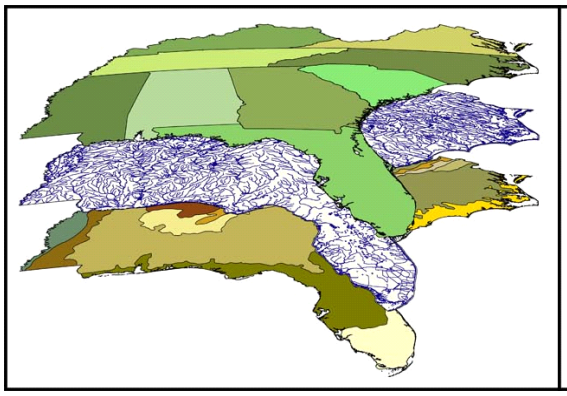


SOUTHEAST GAP ANALYSIS PROJECT

USGS gap BaSIC NARSAL

Species Modeling Report

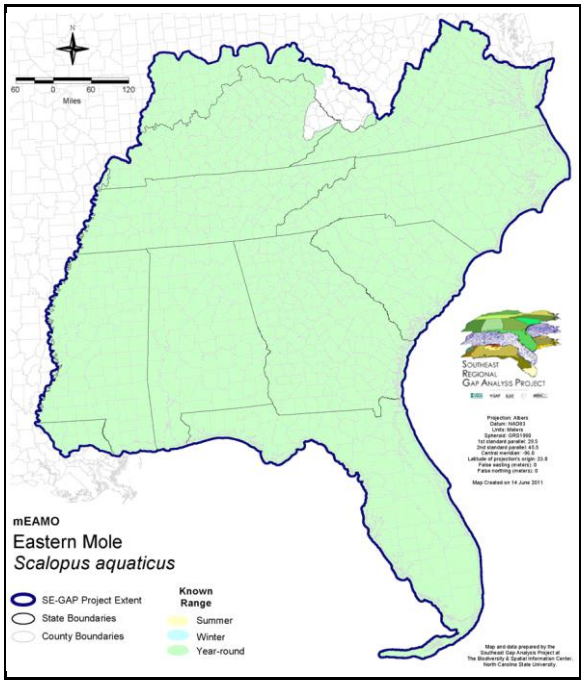
Eastern Mole

Scalopus aquaticus

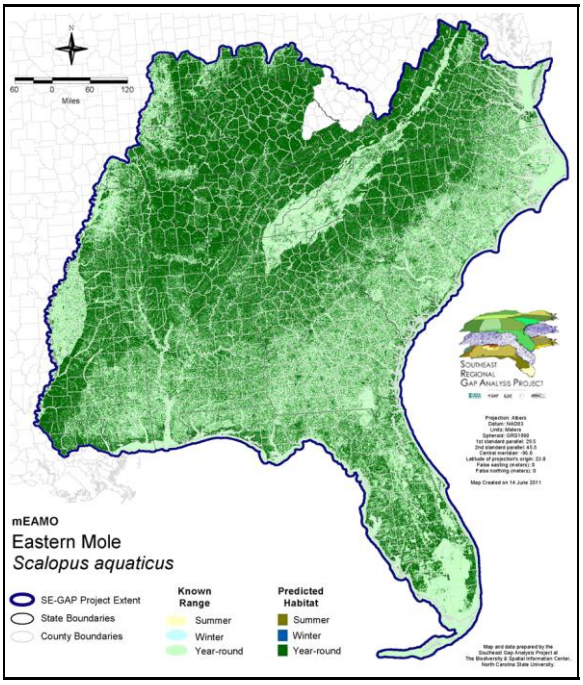
Taxa: Mammalian
Order: Soricomorpha
Family: Talpidae

SE-GAP Spp Code: **mEAMO**
ITIS Species Code: 179979
NatureServe Element Code: AMABB04010

KNOWN RANGE:



PREDICTED HABITAT:



Range Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Range_mEAMO.pdf
Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Dist_mEAMO.pdf
GAP Online Tool Link: http://www.gapserve.ncsu.edu/segap/segap/index2.php?species=mEAMO
Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/mEAMO_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: ---

State Status: KY (N), MS (Non-game species in need of management), NJ (S), NY (U), RI (Not Listed), ON (SC)

NS Global Rank: G5

NS State Rank: AL (S5), AR (S5), CO (S2), CT (S5), DC (S5), DE (S5), FL (SNR), GA (S5), IA (S5), IL (S5), IN (S4), KS (S5), KY (S5), LA (S4S5), MA (S5), MD (S5), MI (S5), MN (SNR), MO (SNR), MS (S5), NC (S5), NE (S5), NJ (S5), NY (S5), OH (SNR), OK (S5), PA (S5), RI (SNR), SC (SNR), SD (S4), TN (S5), TX (S5), VA (S5), WI (S5), WV (S3), WY (S2), ON (S2)

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	36,589.5	< 1	2,602.2	< 1	0.0	0	0.0	0
Status 2	63,428.4	< 1	212,404.5	< 1	0.0	0	3,294.6	< 1
Status 3	2,721.3	< 1	1,214,072.4	2	65,935.4	< 1	463,043.2	< 1
Status 4	56.0	< 1	0.0	0	0.0	0	318.4	< 1
Total	102,795.2	< 1	1,429,079.0	2	65,935.4	< 1	466,656.2	< 1

	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	32,903.8	< 1	82.4	< 1	7,989.8	< 1
Status 2	0.0	0	19,915.5	< 1	8,980.3	< 1	77.8	< 1
Status 3	19,562.2	< 1	99,758.2	< 1	0.0	0	6,644.7	< 1
Status 4	0.0	0	1.0	2	0.0	0	0.0	0
Total	19,562.2	< 1	152,579.0	< 1	9,062.7	< 1	14,712.2	< 1

	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	1,311.3	< 1	77.0	< 1	0.0	0
Status 2	0.0	0	5,326.7	< 1	430,052.9	< 1	1,314.6	< 1
Status 3	9,117.0	< 1	295,939.2	< 1	102,026.7	< 1	163,883.3	< 1
Status 4	0.0	0	0.0	0	74,659.2	< 1	10.2	< 1
Total	9,117.0	< 1	302,577.2	< 1	606,815.8	< 1	165,208.1	< 1

	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	12,371.7	< 1	0.0	0	0.0	0
Status 2	4,720.3	< 1	49,616.1	< 1	4.3	< 1	2,454.8	< 1
Status 3	0.0	0	13,384.3	< 1	20,192.5	< 1	89,973.6	< 1
Status 4	0.0	0	2.1	< 1	2,752.4	< 1	< 0.1	< 1
Total	4,720.3	< 1	75,374.1	< 1	22,949.2	< 1	92,428.6	< 1

	Private Land - No Res.		Water		Overall Total	
	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	93,927.7	< 1
Status 2	0.0	0	0.0	2	801,591.0	1
Status 3	341.4	< 1	1.1	< 1	2,566,596.3	6
Status 4	56,000,142.3	92	28,230.1	< 1	56,180,775.5	92
Total	56,000,483.6	92	28,231.4	< 1	59,642,890.6	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: Eastern moles most commonly occur in open areas with moist soils, such as lawns, meadows, golf courses, grassy fields, pastures, and open forest (Webster et al. 1985). They can also be found in sandy pineland, flatwoods, waste areas, dunes, scrub, and hammocks (Fernald 1989; Layne 1984; Ivey 1959; Moore 1946). They are very localized and rare in the mountains, where they are restricted to river bottoms and low-lying habitats (Webster et al. 1985). Loose sandy to loamy soils are a key habitat feature (Whitaker and Hamilton 1998) and they are often absent from saturated muck or peat soils (Brown 1997). Moles are fossorial mammals and spend most of their lives in an underground system of tunnels. The breeding season is March-April. Gestation lasts 42-45 days. Litter size is 2-5 with one litter per year. They reach sexual maturity within 1 year and few live more than 4 years (Davis and Choate, 1993, J. Mamm. 74:1014-1025). Stacy Smith, 12June05

Selected Map Units:

Functional Group	Map Unit Name
Anthropogenic	Developed Open Space
Anthropogenic	Low Intensity Developed
Anthropogenic	Medium Intensity Developed
Anthropogenic	Pasture/Hay
Anthropogenic	Successional Grassland/Herbaceous
Anthropogenic	Successional Grassland/Herbaceous (Other)
Anthropogenic	Successional Grassland/Herbaceous (Utility Swath)
Anthropogenic	Successional Shrub/Scrub (Clear Cut)
Anthropogenic	Successional Shrub/Scrub (Other)
Anthropogenic	Successional Shrub/Scrub (Utility Swath)
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland - Hardwood Modifier
Forest/Woodland	Atlantic Coastal Plain Central Maritime Forest
Forest/Woodland	Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Offsite Hardwood Modifier
Forest/Woodland	Atlantic Coastal Plain Mesic Hardwood and Mixed Forest
Forest/Woodland	Atlantic Coastal Plain Northern Maritime Forest
Forest/Woodland	Atlantic Coastal Plain Northern Mixed Oak-Heath Forest
Forest/Woodland	Atlantic Coastal Plain Southern Maritime 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 Upland Longleaf Pine Woodland - Offsite Hardwood Modifier
Forest/Woodland	East Gulf Coastal Plain Limestone Forest
Forest/Woodland	East Gulf Coastal Plain Maritime Forest
Forest/Woodland	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest
Forest/Woodland	East Gulf Coastal Plain Northern Loess Bluff Forest
Forest/Woodland	East Gulf Coastal Plain Northern Loess Plain Oak-Hickory Upland - Hardwood 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	Mississippi Delta Maritime Forest
Forest/Woodland	Northeastern Interior Dry Oak Forest - Mixed Modifier
Forest/Woodland	Northeastern Interior Dry Oak Forest-Hardwood Modifier
Forest/Woodland	Northern Atlantic Coastal Plain Dry Hardwood Forest
Forest/Woodland	South-Central Interior Mesophytic Forest
Forest/Woodland	Southeast Florida Coastal Strand and Maritime Hammock
Forest/Woodland	Southern Coastal Plain Dry Upland Hardwood Forest
Forest/Woodland	Southern Interior Low Plateau Dry-Mesic Oak Forest
Forest/Woodland	Southern Interior Low Plateau Dry-Mesic Oak Forest - Evergreen Modifier

Forest/Woodland	Southern Piedmont Dry Oak-(Pine) Forest - Hardwood Modifier
Forest/Woodland	Southern Piedmont Dry Oak-(Pine) Forest - Mixed Modifier
Forest/Woodland	Southern Piedmont Dry Oak-Heath Forest - Hardwood Modifier
Forest/Woodland	Southern Piedmont Dry Oak-Heath Forest - Mixed Modifier
Forest/Woodland	Southern Piedmont Mesic Forest
Forest/Woodland	Southern Ridge and Valley Dry Calcareous Forest
Forest/Woodland	Southern Ridge and Valley Dry Calcareous Forest - Hardwood Modifier
Forest/Woodland	Southwest Florida Coastal Strand and Maritime Hammock
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	Florida Dry Prairie
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 Northern Wet Longleaf Pine Savanna and Flatwoods
Wetlands	Atlantic Coastal Plain Southern Wet Pine Savanna and Flatwoods
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 Pine Flatwoods
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 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 Southern Loblolly-Hardwood Flatwoods
Wetlands	East Gulf Coastal Plain Treeless Savanna and Wet Prairie
Wetlands	South Florida Pine Flatwoods
Wetlands	South-Central Interior/Upper Coastal Plain Wet Flatwoods

CITATIONS:

Baker, Rollin H. 1983. Michigan mammals. Michigan State University Press. 642 pp.

Brown, L. N. 1997. A guide to the mammals of the southeastern United States. University of Tennessee Press, Knoxville. xiv + 236 pp.

Caire, W., J. D. Tyler, B. P. Glass, and M. A. Mares. Z. Marsh (illustrator). 1989. Mammals of Oklahoma. University of Oklahoma Press, Norman. Oklahoma. 567 pp.

Davis, F. W., and J. R. Choate. 1993. Morphologic variation and age structure in a population of the eastern mole, Scalopus aquaticus. J. Mamm., 74:1014-1025, 30 November.

Fernald, R. T. 1989. Coastal Xeric Scrub Communities of the Treasure Coast Region, Florida. Tallahassee,FL: Florida Game and Fresh Water Fish Commission.

Godin, A.J. 1977. Wild Mammals of New England. Johns Hopkins University Press, Baltimore. 304 pp.

Gorman, M. L., and R. D. Stone. 1990. The natural history of moles. Cornell Univ. Press. 208 pp.

Hall, E. R. 1981. The Mammals of North America. Second edition. 2 Volumes. John Wiley and Sons, New York, New York. 1181 p.

Hamilton, William J., Jr., and John O. Whitaker, Jr. 1979. Mammals of the eastern United States. Cornell Univ. Press, Ithaca, New York. 346 pp.

Harvey, M.J. 1976. Home range, movements, and diel activity of the eastern mole, Scalopus aquaticus. Am. Midl.Nat. 95(2):436-445.

Ivey, D. R. 1959. The mammals of Palm Valley, Florida. Journal of Mammalogy. 40(4):585-591.

Jackson, H. H. T. 1915. A review of the American moles. North American Fauna 38:1-100.

Jones, J. K., Jr., et al. 1992. Revised checklist of North American mammals north of Mexico, 1991. Occas. Pap. Mus., Texas Tech Univ. (146):1-23.

Layne, J. N. 1984. The land mammals of South Florida. Environments of South Florida, Past and Present II. P. J. Gleason ed. Coral Gables, Florida: Miami Geological Society; pp. 269-295.

Moore, J. C.1946. Mammals from Welaka, Putnam county, Florida. Journal of Mammalogy. 27(1):49-59.

Schwartz, Charles W., and Elizabeth R. Schwartz. 1981. The wild mammals of Missouri. University of Missouri Press, Columbia. 356 pp.

van Zyll de Jong, C. G. 1983. Handbook of Canadian Mammals. 1. Marsupials and insectivores. Nat. Mus. Canada, Ottawa. 212 pp.

Webster, W. D., J. F. Parnell and W. C. Biggs Jr. 1985. Mammals of the Carolinas, Virginia, and Maryland. The University of North Carolina Press, Chapel Hill, NC.

Whitaker, J.O. Jr. and W.J. Hamilton, Jr. 1998. Mammals of the eastern United States. Cornell Univ. Press, Ithaca, New York. 583 pp.

Wilson, D. E., and D. M. Reeder (editors). 1993. Mammal Species of the World:a Taxonomic and Geographic Reference. Second Edition. Smithsonian Institution Press, Washington, DC. xviii + 1206 pp.

Yates, T.L. and D.J. Schmidly. 1978. Scalopus aquaticus. Am. Soc. Mamm., Mammalian Species No. 105. 4pp.

For more information:: SE-GAP Analysis Project / BaSIC
127 David Clark Labs
Dept. of Biology, NCSU
Raleigh, NC 27695-7617
(919) 513-2853
www.basic.ncsu.edu/segap

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.