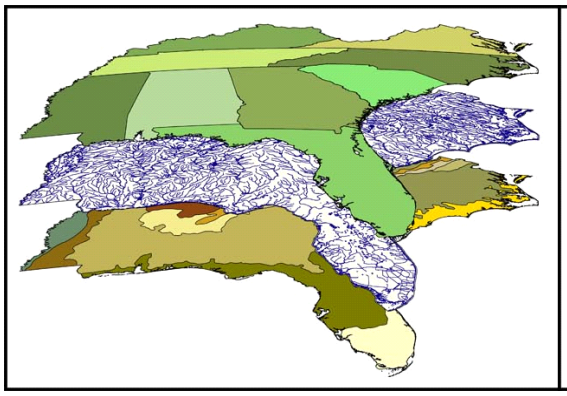


SOUTHEAST GAP ANALYSIS PROJECT

Species Modeling Report

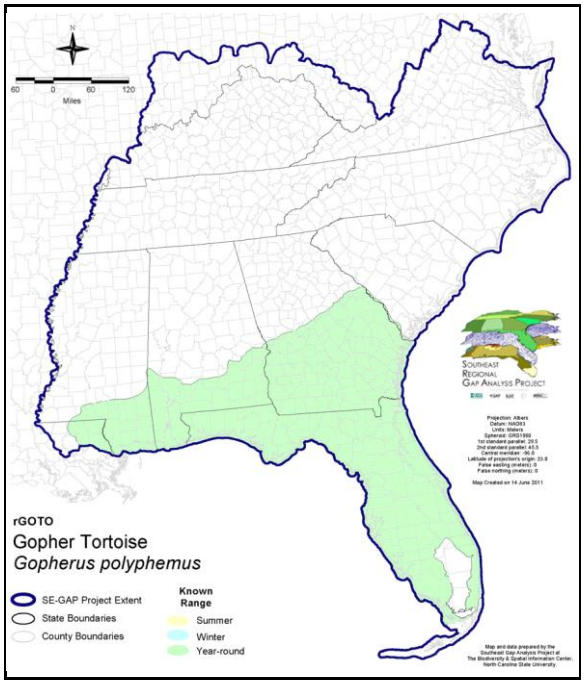
Gopher Tortoise

Gopherus polyphemus

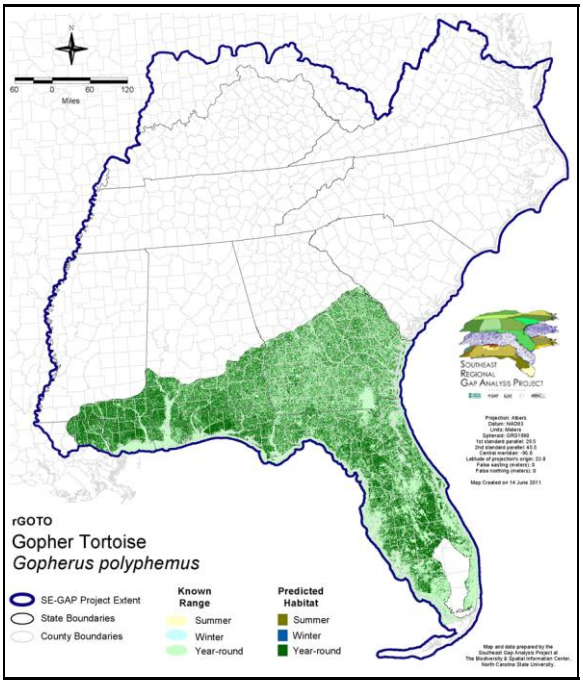
Taxa: Reptilian
Order: Cryptodeira
Family: Testudinidae

SE-GAP Spp Code: **rGOTO**
ITIS Species Code: 173858
NatureServe Element Code: ARAAF01030

KNOWN RANGE:



PREDICTED HABITAT:



Range Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Range_rGOTO.pdf
Predicted Habitat Map Link: http://www.basic.ncsu.edu/segap/datazip/maps/SE_Dist_rGOTO.pdf
GAP Online Tool Link: http://www.gapserve.ncsu.edu/segap/segap/index2.php?species=rGOTO
Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/rGOTO_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: ---
State Status: AL (SP), FL (ST), GA (T), LA (Threatened), MS (LE), SC (SE-Endangered)
NS Global Rank: G3
NS State Rank: AL (S3), FL (S3), GA (S2), LA (S1), MS (S2), SC (S1)

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	25,635.1	< 1	213.9	< 1	0.0	0	0.0	0
Status 2	16,464.2	< 1	21,980.7	< 1	0.0	0	75.6	< 1
Status 3	1.2	< 1	354,356.9	3	0.0	0	314,636.8	2
Status 4	9.1	< 1	< 0.1	< 1	0.0	0	0.0	0
Total	42,109.5	< 1	376,551.6	3	0.0	0	314,712.4	2

	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	8,675.8	< 1	0.0	0	13,897.1	< 1
Status 2	0.0	0	10,295.4	< 1	2,756.1	< 1	54.6	< 1
Status 3	1,993.8	< 1	38,259.6	< 1	0.0	0	3,032.8	< 1
Status 4	0.0	0	1.0	< 1	0.0	0	0.0	0
Total	1,993.8	< 1	57,232.4	< 1	2,756.1	< 1	16,984.5	< 1

	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	294.2	< 1	0.0	0	0.0	0
Status 2	0.0	0	458.6	< 1	166,955.3	1	0.0	0
Status 3	4.0	< 1	312,367.0	2	12,101.8	< 1	232,995.1	2
Status 4	0.0	0	0.0	0	22,077.5	< 1	37.5	< 1
Total	4.0	< 1	313,119.8	2	201,134.6	1	233,032.6	2

	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	1,636.9	< 1	0.0	0	0.0	0
Status 2	3,749.1	< 1	6,405.8	< 1	0.0	0	2,164.5	< 1
Status 3	0.0	0	13,560.0	< 1	19,823.2	< 1	97,890.8	< 1
Status 4	0.0	0	0.0	0	228.2	< 1	< 0.1	< 1
Total	3,749.1	< 1	21,602.8	< 1	20,051.5	< 1	100,055.4	< 1

	Private Land - No Res.		Water		Overall Total	
	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	50,353.0	< 1
Status 2	0.0	0	0.0	< 1	231,360.1	2
Status 3	332.5	< 1	1.1	< 1	1,401,356.4	13
Status 4	11,748,520.7	85	11,627.0	< 1	11,804,570.4	85
Total	11,748,853.2	85	11,628.3	< 1	13,487,639.9	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: Open- canopied, pine scrub oak sandhills, also in ecotones between forests and grasslands, avoiding moist low lying areas, sandy soils are required for burrowing.(Wilson 1995)# Three important parameters: 1. well drained loose soil for digging 2. enough low growing herbaceous plants for food, and 3. open sites for nesting. Primarily longleaf pine/xerophytic oak woodlands [sandhills], also sand pine scrub, coastal strands, live oak hammocks, dry prairies, pine flatwoods, and mixed hardwood/pine communities. Disturbed habitats also, such as roadsides, fencerows, clearings, and oldfields. (Diemer 1992). # Well drained habitats, such as longleaf pine/turkey oak, beach scrub, oak hammocks, and pine flatwoods. Xeric habitats (Ashton 1988). # Well drained sandy soils where at ecotone. (Ernst and Barbour 1972). # High pine, dunes, and deep sand areas (Carr and Goin 1955). Well drained sandy soils with a variety of vegetation communities. Longleaf pine and oak uplands, xeric hammock, sand pine and oak ridges including beach scrub, ruderal communities, roadsides, fencerows, grove edges, clearings, and old fields. Also pine flatwoods, dry prairies, and mixed hardwood/pine. In drought may utilize others, such as edge of cypress and sawgrass. Well drained loose soils, low growing herbs for food, and sunlit areas for nesting. "Extremely low" densities in plantation sand pine. Normal yearly sandhill colony movements confined to less than 4 ha (Diemer 1986).
Minimum viable population size of 40-50 (Cox et al. in Smith 1992). # Home range for 20 females was 10-30 ha in sandhills, 2-10 ha in old field; this method assumed a 1:1 sex ratio, 20 females for MVP (Smith 1992). # Present in scrub and slash pine flatwoods at densities of 1.1-2.7 ha. Decreasing habitat use with canopy cover approaching greater than 80% closure (Breininger et al. 1988). # Densities highest with open canopy, herbaceous understory. Generally absent from "coastal terraced lowlands of the panhandle, terraced low marine zone around the state, intermediate terraced zone in east-central and east-north, also generally absent from high flatlands of the central highlands. Important factor is longleaf pine-oak uplands [mean density of 0.86/ha], xeric hammock [0.07/ha], sand pine/oak ridges [1.43/ha], and ruderal [8.0/ha], (Auffenberg and Franz 1982). # Estimate colony of 40-50 turtles require 25-50 acres. Isolated population on Cape Sable. Lifespan 40-60 years. Reproduction in females after 10-15 years. Soils with very low clay content and organics, extremely fine grained. North Florida coatal strand, south Florida coastal strand, sand pine scrub, longleaf pine/turkey oak sandhills, mixed hardwoods and pines, upland hardwood hammocks, oak hammocks, ruderal, and north Florida and south Florida flatwoods. Population density, within colonies?, was 0.88 - 20.0/ha. Mean clutch size is 5.6, generation length is 22 years, egg survivorship is 1%. Each individual requires 1.1 acre (Richardson et al. 1986 in Cox et al.1987). # Individuals may range over as much as 16 acres (Cox et al. 1987). # Ruderal/adjacent slash pine plantation have emigration movements up to 744 m recorded. Mean home range, for males, was 0.88 ha, for females it was 0.31 ha, for subadults it was 0.05 ha, for juveniles it was 0.01 ha (Diemer 1992). # Uncommon but present in central scrubs. Estimated scrub density 1 per 10-15 acres (Christman 1988). # In southwest Georgia, found along roadsides, edges of fields, pastures, longleaf pine/scrub oak, and planted stands with open canopies; well to excessively drained soils (Garner and Landers 1981?) # Sexual maturity at 12-15 years; mean of 5-8 eggs; life span may exceed 60 years. Survival of young may be approximately 6% of eggs that survive to 1 year. Lack of fire yields closed canopy and abandonment by tortoises (Mushinsky and McCoy 1994). Approximately 66% adult females per year gravid (Diemer and Moore 1994). Referring to juveniles, defined here as less than 4 years old, have a home range mean (n=9) of 718 square m, or 0.0718 ha, with a range of 95 to 3576 m (Wilson et al. 1994). Estimates of survivorship are 11-86% of eggs to hatching, 5.8% of hatchlings to 1 year, 12.5 to 79% from 1 year to maturity, 44-95% adult (Germano 1994). # In the Ordway, they frequent high pine sandhill, old fields, and occasionally xeric oak hammocks (Franz 1995). # In the Ordway, using a minimum convex polygon method, the home range estimates for females adjusted for carapace length and time followed a mean of 0.482 ha for sandhills and 0.105 ha for old field. All feeding activity within 17 m of burrow {in Georgia, 95% of feeding activity within 30 m}. Inter-burrow movements of females averaged 63.2 m, with a range of 10-375 m. Nesting forrays averaged 77 m, with a range of 11-142 m. Most nesting away from burrows. Mean cluth size is 5.76 (Smith 1995). # Prefers habitats with a sandy substrate auitable for burrow construction. Prefer upland sites. May prefer to avoid areas of dense tree canopy (Mushinski 1994). # Tortoises living in areas with large amounts of canopy cover dig numerous burrows to find desirable locations (McCoy & Mushinsky 1995).

Avoidance Mask: Medium - moderately intolerant of human disturbance.

Selected Map Units:

Functional Group	Map Unit Name
Anthropogenic	Bare Sand

Anthropogenic	Bare Soil
Anthropogenic	Developed Open Space
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	Atlantic Coastal Plain Central Maritime 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 - Open Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Fall-line Sandhills Longleaf Pine Woodland - Scrub/Shrub Understory Modifier
Forest/Woodland	Atlantic Coastal Plain Southern Maritime Forest
Forest/Woodland	Atlantic Coastal Plain Upland Longleaf Pine Woodland
Forest/Woodland	East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland - Loblolly 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 Maritime Forest
Forest/Woodland	Florida Longleaf Pine Sandhill - Open Understory Modifier
Forest/Woodland	Florida Longleaf Pine Sandhill - Scrub/Shrub Understory Modifier
Forest/Woodland	Florida Peninsula Inland Scrub
Forest/Woodland	Mississippi Delta Maritime Forest
Forest/Woodland	Southeast Florida Coastal Strand and Maritime Hammock
Forest/Woodland	Southern Coastal Plain Oak Dome and Hammock
Forest/Woodland	Southwest Florida Coastal Strand and Maritime Hammock
Prairie	Florida Dry Prairie
Wetlands	Central Florida Pine Flatwoods
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 Dwarf Cypress Savanna
Wetlands	South Florida Hardwood Hammock
Wetlands	South Florida Pine Flatwoods
Wetlands	Southern Coastal Plain Hydric Hammock
Wetlands	Unconsolidated Shore (Lake/River/Pond)

Selected Secondary Map Units within 120m of Primary Map Units:

Functional Group	Map Unit Name
Coastal Dune & Freshwater Wetland	Atlantic Coastal Plain Northern Dune and Maritime Grassland
Beach	Florida Panhandle Beach Vegetation
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
Beach	South Florida Shell Hash Beach
Beach	Unconsolidated Shore (Beach/Dune)

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