



SOUTHEAST GAP ANALYSIS PROJECT



Species Modeling Report

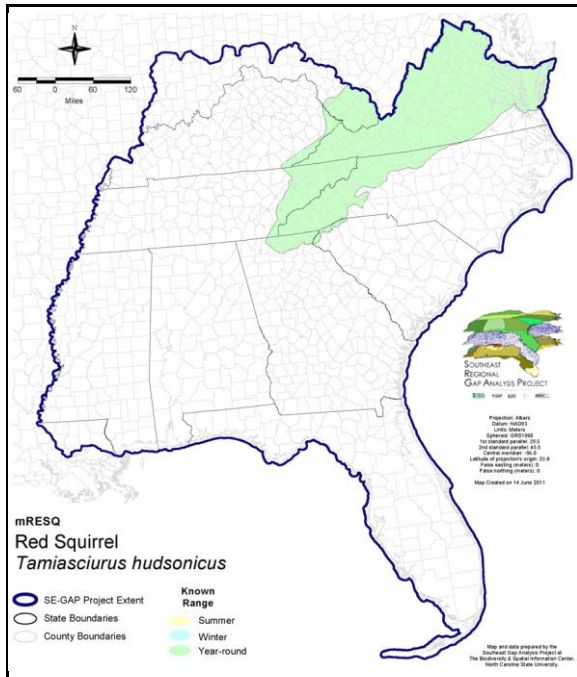
Red Squirrel

Tamiasciurus hudsonicus

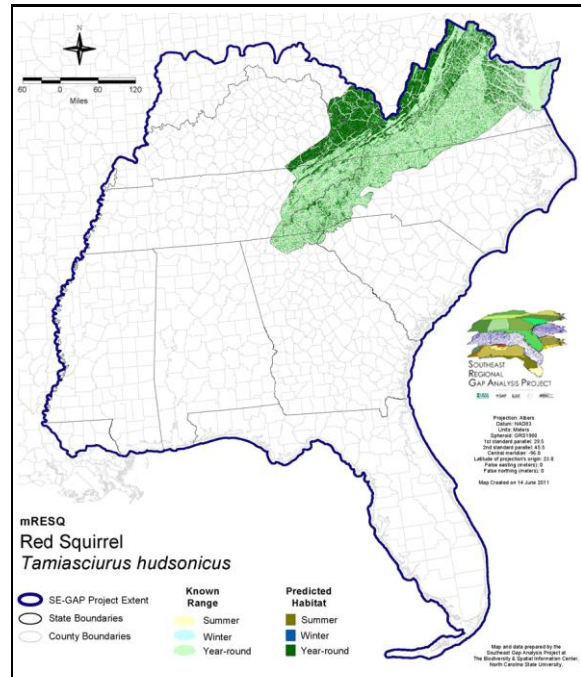
Taxa: Mammalian
Order: Rodentia
Family: Sciuridae

SE-GAP Spp Code: **mRESQ**
ITIS Species Code: 180166
NatureServe Element Code: AMAFB08010

KNOWN RANGE:



PREDICTED HABITAT:



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

Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Dist_mRESQ.pdf

GAP Online Tool Link: <http://www.gapservice.ncsu.edu/segap/segap/index2.php?species=mRESQ>

Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/mRESQ_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: ---

State Status: ID (P), NJ (S), NY (U), RI (Not Listed), UT (None), BC (4 (2005)), BC (4 (2005)), QC (Non suivie), SK (NIAC)

NS Global Rank: G5

NS State Rank: AK (S5), AZ (S5), CO (S5), CT (S5), DC (SH), DE (S3), GA (S3), IA (S3), ID (S5), IL (S3), IN (S4), MA (S5), MD (S5), ME (S5), MI (S5), MN (SNR), MT (S5), NC (S5), ND (SNR), NH (S5), NJ (S5), NM (S5), NY (S5), OH (SNR), OR (S4?), PA (S5), RI (S5), SC (S3?), SD (S5), TN (S4S5), UT (S5), VA (S5), VT (S5), WA (S5), WI (S5), WV (S5), WY (S5), AB (S5), BC (S5), BC (S5), LB (S5), MB (S5), NB (S5), NF (SNA), NS (S5), NT (SNR), NU (SNR), ON (S5), PE (S5), QC (S5), SK (S5), YT (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	457.5	< 1	8,698.7	< 1	0.0	0	0.0	0
Status 2	914.9	< 1	187,619.7	3	0.0	0	1,287.6	< 1
Status 3	187.9	< 1	620,669.3	10	4,454.0	< 1	40,365.6	< 1
Status 4	36.5	< 1	0.0	0	0.0	0	20.3	< 1
Total	1,596.7	< 1	816,987.7	13	4,454.0	< 1	41,673.6	< 1
	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	120,508.8	2	0.0	0	0.0	0
Status 2	0.0	0	9,562.2	< 1	24.8	< 1	0.0	0
Status 3	0.0	0	26,312.9	< 1	0.0	0	0.0	0
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	0.0	0	156,383.9	3	24.8	< 1	0.0	0
	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	0.0	0	0.0	0
Status 2	0.0	0	2,616.8	< 1	49,101.8	< 1	804.0	< 1
Status 3	5,126.5	< 1	16,881.2	< 1	20,807.5	< 1	12,592.8	< 1
Status 4	0.0	0	0.0	0	3,699.1	< 1	0.0	0
Total	5,126.5	< 1	19,498.1	< 1	73,608.3	1	13,396.8	< 1
	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	2,916.8	< 1	0.0	0	0.0	0
Status 2	5.1	< 1	7,325.3	< 1	< 0.1	< 1	0.0	0
Status 3	0.0	0	0.0	0	34.7	< 1	774.3	< 1
Status 4	0.0	0	0.0	0	143.5	< 1	0.0	0
Total	5.1	< 1	10,242.1	< 1	178.3	< 1	774.3	< 1
	Private Land - No Res.		Water		Overall Total			
	ha	%	ha	%	ha	%		
Status 1	0.0	0	0.0	0	132,581.8	2		
Status 2	0.0	0	0.0	0	259,262.2	4		
Status 3	0.0	0	0.0	0	748,206.7	22		
Status 4	4,412,972.7	71	1,469.4	< 1	4,422,004.1	72		
Total	4,412,972.7	71	1,469.4	< 1	5,562,054.8	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: Red squirrels are associated with North American boreal forests. Conifer seeds are a major component of the red squirrel’s diet, and suitable habitat is frequently associated with the presence of coniferous trees. They have been noted as being particularly abundant where there are spruce and hemlock trees (Webster et al. 1985; Linzey and Linzey 1971). They also inhabit mixed and northern hardwood forests at high elevations in the southern Appalachian mountains (Whitaker and Hamilton 1998). However, forest type may not be as important to the squirrel as the availability of food and shelter. Red squirrels are very adaptable in establishing their shelters. They use abandoned woodpecker cavities, holes in the ground or crevices in rocky places, or will build a nest of available materials (sticks, leaves or bark, or some combination thereof) in the crotch or branch of a tree (Hamilton 1964). Old nests of crows and hawks are also used. Breeds March-April and June-July in Quebec. Gestation lasts 31-35 days (Lair 1985). Some females produce 2 litters per year with an average litter size of 4-5. Some females breed when less than one year old (Lair 1986). Stacy Smith, 17June05

Selected Map Units:

Functional Group	Map Unit Name
Anthropogenic	Developed Open Space
Anthropogenic	Low Intensity Developed
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland - Hardwood Modifier
Forest/Woodland	Appalachian Hemlock-Hardwood Forest
Forest/Woodland	Atlantic Coastal Plain Dry and Dry-Mesic Oak Forest
Forest/Woodland	Atlantic Coastal Plain Mesic Hardwood and Mixed Forest
Forest/Woodland	Central and Southern Appalachian Montane Oak Forest
Forest/Woodland	Central and Southern Appalachian Northern Hardwood Forest
Forest/Woodland	Central and Southern Appalachian Spruce-Fir Forest
Forest/Woodland	Central Appalachian Oak and Pine Forest
Forest/Woodland	Northeastern Interior Dry Oak Forest - Mixed Modifier
Forest/Woodland	Northeastern Interior Dry Oak Forest - Virginia/Pitch Pine Modifier
Forest/Woodland	Northeastern Interior Dry Oak Forest-Hardwood Modifier
Forest/Woodland	South-Central Interior Mesophytic Forest
Forest/Woodland	Southern and Central Appalachian Cove Forest
Forest/Woodland	Southern Appalachian Montane Pine Forest and Woodland
Forest/Woodland	Southern Piedmont Dry Oak-(Pine) Forest - Loblolly Pine 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 Dry Oak-Heath Forest - Virginia/Pitch Pine Modifier
Forest/Woodland	Southern Piedmont Mesic Forest
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	North-Central Appalachian Acidic Swamp
Wetlands	North-Central Interior and Appalachian Rich Swamp
Wetlands	Southern Piedmont Small Floodplain and Riparian Forest

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

Banfield, A.W.F. 1974. The mammals of Canada. University of Toronto Press, Toronto.

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

Hafner, M. S., L. J. Barkley, and J. M. Chupasko. 1994. Evolutionary genetics of New World tree squirrels (tribe Sciurini). J. Mamm. 75:102-109.

- Hall, E. R. 1981. The Mammals of North America. Second edition. 2 Volumes. John Wiley and Sons, New York, New York. 1181 p.
- Halvorson, C. H. 1972. Device and technique for handling red squirrels. USFWS Spec. Sci. Rep.--Wildl. 159:1-10.
- Hamilton, W. J. Jr. 1964. American mammals. New York: McGraw-Hill.
- Hamilton, William J., Jr., and John O. Whitaker, Jr. 1979. Mammals of the eastern United States. Cornell Univ. Press, Ithaca, New York. 346 pp.
- Hatt, R.T. 1929. The red squirrel: its life history and habits, with special reference to the Adirondacks of New York and Harvard Forest. New York State Col. For. at Syracuse Univ. Wild Life Annals, 2(1):1-146.
- 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.
- Klenner, W. 1991. Red squirrel population dynamics. II. Settlement patterns and response to removals. J. Anim. Ecol. 60:979-993.
- Klenner, W., and C. J. Krebs. 1991. Red squirrel population dynamics. I. The effect of supplemental food on demography. J. Anim. Ecol. 60:961-978.
- Klugh, A.B. 1927. Ecology of the red squirrel. J. Mamm. 8(1):1-32.
- Lair, H. 1985. Length of gestation in the red squirrel, *Tamiasciurus hudsonicus*. J. Mamm. 66:809-810.
- Lair, H. 1986. Mating seasons and fertility of red squirrels in southern Quebec. Can. J. Zool. 63:2323-2327.
- Larsen, K. W., and S. Boutin. 1994. Movements, survival, and settlement of red squirrel (*TAMIASCIURUS HUDSONICUS*) offspring. Ecology 75:214-223.
- Layne, J.N. 1954. The biology of the red squirrel, *Tamiasciurus hudsonicus* loquar Bangs, in central New York. Ecol. Monogr. 24(2):227-267.
- Lindsay, S. L. 1982. Systematic relationship of parapatric tree squirrel species (*TAMIASCIURUS*) in the Pacific Northwest. Can. J. Zool. 60:2149-2156.
- Linzey, Alicia V., & Donald W. Linzey. 1971. Mammals of the Great Smoky Mountains National Park. The University of Tennessee Press, Knoxville, Tennessee. 114 p.
- Maser, C., and Z. Maser. 1988. Interactions among squirrels, mycorrhizal fungi, and coniferous forests in Oregon. Great Basin Nat. 48:358-369.
- O'Donoghue, M., and S. Stuart. 1993. Hare-raising encounters. Natural History 2/93, pp. 26-33.
- Sullivan, T. P. 1990. Responses of red squirrel (*TAMIASCIURUS HUDSONICUS*) populations to supplemental food. J. Mamm. 71:579-590.
- U.S. Fish and Wildlife Service. 3 June 1987. Determination of endangered status for the Mount Graham red squirrel. Federal Register 52:20994- 20999.
- 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.