



SOUTHEAST GAP ANALYSIS PROJECT



Species Modeling Report

American Black Bear

Ursus americanus

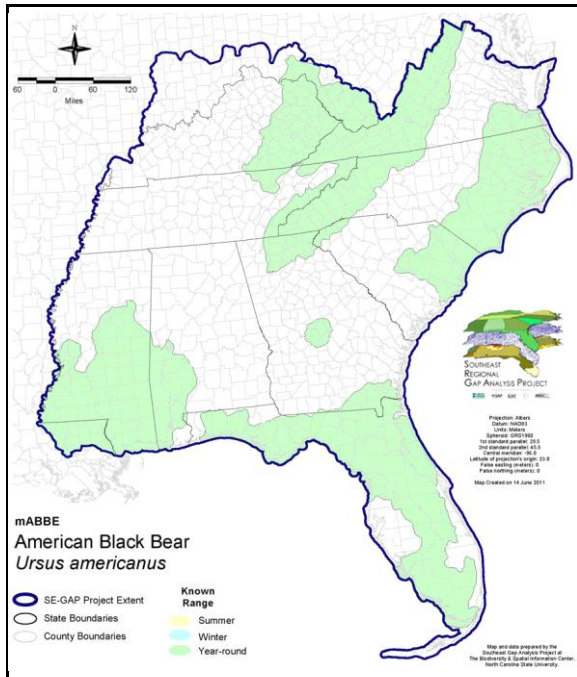
Taxa: Mammalian
Order: Carnivora
Family: Ursidae

SE-GAP Spp Code: **mABBE**

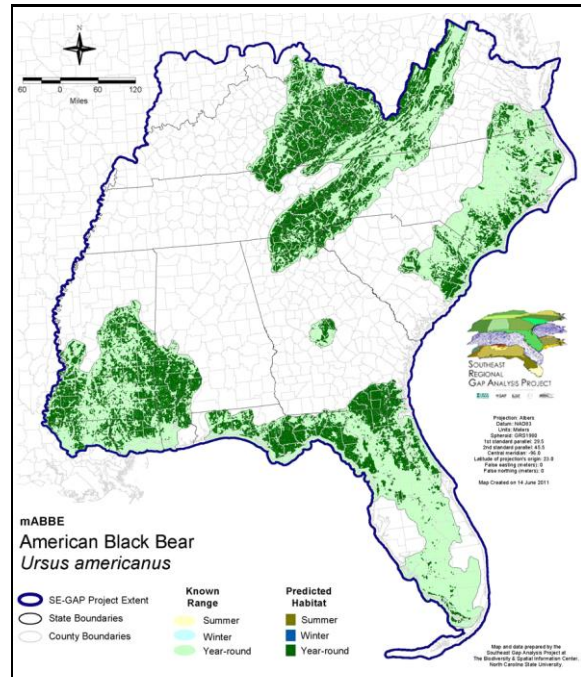
ITIS Species Code: 180544

NatureServe Element Code: AMAJB01010

KNOWN RANGE:



PREDICTED HABITAT:



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

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

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

Data Download: http://www.basic.ncsu.edu/segap/datazip/region/vert/mABBE_se00.zip

PROTECTION STATUS:

Reported on March 14, 2011

Federal Status: ---

State Status: AL (GANOS), ID (G), IN (SX), KY (S), MS (LE), NV (YES), NY (GS), OH (E), RI (Not Listed), TX (T), UT (None), BC (4 (2005)), ON (NAR), QC (Non suivie)

NS Global Rank: G5

NS State Rank: AK (S5), AL (S2), AR (S4), AZ (S5), CA (S5), CO (S5), CT (S3), DE (SX), FL (S5), GA (S4), IA (SX), ID (S5), IL (SX), IN (SX), KS (SX), KY (S2), LA (S2), MA (S4), MD (S3S4), ME (S5), MI (S5), MN (SNR), MO (S3), MS (S1), MT (S5), NC (S4), ND (SX), NE (SX), NH (S5), NJ (S3), NM (S4), NV (S4), NY (S5), OH (S1), OK (S1), OR (S4), PA (S5), RI (SX), SC (S3?), SD (S1), TN (S3), TX (S3), UT (S3), VA (S4), VT (S5), WA (S5), WI (S5), WV (S5), WY (S5), AB (S5), BC (S5), LB (S5), MB (S5), NB (S5), NF (S5), NS (S5), NT (SNR), NU (SNR), ON (S5), PE (SX), 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	214,241.4	1	37,856.9	< 1	0.0	0	0.0	0
Status 2	121,170.5	< 1	369,043.1	2	0.0	0	0.0	0
Status 3	41.8	< 1	2,362,910.1	11	18.1	< 1	168,736.1	< 1
Status 4	1,396.6	< 1	< 0.1	< 1	0.0	0	0.0	0
Total	336,850.3	2	2,769,810.2	13	18.1	< 1	168,736.1	< 1
	US Dept. of Energy		US Nat. Park Service		NOAA		Other Federal Lands	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	364,915.9	2	0.0	0	159.8	< 1
Status 2	0.0	0	9,504.9	< 1	3,114.1	< 1	0.0	0
Status 3	0.0	0	82,078.7	< 1	0.0	0	2,456.6	< 1
Status 4	0.0	0	0.0	0	0.0	0	0.0	0
Total	0.0	0	456,499.4	2	3,114.1	< 1	2,616.4	< 1
	Native Am. Reserv.		State Park/Hist. Park		State WMA/Gameland		State Forest	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	86.1	< 1	0.0	0	0.0	0
Status 2	0.0	0	13,753.4	< 1	374,327.8	2	1,321.2	< 1
Status 3	19,324.9	< 1	270,043.7	1	122,062.5	< 1	293,939.0	1
Status 4	0.0	0	0.0	0	30,779.6	< 1	1.1	< 1
Total	19,324.9	< 1	283,883.3	1	527,169.9	2	295,261.3	1
	State Coastal Reserve		ST Nat.Area/Preserve		Other State Lands		Private Cons. Easemt.	
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	5,000.2	< 1	0.0	0	0.0	0
Status 2	6,947.7	< 1	37,407.6	< 1	0.0	0	370.8	< 1
Status 3	0.0	0	12,239.6	< 1	14,147.0	< 1	74,286.2	< 1
Status 4	0.0	0	0.0	0	173.3	< 1	0.0	0
Total	6,947.7	< 1	54,647.5	< 1	14,320.3	< 1	74,657.0	< 1
	Private Land - No Res.		Water		Overall Total			
	ha	%	ha	%	ha	%	ha	%
Status 1	0.0	0	0.0	0	622,260.3 3			
Status 2	390.0	< 1	0.0	0	937,351.2 4			
Status 3	2,291.0	< 1	0.0	0	3,424,575.2 27			
Status 4	13,726,882.8	65	6,549.8	< 1	13,795,166.1 65			
Total	13,729,563.7	65	6,549.8	< 1	18,779,352.8 100			

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: American black bear (*Ursus americanus*) populations have been extirpated from approximately 90% of the former range, and remain fragmented in the southeastern US (Maehr 1984, Clark et al. 2005). In the Southeast black bears persist in habitats that contain nutrient rich seasonal foods, sufficient den habitat and which are sufficiently remote to protect them from human exploitation (Pelton 1986). Black bears use a variety of habitats in different stages of vegetation succession, due to the seasonality of their food sources. Foods of black bears have been shown to include ants and insect larvae and some meat during all seasons (Clapp 1990, Powell 1997), grasses, forbes and buds in the spring (Clapp 1990), squaw root and old acorns in early summer (Powell 1997), berries and fruits in the summer and fall and hard mast of acorns and nuts in the fall and early winter (Eagle and Pelton 1980, Pelton 1982, Clapp 1990). Mammals, including deer are a rare food source (Powell 1997). In the Fall bears rely on high nutrient food sources to store fat for the winter and for reproduction. These foods include soft mast species which fruit throughout the winter in upland habitats of the piedmont and coastal plain. Hard mast such as acorns and gum fruit from the *Nyssa* genus are important for reproduction in the fall (Maehr 1984, Clapp 1990, Dobey et al. 2002,). Habitat quality directly affects the reproductive success through its effects on pre- and post-natal nutrition (Rogers 1977, Elowe and Dodge 1989, Dobey et al. 2002).

Bears in the south tend to exist in regions of remote pine plantation timberlands and bottomland swamps (Hellgren et.al 1993). In this habitat matrix black bears were reported to use riparian habitats (also associated with hardwood species) in greater proportion to their availability (Stratman et al. 2001). Oak-hickory and mixed hardwood-pine forests provide hard mast foods and were selected over pine forests by black bears in Arkansas (Clark et al. 1993). Early successional habitats such as clearcuts provide high densities of soft mast species and may be exploited by congregated bears that display little aggressive behavior (Powell 1997, Rogers 1987). Agricultural habitats are also exploited (Allen 1999, Beausoleil 1999). Black bears were observed to spend most time in plantation pine in the Okefenokee Swamp, however scat analysis of diet revealed that bears were foraging on black gum. These results were explained by the fact that radio-tracking was done only during daylight hours and that bears were using pine as escape cover from hunters (Dobey et al. 2002). Bears forage in agricultural habitats adjacent to forest and may be able to exist solely on agricultural crops in highly fragmented forest, provided that they are not poached and there is a year round crop supply (Beausoleil 1999). These findings demonstrate the value of general forest cover to bear populations.

Forest fragmentation and road density, in the southeast has been correlated with the absence of breeding black bears. Researchers suggest that bears can persist in areas with a threshold of road density (Hellgren and Maehr 1993), but no range of density has been suggested. Low traffic volume, remote roads were selected by bears, likely due to the abundance of soft mast along road edges (Smith 1985, Garner 1986, Hellgren and Vaughn 1988, Hellgren et al. 1991). However in areas where bears are commonly hunted or poached, bears tend to avoid roads (Hamilton 1978, Carr and Pelton 1984). Low recruitment and high mortality were correlated with remote road density in Arizona (Mollohan and Lecount 1989). In protected areas high traffic volume roads were avoided (Garner 1986) and crossing was less frequent (Brody and Pelton 1989). Bears avoided habitats within 120 m of roads in Arkansas (Clark 1991). In Florida some black bear populations were reduced by up to 8 % annually due to traffic collisions (Simek et. Al 2005). Illegal hunting efficiency can increase with road access (Trombulak and Frissell 2000). Evidence suggests that bears that cross heavily trafficked roads less frequently, may shift their home ranges to avoid intolerable road densities or may be obligated to cross roads more frequently than they would normally prefer, to access necessary food resources (Brody and Pelton 1989). Forest fragmentation may act as a surrogate to road density for predicting the occurrence of bears. Rudis and Tansey (1995) showed that black bear population occurrence in the southeast correlated with counties containing more than 160 km² of bottomland hardwood, hydric woodland, or timberlands. In Florida anecdotal evidence suggests that the minimum unit of forested area that can be considered occupied bear range is 100 square kilometers (Maehr et. al 2001). The minimum size of public lands occupied by bears in Florida was 10km² (Hellgren and Maehr 1993).

Black bear home range size and use in the southeastern US depend on seasonal food abundance (Powell et al.,1997) and human activity along roads (Brody and Pelton 1989). Female black bear home range use depends in part on male defense of the most productive habitats (Jonkel and Cowan 1971) and avoidance of aggressive males due to the threat of infanticide (Powell et al. 1997, Rogers 1987). Where resources are limiting, black bears exhibit territorial behavior in the northern US (Rogers 1987, Samson 2001). However, habitats are generally more productive in the southeast and consequently female bear home ranges tend to overlap (Garshelis and Pelton 1981, Smith and Pelton 1990). Average annual home range size for female bears in southeast Georgia in the Okefenokee Swamp have been estimated to be as high as 57.9

km² for females with cubs and 95.8 km² for solitary females, whereas solitary and with cub female home range sizes in the adjacent Osceola National Forest in Florida were less than half the size of solitary and with cub females in the Okefenokee (Dobey et al. 2005). Seasonal home ranges in north Georgia for females have been estimated at 8.9 to 13.8 km² for summer, and 11.4 to 14 km² during the fall, whereas male black bear home ranges were reported as 15 to 41.6 km² for summer, and 12.9 to 24.4 km² during the fall (Brody and Pelton 1989). The difference in home ranges between the north Georgia, the Okefenokee and Osceola bears is likely due to habitat productivity (Dobey et.al 2005). Bear habitats in the Okefenokee are interspersed with flooded areas within swamps, and thus food and shelter resources are more widely dispersed, necessitating exploitation of larger home ranges. In the Mississippi alluvial valley, a riparian environment in the southeastern US, males maintained annual home ranges averaging 68.5 km² compared to 10.5 km² for females (White 1996).

Den habitat can be critical to cub survival and black bear reproductive rate. Bears using ground dens without sufficient cover tend to exhibit decreased survival and productivity (Johnson and Pelton 1981). Black bears in the southeastern US select den sites primarily in large trees when they are available (White 1996), or in rock crevices (Clark et al. 1998). Ground dens dug under slash and downed trees are used in areas of timber harvest (White 1996).

Black bears in the southeast exhibit habitat selection on timber harvest lands. Female black bears in Arkansas selected immature and mature poletimber oak-hickory stands and avoided immature and mature sawtimber pine stands (Clark 1991), however during daylight hours, while bears are most likely resting, pine habitats were selected in the Okefenokee Swamp (Dobey et. al 2005). Clearcuts were selected by male and female black bears in North Carolina due to high abundance of soft mast species (Brody 1984). Clearcuts were not selected by female bears with cubs in Arkansas, potentially due to avoidance of males who defended the use of these habitats (Clark 1991).

Model parameters were based on the following findings. In North Carolina Beringer et al. (1990) reported maximum home range road density for highways as 0.5 km/km². For gravel and paved roads density was 0.7 km/km² and restricted remote forest road density was 1.6 km/km². Mykytka and Pelton (1990) report maximum road densities for paved and graded roads in Florida, within the composite home range as 0.68 Km/km². The minimum size of public lands occupied by bears in Florida was 10km² (Helgren and Maehr 1993). This also corresponds to the range of the smallest average MCP home range sizes reported for females in the southeast (White 1996, Garshelis and Pelton 1981, Smith and Pelton 1989). A road density mask of 0.7 km/km² was used for a moving window size of 100,000 ha. Windows with 800 ha. Of habitat will be classed as having potential black bear occurrence. Habitat is considered to be all selected forest Mus, clear cuts, and agricultural areas within 300m of forest. The distance to forest was based on an assumption for escape cover and from bear location data from GPS collared males in central Georgia (Cook et al. unpublished data), where maximum distance to forest was 300m which represented less than 5% of locations.

K.Cook - 6-20-05

Avoidance Mask: Low - partially intolerant of human disturbance.

Non-contiguous Patch Constraints: 80 % within 1000 hectares.

Selected Map Units:

Functional Group	Map Unit Name
Anthropogenic	Deciduous Plantations
Anthropogenic	Evergreen Plantations
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)
Bald	Central Appalachian Montane Rocky Bald - Herbaceous Modifier
Bald	Central Appalachian Montane Rocky Bald - Shrub Modifier
Bald	Southern Appalachian Grass and Shrub Bald - Herbaceous Modifier
Bald	Southern Appalachian Grass and Shrub Bald - Shrub Modifier
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Northern Tidal Wooded Swamp
Brackish Tidal Marsh & Wetland	Atlantic Coastal Plain Southern Tidal Wooded Swamp

Brackish Tidal Marsh & Wetland	East Gulf Coastal Plain Tidal Wooded Swamp
Brackish Tidal Marsh & Wetland	South Florida Mangrove Swamp
Brackish Tidal Marsh & Wetland	Southwest Florida Perched Barriers Salt Swamp and Lagoon - Mangrove Modifier
Forest/Woodland	Alabama Ketona Glade and Woodland
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland - Hardwood Modifier
Forest/Woodland	Allegheny-Cumberland Dry Oak Forest and Woodland - Pine Modifier
Forest/Woodland	Appalachian Hemlock-Hardwood Forest
Forest/Woodland	Appalachian Serpentine Woodland
Forest/Woodland	Appalachian Shale Barrens
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 - 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 Northern Maritime Forest
Forest/Woodland	Atlantic Coastal Plain Northern Mixed Oak-Heath Forest
Forest/Woodland	Atlantic Coastal Plain Southern Maritime Forest
Forest/Woodland	Atlantic Coastal Plain Upland Longleaf Pine Woodland
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 Alkaline Glade and Woodland
Forest/Woodland	Central Appalachian Oak and Pine Forest
Forest/Woodland	Central Appalachian Pine-Oak Rocky Woodland
Forest/Woodland	Central Interior Highlands Calcareous Glade and Barrens
Forest/Woodland	Central Interior Highlands Dry Acidic Glade and Barrens
Forest/Woodland	Cumberland Sandstone Glade and Barrens
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 Maritime Forest
Forest/Woodland	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest
Forest/Woodland	East Gulf Coastal Plain Northern Dry Upland Hardwood Forest - Offsite Pine Modifier
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 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	Florida Peninsula Inland Scrub
Forest/Woodland	Mississippi Delta Maritime Forest
Forest/Woodland	Nashville Basin Limestone Glade
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	Northern Atlantic Coastal Plain Dry Hardwood Forest

Forest/Woodland	Ridge and Valley Calcareous Valley Bottom Glade and Woodland
Forest/Woodland	South Florida Pine Rockland
Forest/Woodland	South-Central Interior Mesophytic Forest
Forest/Woodland	Southeast Florida Coastal Strand and Maritime Hammock
Forest/Woodland	Southeastern Interior Longleaf Pine Woodland
Forest/Woodland	Southern and Central Appalachian Cove Forest
Forest/Woodland	Southern and Central Appalachian Mafic Glade and Barrens
Forest/Woodland	Southern and Central Appalachian Oak Forest
Forest/Woodland	Southern and Central Appalachian Oak Forest - Xeric
Forest/Woodland	Southern Appalachian Low Mountain Pine Forest
Forest/Woodland	Southern Appalachian Montane Pine Forest and Woodland
Forest/Woodland	Southern Coastal Plain Dry Upland Hardwood Forest
Forest/Woodland	Southern Coastal Plain Oak Dome and Hammock
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 - 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 Glade and Barrens
Forest/Woodland	Southern Piedmont Mafic Hardpan Woodland
Forest/Woodland	Southern Piedmont Mesic Forest
Forest/Woodland	Southern Piedmont Northern Triassic Basin Dry Forest
Forest/Woodland	Southern Ridge and Valley Dry Calcareous Forest
Forest/Woodland	Southern Ridge and Valley Dry Calcareous Forest - Hardwood Modifier
Forest/Woodland	Southern Ridge and Valley Dry Calcareous Forest - Pine Modifier
Forest/Woodland	Southwest Florida Coastal Strand and Maritime Hammock
Rock Outcrop	Allegheny-Cumberland Sandstone Box Canyon and Rockhouse
Rock Outcrop	Central Interior Acidic Cliff and Talus
Rock Outcrop	Central Interior Calcareous Cliff and Talus
Rock Outcrop	East Gulf Coastal Plain Dry Chalk Bluff
Rock Outcrop	North-Central Appalachian Acidic Cliff and Talus
Rock Outcrop	North-Central Appalachian Circumneutral Cliff and Talus
Rock Outcrop	Southern Appalachian Montane Cliff
Rock Outcrop	Southern Appalachian Rocky Summit
Rock Outcrop	Southern Interior Acid Cliff
Rock Outcrop	Southern Interior Calcareous Cliff
Rock Outcrop	Southern Piedmont Cliff
Wetlands	Atlantic Coastal Plain Blackwater Stream Floodplain Forest - Forest Modifier
Wetlands	Atlantic Coastal Plain Brownwater Stream Floodplain Forest
Wetlands	Atlantic Coastal Plain Clay-Based Carolina Bay Forested Wetland
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 Wet Longleaf Pine Savanna and Flatwoods
Wetlands	Atlantic Coastal Plain Peatland Pocosin
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 Riparian - Forest Modifier
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 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 Seepage Swamp
Wetlands	East Gulf Coastal Plain Small Stream and River Floodplain Forest
Wetlands	East Gulf Coastal Plain Southern Loblolly-Hardwood Flatwoods
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	North-Central Appalachian Acidic Swamp
Wetlands	North-Central Appalachian Seepage Fen
Wetlands	North-Central Interior and Appalachian Rich Swamp
Wetlands	South Florida Cypress Dome
Wetlands	South Florida Hardwood Hammock
Wetlands	South Florida Pine Flatwoods
Wetlands	South Florida Pond-Apple/Popash Slough
Wetlands	South-Central Interior Large Floodplain - Forest 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 Blackwater River Floodplain Forest
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 Seepage Wetland
Wetlands	Southern Piedmont Small Floodplain and Riparian Forest
Wetlands	Southern Piedmont/Ridge and Valley Upland Depression Swamp

Selected Secondary Map Units within 250m of Primary Map Units:

Functional Group	Map Unit Name
Anthropogenic	Row Crop

CITATIONS: Allen, T.G. 1999. Black bear population size and habitat use on Alligator River National Wildlife Refuge, North Carolina. PhD dissertation. University of Tennessee, Knoxville, TN.

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.

Beausoleil, R.A.. 1999. Population and spatial ecology of the Louisiana black bear in a fragmented bottomland hardwood forest. PhD dissertation. University of Tennessee, Knoxville, TN.

Beringer, J.J., S.G. Seibert, and M.R. Pelton. 1990. Incidence of road crossing by black bears on Pisgah National Forest, North Carolina. Papers of the International Conference on Bear Research and Management 8:85-92.

Brody, A.J. 1984. Habitat use by black bears in relation to forest management in Pisgah National Forest, North Carolina. PhD dissertation. University of Tennessee, Knoxville, TN. 123pp.

Brody, A.J. and M.R. Pelton. 1989. Effects of roads on black bear movement in western North Carolina. Wildlife Soc. Bull. 17:5-10.

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.

Carr, P.C. and M.R. Pelton. 1984. Proximity of adult female black bears to limited access roads. Proceedings of the Annual Conference of the Southeastern Association of Fish and Wildlife Agencies 38:70-77.

- Clapp, D.S. 1990. Availability and consumption of foods and importance of habitats used by black bears in Arkansas. PhD dissertation. University of Arkansas, Little Rock, AR
- Clark, J. 1991. Ecology of two black bear (*Ursus americanus*) populations in the interior highlands of Arkansas. PhD dissertation. University of Arkansas, Little Rock, AR
- Clark, J. D., and K. G. Smith, editors. 1991. Proceedings of the eastern workshop on black bear research and management. Univ. Arkansas. 150 pp.
- Clark, J.D., J.E. Dunn, and K.G. Smith. 1993. A multivariate method of female black bear habitat use for a geographic system. *J. Wildl. Manage.* 57:519-526.
- Clark, J.E., F.T. vanManen, J.D. Clark, R. Eastridge, W. Abler, M. Davidson, D. Hamilton, K.R. Hersey, S. McDonald and D. Telesco. 2005. Distribution of black bears in the southern Coastal Plain and Interior Highlands. *Ursus*: In Press.
- Coy, P. L., and D. L. Garshelis. 1992. Reconstructing reproductive histories of black bears from the incremental layering of dental cementum. *Canadian J. Zoology* 70:2150-2160.
- Cronin, M. A., et al. 1991. Interspecific and intraspecific mitochondrial DNA variation in North American bears (*URSUS*). *Canadian J. Zoology* 69:2985-2992.
- Darling, L., and R. Archibald, editors. 1990. Bears--their biology and management. Proc. Eighth Int. Conf. on Bear Res. and Manage., Victoria, British Columbia, Feb. 1989. 438 pp.
- Dobey, S., D.V. Masters, B.K. Scheick, J.D. Clark, M.R. Pelton, and M. Sunquist. 2005. Ecology of Florida black bears in the Okefenokee--Osceola ecosystem: Wildlife Monographs.158
- Dobey, S., Master D.V., Scheick B.K., Clark J.D., Pelton M.R., Sunquist M. 2002. Population Ecology of Black Bears in the Okefenokee-Osceola Ecosystem. Final Report submitted to USDA Forest Service, USFWS, & USGS et al. study cooperators.
- Eagle, T.C., and M.R. Pelton. 1983. Seasonal nutrition of black bears in the Great Smoky Mountains National Park. *International Conference Bear Research and Management*. 5:94-101.
- Eiler, J. H., W. G. Wathen, and M. R. Pelton. 1989. Reproduction in black bears in the southern Appalachian Mountains. *J. Wildlife Management* 53:353-360.
- Elowe, K.D., Wendell E. Dodge. 1989. Factors affecting black bear reproductive success and cub survival. *Journal of Wildlife Management* 53(4):962-8.
- Figg, D. E. 1993. Missouri Department of Conservation wildlife diversity report, July 1992-June 1993. 75 pp.
- Garner, N.P. 1986. Seasonal movements, habitat selection, and food habits of black bears (*Ursus americanus*) in Shenandoah National Park, Virginia. PhD dissertation. Virginia Polytechnic Institute.
- Garshelis, D.L, Pelton, M.R. 1981. Movements of black bears in the Great Smokey Mountains National Park. *Journal of Wildlife Management.* 45:912-25.
- Garshelis, D.L. 1978. Movement, ecology and activity behavior of black bears in the Great Smoky Mountains National Park. M.S. thesis. Univ. Tennessee, Knoxville.
- Garshelis, D.L. and M.R. Pelton. 1980. Activity of black bears in the Great Smoky Mountains National Park. *J. Mammal.* 61:8-19.
- Gibeau, M. L., and P. C. Paquet. 1991. Evaluation of Telazol for immobilization of black bears. *Wildlife Society Bull.* 19:400-402.
- Godin, A.J. 1977. *Wild Mammals of New England*. Johns Hopkins University Press, Baltimore. 304 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, R.J. 1978. Wildlife management in north carolina: Ecology of the black bear in southeastern North Carolina black bear in southeastern North Carolina. Report to the N.C. wildlife resources commission. 1978. 234P.
- Hamilton, William J., Jr., and John O. Whitaker, Jr. 1979. *Mammals of the eastern United States*. Cornell Univ. Press, Ithaca, New York. 346 pp.
- Handley, C. O., Jr. 1991. Mammals. Pages 539-616 in K. Terwilliger, coordinator. *Virginia's endangered species: proceedings of a symposium*. McDonald and Woodward Publishing Company, Blacksburg, Virginia.
- Hellgren, E. C. and M. R. Vaughan. 1988. Seasonal food habits of black bears in Great Dismal swamp, Virginia/North Carolina. *Proceeding of Annual Conference Southeast Association, Fish and Wildlife Agencies*, 42:295-305.
- Hellgren, E. C., and M. R. Vaughan. 1989. Demographic analysis of a black bear population in the Great Dismal Swamp. *J. Wildlife Management* 53:969-977.
- Hellgren, E. C., M. R. Vaughan, and D. F. Stauffer. 1991. Macrohabitat use by black bears in a southeastern wetland. *J. Wildlife Management* 55:442-448.
- Hellgren, E.C. 1988. Ecology and physiology of a black bear (*Ursus americanus*) population in Great Dismal Swamp and reproductive physiology in the captive female black bear. Unpublished Ph.D. diss., Virginia Polytechnic Institute, Blacksburg, Virginia. 23
- Hellgren, E.C. and D.S. Maehr. 1993. Habitat fragmentation and Black bears in the eastern United States. *Proceedings 11th Eastern Black Bear Workshop*. Orff E P, editor. 11: 154-165.
- Herrero, ed. *Bears -- their biology and management*. IUCN Publ. new ser., No. 23, 371 pp.

- Herrero, S. 1985. Bear attacks: their causes and avoidance. Winchester Press. 287 pp.
- Horner, M. A., and R. A. Powell. 1990. Internal structure of home ranges of black bears and analyses of home-range overlap. *J. Mammalogy* 71:402-410.
- Johnson, K.G., Pelton, M.R. 1981. Selection and availability of dens for black bears in Tennessee. *Journal of Wildlife Management* 45[1], 111-119.
- Jonkel, C.J. and I.M. Cowan. 1971. The black bear in the spruce-fir forest. *Wildlife Monographs* 27. 57 pp.
- Klenner, W. 1987. Seasonal movements and home range utilization patterns of the black bear, *URSUS AMERICANUS*, in western Manitoba. *Canadian Field-Naturalist* 101:558-568.
- LeCount, A.L. 1986. Black bear field guide: a manager's manual. Arizona Game and Fish Dept. (Special Report no. 16). 135 pp.
- Maehr, D. S. and J. R. Brady. 1984. Proceedings Seventh Eastern Workshop on Black Bear Research and Management. Florida Game and Fresh Water Fish Commission.
- Maehr, D.S., T.S. Hootor, L.J. Quinn, and J.S. Smith. 2001. Black bear habitat management practices for Florida. Technical Report No.17. Florida Fish and Wildlife Conservation Commission, Tallahassee, FL. 83 pp.
- Martinka, C. J., and K. L. McArthur, eds. 1980. Bears: their biology and management. Bear Biology Assoc. Conf. Ser. No. 3. Bear Biology Assoc., Boise, Idaho. 375 pp.
- Mollohan, C.M., LeCount, A.L., 1989. Problems of maintaining a viable black bear population in a fragmented forest. In: Teale, A., Covington, W.W., Hamre, R.H. (Eds.), (Technical Coordinators), *Multiresource Management of Ponderosa Pine Forests*, U.S. For.
- Mykatka, J.M. and M.R. Pelton. 1990. Management strategies for Florida black bears based on home range habitat composition. *International Conf. Bear Res. and Manage.* 8:161-167.
- Nowak, R. M. 1991. Walker's mammals of the world. Fifth edition. Vols. I and II. Johns Hopkins Univ. Press, Baltimore. 1629 pp.
- Pelton, M.R. 1982. Black Bear. Pages 504-514 in J.A. Chapman and G.A. Feldhamer, eds., *Wild mammals of North America*. Johns Hopkins University Press, Baltimore.
- Pelton, M.R. 1986. Habitat needs of black bears in the east. In: *Wilderness and Natural Areas in the Eastern United States: A Management Challenge*. D.L. Kulhavy and Conner, R.N. p 49-53.
- Powell, R.A. 1987. Black bear home range overlap in North Carolina and the concept of home range as applied to black bears. *International Conference on Bear Research and Management* 7: 235-242.
- Powell, R.A., J. W. Zimmerman, and D. E. Seaman. 1997. *Ecology and Behavior of North American Black Bears: Home ranges, habitat and social organization*. London, UK: Chapman & Hall.
- Rogers, L. L. 1986. Effects of translocation distance on frequency of return by adult black bears. *Wildlife Society Bull.* 14:76-80.
- Rogers, L. L. 1987. Effects of food supply and kinship on social behavior, movements, and population growth of black bears in northeastern Minnesota. *Wildlife Monographs* 97:1-72.
- Rogers, L. L., G. A. Wilker, and S. S. Scott. 1991. Reactions of black bears to human menstrual odors. *J. Wildlife Management* 55:632-634.
- Rogers, L. 1977. Effects of mast and berry crop failures on survival, growth, and reproductive success of black bears. *Trans. N. Am. Wildl. Nat. Res. Conf.* 41, 431-438.
- Rudis, V.A. and J.B. Tansey. 1995. Regional assessment of remote forests and black bear habitat from forest resource surveys. *J. Wildl. Manage.* 59:170-180.
- Samson, C. and J.Hout. 2001. Spatial and temporal interactions between female American black bears in mixed forests of eastern Canada. *Canadian Journal of Zoology* 79:633-41.
- Schwartz, Charles W., and Elizabeth R. Schwartz. 1981. *The wild mammals of Missouri*. University of Missouri Press, Columbia. 356 pp.
- Shields, G. F., and T. D. Kocher. 1991. Phylogenetic relationships of North American ursids based on analysis of mitochondrial DNA. *Evolution* 45:218-221.
- Simek, S., S.A. Jonker, B.K. Scheick, M.J. Endries and T.H. Eason. 2005. Statewide Assessment of Road Impacts on Bears in Six Study Areas in Florida from May 2001- September 2003. Final Report Contract BC-972: pp.78.
- Smith, T.R. 1985. Ecology of black bears in the bottomland hardwood forest in Arkansas. PhD dissertation. University of Tennessee.
- Smith, T.R. and M.R. Pelton. 1990. Home ranges and movements of black bears in a bottomland hardwood forest in Arkansas. *Int. Conf. Bear Res. and Manag.* Darling, L.M. and W.R. Archibald Eds. 8:213-218.
- Stratman, M.R., Alden, C.D., Pelton, M.R., and Sunquist, M.E.. 2001. Habitat use by American black bears in the sandhills of Florida. *Ursus* 12, 109-114.
- Trombulak, S.C., Frissell, C.A. 2000. Review of ecological effects of roads of terrestrial and aquatic communities. *Conservation Biology* 14[1], 18-30.
- U.S. Fish and Wildlife Service. 19 August 1988. Notice of findings on petitions to list the Louisiana black bear, lower Keys marsh rabbit, and Sherman's fox squirrel. *Federal Register* 53:31723-31725.

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

White, T.H. 1996. Black bear ecology in forested wetlands of the mississippi alluvial valley. PhD dissertation. University of Mississippi.

Williamson, S. J. No date. Forester's guide to wildlife habitat improvement. Cooperative Extension Service, Univ. of New Hampshire. 56 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.

Wooding, J. B., and T. S. Hardisky. 1992. Denning by black bears in northcentral Florida. J. Mammalogy 73:895-898.

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.