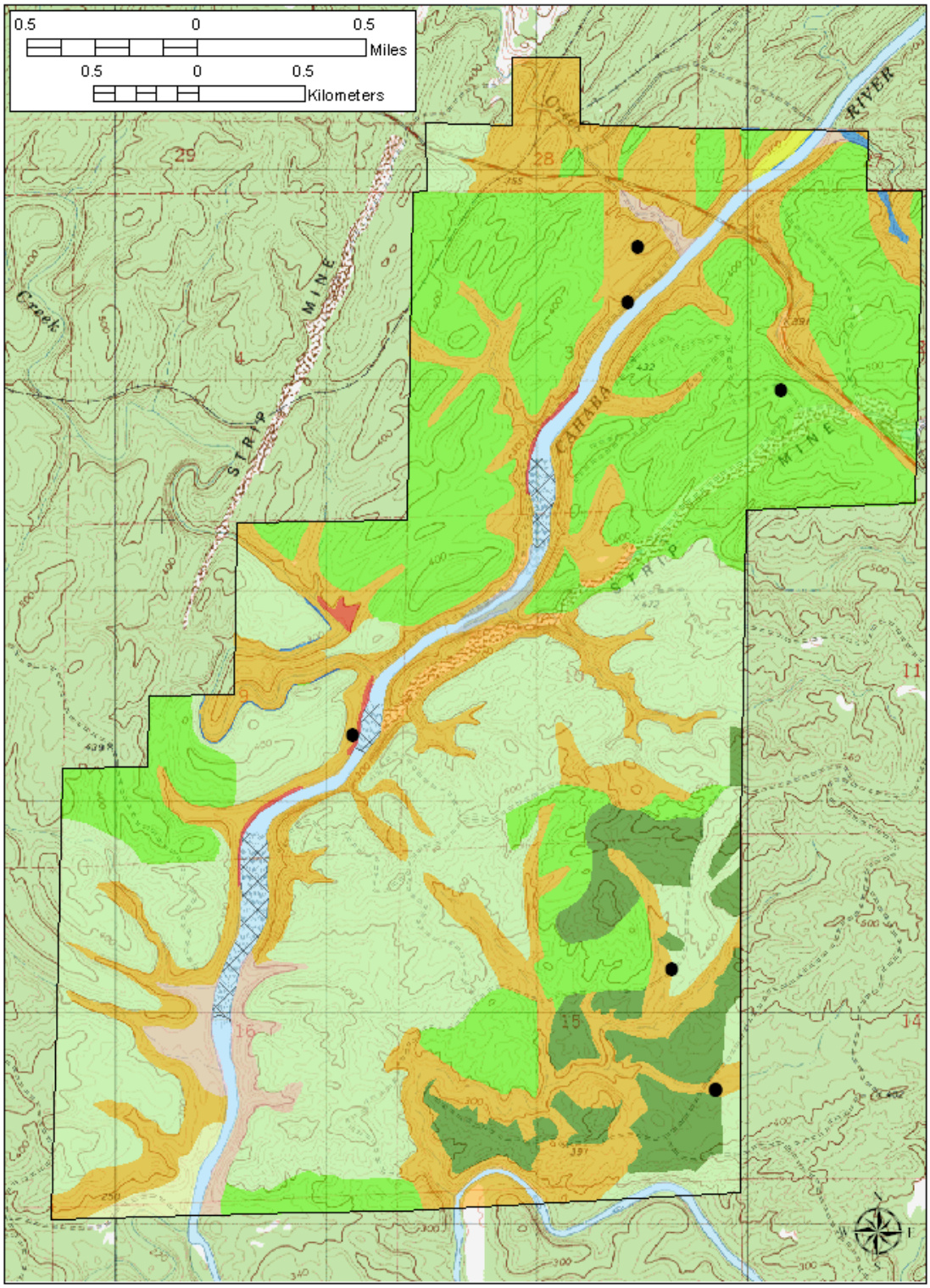
The racer, *Coluber constrictor*, ranges across much of the United States and is a common, generalist species. In Alabama it occurs statewide and may be found in most any terrestrial habitat. Prey items are as varied as the habitats the racer uses; frogs, toads, lizards, snakes, birds, bird eggs, and small mammals are all eaten North American racer is a uniform black to dark gray except for the chin which is white. Typical size of adult racers is 1 to 1.5 m but the slim-bodied snake may attain a maximum length of 2 m.

Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation

Management recommendations: None; common species.

North American racer (*Coluber constrictor*) observations on the Cahaba River National Wildlife Refuge.



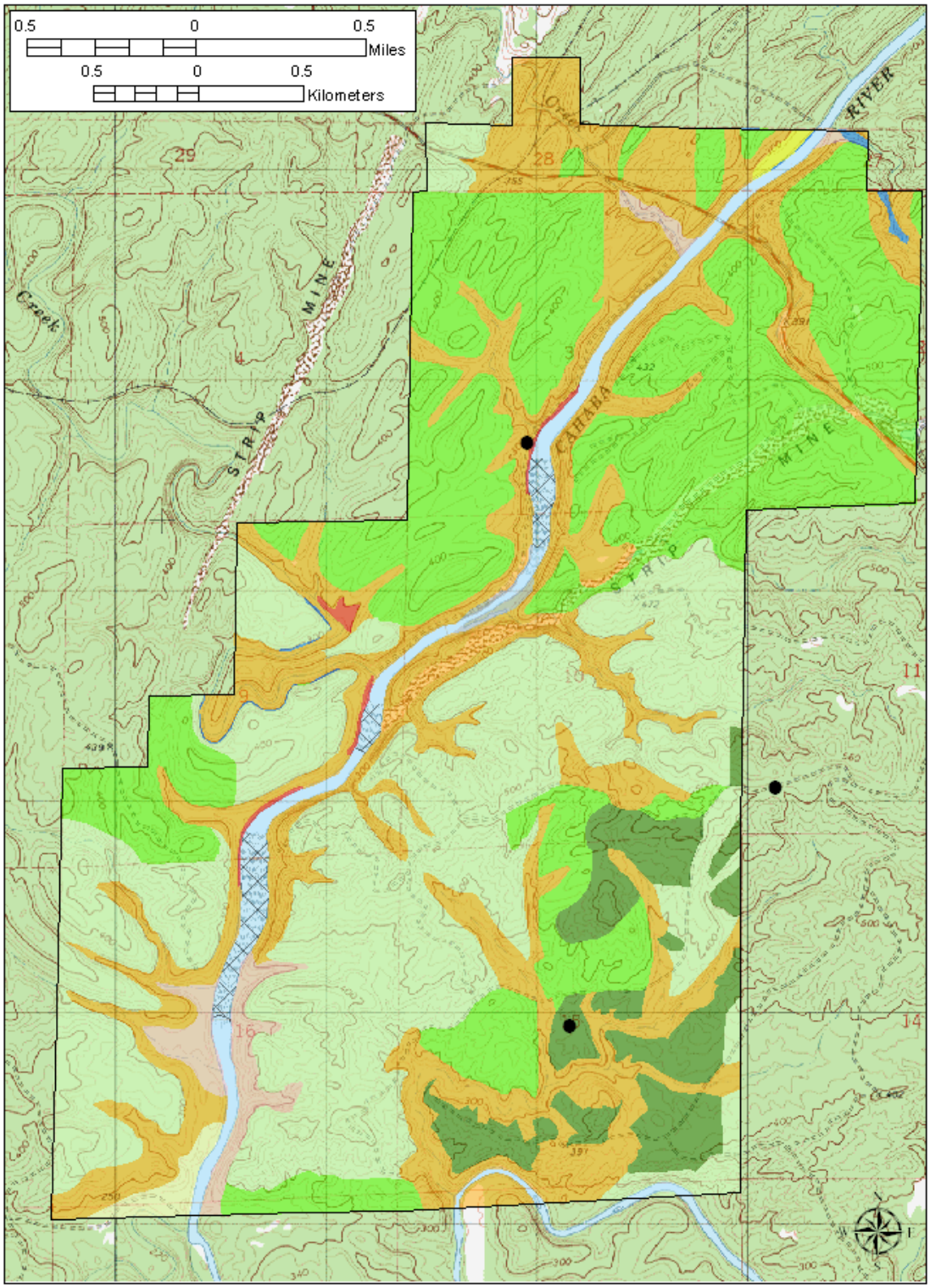
Lampropeltis getula nigra
common kingsnake

Lampropeltis getula is a medium-sized snake with a maximum total length of less than 1.5 m. The black kingsnake is recognizable by the overall black coloration with small yellow spots. The venter is an alternating yellow and black pattern. Kingsnakes, as constrictors, are noted for feeding upon other snakes but their diet also includes birds, small mammals, lizards, and amphibians. *L. getula* inhabits a variety of terrestrial habitats.

Habitat association:
Lower Piedmont Chestnut Oak Forest
Longleaf Pine Plantation

Management recommendations: None; common species.

Black kingsnake (*Lampropeltis getula nigra*) observations on the Cahaba River National Wildlife Refuge.



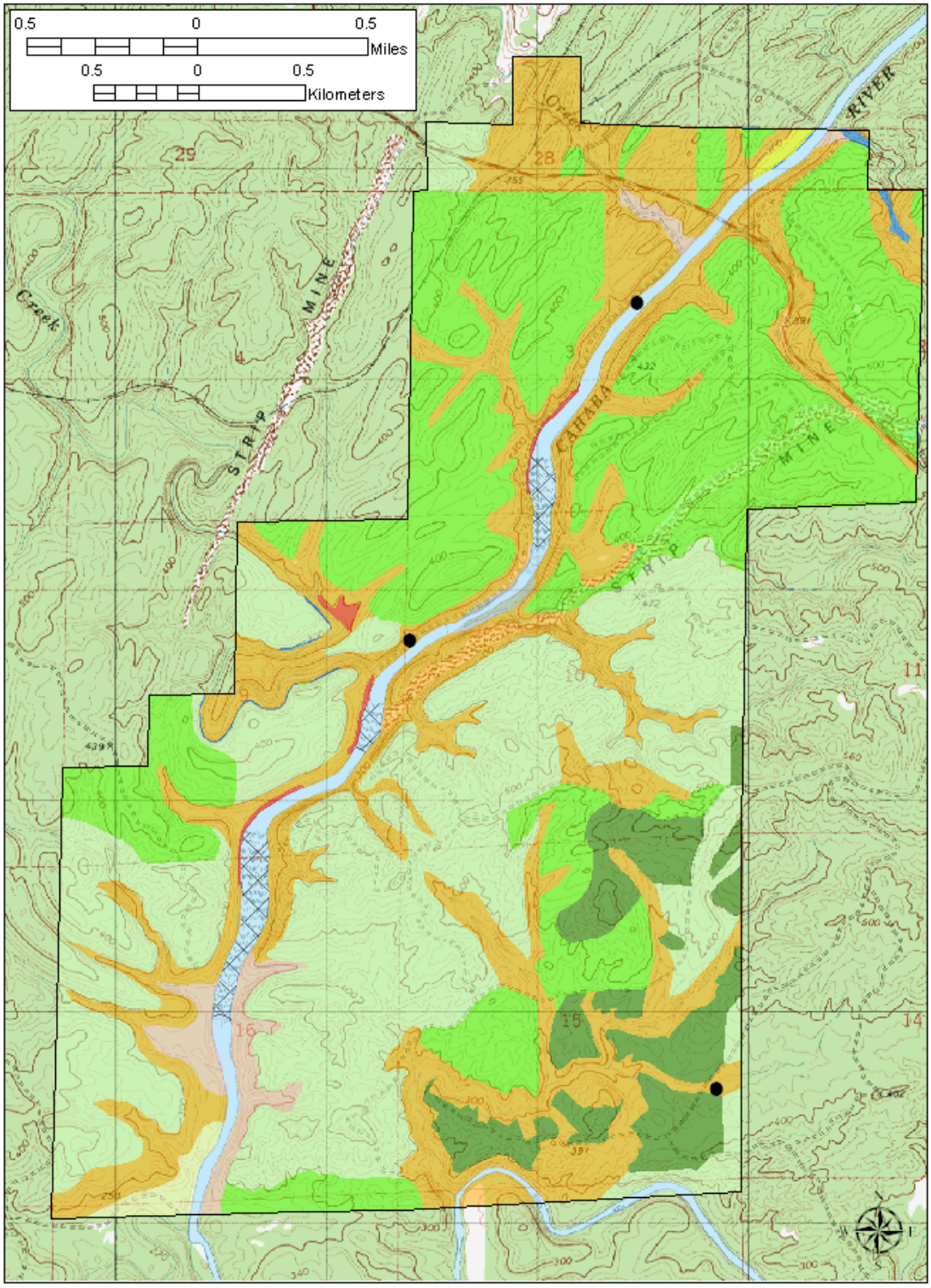
***Elaphe obsoleta* (*Pantherophis spiloides*)**
gray ratsnake

The gray ratsnake is one of the larger and more common snakes to be seen in Alabama and inhabits a variety of terrestrial environments. Maximum size attained by this species is 2 m. *Elaphe obsoleta* in the Bibb County area has a grayish dorsum with large irregular blockish dark dorsal and lateral blotches. The venter is white with dark quadrate spots. Juvenile gray ratsnakes feed upon lizards, frogs, and small rodents but with larger individuals the diet shifts to birds and mammals which are subdued by constriction. *E. obsoleta* is an accomplished climber.

Habitat association:
Lower Piedmont Chestnut Oak Forest

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Gray ratsnake (*Elaphe obsoleta*) observations on the Cahaba River National Wildlife Refuge.



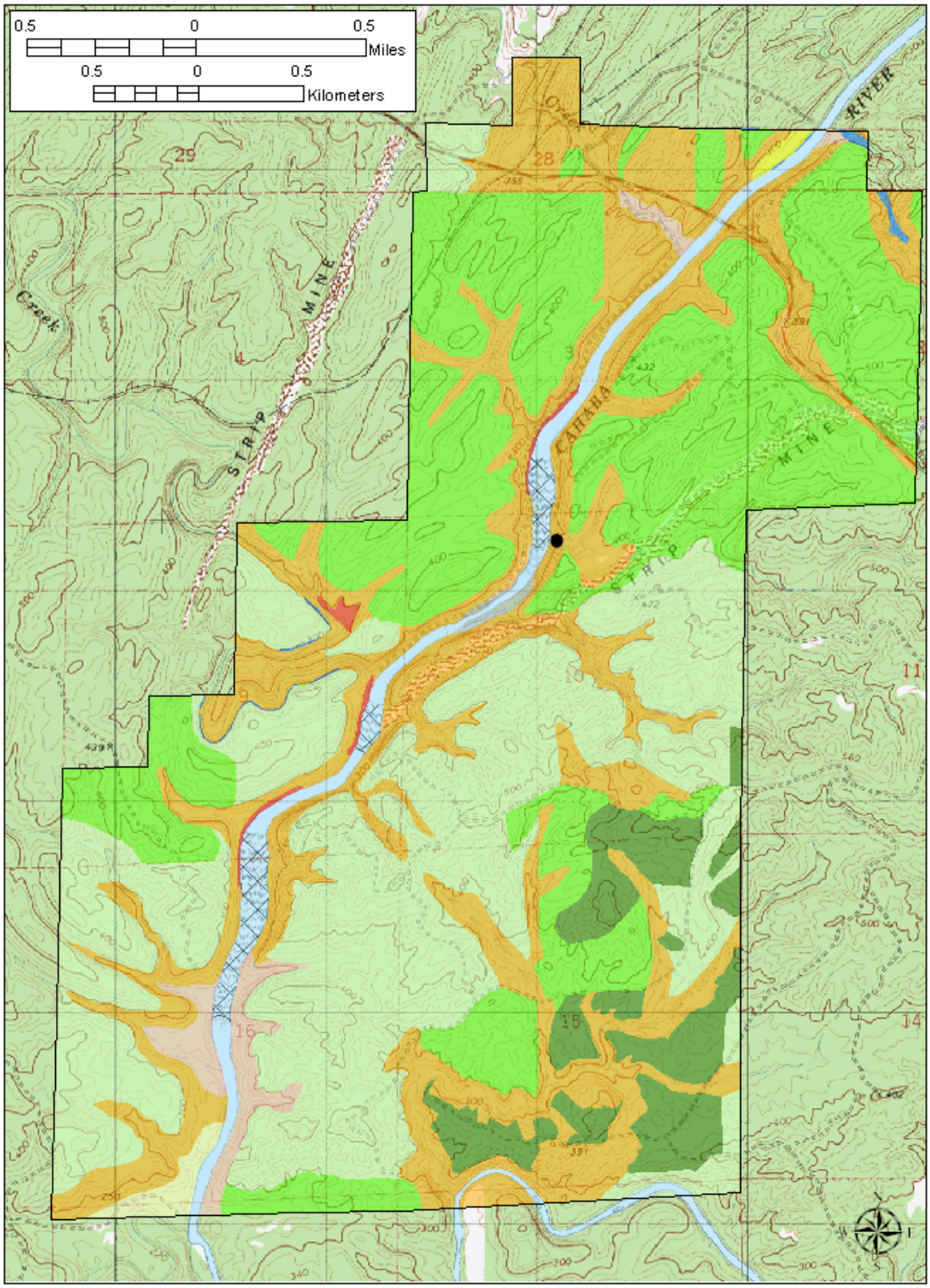
Opheodrys aestivus
rough greensnake

Opheodrys aestivus is a slim, green, arboreal snake that seldom exceeds 1 m in length. Rough greensnakes may be found in trees and shrubs often around the edge of ponds or along stream courses. Food of this harmless snake includes insects, spiders, or other soft-bodied arthropods.

Habitat association:
Lower Piedmont Chestnut Oak Forest

Management recommendations: Maintain or improve riparian vegetation along stream courses.

Rough greensnake (*Opheodrys aestivus*) observations on the Cahaba River National Wildlife Refuge.



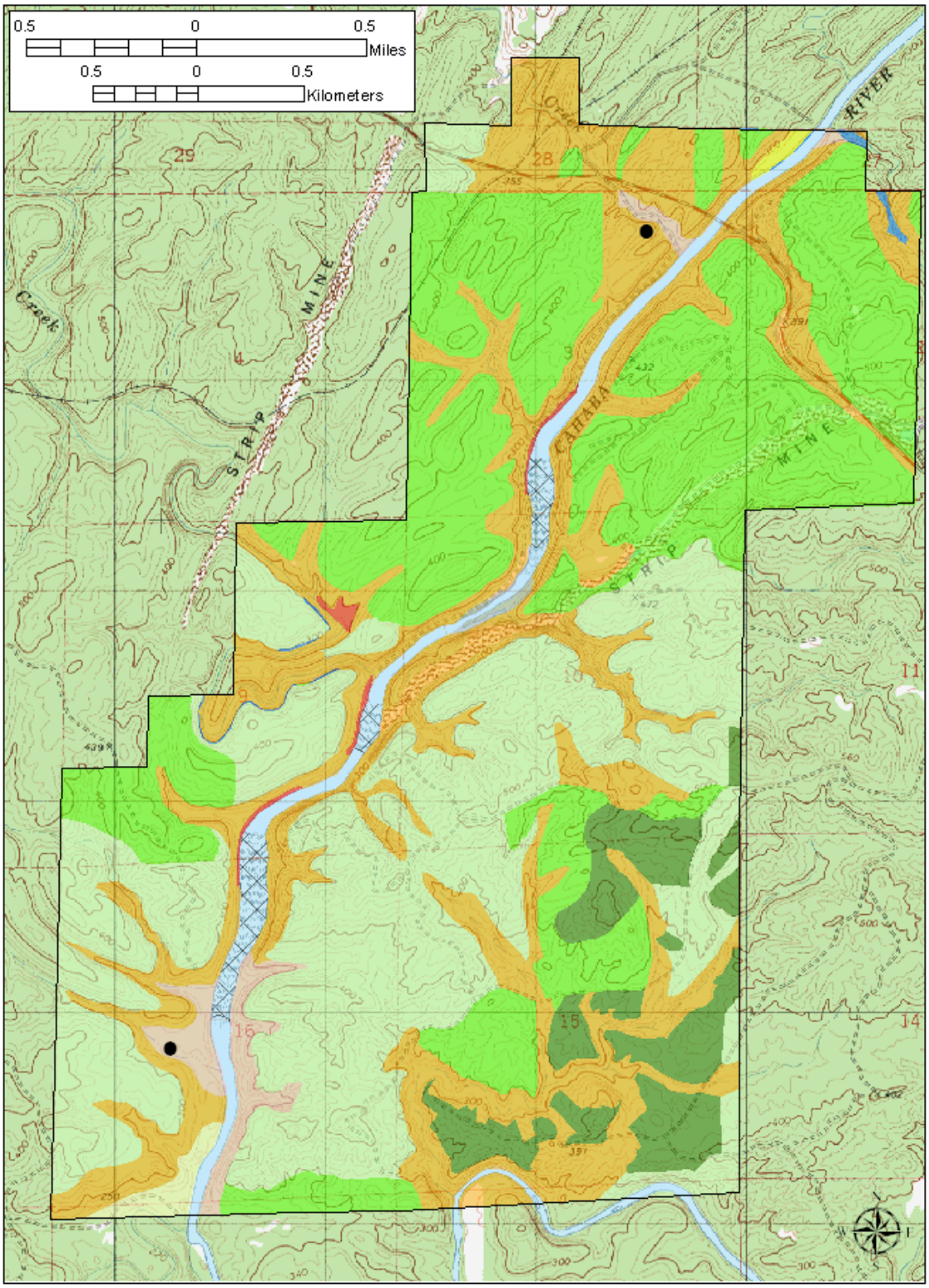
Carphophis amoenus
eastern worm snake

Carphophis amoenus is a small, fossorial, woodland snake of which little is known. The eastern worm snake is distributed across the eastern United States, inhabits mesic hardwood forests, and feeds upon earthworms. The dorsum of the snake is brown and the venter pink; the dorsal and ventral colors are sharply demarcated. Scales on the tip of the tail form a small, sharp spine.

Habitat association:
Lower Piedmont Chestnut Oak Forest
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; wide-ranging and common species although not widespread on refuge.

Eastern worm snake (*Carphophis amoenus*) observations on the Cahaba River National Wildlife Refuge.



Diadophis punctatus
ring-necked snake

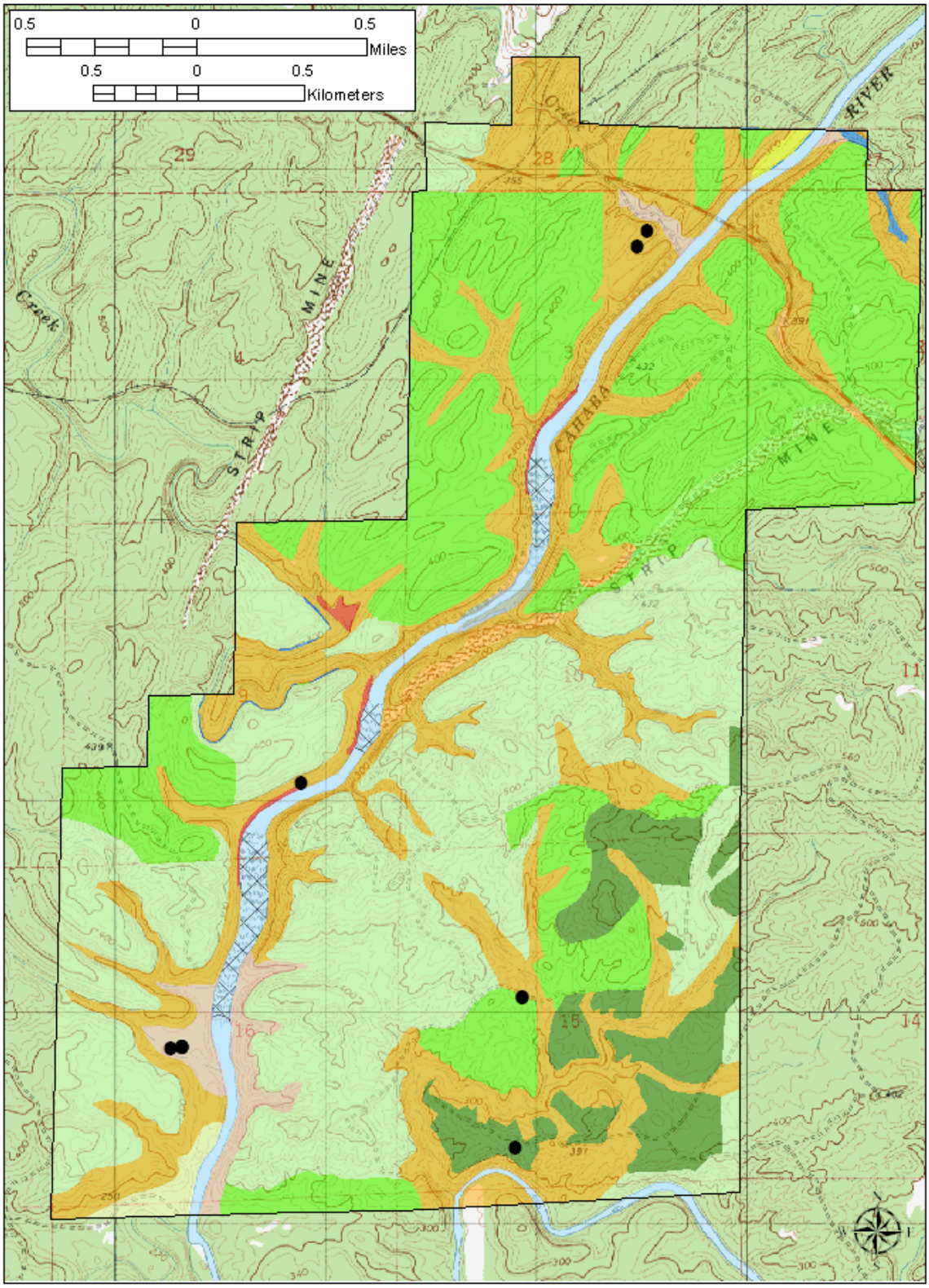
Diadophis punctatus, the ring-necked snake, is a small, harmless, easily recognized fossorial species that inhabits a variety of terrestrial habitats. Ring-necked snakes range throughout the eastern and central United States. As the common name implies *D. punctatus* possess a distinctive yellow to orange ring behind the head; coloration of the ring is obvious against the dark gray color of the head and body. The venter is also a yellow to orange. Ring-necked snakes feed upon invertebrates and small amphibians and reptiles.

Habitat associations:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Longleaf Pine Plantation
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; common species.

Ring-necked snake (*Diadophis punctatus*) observations on the Cahaba River National Wildlife Refuge.



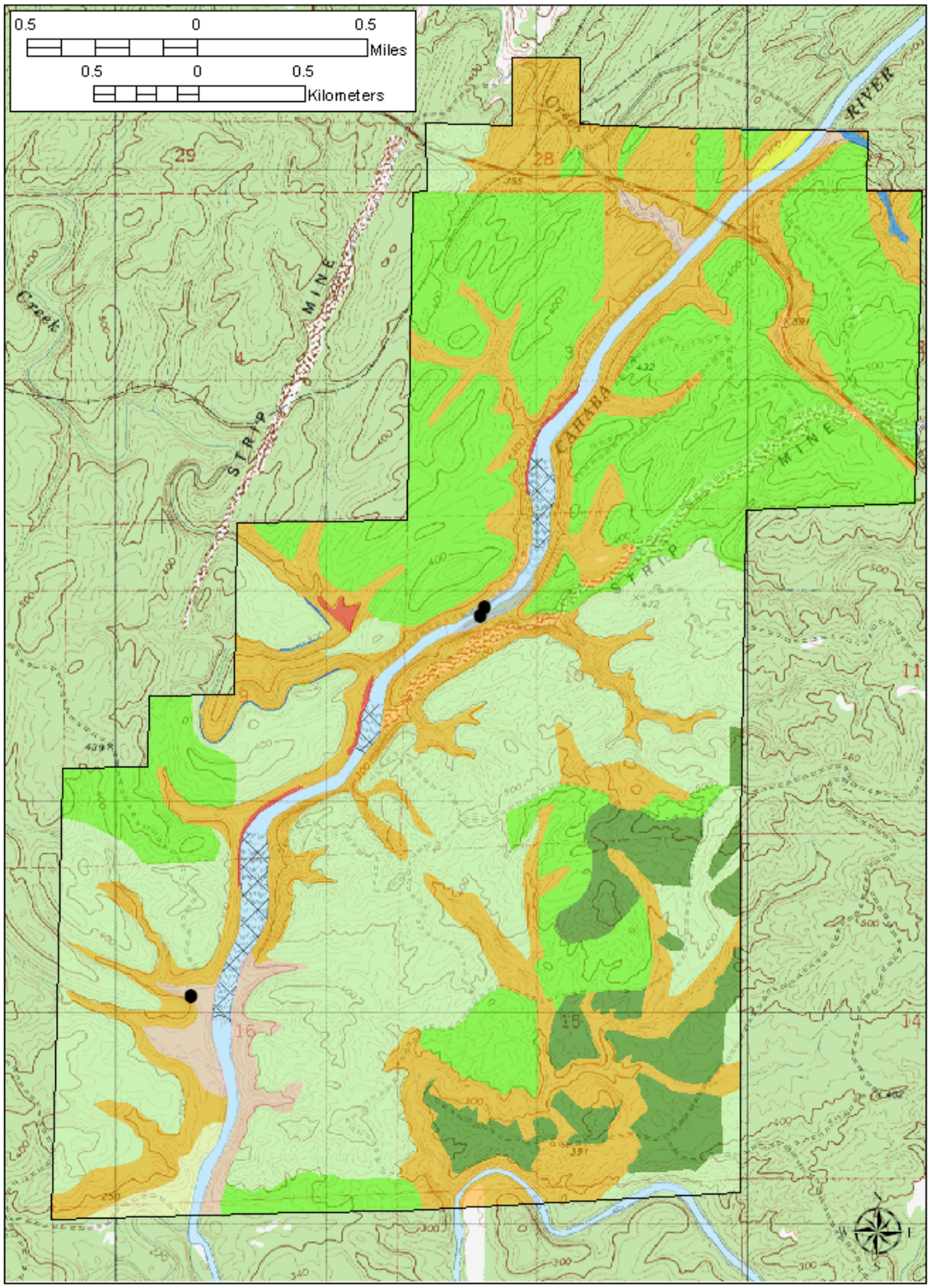
Nerodia sipedon pleuralis
midland watersnake

Nerodia sipedon pleuralis is a medium-sized aquatic snake that ranges throughout much of Alabama. Midland watersnake is an overall gray, light brown, or reddish-brown with darker contrasting bands and alternating dorsal and lateral blotches. Maximum size of the watersnake is less than 1.5 m. Fish are the primary food item but amphibians are consumed as well.

Habitat associations:
White Oak – Beech Small Stream Floodplain Forest
River

Management recommendations: Maintain integrity of river and riparian habitats.

Midland watersnake (*Nerodia sipedon pleuralis*) observations on the Cahaba River National Wildlife Refuge.



Regina septemvittata
queensnake

The queensnake is an aquatic species found throughout the state and inhabit stream and pond margins frequently basking in vegetation overhanging the water. Food of the queensnake is almost exclusively crayfish. *R. septemvittata* is a small to medium-sized snake less than 1 m total length. Dorsum is a dark olive brown with three obscure dark stripes and the venter is typically off-white with a pair of dark stripes.

Habitat associations:
River

Management recommendations: Maintain integrity of river and riparian habitats.

No map available: Recorded during bioblitz and exact locality not provided.

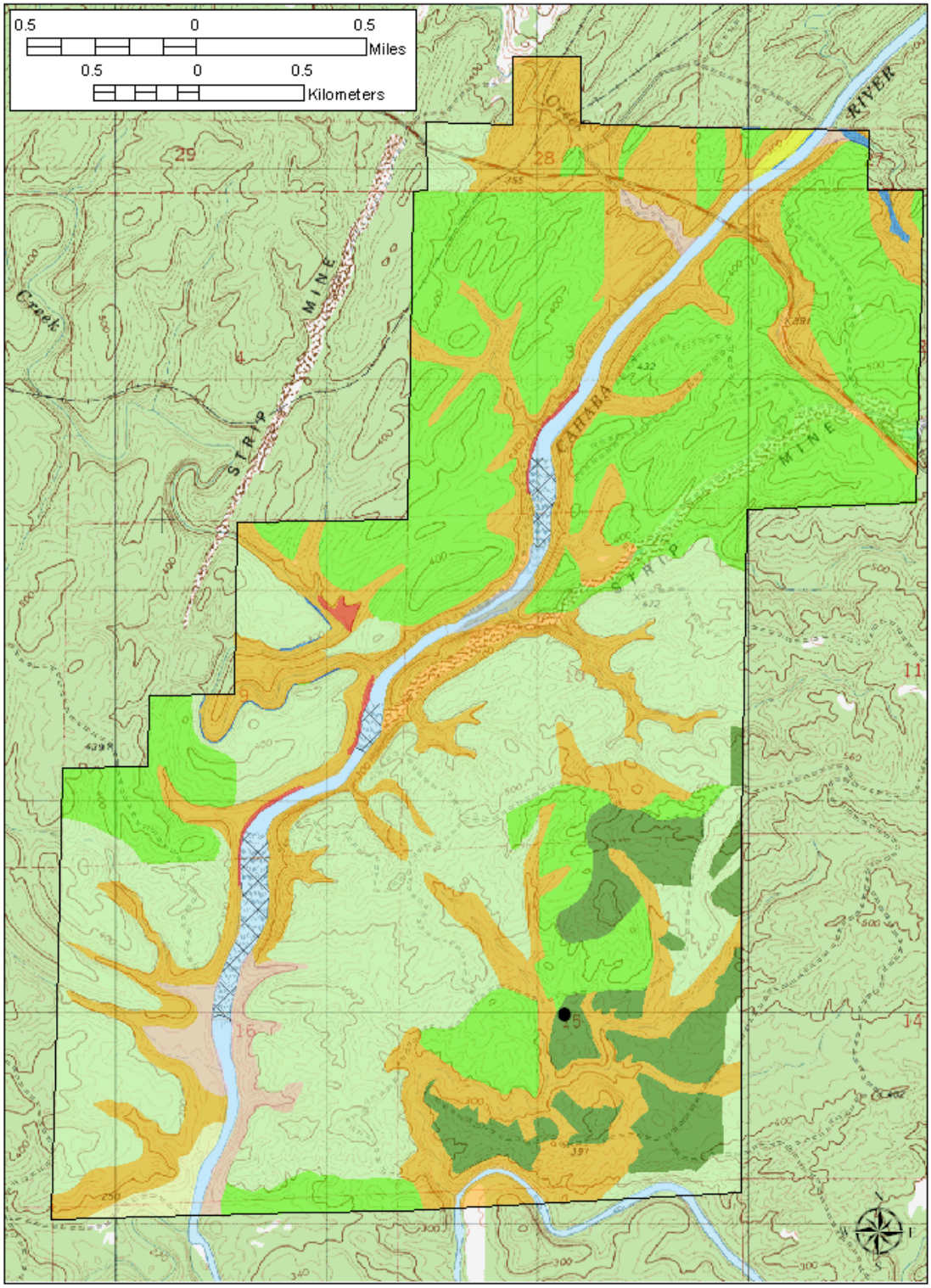
Storeria dekayi
Dekay's brownsnake

Storeria dekayi is a small (< 450 mm) snake of a variety of terrestrial habitats including urban settings. The species ranges throughout the eastern United States. This harmless species is an overall brown coloration with a dark head, dark neck ring, and a series of broken, dark dorsal bars. Earthworms, slugs, spiders, and small amphibians make up the diet.

Habitat association:
Longleaf Pine Plantation

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Dekay's brownsnake (*Storeria dekayi*) observations on the Cahaba River National Wildlife Refuge.



Storeria occipitomaculata
red-bellied snake

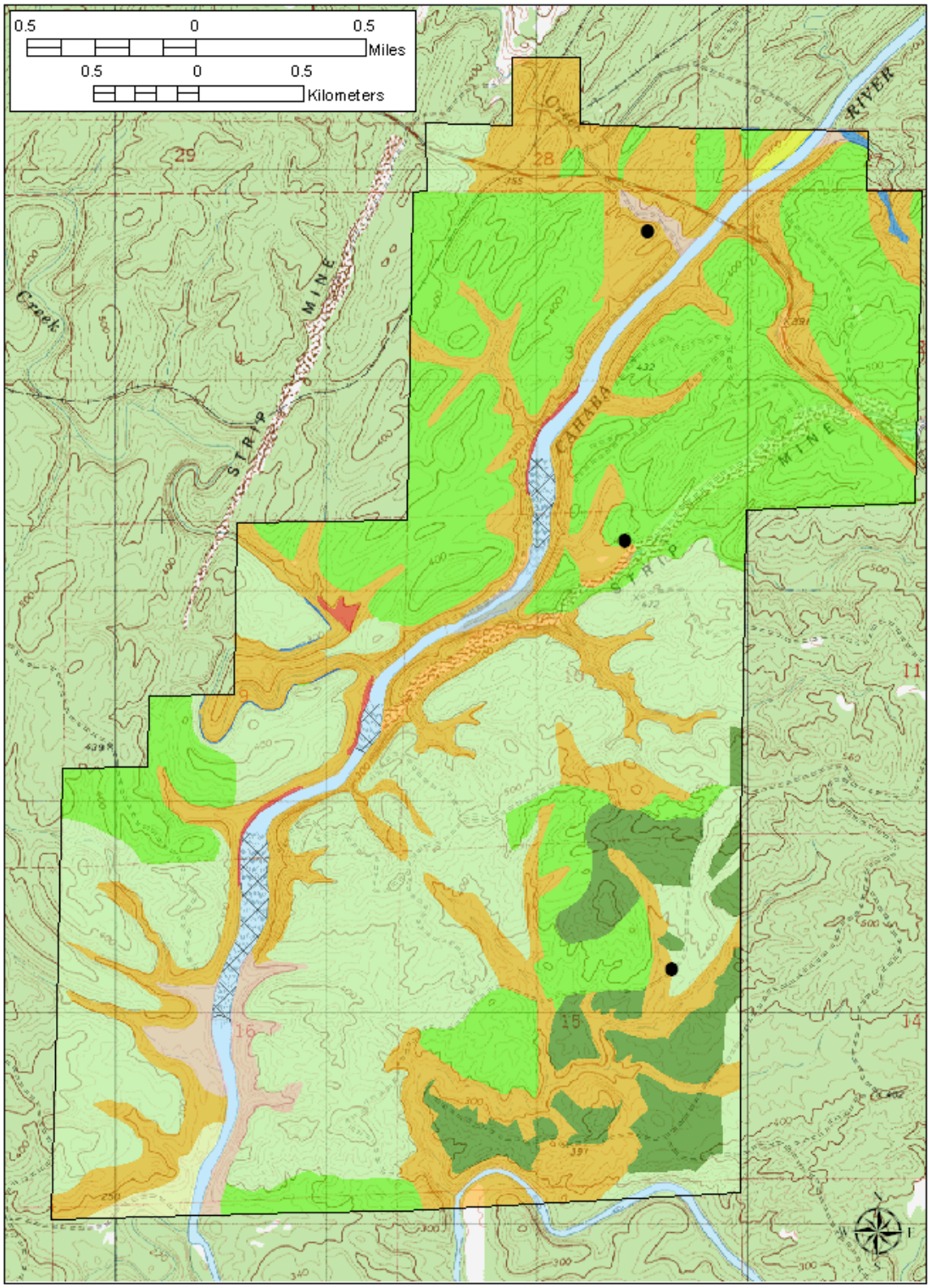
Similar in size to *S. dekayi* and having a similar range, *S. occipitomaculata* is a small snake inhabiting mesic, forested hilly habitats. The red-bellied snake has a gray or brown dorsum, dark head, and light neck ring, with a pink, orange, or reddish venter. Insects, snails, and other small invertebrates are eaten.

Habitat association:

Lower Piedmont Chestnut Oak Forest
Loblolly Pine Plantation
Montane Longleaf Pine Woodland

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Red-bellied snake (*Storeria occipitomaculata*) observations on the Cahaba River National Wildlife Refuge.



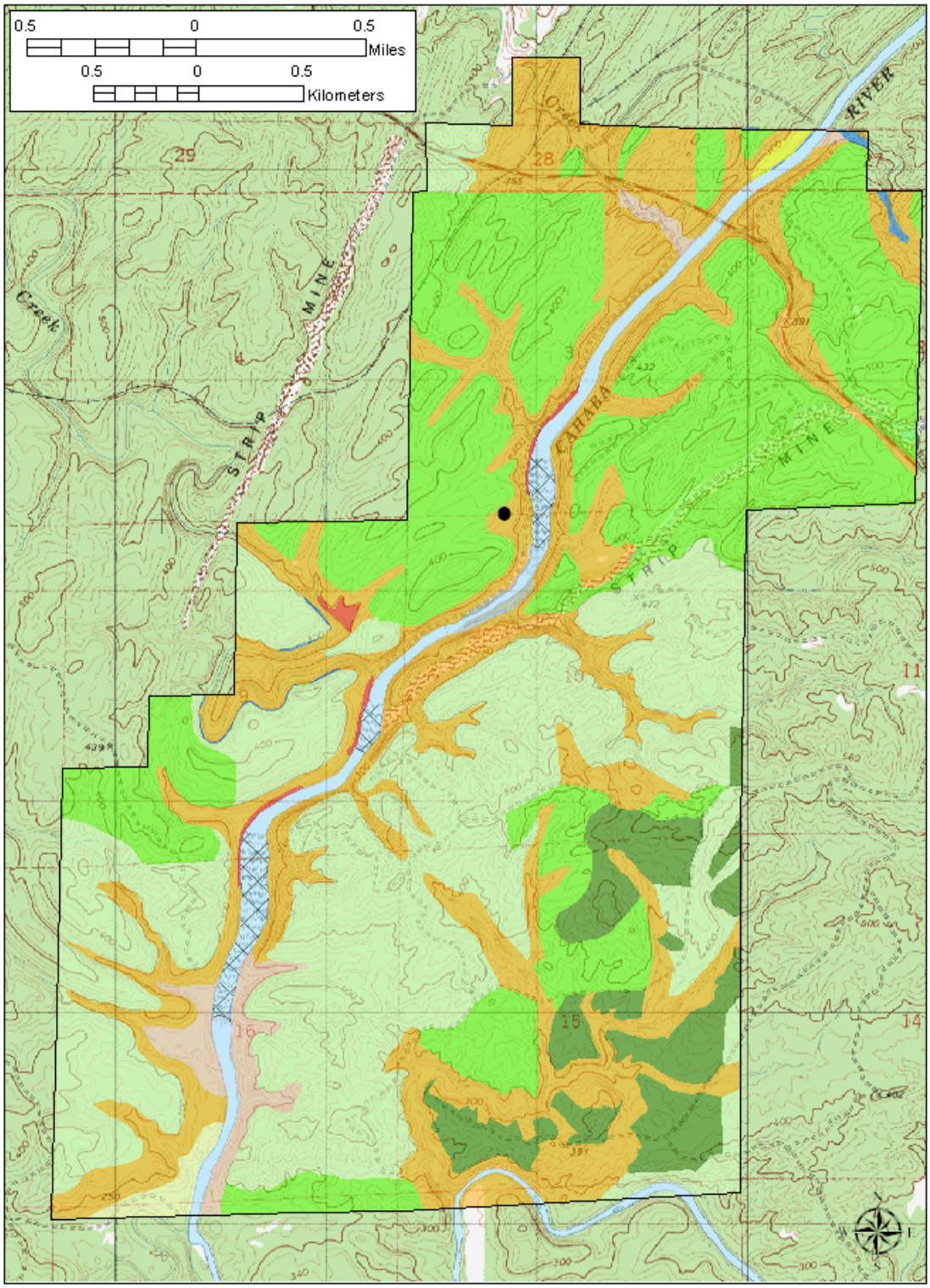
Thamnophis sirtalis
eastern garter snake

The eastern garter snake is a generalist species but is often found in lowland situations near water. *Thamnophis sirtalis* feeds upon frogs, toads, salamanders, fish, and earthworms, primarily. This is a medium-sized snake reaching a maximum length of nearly 1.3 m. A yellow to tan mid-dorsal stripe runs the length of the body while the sides have a checkered appearance of alternating squarish spots. Garter snakes are pugnacious and when captured often bite and freely exude musk.

Habitat association:
Lower Piedmont Chestnut Oak Forest

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Eastern garter snake (*Thamnophis sirtalis*) observations on the Cahaba River National Wildlife Refuge.



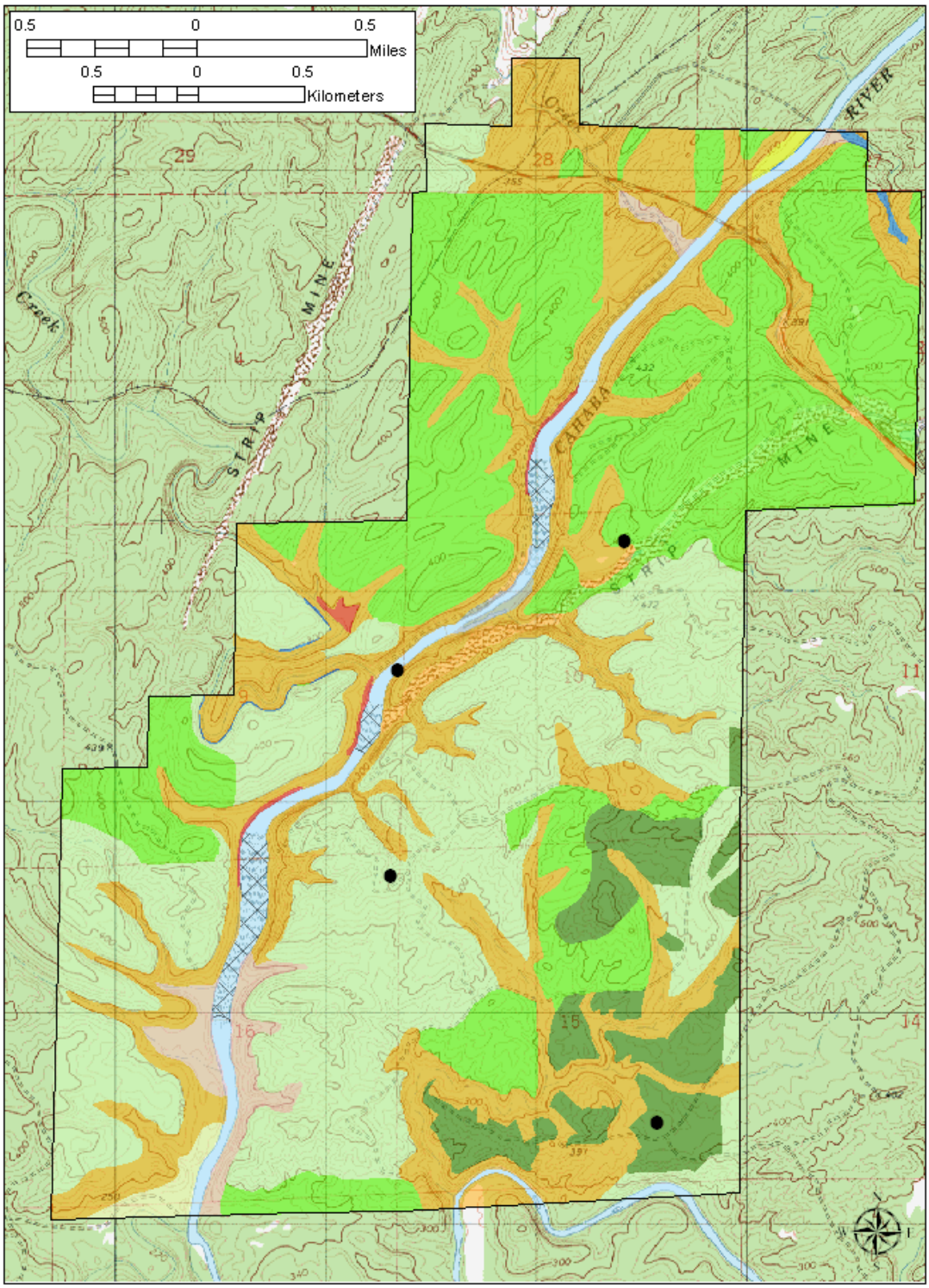
Heterodon platirhinos
eastern hog-nosed snake

The eastern hog-nosed snake is a medium-sized snake attaining a maximum length slightly exceeding 1 m. This thick-bodied snake is easily recognized by the upturned snout and is known for its flattening of the neck, hissing, puffing up, and feigning death. Coloration of *H. platirhinos* may be entirely black or have a tan to brown blotched pattern. Preferred food of *H. platirhinos* is toads.

Habitat association:
- Loblolly Pine Plantation
- Longleaf Pine Plantation
- Montane Longleaf Pine Woodland

Management recommendations: None; wide-ranging and common species, although not widespread on refuge.

Eastern hog-nosed snake (*Heterodon platirhinos*) observations on the Cahaba River National Wildlife Refuge.



Agkistrodon contortrix
copperhead

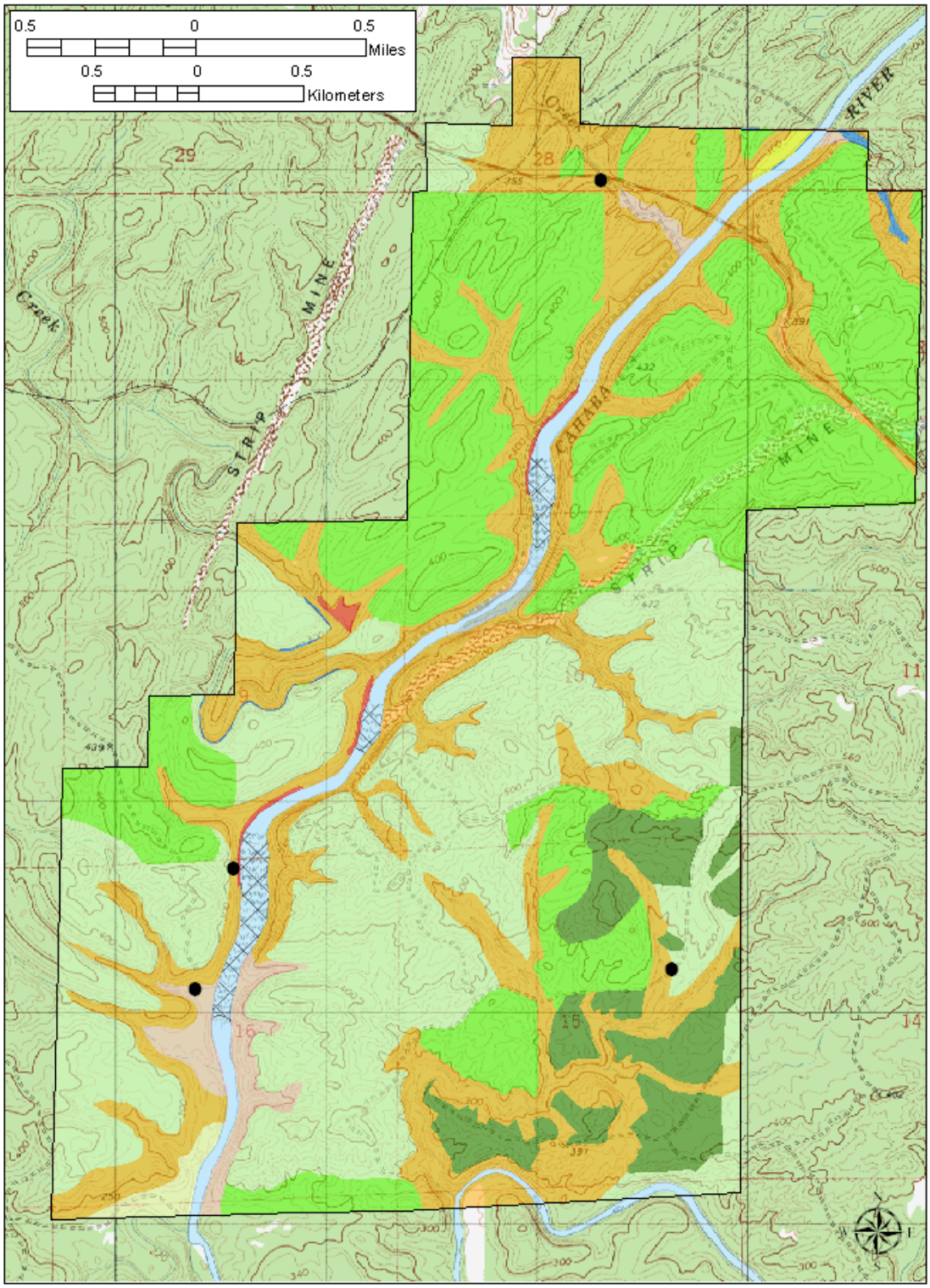
Copperheads range across the eastern United States inhabiting forested areas with rocky bluffs and ravines, if these are present. *A. contortrix* is a colorful snake with a coppery ground color overlain with light brown hourglass markings. Maximum size of this stout-bodied pit viper is about 1.3 m. Diet of *A. contortrix* is small mammals, frogs, lizards, and insects.

Habitat associations:

Montane Longleaf Pine Woodland
Lower Piedmont Chestnut Oak Forest
White Oak – Beech Small Stream Floodplain Forest

Management recommendations: None; common species.

Copperhead (*Agkistrodon contortrix*) observations on the Cahaba River National Wildlife Refuge.



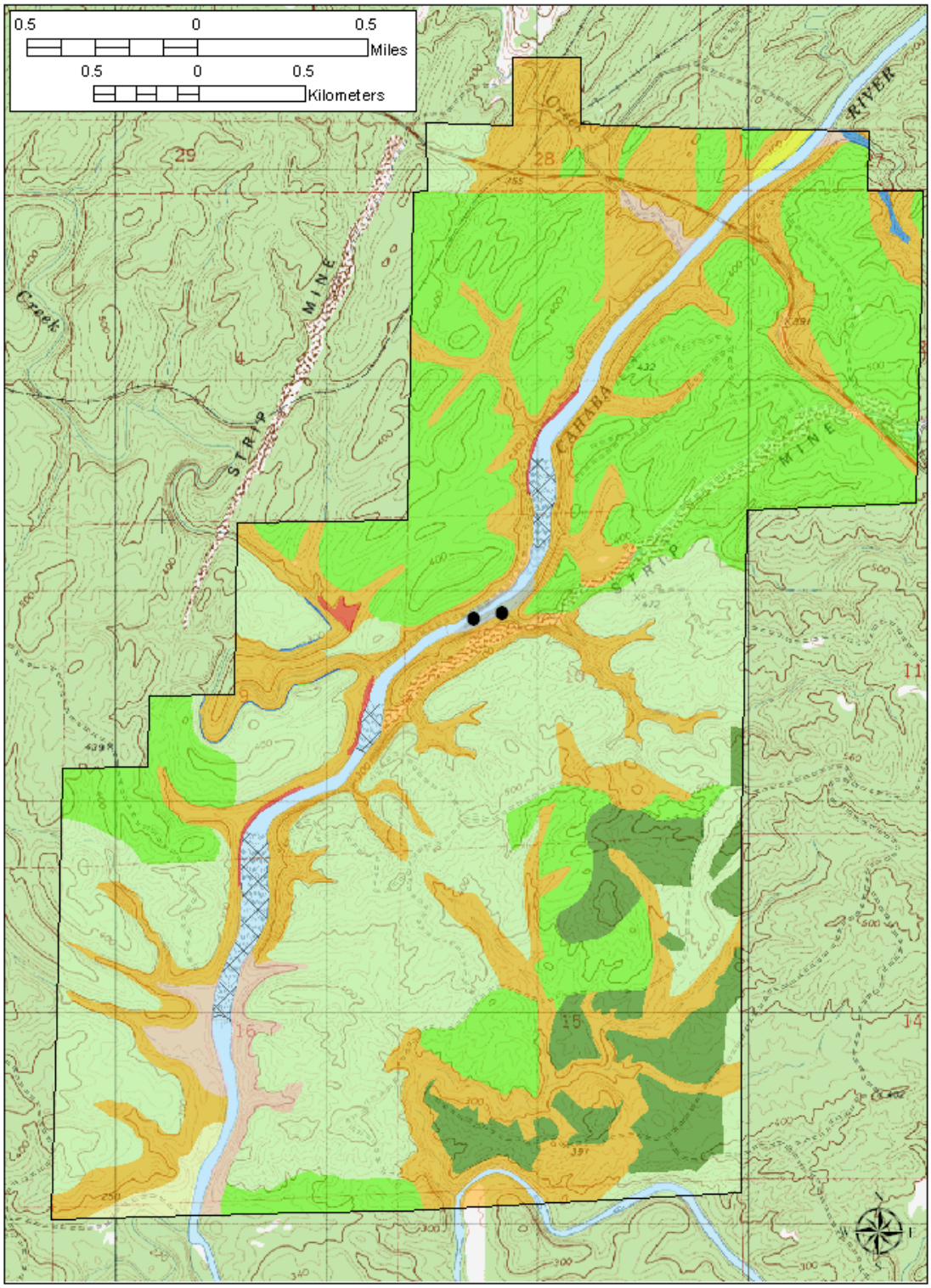
Agkistrodon piscivorous
cottonmouth

Agkistrodon piscivorous may be considered the aquatic counterpart to *A. contortrix* although *A. piscivorous* attains a larger size (1.8 m) has a thicker body, and duller color. The cottonmouth inhabits riparian zones around streams, ponds, marshes, and swamps where it feeds upon frogs, fish, lizards, turtles, snakes, birds, and small mammals. When alarmed the cottonmouth and copperhead give off a pungent musk. When in a defensive posture the cottonmouth will coil its body, cock the head upward, and open the mouth, revealing the inner white lining.

Habitat association:
river

Management recommendations: None; common species.

Cottonmouth (*Agkistrodon piscivorous*) observations on the Cahaba River National Wildlife Refuge.



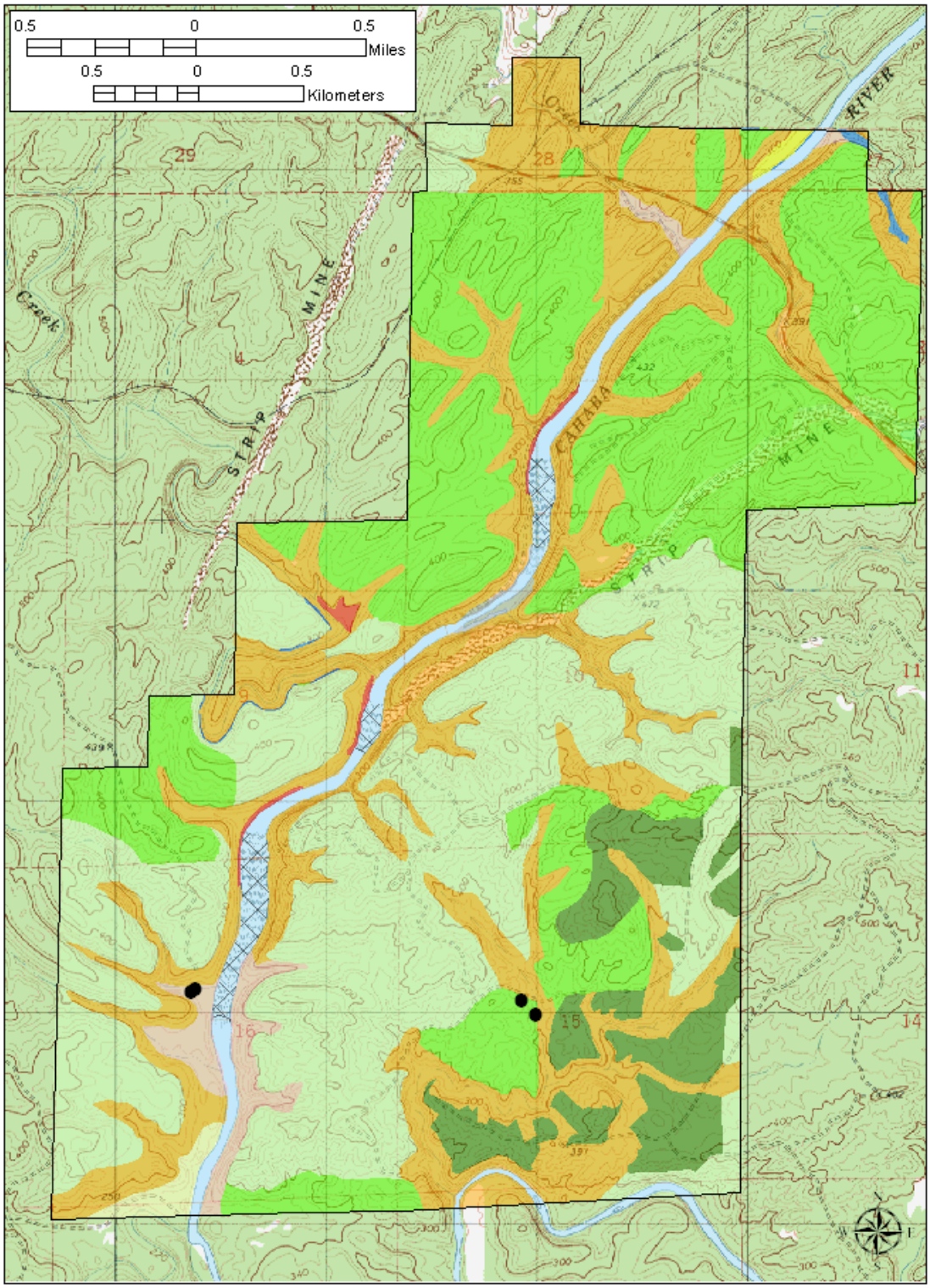
Crotalus horridus
timber rattlesnake

Crotalus horridus ranges across the eastern United States where it inhabits forests, floodplains, and swampy areas. Rattlesnakes are unique in possessing a terminal rattle, composed of unshed scales, that is used to give an aural warning. Small mammals are the main food item of timber rattlesnakes but birds are also consumed. *C. horridus* are thick-bodied, may reach a maximum size of 1.8 m, and have a ground color of tan to brown, with an overlying pattern of dark dorsal chevrons.

Habitat associations:
White Oak – Beech Small Stream Floodplain Forest
Loblolly Pine Plantation

Management recommendations: None; common species.

Timber rattlesnake (*Crotalus horridus*) observations on the Cahaba River National Wildlife Refuge.



Management Recommendations

Amphibian and reptile species documented during this inventory are, for the most part, wide-ranging, relatively common species without narrow ecological needs. Restoration plans for the Cahaba River National Wildlife Refuge will be to re-establish longleaf pine forest to sites that historically supported this type of forest. To accomplish that goal the gob pile from past mining operations will need to undergo radical restoration. This will undoubtedly impact a host of species and thousands of individuals, but the outcome will return an area of refuge back to a more natural state. Amphibians and reptiles will die during this process but the affected populations should rebound rapidly once more natural ecological processes are established.

Forest conversion from loblolly pine plantation and early stages of longleaf pine plantation to an ecologically balanced longleaf pine forest will entail the death of amphibians and reptiles, but most likely to a lesser degree than the radical earth movement that will be done during the mine reclamation process. Clearcutting of loblolly pine, replanting with longleaf, and prescribed fires will alter the current state of forests but these are necessary processes in order to attain the goal of an ecologically functional longleaf pine forest. Amphibian and reptile populations within the affected areas will have numbers change, and species compositions of the herptile communities will change.

Acknowledgements

US Fish and Wildlife staff of the Mountain Longleaf/Cahaba River National Wildlife Refuge have been extremely helpful and interested in this inventory. Steve Miller, Refuge Manager, and Eva Kristofik, Deputy Refuge Manager, provided field assistance on numerous occasions. Mike Wines and Bill Hubbard provided invaluable assistance by lugging trap materials, pounding stakes, and setting funnel traps. Three universities participated in the bioblitz, Auburn University (Sean Graham, David Steen, Matthew Connell, Katherine Gray), University of Alabama (JJ Apodaca, Wally Smith, Chris Thawley), Alabama A&M (William Sutton, Becky Hardman) and University of Georgia (Andrew Durso, Kerry Nelson, Grover Brown, Elizabeth Nixon, Todd Pierson). The efforts of the participants added a few species that otherwise would have been missed. Alan Cressler and Dan Calhoun, of the Atlanta, GA, US Geological Survey aided with amphibian collections during their water quality and chytrid fungus surveys. Dr. Greg Pauly and Dr. Brad Shaffer and family, from the University of California at Davis, spent a day on the Cahaba River collecting turtles. A special thanks to my wife, Lenela Glass-Godwin, for editing this report.

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Appendix 1. A listing of commonly recognized scientific and common names.

	Previous Scientific Name	Current Scientific Name	CNAH common name	SSAR common name
Class Amphibia				
Order Anura				
Family Bufonidae	*Bufo fowleri*	*Anaxyrus fowleri*	Fowler's toad	Fowler's toad
Family Hylidae	*Acris gryllus*	*Acris gryllus*	southern cricket frog	southern cricket frog
	Hylla chrysoscelis	*Hylla chrysoscelis*	Cope's gray treefrog	Cope's gray treefrog
	Hyla cinerea	*Hyla cinerea*	green treefrog	green treefrog
	Pseudacris brachyphona	*Pseudacris brachyphona*	mountain chorus frog	mountain chorus frog
	Pseudacris crucifer	*Pseudacris crucifer*	spring peeper	spring peeper
Family Microhylidae	*Gastrophryne carolinensis*	*Gastrophryne carolinensis*	eastern narrowmouth toad	eastern narrow-mouthed toad
Family Ranidae	*Rana catesbeiana*	*Lithobates catesbeianus*	bullfrog	American bullfrog
	Rana clamitans	*Lithobates clamitans*	bronze frog	bronze frog
	Rana sphenocephala	*Lithobates sphenocephalus*	Florida leopard frog	southern leopard frog
Order Caudata				
Family Ambystomatidae	*Ambystoma maculatum*	*Ambystoma maculatum*	spotted salamander	spotted salamander
Family Plethodontidae	*Desmognathus conanti*	*Desmognathus conanti*	spotted dusky salamander	spotted dusky salamander
	Desmognathus monticola	*Desmognathus monticola*	seal salamander	seal salamander
	Eurycea cirrigera	*Eurycea cirrigera*	southern two-lined salamander	southern two-lined salamander
	Eurycea guttolineata	*Eurycea guttolineata*	three-lined salamander	three-lined salamander
	Plethodon glutinosus	*Plethodon glutinosus*	northern slimy salamander	northern slimy salamander
	Plethodon ventralis	*Plethodon ventralis*	southern zigzag salamander	southern zigzag salamander
	Plethodon websteri	*Plethodon websteri*	Webster's salamander	Webster's salamander
	Pseudotriton ruber	*Pseudotriton ruber*	red salamander	red salamander
Family Salamandridae	*Notophthalmus viridescens*	*Notophthalmus viridescens*	eastern newt	eastern newt
Class Chelonia				
Family Emydidae	*Graptemys pulchra*	*Graptemys pulchra*	Alabama map turtle	Alabama map turtle
	Pseudemys concinna	*Pseudemys concinna*	eastern river cooter	river cooter
	Terrapene carolina	*Terrapene carolina*	eastern box turtle	eastern box turtle
	Trachemys scripta	*Trachemys scripta*	slider	pond slider
Family Kinosternidae	*Sternotherus minor peltifer*	*Sternotherus minor peltifer*	stripeneck musk turtle	stripe-necked musk turtle
Family Trionychidae	*Apalone spinifer*	*Apalone spinifer*	spiny soft shell	spiny soft shell
Class Reptilia				
Order Squamata				

Family Iguanidae	*Sceloporus undulatus*	*Sceloporus undulatus*	eastern fence lizard	eastern fence lizard
Family Polychrotidae	*Anolis carolinensis*	*Anolis carolinensis*	green anole	green anole
Family Scincidae	*Eumeces fasciatus*	*Plestiodon fasciatus*	five-lined skink	common five-lined skink
	Eumeces laticeps	*Plestiodon laticeps*	broadhead skink	broad-headed skink
	Scincella lateralis	*Scincella lateralis*	ground skink	little brown skink
Family Teiidae	*Cnemidophorus sexlineatus*	*Aspidoscelis sexlineata*	six-lined racerunner	six-lined racerunner
Family Colubridae	*Coluber constrictor*		eastern racer	North American racer
	Lampropeltis getula nigra		black kingsnake	eastern black kingsnake
	Elaphe obsoleta	*Scotophis spiloides (CNAH); Pantherophis spiloides (*SSAR*)*	midland rat snake	gray ratsnake
Family Dipsadidae	*Carphophis amoenus*		eastern worm snake	easternworm snake
	Diadophis punctatus		ringneck snake	ring-necked snake
Family Natricidae	*Nerodia sipedon pleuralis*		midland water snake	midland watersnake
	Regina septemvittata		queen snake	queensnake
	Storeria dekayi		brown snake	Dekay's brownsnake
	Storeria occipitomaculata		redbelly snake	red-bellied snake
Family Xenodontidae	*Heterodon platirhinos*		eastern hognose snake	eastern hog-nosed snake
Family Crotalidae	*Agkistrodon contortrix*		copperhead	copperhead
	Agkistrodon piscivorous		cottonmouth	cottonmouth
	Crotalus horridus		timber rattlesnake	timber rattlesnake