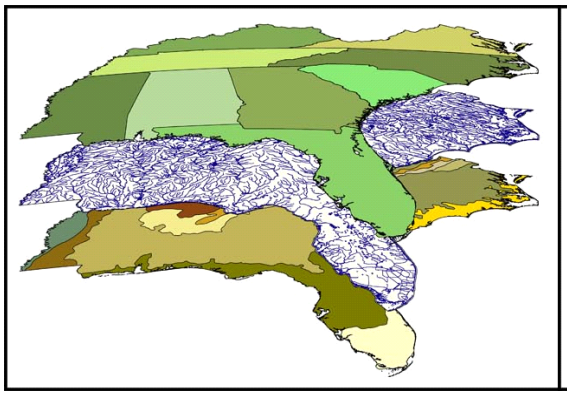


SOUTHEAST GAP ANALYSIS PROJECT

Species Modeling Report

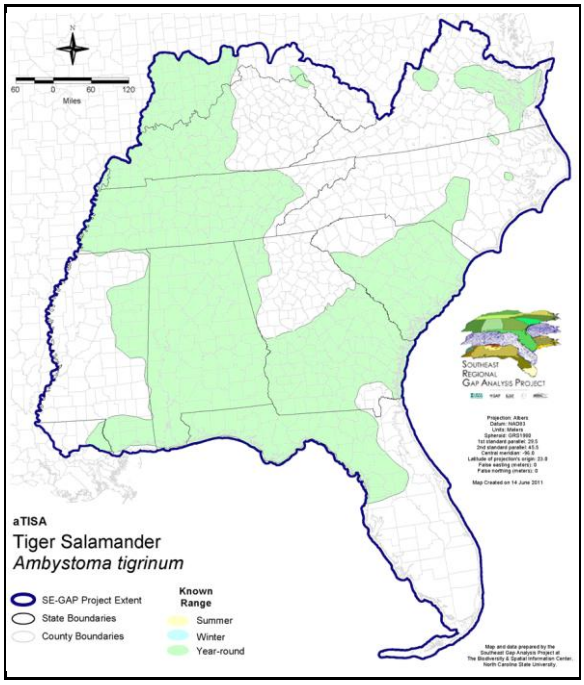
Tiger Salamander

Ambystoma tigrinum

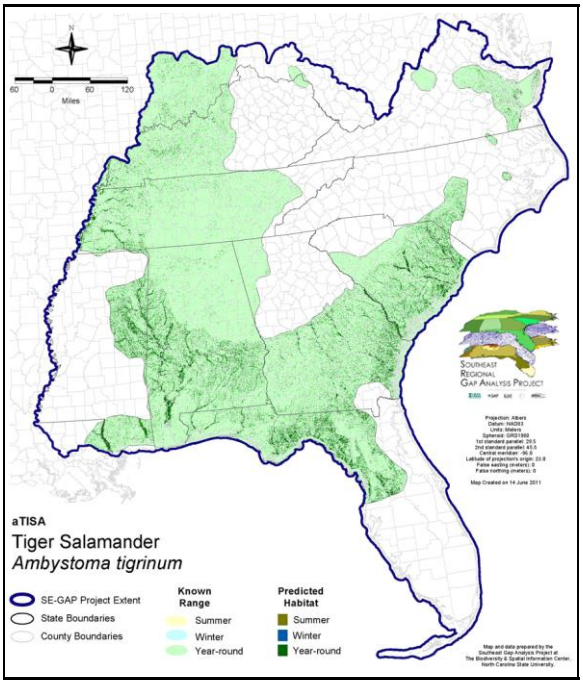
Taxa: Amphibian
Order: Caudata
Family: Ambystomatidae

SE-GAP Spp Code: **aTISA**
ITIS Species Code: 173592
NatureServe Element Code: AAAAA01140

KNOWN RANGE:



PREDICTED HABITAT:



Range Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Range_aTISA.pdf
Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Dist_aTISA.pdf
GAP Online Tool Link: http://www.gapserve.ncsu.edu/segap/segap/index2.php?species=aTISA
Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/aTISA_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: ---

State Status: ID (P), KY (N), LA (Prohibited), MD (E), NC (T), NY (E), OH (N), UT (None), VA (LE), WA (M), ON (EXP)

NS Global Rank: G5

NS State Rank: AL (S3), AR (S3), AZ (S5), CO (S5), DE (S1), FL (S3), GA (S3S4), IA (S5), ID (S5), IL (S5), IN (S4), KS (S5), KY (S4), LA (S1), MD (S2), MI (S3S4), MN (SNR), MO (SNR), MS (S1), MT (S4), NC (S2), ND (SNR), NE (S5), NJ (SNR), NM (S5), NV (SNA), NY (S1S2), OH (S3), OK (S5), OR (S2?), PA (SX), SC (SNR), SD (S5), TN (S5), TX (S5), UT (S4), VA (S1), WA (S3), WI (S4), WY (S4), AB (S4), MB (S4S5), ON (SX), SK (S5)

SUMMARY OF PREDICTED HABITAT BY MANAGMENT AND GAP PROTECTION STATUS:

	US FWS		US Forest Service		Tenn. Valley Author.		US DOD/ACOE	
	ha	%	ha	%	ha	%	ha	%
Status 1	10,932.0	< 1	5,333.0	< 1	0.0	0	0.0	0
Status 2	58,842.2	< 1	26,175.2	< 1	0.0	0	0.0	0
Status 3	742.0	< 1	184,810.6	3	10,539.8	< 1	87,047.5	1
Status 4	5.6	< 1	0.0	0	0.0	0	0.0	0
Total	70,521.8	< 1	216,318.7	3	10,539.8	< 1	87,047.5	1

	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	8,524.5	< 1	11.5	< 1	0.0	0
Status 2	0.0	0	106.9	< 1	1,739.7	< 1	38.8	< 1
Status 3	16,289.6	< 1	2,862.4	< 1	0.0	0	930.1	< 1
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	16,289.6	< 1	11,493.8	< 1	1,751.2	< 1	968.9	< 1

	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	196.2	< 1	6.8	< 1	0.0	0
Status 2	0.0	0	703.2	< 1	176,934.3	3	0.0	0
Status 3	2,139.8	< 1	110,574.5	2	41,773.9	< 1	67,900.6	< 1
Status 4	0.0	0	< 0.1	< 1	3,851.3	< 1	3.2	< 1
Total	2,139.8	< 1	111,473.9	2	222,566.2	3	67,903.8	< 1

	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	1,572.0	< 1	0.0	0	0.0	0
Status 2	1,815.6	< 1	23,322.1	< 1	1.2	< 1	224.3	< 1
Status 3	0.0	0	1,393.7	< 1	2,215.2	< 1	23,928.6	< 1
Status 4	0.0	0	0.0	0	611.1	< 1	0.0	0
Total	1,815.6	< 1	26,287.7	< 1	2,827.4	< 1	24,152.9	< 1

	Private Land - No Res.		Water		Overall Total	
	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	26,576.0	< 1
Status 2	0.0	0	0.0	0	289,903.3	4
Status 3	344.1	< 1	1.0	< 1	553,493.1	10
Status 4	5,992,946.1	85	5,150.5	< 1	6,006,413.6	85
Total	5,993,290.2	85	5,151.5	< 1	6,876,386.0	100

GAP Status 1: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a natural state within which disturbance events (of natural type, frequency, and intensity) are allowed to proceed without interference or are mimicked through management.

GAP Status 2: An area having permanent protection from conversion of natural land cover and a mandated management plan in operation to maintain a primarily natural state, but which may receive use or management practices that degrade the quality of existing natural communities.

GAP Status 3: An area having permanent protection from conversion of natural land cover for the majority of the area, but subject to extractive uses of either a broad, low-intensity type or localized intense type. It also confers protection to federally listed endangered and threatened species throughout the area.

GAP Status 4: Lack of irrevocable easement or mandate to prevent conversion of natural habitat types to anthropogenic habitat types. Allows for intensive use throughout the tract. Also includes those tracts for which the existence of such restrictions or sufficient information to establish a higher status is unknown.

PREDICTED HABITAT MODEL(S):

Year-round Model:

Habitat Description: Breeds in fishless pools or ponds in relatively open terrain, pastures, flooded roadside ditches (Mount 1975), vernal ponds in flatwoods and fallow fields. Found in virtually any habitat, providing there is a terrestrial substrate suitable for burrowing and a body of water nearby suitable for breeding. Fossorial adults inhabit bottomland deciduous forests, conifer forests and woodlands, mixed forest, moist hammock areas, pine savannah, open fields and brushy areas, alpine and subalpine meadows and grassland. The tiger salamander is rare in the low country of Atlantic coast states (Martof et al. 1980). In the coastal plain and sandhills of North Carolina, sandy soil appears to be an important component to the salamander's distribution (Martof et al. 1980, Wilson 1995). Populations are found from sea level to about 3350m in elevation. In the southeastern U.S., requires sandy soils, sandhills, and flatwoods ponds that do not contain fishes. Found in Florida to limits of mesic-temperate hammock. Current range is but a fraction of historic one. Distribution and abundance in NC has dramatically decreased. Populations in the southeastern United States have been detrimentally affected by deforestation and loss of wetland habitats (Petranka 1998). Tiger salamanders breed in the spring in the north and at high elevations, and in winter in the southern U.S. Typically the female oviposits within two days after picking up a spermatophore. Lays up to 1000 eggs singly or in small clusters in the west, in larger masses in the east. Eggs hatch in about 2-5 weeks, depending on the temperature. Larvae metamorphose in their first or second summer, or become paedomorphic. Reproductive success may be highly dependent on seasonal patterns of rainfall and temperature (Mitchell 1991). In South Carolina, reproductive success varied greatly in different years; little or no recruitment occurred during drought periods (Pechmann et al. 1991). Breeding aggregations may include a few or up to several hundred adults. Egg clusters attached to objects in water to 1m deep. Larvae transform in May/June at 10-12 cm total length. S. Smith 18Feb05

Elevation Mask: < 3350m

Hydrography Mask:

Freshwater Only

Utilizes open water features with buffer of 250m from selected water features.

Utilizes wet vegetation features with buffer of unlimited into selected vegetation features.

Selected Map Units:

Functional Group	Map Unit Name
Forest/Woodland	Appalachian Hemlock-Hardwood Forest
Forest/Woodland	Atlantic Coastal Plain Fall-Line Sandhills Longleaf Pine Woodland - Loblolly Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Offsite Hardwood Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Open Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Scrub/Shrub Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Mesic Hardwood and Mixed Forest
Forest/Woodland	Atlantic Coastal Plain Upland Longleaf Pine Woodland
Forest/Woodland	Central Appalachian Oak and Pine Forest
Forest/Woodland	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland - Woodland Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest - Hardwood Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest - Mixed Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest - Pine Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Loblolly Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Offsite Hardwood Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Open Understory Modifier
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Scrub/Shrub Modifier
Forest/Woodland	East Gulf Coastal Plain Limestone Forest
Forest/Woodland	East Gulf Coastal Plain Northern Loess Bluff Forest
Forest/Woodland	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland - Juniper Modifier
Forest/Woodland	East Gulf Coastal Plain Northern Mesic Hardwood Forest
Forest/Woodland	East Gulf Coastal Plain Southern Loess Bluff Forest
Forest/Woodland	East Gulf Coastal Plain Southern Mesic Slope Forest
Forest/Woodland	Florida Longleaf Pine Sandhill - Open Understory Modifier
Forest/Woodland	Florida Longleaf Pine Sandhill - Scrub/Shrub Understory Modifier

Forest/Woodland	South-Central Interior Mesophytic Forest
Forest/Woodland	Southeastern Interior Longleaf Pine Woodland
Forest/Woodland	Southern and Central Appalachian Cove Forest
Forest/Woodland	Southern and Central Appalachian Oak Forest
Forest/Woodland	Southern and Central Appalachian Oak Forest - Xeric
Forest/Woodland	Southern Appalachian Montane Pine Forest and Woodland
Forest/Woodland	Southern Coastal Plain Oak Dome and Hammock
Forest/Woodland	Southern Piedmont Dry Oak-Heath Forest - Virginia/Pitch Pine Modifier
Forest/Woodland	Southern Piedmont Mesic Forest
Prairie	Bluegrass Basin Savanna and Woodland
Prairie	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland
Prairie	East Gulf Coastal Plain Black Belt Calcareous Prairie and Woodland - Herbaceous Modifier
Prairie	East Gulf Coastal Plain Jackson Plain Prairie and Barrens
Prairie	East Gulf Coastal Plain Jackson Prairie and Woodland
Prairie	Eastern Highland Rim Prairie and Barrens
Prairie	Eastern Highland Rim Prairie and Barrens - Dry Modifier
Prairie	Panhandle Florida Limestone Glade
Prairie	Pennyroyal Karst Plain Prairie and Barrens
Prairie	Southern Ridge and Valley Patch Prairie
Prairie	Western Highland Rim Prairie and Barrens
Wetlands	Atlantic Coastal Plain Blackwater Stream Floodplain Forest - Forest Modifier
Wetlands	Atlantic Coastal Plain Blackwater Stream Floodplain Forest - Herbaceous Modifier
Wetlands	Atlantic Coastal Plain Brownwater Stream Floodplain Forest
Wetlands	Atlantic Coastal Plain Clay-Based Carolina Bay Forested Wetland
Wetlands	Atlantic Coastal Plain Clay-Based Carolina Bay Herbaceous Wetland
Wetlands	Atlantic Coastal Plain Depression Pondshore
Wetlands	Atlantic Coastal Plain Large Natural Lakeshore
Wetlands	Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest - Taxodium/Nyssa Modifier
Wetlands	Atlantic Coastal Plain Nonriverine Swamp and Wet Hardwood Forest - Oak Dominated Modifier
Wetlands	Atlantic Coastal Plain Northern Basin Peat Swamp
Wetlands	Atlantic Coastal Plain Northern Basin Swamp and Wet Hardwood Forest
Wetlands	Atlantic Coastal Plain Northern Pondshore
Wetlands	Atlantic Coastal Plain Northern Wet Longleaf Pine Savanna and Flatwoods
Wetlands	Atlantic Coastal Plain Peatland Pocosin
Wetlands	Atlantic Coastal Plain Sandhill Seep
Wetlands	Atlantic Coastal Plain Small Blackwater River Floodplain Forest
Wetlands	Atlantic Coastal Plain Small Brownwater River Floodplain Forest
Wetlands	Atlantic Coastal Plain Southern Wet Pine Savanna and Flatwoods
Wetlands	Atlantic Coastal Plain Streamhead Seepage Swamp, Pocosin, and Baygall
Wetlands	Central Appalachian Floodplain - Forest Modifier
Wetlands	Central Appalachian Floodplain - Herbaceous Modifier
Wetlands	Central Appalachian Riparian - Forest Modifier
Wetlands	Central Appalachian Riparian - Herbaceous Modifier
Wetlands	Central Florida Herbaceous Pondshore
Wetlands	Central Florida Herbaceous Seep
Wetlands	Central Florida Pine Flatwoods
Wetlands	Central Interior Highlands and Appalachian Sinkhole and Depression Pond
Wetlands	East Gulf Coastal Plain Interior Shrub Bog
Wetlands	East Gulf Coastal Plain Jackson Plain Dry Flatwoods - Open Understory Modifier
Wetlands	East Gulf Coastal Plain Jackson Plain Dry Flatwoods - Scrub/Shrub Understory Modifier
Wetlands	East Gulf Coastal Plain Large River Floodplain Forest - Forest Modifier
Wetlands	East Gulf Coastal Plain Large River Floodplain Forest - Herbaceous Modifier
Wetlands	East Gulf Coastal Plain Near-Coast Pine Flatwoods - Offsite Hardwood Modifier
Wetlands	East Gulf Coastal Plain Near-Coast Pine Flatwoods - Open Understory Modifier
Wetlands	East Gulf Coastal Plain Near-Coast Pine Flatwoods - Scrub/Shrub Understory Modifier
Wetlands	East Gulf Coastal Plain Northern Depression Pondshore

Wetlands	East Gulf Coastal Plain Northern Seepage Swamp
Wetlands	East Gulf Coastal Plain Small Stream and River Floodplain Forest
Wetlands	East Gulf Coastal Plain Southern Depression Pondshore
Wetlands	East Gulf Coastal Plain Southern Loblolly-Hardwood Flatwoods
Wetlands	East Gulf Coastal Plain Treeless Savanna and Wet Prairie
Wetlands	Floridian Highlands Freshwater Marsh
Wetlands	Lower Mississippi River Bottomland and Floodplain Forest
Wetlands	Lower Mississippi River Bottomland Depressions - Forest Modifier
Wetlands	Lower Mississippi River Bottomland Depressions - Herbaceous Modifier
Wetlands	Mississippi River Low Floodplain (Bottomland) Forest
Wetlands	Mississippi River Riparian Forest
Wetlands	North-Central Interior and Appalachian Rich Swamp
Wetlands	South Florida Dwarf Cypress Savanna
Wetlands	South Florida Pine Flatwoods
Wetlands	South-Central Interior Large Floodplain - Forest Modifier
Wetlands	South-Central Interior Large Floodplain - Herbaceous Modifier
Wetlands	South-Central Interior Small Stream and Riparian
Wetlands	South-Central Interior/Upper Coastal Plain Wet Flatwoods
Wetlands	Southern and Central Appalachian Bog and Fen
Wetlands	Southern Coastal Plain Herbaceous Seepage Bog
Wetlands	Southern Coastal Plain Hydric Hammock
Wetlands	Southern Coastal Plain Nonriverine Basin Swamp
Wetlands	Southern Coastal Plain Nonriverine Cypress Dome
Wetlands	Southern Coastal Plain Seepage Swamp and Baygall
Wetlands	Southern Piedmont Large Floodplain Forest - Forest Modifier
Wetlands	Southern Piedmont Large Floodplain Forest - Herbaceous Modifier
Wetlands	Southern Piedmont Seepage Wetland
Wetlands	Southern Piedmont Small Floodplain and Riparian Forest
Wetlands	Southern Piedmont/Ridge and Valley Upland Depression Swamp
Wetlands	Western Highland Rim Seepage Fen

CITATIONS:

Allison, L. J., P. E. Brunkow, and J. P. Collins. 1994. Opportunistic breeding after summer rains by Arizona tiger salamanders. Great Basin Nat. 54:376-379.

Bishop, S. C. 1941. The salamanders of New York. New YorkState Mus. Bull. 324:1-365.

Collins, J. P., J. B. Mitton, and B. A. Pierce. 1980. AMBYSTOMA TIGRINUM:a multispecies conglomerate? Copeia 1980:938-941.

Collins, J. P., T. R. Jones, and H. J. Berna. 1988. Conserving genetically distinctive populations:the case of the Huachuca tiger salamander (AMBYSTOMA TIGRINUM STEBBINSI Lowe). Pages 45-53 in B88SZA01NA.

Collins, J.T., Huheey, Knight & Smith. 1982. STANDARD COM. &CURRENT SCIENTIFIC NAMES FOR NORTH AMERICAN AMPHIBIANS & REPTILES. SOC. FOR THE STUDY OF AMPH. & REPT., COMMITTEE ON COMMON & SCIENTIFIC NAMES. MISC. PUB. HERP. CIRC. NO.1.

Corn, P. S., and F. A. Vertucci. 1992. Descriptive risk assessment of the effects of acidic deposition on Rocky Mountain amphibians. J. Herpetol. 26:361-369.

Fernandez, P. J., Jr., and J. P. Collins. 1988. Effect of environment and ontogeny on color pattern variation in Arizona tiger salamanders (AMBYSTOMA TIGRINUM NEBULOSUM Hallowell). Copeia 198:928-938.

Gehlbach, F. R. 1967. Ambystoma tigrinum. Cat. Am. Amph. Rep. 52.1-52.4.

Geraghty, C., and R. Willey. 1992. Current habitat status of and anthropogenic impacts on the tiger salamander, AMBYSTOMA TIGRINUM NEBULOSUM. Abstract, 6th Annual Meeting of the Society for Conservation Biology, p. 61.

Hammerson, G. A. 1982. Amphibians and reptiles in Colorado. Colorado Division of Wildlife, Denver. vii + 131 pp.

Harte, J., and E. Hoffman. 1989. Possible effects of acidic deposition on a Rocky Mountain population of the tiger salamander AMBYSTOMA TIGRINUM. Conservation Biology 3:149-158.

Irschick, D. J., and H. B. Shaffer. 1997. The polytypic species revisited:morphological differentiation among tiger salamanders (AMBYSTOMA TIGRINUM) (Amphibia:Caudata). Herpetologica 53:30-49.

Jones, T. R., A. G. Kluge, and A. J. Wolf. 1993. When theories and methodologies clash:a phylogenetic reanalysis of the North American ambystomatid salamanders (Caudata:Ambystomatidae). Systematic Biology 42:92-102.

Jones, T. R., and J. P. Collins. 1992. Analysis of a hybrid zone between subspecies of the tiger salamander (AMBYSTOMA TIGRINUM) in central New Mexico. J. Evol. Biol. 5:375-402.

Jones, T. R., E. J. Routman, D. J. Begun, and J. P. Collins. 1995. Ancestry of an isolated subspecies of salamander, AMBYSTOMA TIGRINUM STEBBINSI Lowe:the evolutionary significance of hybridization. Molecular Phylogenetics and Evolution 4:194-202.

Jones, T. R., et al. 1988. Systematic status and distribution of AMBYSTOMA TIGRINUM STEBBINSI Lowe (Amphibia:Caudata). Copeia 1988:621-635.

Kraus, F. 1985. A new unisexual salamander from Ohio. Univ. Michigan Mus. Zool., Occas. Pap. 709:1-24.

Kraus, F. 1988. An empirical evaluation of the use of the ontogeny polarization criterion in phylogenetic inference. Systematic Zoology 37:106-141.

Kraus, F., et al. 1991. Two new triparental unisexual AMBYSTOMA from Ohio and Michigan. Herpetologica 47:429-439.

Lowcock, L. A., L. E. Licht, and J. P. Bogart. 1987. Nomenclature in hybrid complexes of AMBYSTOMA (Urodela:Ambystomatidae):no case for the erection of hybrid "species." Syst. Zool. 36:328-336.

Martof, B. S., W. M. Palmer, J. R. Bailey, and J. R. Harrison, III. 1980. Amphibians and reptiles of the Carolinas and Virginia. University of North Carolina Press, Chapel Hill, North Carolina. 264 pp.

Minton, S. A., Jr. 1972. Amphibians and reptiles of Indiana. Indiana Academy Science Monographs 3. v + 346 pp.

Mitchell, J. C. 1991. Amphibians and reptiles. Pages 411-76 in K. Terwilliger (coordinator). Virginia's Endangered Species:Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

Mount, R. H. 1975. The Reptiles and Amphibians of Alabama. Auburn University Agricultural Experiment Station, Auburn, Alabama. vii + 347 pp.

Pechmann, J. H. K., et al. 1991. Declining amphibian populations:the problem of separating human impacts from natural fluctuations. Science 253:892-895.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Washington DC: Smithsonian Inst. Press.

Pierce, B. A., and J. B. Mitton. 1980. Patterns of allozyme variation in AMBYSTOMA TIGRINUM MAVORTIUM and A. T. NEBULOSUM. Copeia 1980:594-605.

Semlitsch, R. D. 1983. Structure and dynamics of two breeding populations of the eastern tiger salamander, AMBYSTOMA TIGRINUM. Copeia 1983:608-616.

Shaffer, H. B., and M. L. McKnight. 1996. The polytypic species revisited:genetic differentiation and molecular phylogenetics of the tiger salamander AMBYSTOMA TIGRINUM (Amphibia:Caudata) complex. Evolution 50:417-433.

Shaffer, H. B., J. M. Clark, and F. Kraus. 1991. When molecules and morphology clash:a phylogenetic analysis of the North American ambystomatid salamanders (Caudata:Ambystomatidae). Systematic Zoology 40:284-303.

Stebbins, R. C. 1985. A Field Guide to Western Reptiles and Amphibians. Second Edition. Houghton Mifflin Company, Boston, Massachusetts. xiv + 336 pp.

Vogt, R. G. 1981. Natural history of amphibians and reptiles of Wisconsin. Milwaukee Public Museum. 205 pp.

Wilson, L. A. 1995. The Land Manager's Guide to the amphibians and reptiles of the South. Chapel Hill, NC: The Nature Conservancy.

Wissinger, S. A., and H. H. Whiteman. 1992. Fluctuation in a Rocky Mountain population of salamanders:anthropogenic acidification or natural variation? J. Herpetol. 26:377-391.

Worthylake, K. M., and P. Hovingh. 1989. Mass mortality of salamanders (AMBYSTOMA TIGRINUM) by bacteria (ACINETOBACTER) in an oligotrophic seepage mountain lake. Great Basin Nat. 49:364-372.

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Compiled: 15 September 2011

This data was compiled and/or developed by the Southeast GAP Analysis Project at The Biodiversity and Spatial Information Center, North Carolina State University.