





# Species Modeling Report

## **Least Tern**

Sterna antillarum

Taxa: Avian

Order: Charadriiformes

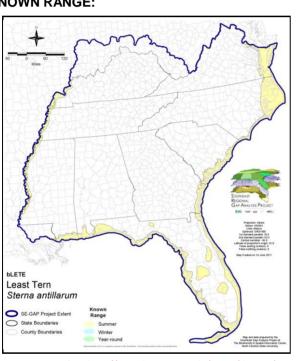
Family: Laridae

SE-GAP Spp Code: **bLETE** 

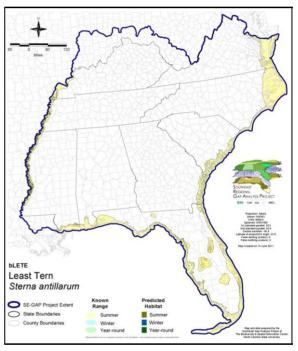
ITIS Species Code: 176923

NatureServe Element Code: ABNNM08100

#### **KNOWN RANGE:**



### PREDICTED HABITAT:



Range Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE Range bLETE.pdf

Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE Dist bLETE.pdf GAP Online Tool Link: http://www.gapserve.ncsu.edu/segap/segap/index2.php?species=bLETE

Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/bLETE\_se00.zip

#### **PROTECTION STATUS:**

Reported on March 14, 2011

Federal Status: ---

State Status: CO (SE), CT (T), CT (T), DE (E), FL (ST), GA (R), IA (E), ID (P), IL (LE), KS (E), KY (N), MA (SC), MD (T), ME (E), NC (SC), NC (SC), ND (Level II), NH (E), NH (E), NJ (E), NM (E), NV (YES), NY (T), PA (PE), RI (State Threatened), SC (ST-Threatened), UT (None), VA (SC), VA (SC), QC (Non suivie)

NS Global Rank: G4

NS State Rank: AL (S2B,S4N), AR (S2), AZ (S2M), CA (S2S3B), CO (S1B), CT (S2B), CT (S2B), DE (S1B), FL (S3), GA (S3), HI (SNA), IA (S1), ID (SNA), IL (S1), IN (SNRB), IN (SNRB), KS (S1B), KY (S1S2), LA (S4B), MA (S2B), MD (S2B), ME (S1B), MI (SNA), MO (S1), MS (S3B), MS (S3B), MT (S1B), MT (S1B), NC (S3B), NC (S3B), ND (S1), NE (S2), NH (SHB), NH (SHB), NJ (S1B,S1N), NM (S1B,S4N), NV (SNA), NY (S3B), OH (SNA), OK (S2B), OR (SNA), PA (SNA), RI (S2B,S2N), SC (S3), SD (S2B), SD (S2B), TN (S2S3B), TX (S3B), UT (SNA), VA (S2B), VA (S2B), WA (SNA), WI (SNA), WY (SHB), BC (SNA), MB (SNA), NB (SNA), NF (SNA), NS (SNA), ON (SNA), QC (SNA), SK (SNA)

**bLETE** Page 1 of 6

#### 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	47,459.1	3	0.0	0	0.0	0	0.0	0
Status 2	33,055.3	2	61.9	< 1	0.0	0	0.0	0
Status 3	702.5	< 1	416.3	< 1	0.0	0	24,705.1	2
Status 4	0.0	0	0.0	0	0.0	0	225.5	< 1
Total	81,216.8	6	478.2	< 1	0.0	0	24,930.6	2
1	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	614.7	< 1	1,082.2	< 1	4,960.3	< 1
Status 2	0.0	0	36,729.8	3	25,508.3	2	10.4	< 1
Status 3	0.0	0	1,820.6	< 1	0.0	0	0.0	0
Status 4	0.0	0	3.0	0	0.0	0	0.0	0
Total	0.0	0	39,168.3	3	26,590.5	2	4,970.7	< 1
	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	1.8	< 1	0.0	0	0.0	0
Status 2	0.0	0	76.3	< 1	53,800.8	4	0.0	0
Status 3	0.0	0	30,104.5	2	7,255.5	< 1	2,372.2	< 1
Status 4	0.0	0	0.0	0	2,085.8	< 1	0.0	0
Total	0.0	0	30,182.6	2	63,142.1	5	2,372.2	<1
	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	467.5	< 1	0.0	0	0.0	0
Status 2	25,799.2	2	24,991.6	2	0.0	0	0.0	0
Status 3	0.0	0	733.8	< 1	224.6	< 1	5,578.1	< 1
Status 4	0.0	0	0.0	0	15.3	< 1	0.0	0
Total	25,799.2	2	26,192.8	2	239.9	< 1	5,578.1	< 1
	Private Land - No Res.		Water				Overall Total	
	ha	%	ha	%			ha	%
Status 1	0.0	0	0.0	0			54,585.6	4
Status 2	0.8	< 1	0.0	0			200,034.7	15
Status 3	129.9	< 1	0.0	0			74,042.9	5
Status 4	1,003,439.7	74	28,431.0	2			1,036,286.2	76
Total	1,003,570.6	74	28,431.2	2			1,364,949.5	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.

Page 2 of 6

### PREDICTED HABITAT MODEL(S):

#### **Summer Model:**

Habitat Description: Usually forms colonies on bare or sparsely vegetated sand or dried mudflats along coasts or rivers, but also on sandy or shell islands. Prominent use of sand or shell beaches located just above high-tide level, or riverine sandbars on which vegetation is limited by seasonal flooding (Thompson et al. 1997). More recently, has shifted traditional nesting habitats to account for human activities and will nest on agricultural fields, parking lots, bare land associated with airports, and flat, graveled rooftops. Forages in a variety of shallow-water habitats. On marine coasts, feeds primarily in bays, lagoons, estuaries, river and creek mouths, tidal marshes, and lakes. Occassionally forages offshore. Inland feeding sites include rivers, streams, sloughs, marshes, ponds, and reservoirs (Thompson et al. 1997). M. Rubino, 31dec04.

#### Hydrography Mask:

Utilizes flowing water features with buffers of unlimited from and 250m into selected water features.

Utilizes open water features with buffers of unlimited from and 250m into selected water features.

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

lected Map Units:					
Functional Group	Map Unit Name				
Beach	Atlantic Coastal Plain Northern Sandy Beach				
Beach	Atlantic Coastal Plain Sea Island Beach				
Beach	Atlantic Coastal Plain Southern Beach				
Beach	Florida Panhandle Beach Vegetation				
Beach	South Florida Shell Hash Beach				
Beach	Southeast Florida Beach				
Beach	Southwest Florida Beach				
Beach	Unconsolidated Shore (Beach/Dune)				
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Central Salt and Brackish Tidal Marsh				
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Embayed Region Tidal Salt and Brackish Marsh				
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Indian River Lagoon Tidal Marsh				
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Northern Tidal Salt Marsh				
Brackish Tidal Marsh & Wetland	Florida Big Bend Salt-Brackish Tidal Marsh				
Brackish Tidal Marsh & Wetland	Mississippi Sound Salt and Brackish Tidal Marsh				
Coastal Dune & Freshwater Wetland	Atlantic and Gulf Coastal Plain Interdunal Wetland				
Coastal Dune & Freshwater Wetland	Atlantic Coastal Plain Northern Dune and Maritime Grassland				
Coastal Dune & Freshwater Wetland	Atlantic Coastal Plain Southern Dune and Maritime Grassland				
Coastal Dune & Freshwater Wetland	East Gulf Coastal Plain Dune and Coastal Grassland				
Coastal Dune & Freshwater Wetland	Southwest Florida Dune and Coastal Grassland				
Water	Open Water (Brackish/Salt)				
Water	Open Water (Fresh)				
Wetlands	Lower Mississippi River Bottomland and Floodplain Forest				
Wetlands	Lower Mississippi River Bottomland Depressions - Forest Modifier				
Wetlands	Mississippi River Low Floodplain (Bottomland) Forest				
Wetlands	Mississippi River Riparian Forest				
Wetlands	Unconsolidated Shore (Lake/River/Pond)				
lected Secondary Map Units withir	n 250m of Primary Map Units:				
Functional Group	Map Unit Name				
Anthropogenic	Developed Open Space				
Anthropogenic	Low Intensity Developed				
Anthropogenic	Medium Intensity Developed				
Anthropogenic	High Intensity Developed				

#### CITATIONS:

Akers, J. W. 1975. The least tern in Virginia: breeding biology and population distribution. M.S. thesis, William and Mary College, Williamsburg. 77 pp.

American Ornithologists' Union (AOU), Committee on Classification and Nomenclature. 1983. Check-list of North American Birds. Sixth Edition. American Ornithologists' Union, Allen Press, Inc., Lawrence, Kansas.

**bLETE** Page 3 of 6 Atwood, J. L., and B. W. Massey. 1988. Site fidelity of least terns in California. Condor 90:389-394

Bent, A.C. 1921. Life histories of North American gulls and terns. U.S. Natl. Mux. Bull. 113. Washington, D.C.

Blodgett, B. 1978. The effects of off-road vehicles on least terns and other shore birds. Univ. Massachusetts - Natl. Park Service Report 26:1-79.

Blus, L. J., and R. M. Prouty. 1979. Organochlorine pollutants and population status of least terns in South Carolina. Wilson Bull. 91:62-71.

Buckley, P. A., and F. G. Buckley. 1984. Seabirds of the north and middle Atlantic coast of the United States: their status and conservation. Pages 101-133 in Croxall et al., eds. Status and conservation of the world's seabirds. ICBP Tech. Pub. No. 2.

Bull, J. 1974. Birds of New York state. Doubleday/Natural History Press, Garden City, New York. Reprint, 1985 (with Supplement, Federation of New York Bird Clubs, 1976), Cornell Univ. Press, Ithaca, New York.

Burger, J. 1984. Colony stability in least terns. Condor 86:61-67

Burger, J. 1988. Social attraction in nesting least terns: effects of numbers, spacing, and pair bonds. Condor 90:575-582

Burger, J., and M. Gochfeld. 1990. Nest site selection in least terns (STERNA ANTILLARUM) in New Jersey and New York. Colonial Waterbirds 13:31-40.

Burroughs, J. R. 1966. A study of the breeding biology of least terns on Nantucket Island. M.S. thesis, Univ. Massachusetts. 87 pp.

Byrd, M.A., and D.W. Johnston. 1991. Birds. Pages 477-537 in K. Terwilliger, coordinator. Virginia's endangered species:proceedings of a symposium. McDonald and Woodward Publ. Co., Blacksburg, Virginia.

California Department of Fish and Game. 1990. 1989 annual report on the status of California's state listed threatened and endangered plants and animals. 188 pp.

Campbell, L. 1995. Endangered and Threatened Animals of Texas: Their Life History and Management. Texas Parks and Wildlife Department, Endangered Resources Branch, Austin, Texas. ix + 129 pp.

Carvacho, A., et al. 1989. STERNA ANTILLARUM BROWNI en el Golfo de California: observaciones sobre una colonia reproductora en una zona vulnerable al impacto turistico. Southwestern Naturalist 34:124-130.

Clapp, R. B., and P. A. Buckley. 1984. Status and conservation of seabirds in the southeastern United States. Pages 135-155 in Croxall et al., eds. Status and conservation of the world's seabirds. ICBP Tech. Pub. No. 2.

Clapp, R.B., M.K. Klimkiewicz, and J.H. Kennard. 1982. Longevity records of North American birds: Gaviidae through Alcidae. Journal of Field Ornithology 53:81-124.

Cogswell, H.L. 1977. Water birds of California. Univ. California Press, Berkeley. 399 nn.

Cowgill, R. W. 1989. Nesting success of least terns on two South Carolina barrier islands in relation to human disturbance. Chat 53:81-87.

Craig, A. M. 1971. Survey of California least tern nesting sites. California Dept. Fish and Game, Project W54R-4. 55

Czaplewski, M. M. 1989. Least terns at Lake McConaughy. Nebraska Bird Rev. 57:95-

Dorr, D. K. 1976. Least tern, STERNA ALBIFRONS, nesting habitat in Maine and its relevance to the Critical Areas Program. Maine Critical Areas Program, Planning Report No. 11.21 pp.

Downing, R. L. 1980. Survey of interior least tern nesting populations. Am. Birds 34:209-211

Ducey, J. 1982. The 1982 least tern and piping plover breeding season on the lower Platte River, Nebraska. Nebraska Bird Rev. 50:68-72.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1988. The birder's handbook:a field guide to the natural history of North American birds. Simon and Shuster, Inc., New York. xxx + 785 pp.

Ehrlich, P.R., D.S. Dobkin, and D. Wheye. 1992. Birds in jeopardy: the imperiled and extinct birds of the United States and Canada, including Hawaii and Puerto Rico. Stanford University Press, Stanford, California. 259 pp.

Engstrom, R. T., G. S. Butcher, and J. D. Lowe. 1990. Population trends in the least tern (STERNA ANTILLARUM) from Maine to Virginia:1975-1986. Pages 130-138 in J. R. Sauer and S. Droege, editors. Survey designs and statistical methods for the estimation

Erwin, R. M. 1978. Population and colony site dynamics in selected Massachusetts seabirds. Proc. 1977 Conf. Colonial Waterbirds Group 1:19-25

Faanes, C. A. 1983. Aspects of the nesting ecology of least terns and piping plovers in central Nebraska. Prairie Naturalist 15:145-154

Farrand, J., editor. 1983. Audubon Society master guide to birding. Alfred A. Knopf, New York. 3 vols., 1244 np.

Figg, D. E. 1993. Missouri Department of Conservation wildlife diversity report, July 1992-June 1993. 75 pp.

Fisk, E. J. 1975. Least tern:beleaguered, opportunistic, and root nesting. American Birds 29(1):15-16

Forbush, E. H. 1925-1929. Birds of Massachusetts and other New England states. 3 vols. Massachusetts Dept. Agric., Roston.

Gochfeld, M. 1983. Colony site selection by least terns:physical attributes of sites. Colonial Waterbirds 6:205-

Gore, J. A. 1991. Distribution and abundance of nesting least terns and black skimmers in northwest Florida. Florida Field Naturalist 19(3):65-96.

Gore, J. A., and M. J. Kinnison. 1991. Hatching success in roof and ground colonies of least terns. Condor 93:759-762

Grover, P. B., and F. L. Knopf. 1982. Habitat requirements and breeding success of charadriiform birds nesting at Salt Plains National Wildlife Refuge, Oklahoma. J. Field Ornithol. 53:139-148.

Haddon, P. C., and R. C. Knight. 1983. A guide to little tern conservation. Royal Soc. Protection of Birds. 114 pp.

Hagan, J.M., III, and D.W. Johnston, editors. 1992. Ecology and conservation of neotropical migrant landbirds. Smithsonian Institution Press, Washington. D.C. xiii + 609 pp.

Hardy, J. W. 1957. The least tern in the Mississippi Valley. Publ. Mus. Michigan State Univ., Biol. Ser. 1:1-60.

Harrison, C. 1978. A field guide to the nests, eggs and nestlings of North American birds. Collins, Cleveland, Ohio.

Hays, M. B. 1980. Breeding biology of the least tern, STERNA ALBIFRONS, on the Gulf Coast of Mississippi. M.S. thesis, Mississippi State Univ. 69 pp.

Herkert, J. R., editor. 1992. Endangered and threatened species of Illinois:status and distribution. Vol. 2:Animals. Illinois Endangered Species Protection Board. iv + 142 pp.

Hill, L. A., and L. G. Talent. 1990. Effects of capture, handling, banding, and radio-marking on breeding least terns and snowy plovers. J. Field Ornithology 61:310-319.

Houde, P. 1977. Low productivity of terns on Hicks Island, 1975. Proc. Linn. Soc. 73:49-57

Hovis, J. A., and M. S. Robson. 1989. Breeding status and distribution of the least tern in the Florida Keys. Florida Field Nat. 17:61-66.

Jernigan, L., et al. 1978. Nesting habitats and breeding populations of the least tern colonies in North Carolina. Univ. North Carolina Sea Grant Publ. 39 pp.

Kaufman K. 1996. Lives of North American Birds. Boston, New York: Houghton Mifflin Company.

Kotliar, N. B. 1984. Colony site selection and abandonment by least terns in New Jersey. M.S. thesis, Rutgers Univ.

Kotliar, N. B., and J. Burger. 1984. The use of decoys to attract least terns (STERNA ANTILLARUM) to abandoned colony sites in New Jersey. Colonial Waterbirds 7:134-138.

Kress, S. W., E. H. Weinstein, and I. C. T. Nisbet. 1983. The status of tern populations in the northeastern United States and adjacent Canada. Colonial Waterbirds 6:84-106.

Litwin, S. 1983. Long Island least tern and piping plover survey. Seatuck Research Program, Cornell Univ. and New York Dept. Environ. Conservation. 35 pp.

MacLean, D. C., et al. 1991. Nesting biology, habitat use, and inter-colony movements of the least tern (STERNA ANTILLARUM) om Long Island, N.Y. The Seatuck Research Program in cooperation with the New York State Dept. of Environ. Conserv. 70 pp.

Massey, B. W. 1971. A breeding study of the California least tern. California Dept. Fish and Game, Wildlife Management Administrative Report, pp. 71-79.

Massey, B. W. 1974. Breeding biology of the California least tern. Proc. Linn. Soc. New York 72:1-

Massey, B. W. 1976. Vocal differences between American least terns and the European little tern. Auk 93:760-773.

Massey, B. W. 1981. A least tern makes a right turn. Nat. Hist. 90:61-72.

bl FTF

Massey, B. W., and J. L. Atwood. 1978. Plumages of the least tern. Bird-banding 49:360-371

Massey, B. W., and J. L. Atwood. 1981. Second-wave nesting of the California least tern:age composition and reproductive success. Auk 98:596-605.

Massey, B. W., K. Keane, and C. Boardman. 1988. Adverse effects of radio transmitters on the behavior of nesting least terns. Condor 90:945-947.

Matthews, J. R., and C. J. Moseley (editors). 1990. The Official World Wildlife Fund Guide to Endangered Species of North America. Volume 1. Plants, Mammals. xxiii + pp 1-560 + 33 pp. appendix + 6 pp. glossary + 16 pp. index. Volume 2. Birds, Reptiles, Am

Page 5 of 6

Minsky, D. 1980. Preventing fox predation at a least tern colony with an electric fence. J. Field Ornithology 51(2):17-18.

Minsky, D. 1981. The terns of Cape Cod. The Associaiton for the Preservation of Cape Cod, Informational Bull. No. 9. 34 pp.

Moseley, L. J. 1976. Behavior and communication in the least tern. Ph.D. dissertation, Univ. North Carolina. 164 pp.

National Geographic Society (NGS). 1983. Field guide to the birds of North America. National Geographic Society, Washington, D.C.

Sauer, J.R., and S. Droege. 1992. Geographical patterns in population trends of neotropical migrants in North America. Pages 26-42 in J.M. Hagan III and D.W. Johnston, editors. Ecology and conservation of neotropical migrant landbirds. Smithsonian Institu

Schulenberg, J., and M. Ptacek. 1984. Status of the interior least tern in Kansas. Am. Birds 38:975-981

Scott, S.L., ed. 1983. Field guide to the birds of North America. Washington, D.C.: National Geographic Society. 464p.

Sibley, C.G., and B.L. Monroe. 1990. Distribution and taxonomy of birds of the world. Yale University Press, New Haven, Connecticut. xxiv + 1111 pp.

Spendelow, J.A., and S.R. Patton. 1988. National atlas of coastal waterbird colonies in the contiguous United States:1976-1982. U.S. Fish and Wildlife Service, Biological Report 88(5). x + 326 pp.

Sprunt, A., IV. 1984. The status and conservation of seabirds of the Bahama Islands. Pages 157-168 in Croxall et al., eds. Status and conservation of the world's seabirds. ICBP Tech. Pub. No. 2.

Stiles, F.G., and A.F. Skutch. 1989. A guide to the birds of Costa Rica. Comstock Publ. Associates, Cornell University Press, Ithaca, New York. 511 pp.

Swickard, D. K. 1974. An evaluation of two least tern nesting sites. California Fish and Game 60:88-90

Terres, J.K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.

Thompson, B. C., et al. 1992. Subspecific status of least tern populations in Texas:North American implications. Wilson Bull. 104:244-262.

Thompson, B.C. and R.D. Slack. 1982. Physical aspects of colony selection by least terns on the Texas coast. Colonial Waterbirds 5:161-168.

Thompson, B.C., J.A. Jackson, J. Burger, L.A. Hill, E.M. Kirsch, and J.L. Atwood. 1997. Least tern (Sterna antillarum). In A. Poole and F. Gill, eds., The Birds of North America, No. 290. The Academy of Natural Sciences, Philadelphia and The American Orni

U.S. Fish and Wildlife Service (USFWS). 1990. Endangered and threatened species recovery program:report to Congress. 406 pp.

U.S. Fish and Wildlife Service (USFWS). 1990. Recovery plan for the interior population of the least tern (STERNA ANTILLARUM). USFWS, Twin Cities, Minnesota. 90 pp.

U.S. Fish and Wildlife Service. 1980. California least tern recovery plan. 58

U.S. Fish and Wildlife Service. 1980. Selected vertebrate endangered species of the seacoast of the United States-- California least tern. FWS/OBS-80/01.20. 8 pp.

U.S. Fish and Wildlife Service. 1983. Marine birds of the southeastern United States and Glf of Mexico. Part III. Charadriiformes. Pages 599-635.

van Halewyn, R., and R. L. Norton. 1984. The status and conservation of seabirds in the Caribbean. Pages 169-222 in Croxall et al., eds. Status and conservation of the world's seabirds. ICBP Tech. Pub. No. 2.

Whitman, P. L. 1988. Biology and conservation of the endangered interior least tern:a literature review. U.S. Fish and Wildlife Service, Biological Report 88(3). 22 pp.

Wilbur, S. R. 1974. The literature of the California least tern. U.S. Fish and Wildlife Service Spec. Sci. Rep. Wildl. 175 pp.

Wolk, R. G. 1954. Some preliminary observations on the reproductive behavior of the least tern.

Zickefoose, J. 1985. Least tern/piping plover recovery program. Final report to The Nature Conservancy, Connecticut Chapter. 22 pp.

Ziewitz, J. W., J. G. Sidle, and J. J. Dinan. 1992. Habitat conservation for nesting least terns and piping plovers on the Platte River, Nebraska. Prairie Naturalist 24(1):1-20.

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.

bl FTF