East Texas Black Bear Conservation and Management Plan

2005 – 2015

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PURPOSE OF PLAN

To facilitate the conservation
and management of
black bears in East Texas
through cooperative efforts

Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

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Robert L. Cook, Executive Director
Texas Parks and Wildlife Department

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EXECUTIVE SUMMARY

It is recognized that historically two sub-species of black bear inhabited Texas. The American black bear (*Ursus americanus americanus*) occurred throughout most of west and central Texas, and the Louisiana black bear (*Ursus americanus luteolus*) ranged throughout East Texas. Currently, the status of the Louisiana black bear in East Texas is unknown; however, bear sightings are on the rise and their interactions with the public are expected to increase in the future. With this in mind, a committee of stakeholders comprised of representatives from state, federal, and private entities collaborated to develop this East Texas Black Bear Conservation and Management Plan.

This plan was produced in the spirit of conservation for the purpose of re-establishing the bear as a viable part of the native wildlife community of East Texas. Several goals to be accomplished within the next 10 years were identified and include increased public coordination and communication, habitat management, research activities, and development and distribution of informational materials. Specific strategies addressed in this plan strive to promote public awareness through outreach while providing public and private biologists and willing landowners with the technical knowledge to increase and/or enhance suitable black bear habitat throughout East Texas. Research activities are directed at evaluating habitat availability and distribution, encouraging habitat restoration and management, and determining the survivability and reproductive capacity of black bears should they be introduced in East Texas.

This planning endeavor was built upon a sound foundation of partnerships involving private landowners, private corporations, state and federal agencies, and interested conservation groups. The success of this plan will ultimately depend upon the strengths of these partnerships and the public and political support required to restore a federally threatened sub-species of black bear to the forests of East Texas.

CONTRIBUTING AUTHORS

James Barker[1]	National Park Service, Big Thicket National Preserve
Omar Bocanegra	U.S. Fish and Wildlife Service, Arlington
Gary Calkins	Texas Parks and Wildlife Department, Jasper
Don Dietz	Temple Inland Forest Products Corporation, Diboll
Dr. Jeff Duguay[2]	Stephen F. Austin State University, Nacogdoches
Nathan Garner	Texas Parks and Wildlife Department, Tyler
Ricky Maxey	Texas Parks and Wildlife Department, Nacogdoches

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Participating Agencies and Organizations

Alabama-Coushatta Tribe
Arkansas Game and Fish Commission
Bear Trust International
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Black Bear Conservation Committee
Boone and Crockett Club
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International Paper Corporation
Louisiana Department of Wildlife and Fisheries
Louisiana Pacific
Michigan State University
National Forests and Grasslands of Texas
National Park Service, Big Thicket National Preserve
Natural Resource Conservation Service
Neches River Protection Coalition
Newton County Landowner and Leaseholder Association
Oklahoma Department of Wildlife Conservation
Oklahoma State University
Rice University
Arthur Temple College of Forestry, Stephen F. Austin State University
Temple-Inland
Texas Committee on Natural Resources
Texas Department of Transportation
Texas Forest Service
Texas Forestry Association
Texas Parks and Wildlife Department
The Nature Conservancy
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United States Department of Agriculture, Wildlife Services - Louisiana
United States Department of Agriculture, Wildlife Services –Texas
United States Fish and Wildlife Service

[1] West Virginia; [2] Delta State College, Mississippi

INTRODUCTION

Black bears (U*rsus americanus)* are a part of the heritage of Texas. Historically, black bears were widely distributed throughout all major eco-regions in Texas prior to Anglo-American colonization in 1820 (Hall 1981). Numerous historic accounts refer to black bears as being common and widespread in East Texas. Black bears inhabited the forests of East Texas at the time when settlers established towns in the early to mid 1800s. For example, a chain carrier who helped survey land in southeast Texas in the mid 1800s when county lines were being established reported seeing numerous bear tracks. Two hunters in Liberty County in a two-year period from 1883 to 1885 reportedly killed 182 black bears within a 10-mile radius in the Trinity River drainage of southeast Texas (Bailey 1905).

Bear meat was eaten by settlers, logging crews, and railroad workers in East Texas. Bear fat was used for standard cooking oil by Anglo-American settlers and the native Indians. The supply lasted about a century after the first Anglo-American settlers arrived. After their value for grease and food had decreased, black bears continued to be pursued relentlessly with horse, hound and horn and killed for their high game and trophy value. By the time the first organized survey of mammals took place from 1890 to 1904, black bears in East Texas were seriously reduced to scattered remnant populations or eliminated altogether in many areas largely as a result of indiscriminate and unregulated hunting (Bailey 1905). Extensive habitat loss of prime forested areas combined with human exploitation contributed to the decline in the bear population in Texas. Many people consider "Uncle Bud" Brackin from Hardin County the champion Texas bear hunter because when he stopped bear hunting in 1887, he had 305 bear hides from East Texas to prove his kill. He contended that he quit bear hunting when the black bear became scarce. The lower portion of the "Big Thicket" area was apparently the last stronghold of native bears in East Texas (Truett and Lay 1984). The last native East Texas bear was believed to have been killed in the Pineywoods in the late 1950s in Polk County (Fleming 1980).

Today, black bears are returning to their historic range in Texas. Since 1977, The Texas Parks and Wildlife Department has documented black bear sightings and mortalities in Texas. Observations in the 1990s indicate the return of a few black bears to the remote forests of East Texas, primarily composed of transient, solitary males. There is no current evidence of a resident breeding population of black bears in East Texas; however, increased sightings combined with bear recovery and range expansion in bordering Louisiana, Arkansas, and Oklahoma will increase bear occurrence and activity in East Texas in the next ten years. A comprehensive black bear conservation and management plan for East Texas is essential to prepare state and federal Agencies as well as landowners and the public for that possibility. It is unlikely that long-lasting bear conservation can be achieved without public and political support, particularly within neighboring human communities in the forests of East Texas where people will strive to co-exist with the return of black bears. This document will provide an organized approach to successful conservation and management planning for black bears in East Texas. It could not have been prepared without the many contributions of the East Texas Bear Working Group made of representatives from private industry, landowners, conservation groups, government agencies and universities who met regularly over a two year period from 2002 to 2004.

NATURAL HISTORY

Distribution

Adult male and adult female American black bears *(Ursus americanus)* currently occupy and live together within 5 to 10 percent of their historic range in the south-eastern United States (Maehr 1984, Pelton 1986, Wooding et al. 1996, Black Bear Conservation Committee 1997). The Louisiana black bear (*U. a. luteolus*) was once a common inhabitant of forested regions of East Texas, Louisiana and Mississippi (U.S. Fish and Wildlife Service 1995, Black Bear Conservation Committee 1997; Figure 1). Approximately one-fifth of the original bear habitat remains within these areas (Neal 1992).

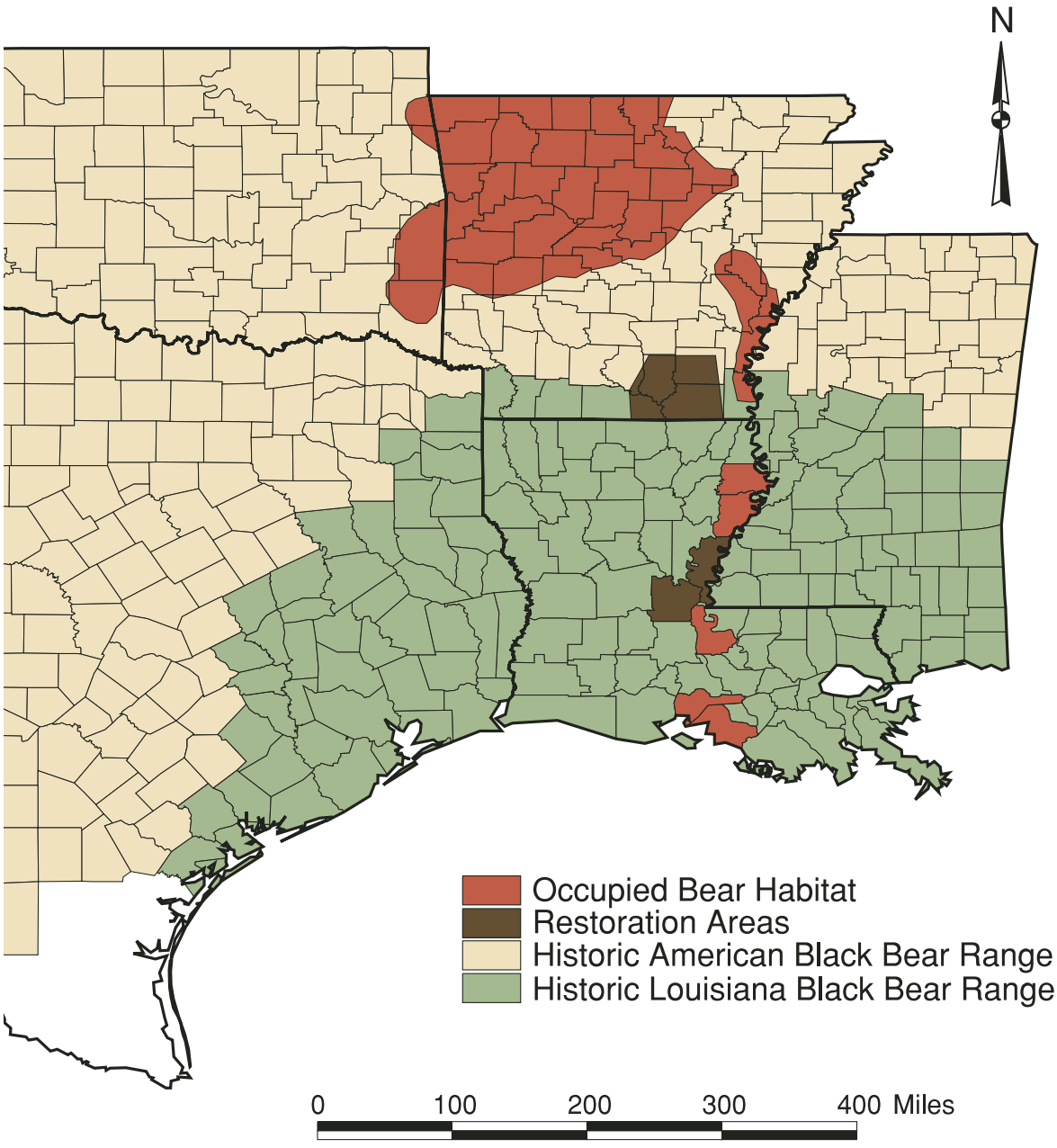

Figure 1. Historic and occupied black bear ranges of the West Gulf Coastal Plain, United States.

Louisiana

Habitat supporting confirmed breeding populations of Louisiana black bear are confined to three areas in Louisiana (Figure 1). One population occurs in the Tensas River Basin of eastern Louisiana, and the other two occur within the Atchafalaya River Basin of south-central and southern Louisiana (Black Bear Conservation Committee 1997). The Tensas River Basin population occurs in bottomland hardwood forests largely on the Tensas River National Wildlife Refuge, the adjacent Big Lake Wildlife Management Area in Tensas, Madison, Franklin, East Carroll and Richland parishes, and on small privately owned Deltic properties (Weaver et al. 1990a, Marchinton 1995, Black Bear Conservation Committee 1997). One of the Atchafalaya River Basin populations occurs within the south-central basin in Pointe Coupee Parish, and the other occurs within coastal Louisiana in Iberia and Saint Mary parishes in the southwestern part of the basin (Pace et al. 1993, Black Bear Conservation Committee 1997). All three breeding populations are considered demographically isolated (Black Bear Conservation Committee 1997). There are a number of other areas within Louisiana, including the Kisatchie National Forest and near-border areas with Texas, where periodic sightings of bears may indicate potential occupied habitat (Black Bear Conservation Committee 1997).

Mississippi

There are a number of areas in Mississippi where black bears have been sighted that could potentially be occupied. These areas include the Lower Yazoo/Mississippi River Basin, portions of the DeSoto National Forest, the Lower Pascagoula River Basin, the Lower Pearl River Basin and adjacent southern basin in Louisiana, and the Loess Bluff hardwood region in southern Wilkinson County and adjacent areas in West Feliciana Parish, Louisiana (Carter 1987, Shropshire 1988, Stinson and Pace 1995, Stinson 1996, Wooding et al. 1996, Black Bear Conservation Committee 1997). Of these areas in Mississippi, and adjacent areas in Louisiana, about 513 square miles of the Tunica Hills region of Wilkinson County, Mississippi, and northern Feliciana Parish, Louisiana, are the only areas where surveys have been conducted (Stinson and Pace 1995, Stinson 1996). Survey work verified the presence of a number of bears, but breeding was not confirmed. Tracks of a sub adult have been recorded in the Tunica Hills area as well. (Black Bear Conservation Committee 1997, R. Pace 2003 personal communication).

Arkansas

Currently there is debate among black bear biologists concerning the presence or absence of the Louisiana black bear within the bottomland hardwood forest habitats of the White River National Wildlife Refuge in Arkansas. Csiki et al. (2003) found that black bears of the Ozark and Ouachita Mountains were most likely genetically related to bears in Minnesota. Miller et al. (1998) concluded that populations in Arkansas and Louisiana were more closely related to each other than to bears in Minnesota. Warrilow et. al. (2001) concluded that black bears from the upper and lower reaches of the Atchafalaya were genetically similar to black bears from the White River National Wildlife Refuge in Arkansas. Csiki et al. (2003) concluded from their data that a number of black bear populations within the range of Louisiana black bear are largely derived from translocated black bear genes. The populations in the White River National Wildlife Refuge and in coastal Louisiana were likely genetically isolated, and appear to be unaltered by translocation projects. So, conclusive results of whether or not the bears in the White River National Wildlife Refuge are the *U. a. luteolus* subspecies are still forthcoming.

Oklahoma

The U.S. Fish and Wildlife Service did not include any portions of Oklahoma within the historic range of the Louisiana black bear. However, it appears that black bear populations in southeastern Oklahoma, including those in the Ouachita Mountains, and the Ouachita National Forest, are on the increase. Most of the compartments of the Ouachita National Forest are less than 100 land miles from the Texas border, and there are some units that are literally within miles of the border. This combined with an increased number of sightings over the last decade within the Red and Sulphur River basins of northeast Texas, underscores the significance of the black bear population in southeast Oklahoma on natural dispersal into northeast Texas.

Texas

The American black bear once occurred throughout the state of Texas (Davis 1978). According to survey work done by Bailey in 1905, black bears were considered rare at the beginning of the twentieth century. Black bears disappeared first from the western, northern, and southern parts of the region during the period from 1850 to 1890. Schmidly (1983) stated that there were no black bears currently existing in East Texas. Their last strongholds in East Texas were in the swamps and thickets of the Big Thicket Region of southeast Texas. The majority of the remaining bears were exterminated from this area during the period between 1900 to 1940, with the possible exception of a few individuals in the Big Thicket of Hardin County, and in the dense woods of Matagorda County, where they were sighted in 1943 and 1940, respectively (Schmidly 1983). The U.S. Fish and Wildlife Service in its 1995 recovery plan for the Louisiana black bear stated that the historic range of the Louisiana black bear included all Texas counties east of and including Cass, Marion, Harrison, Upshur, Rusk, Cherokee, Anderson, Leon, Robertson, Burleson, Washington, Lavaca, Victoria, Refugio and Aransas (Hall 1981; Figure 1).

There have been periodic but rare sightings of black bears within East Texas following the previously mentioned period of extirpation. There was a resurgence of sightings within this region that followed a release of 161 black bears from Minnesota by the Louisiana Department of Wildlife and Fisheries in an effort to boost populations of the species in Louisiana between 1964 and 1967 (Schmidly 1983). A number of these bears showed up in portions of East Texas in the years that followed. The Big Thicket Museum in Saratoga, Texas, at one time contained the remains of a black bear shot May 20, 1973, at a locality 8 miles north of Silsbee, Texas. According to museum records, the animal wandered into Texas from a preserve in Louisiana. The bear was over 2 years old, and measured 5.16 feet in length (Schmidly 1983).

Since 1977, the Texas Parks and Wildlife Department (TPWD) has documented reliable sightings of black bears at 24 locations within eastern Texas (Departmental Federal Aid Reports and Black Bear Investigation Reports). This region includes the Pineywoods, the upper Post Oak Woodlands and Prairies, and a portion of the Blackland Prairie. Black bears were sighted in 22 counties. Those counties included Anderson, Angelina, Bowie, Cass, Fannin, Franklin, Hardin, Harrison, Henderson, Hopkins, Jasper, Lamar, Marion, Morris, Nacogdoches, Newton, Panola, Polk, Red River, San Jacinto, Shelby and Wood counties (Figure 2). There were sightings at 3 locations between 1977 and 1980. There were sightings at 5 locations between 1981 and 1990 and sightings at 13 locations between 1991 and 2000. There have been

sightings at 3 locations since 2000. Following an arbitrary line on the northern borders of Leon, Houston, Angelina, Nacogdoches and Shelby counties; there were 15 sightings (62.5 percent) in northeast Texas, and 9 sightings (37.5 percent) in southeast Texas. A total of 16 of the entire 24 black bear sightings (66.7 percent) within the region have occurred within the decade from 1991 through 2000 (Garner and Maxey 2002).

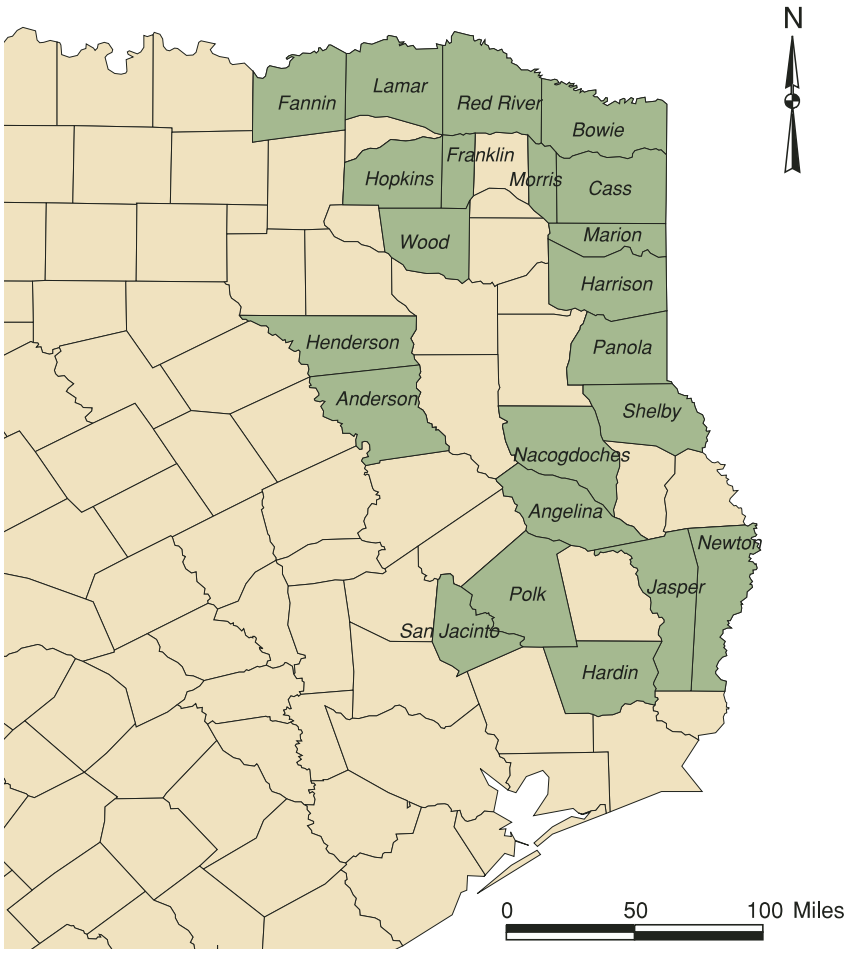

Figure 2. Counties in East Texas with confirmed black bear sightings, 1977 - 2003.

It is very likely that most of these bears are juvenile or sub-adult males that have roamed into the region from expanding populations in the adjacent states of Arkansas, Louisiana and Oklahoma (personal communications with various researchers). Most of the sightings were of solitary bears. A sighting in Panola County in 1993 described 2 individual bears walking together. There were 2 verified sightings in Harrison County in 1994, and at least 9 other unverified sightings nearby. There was also a report in 1995 from Jasper County of a black bear sow with a cub. There were a number of bear sightings in 1998 near Paris, Texas, in Lamar County; one landowner actually made a VHS video recording of a black bear feeding at his deer feeder. The most direct evidence of black bear activity occurred in 1999 on the Franklin-Hopkins County Line when a black bear was struck and killed by a tractor-trailer rig on U.S. Interstate 30 (Garner and Maxey 2002).

Recent sightings during 2002 included a black bear in Cass County feeding on garbage near a residence, and a track verified by a TPWD Biologist near Lumberton, Texas, in Hardin County. Sightings in 2003 included a sighting by a school bus driver in Wood County, Texas, and a black bear within the city limits of Texarkana, which is evenly divided by the Arkansas-Texas state line. This bear was captured within the city limits of Texarkana on the Arkansas side (Black Bear Investigation Reports and unpublished reports).

Other than gathering of data concerning sightings of black bears within East Texas, there has been no formal survey work done to confirm black bear occurrence within the region. It is unknown how many bear sightings go unreported in East Texas. A proposal to survey black bear occurrence within the Sulphur River Basin of northeast Texas was submitted to the U.S. Fish and Wildlife Service in 2002. This proposal was to survey remaining high quality habitat within the Sulphur River, for the occurrence of bears where there have been a number of recent sightings (Bittner et al. 2002).

Description

The color of the black bear varies from black which is the most common color morph, or type, in the eastern United States to cinnamon which is more common in the western range to nearly white in British Columbia (Burt and Grossenheider 1976). In the southeast, the black bear is typically solid black with a brownish muzzle and an occasional white chest blaze (Pelton 2001; Figure 3). The Louisiana black bear is one of 16 subspecies of American black bears (Hall 1981). Although the Latin word *luteolus* means yellowish, resulting in the Louisiana black bear sometimes being referred to as the "yellow bear" (Griffith 1821), it is similar in appearance to the American black bear and is distinguished from other black bears by possessing a skull that is longer, narrower, and flat, and by possessing proportionately large molar teeth (Nowack 1986).

Figure 3. *Ursus americanus* in a natural forested habitat (photo by David Telesco).

Black bears have a relatively heavy, compact body structure and measure 5-6 feet in length and 2-3 feet high at the shoulder (Burt and Grossenheider 1976). Body weight of black bears varies depending on location and food supplies. Adult males weigh 200-475+ pounds (Burt and Grossenheider

1976) and adult females weigh less (85-400 pounds) with weights of 120-250 pounds most common for adult females (Yarrow and Yarrow 1999, Pelton 2000). Females typically reach full skeletal size at 5 years of age, whereas males normally do not reach maximum size until 7 or 8 years of age. Both sexes may increase in body mass for another 3 to 4 years (Pelton 2000).

Life History

Habitat Requirements

Like most creatures, the Louisiana black bear's habitat requirements include food, cover and water (U.S. Fish and Wildlife Service 1995). Additionally, they require suitable denning sites and relatively large, remote blocks of land (Black Bear Conservation Committee 1997). Black bears are forest creatures, but within woodland areas they are highly adaptable, inhabiting both upland and bottomlands woods as well as swamps. Stratman et al. (2001) found that black bears in the Florida Sandhills spent more time annually in riparian habitats, followed by swamps and pine plantations. The best bear habitats are large forests dominated by mature hardwoods comprised of a wide variety of mast producing trees and shrubs (Mitchell et. al. 1995, Rogers 2002). The U.S. Fish and Wildlife Service endangered and threatened species account of the Louisiana black bear notes that preferred habitat is in river basin bottomland hardwood timber (FWS Region 4 1992). Additionally, bears need escape cover including extensive areas of minimal human disturbance (U.S. Fish and Wildlife Service 1995, Mitchell et. al. 1995, Rudis and Tansey 1995). Garner and Willis (1998) found the most suitable habitat in East Texas to be the Middle Neches River Corridor because not only did it have suitable food and cover, this area also had low levels of human/bear conflict zones and relatively low open road density. Brody and Pelton (1989) also pointed out that frequently traveled roads were hazardous to bears and that narrow roads were much more tolerated than wide, heavily traveled highways. The Black Bear Conservation Committee (1997) listed fragmentation by manmade structures, such as multi-lane highways, as one of the reasons that the quality of bear habitat has been reduced. This relates directly to the large home ranges of black bears, which range in size from 2-196 square kilometers (1-76 square miles; Pelton 1982). The U.S. Fish and Wildlife Service (1995) considered good bear habitat to be remote. They considered remoteness to be timberlands at least 0.8 kilometers (0.5 miles) from major roads and in blocks of at least 1,000 hectares (2,500 acres).

Bears in the Big Thicket preferred the dense canebrake thickets beneath an over-story of mast producing hardwoods (Truett and Lay 1984). According to the U.S. Fish and Wildlife Service (1995) suitable forest community types include the species bald cypress (*Taxodium distichum*), water tupelo (*Nyssa aquatica*), river birch (*Betula nigra*), American sycamore (*Platanus occidentalis*), cottonwood (*Populus deltoides*), American elm (*Ulmus Americana*), green ash (*Fraxinus pennsylvanica*), Nuttal oak (*Quercus nuttallii*), overcup oak (*Quercus lyrata*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), swamp chestnut oak (*Quercus michauxii*), and cherrybark oak (*Quercus falcata*).

Food Habits

Rogers (1976) found that the variation of food supply and its effect on health and reproduction appeared to be the most critical natural factor regulating black bear populations. He noted that survival rates of cubs were shown to be directly related to the physical condition of the mother and that poor

reproduction usually followed a poor mast year. Although the bear is known to select for acorns when available, it is a true omnivore (Bauer 1972, East 1977). Preferred foods of black bear range from hard and soft masts of oaks (*Quercus* spp.) to wild honey (Truett and Lay 1984, Stirling 1993). An opportunistic feeder, the Louisiana black bear has even been observed eating alligator eggs (Jones 1999). Both Bauer (1972) and East (1977) indicated that black bears consume carrion, insects and their grubs, frogs, snakes and small mammals. Food habit studies of the bear in the southeastern U.S. indicate that it predominately feeds as a herbivore (Smith 1985, Black Bear Conservation Committee 1997). Some important food plants listed were acorns *(Quercus* spp.*)* pecans (*Carya* spp.*)* dewberries and blackberries *(Rubus spp.),* wild grapes *(Vitus* spp.*),* red mulberry *(Morus rubra*), hawthorne *(Cataegus* spp.*),* sassafras *(Sassafras albidum),* paw-paw *(Asimina* spp.*)*, pokeberry *(Rivina humilis),* dogwood *(Cornus florida),* persimmon *(Diospyros virginiana),* and black gum *(Nyssa sylvatica);* (Weaver et al. 1990). Agricultural crops like sugar cane (*Saccharum officinarum*), and corn (*Zea mays*) are also used, especially in fragmented habitat. Although capable of killing large game and domestic livestock, meat in a black bear diet generally comes from scavenging already dead carcasses. Maehr and Brady (1984) reported that frequently found animal matter in Florida black bear (*Ursus americanus floridanus*) included armadillo (*Dasypus novemcinctus*) and feral hogs (*Sus scrofa*).

The black bear's diet changes seasonally (Maehr and Brady 1984, U.S. Fish and Wildlife Service 1995, Mitchell et al. 1995). Rogers (1987) noted that behavioral patterns for Minnesota black bears were closely tied to the annual cycle of food availability. Bears emerging from dens in the early spring fed on green vegetation as soon as it became available (Hamilton and Marchinton 1980). Spring diets of blacks bears consist mostly green herbaceous matter from grasses, greenbrier *(Smilax* spp.*),* and tree cambium (Mitchell et al. 1995). Garner (1986) found that bears in spring in Virginia primarily consumed the leaves, stems, roots, and fruits of various forbs.

The summer diet changes from green vegetation to ripening soft mast in the form of berries (Maehr and Brady 1984, Garner 1986). The Black Bear Conservation Committee (1997) listed fruits of dewberries, black berries, elderberry *(Sambucus canadensis*), grapes, and others vines and shrubs as important to bears in the early summer, while fruits and berries from pokeberry, dogwood and persimmon were important in late summer and early fall. Garner (1986) found bears in Virginia consumed domestic apples and cherries from abandoned home places as well as native fruits during the summer months. Rogers (2002) observed that once the mating season was completed in mid-summer, bears spent the majority of their days foraging for ripening fruits. Insects are consumed primarily during the late spring and summer months (Garner 1986, Mitchell et al. 1995). Maehr and Brady (1984) found that colonial species like honey bees *(Apis mellifera),* yellow jackets *(Vespula* spp.*),* bumble bees *(Bombus bimaculatus),* and carpenter ants *(Campanotus* spp.*)* were among the major species of insects consumed in Florida.

Fall diets change from mostly soft mast of fruit bearing shrubs and vines to hard mast of hickory and oaks (Maehr and Brady 1984, Garner 1986). The high fat and carbohydrate content of acorns and other hard masts enable bears to build up fat reserves prior to denning (Black Bear Conservation Committee 1996; Figure 4). Winter active bears have been shown to continue to feed on hard mast and domestic foods like corn and fallen apples (Garner 1986, Mitchell et al. 1995). Garner (1986) also noted that an increased use of dry grasses and sedges in early winter was probably related to the formation of fecal plugs immediately prior to denning.

Figure 4. *U. a. luteolus* in an oak tree (photo by U.S. Fish and Wildlife Service).

To summarize, bears are opportunistic feeders and their diet changes with the seasons. Primarily vegetarians, they consume hard mast like acorns and hickory nuts, and soft mast like greenbrier and gall berries in the late winter and early spring. Mid- to-late spring finds them grazing on succulent forbs, grasses, tree cambium, pokeberry, insects and small animals. During the breeding months of July and August, they are eating the soft masts of blackberry, blueberry, and huckleberry, as well as insects. The pre-denning months of August and November find the black bear gorging on holly berries, dogwood berries, persimmons, black gum, sassafras, and green brier (Mitchell et al. 1995).

Reproduction

Reproductive success appears to be closely tied to the availability of high quality fall foods (Rogers 1976, 1987, Eiler et al. 1989). Depending on nutritional status, female black bears reach sexual maturity at 2 to 7 years of age (Pelton 2000), with 3-5 years of age being common (Pelton 1982), and males reach sexual maturity at 3 to 4 years of age (Garshelis and Hellgren 1994). Black bears are polygynous and dominant males may mate with several females (Pelton 2000). Among male black bears, access to females is governed by a dominance hierarchy, with older, larger males displacing younger males (Garshelis and Hellgren 1994).

Breeding occurs in summer with females coming into estrus as early as late May and as late as August, with the peak of breeding normally in July (Pelton 2000). Females remain in estrus until bred or until ovarian follicles begin to degenerate. Black bear females exhibit delayed implantation. Fertilized eggs (blastocysts) float in the uterus and do not implant until late November or early December. Fetal development thus only occurs during the last 6 to 8 weeks (Pelton 2000). Poor nutrition resulting in low fall body mass of females may result in no implantation of the blastocysts, resorptions of implanted fetuses, or early death of neonates (Pelton 2000). One study demonstrated that heavier females had greater reproductive success than lighter ones (Rogers 1976).

Cubs are born in winter dens in January and February. Although twins are most common, litter sizes can range from 1 to 5. At birth, cubs are approximately 8 inches in length and weigh 8 to 12 ounces (Yarrow and Yarrow 1999). At den emergence, April or May, cubs weigh 4 to 8 pounds (Yarrow and Yarrow 1999) and continue to nurse through the summer (Pelton 2000; Figure 5). Cubs usually stay with

their mother 15 to 17 months from birth just prior to the female coming into estrus estrus again (Yarrow and Yarrow 1999, Pelton 2000).

Figure 5. ***U. a. luteolus*** **female with cubs on ground nest in spring (photo by Paul Davidson, Black Bear Conservation Committee).**

Movements

Movements of black bears are primarily focused on meeting two basic needs; seeking and utilizing habitat(s), and finding mates during the breeding season (Stewart 2000). The area in which an individual bear meets these needs is known as its home range. The home range provides food, cover, space, denning sites, and contact with potential mates. Size, shape and dynamics of an individual black bear's home range are determined by habitat type(s), sex, age, season, environmental conditions, and population density (Black Bear Conservation Committee 1997).

General size estimates for black bear home ranges vary greatly depending upon geography, habitat type(s) and spatial arrangement, and method(s) of analysis (Black Bear Conservation Committee 1997). Reported black bear home ranges vary from 4,141-105,660 acres (1,680-42,760 ha.) for males, and 1,360-26,044 acres (550-10,540 ha.) for females (Pelton 1982, Rogers and Allen, 1987). Adult males generally have home ranges 3 to 8 times larger than adult females (Pelton 1982).

Estimates of home range size in the Tensas River Basin of Louisiana, mostly from Tensas National Wildlife Refuge, indicated that adult males used areas from 11,000-40,000 acres (4,451-16,187 ha.), and adult females used areas from 2,500-18,000 acres (1,012-7,285 ha.; Weaver 1999). These home ranges included combinations of forested and agricultural lands with considerable spatial overlap (Black Bear Conservation Committee 1997).

Home range sizes are generally expected to be larger in fragmented forest habitats than in contiguous, unfragmented habitat. A study of black bear home ranges in the highly fragmented Deltic bottomland hardwood tracts, north of the Tensas River National Wildlife Refuge, indicated that bear home ranges were much smaller than would have been expected (Marchinton 1995). This was particularly true for females. Annual mean home range for males was 4,480 acres (1,792 ha.), and for females was 2,176 acres (870.4 ha.) Another interesting, yet confounding finding was that use of bottomland hardwood forest fragments did not increase in proportion to the size of the fragment (Marchinton 1995).

Average male black bear home range in the northern Atchafalaya River Basin of Louisiana (Point Coupee Parish) was determined to be 84,032 acres (33,612.8 ha.). For the two coastal populations in

the Atchafalaya River Basin male black bear home ranges were determined to be 10,368 acres (4,147.2 ha.) in Saint Mary Parish, and 3,712 acres (1,484.8 ha.) for Iberia Parish (Wagner 1995). While not as highly fragmented as the Deltic bottomland hardwood tracts, bears in these coastal populations also had smaller home ranges than expected. In the lower Atchafalaya River Basin, bears had smaller spring-summer and fall home ranges than bears in the northern basin; likely reflecting higher habitat quality in the lower basin (Wagner 1995).

Seasonal movements of bears, with the exception of searching for mates, are typically done to maximize use of foods available within various habitat types nearby. Nyland (1995) determined that coastal bears in the Atchafalaya River Basin preferred upland deciduous forests in spring-summer, and during fall, upland hardwood forest and spoil, agricultural fields and marsh. Wagner (1995) found that although seasonal bear movements in the coastal population are typically less than in the northern basin, that in a consecutive season these bears actually moved more. This increase in movement between seasons likely indicated a greater variability in resource location in that season. So, we can infer from this that seasonal bear movements will be determined by availability of resources, and can change with seasonal events like floods or mast crop failures.

Population densities of black bears have also been recorded to impact their movements. There is significant variability in recorded densities among black bear populations throughout their range (Pelton 1982). Relatively little is known concerning population densities of Louisiana black bear populations in the Atchafalaya and Tensas river basins (Black Bear Conservation Committee 1997). In the highly fragmented Deltic bottomland hardwood tracts of the Tensas River Basin, unusually high densities of 1.4 bears/sq. mi. (3.6 bears/sq. km.) were observed in a 2.1 sq. mi. (5.5 sq. km.) wooded tract occupied by 20 bears (Beausoleil 1999). Factors contributing to this high density included the propensity of females to avoid crossing open agricultural fields to other woodlands, high overlap of home ranges, and availability of food from natural sources and agricultural crops (Marchinton 1995). Other studies in southeastern Coastal Plain wetlands revealed population densities ranging from 0.16-1.71 bears/sq. mi. (0.06-0.66 bears/sq. km.) (Hellgren and Vaughan 1989b).

The lowest densities for black bears were recorded in the southeastern Coastal Plain of Florida, primarily in the Appalachicola and Ocala national forests, in pine dominated uplands and pine flatwood forests. These habitats were of poor quality for black bears and had estimated densities of 0.14 bears/sq. mi. (0.05 bears/sq. km.) and 0.02 bears/sq. mi. (0.008 bears/sq. km.) respectively (Wooding and Hardisky 1992; Wooding, Florida Game and Freshwater Fish Commission, personal communication). Until reliable density estimates for Louisiana black bears are available Smith's (1985) estimates in an Arkansas bottomland hardwood forest may establish reasonable estimates for expectations for the bottomland hardwood forests of Louisiana at 0.44-1.09 bears/sq. mi. (0.17-0.42 bears/sq. km.). Additional research has been done to measure abundance and density of Louisiana black bears (Beausoleil 1999, Boersen 2001, Triant 2001).

Two significant causes of movement in black bears is the location of other bears during the breeding season, and the dispersal of sub-adult bears following separation with their mother. Sub-adult females, upon this separation, typically establish a home range partially within, or adjacent to the mother's home range (Rogers 1987). Sub-adult males typically move far out of their maternal home range, and have

been recorded to disperse as much as 136 miles (200 km.) away (Elowe 1987, Black Bear Conservation Committee 1997). Establishment of mating ranges for young males can be affected by the availability of unoccupied ranges and the number of dominant males in an area (Pelton 1982, Rogers 1987). Adults of both sexes can deter immigration by younger bears (Black Bear Conservation Committee 1997). Adult bear aggression and food shortages may not be the primary factor initiating young male dispersal (Rogers 1987). Dispersal of young males in Minnesota resulted in establishment of territories from 8-136 miles (13-219 km.) away from their natal area (Rogers 1987). Similar trends were measured in Massachusetts with a range from 19-124 miles (30-200 km.; Elowe 1987). Three documented sub adult immigration/emigration(s) measured in the Tensas River Basin in Louisiana were within this range of values (Black Bear Conservation Committee 1997, Beausoleil 1999).

One move occurred in 1991, when a sub adult male, originally captured on the Tensas River National Wildlife Refuge, traveled over 40 miles to the east and was ultimately poached in Claiborne County, Mississippi (Black Bear Conservation Committee 1997). This event underscores the risk that dispersing bears face from humans and their activities. Another move occurred in 1995, when a sub adult male was recorded as moving from the Tensas River National Wildlife Refuge 40 miles to the south, only to return to the refuge again (Edwards, T., Tensas River NWR, personal communication).

In our modern-day, highly fragmented landscape that is a patch-work mosaic of forested, agricultural and developed lands, corridors of habitats that are arranged either connecting, or in close proximity to patches of suitable size and quality habitats to support movements of black bears are becoming critical. These travel corridors or habitat linkages likely facilitate movements of bears through or across expanses of open land (Pelton 1982, Noss 1987). Detection of radio-collared bears and bear sign in and along uncleared drainages, ditches, bayous, and river banks in the Tensas River Basin support this theory (Marchinton 1995, Anderson 1997). Bears have been recorded to use drainage ditches less than 15 yards (14 m.) wide, lined with trees or brush, to cross these open patches (K. Weaver, Univ. Tenn., personal communication). In contradiction, Marchinton (1995) recorded bears in the Tensas River Basin crossing open agricultural lands when moving among forested tracts while there were forested corridors available nearby. He also found that male bears in the Deltic tracts of the Tensas River Basin used more woodland patches than females, and were more likely to be found in agricultural fields further from woodland cover than females.

As with most species of wildlife, demographic isolation of populations, or sub-populations across a landscape can be detrimental to black bears. Marchinton (1995) recorded no immigration or emigration in the Deltic tracts of the Tensas River Basin. This population appears to be demographically isolated from the larger, less fragmented habitats south on the Tensas River National Wildlife Refuge and Big Lake Bottom Wildlife Management Area to the south. It appears that Interstate 20, which is fenced, and U.S. Highway 80, and nearby developed areas probably currently serve as a barrier prohibiting dispersal between these areas. Habitat fragmentation and population isolation varies substantially between the Tensas River Basin and Atchafalaya River Basin populations. Habitat corridors and/or linkages become critical for conservation of the species across the landscape. Adequate immigration/emigration of bears among habitat patches and isolated populations can lead to connectivity creating a functional metapopulation (Lande 1987). Local extirpations can be averted, or their probability reduced by periodic "rescues" from colonizing bears (Brown and Kodric-Brown 1977, Stacey and Taper 1992).

Other movements of black bears are triggered by interactions with or actions of man in the management of bears. One such movement involved the release of a number of bears by state wildlife agencies in Arkansas and Louisiana of black bears during the 1960s and 1970s from Minnesota to those states to boost or increase local remaining populations. Like most relocated bears, these animals left the areas of release in search of familiar surroundings and many were either poached or killed in road collisions within those states and in neighboring states, including Texas (Schmidly 1983). These bears were *Ursus americanus americanus,* and not *U. americanus luteolus*, so there was some potential for gene flow between the two subspecies. Another such move occurred in 1990, when a 185 lb. nuisance bear was captured and tagged in the White River National Wildlife Refuge in Arkansas. It was released 100 miles (161 km.) south on Seven Devils Wildlife Management Area near Monticello, Arkansas. It showed up two years later at 335 lbs. on the Tensas River National Wildlife Refuge in Louisiana (Black Bear Conservation Committee 1997), an atypical move (Beeman and Pelton 1976).

Denning Ecology

Black bears are not true hibernators; they actually undergo a dormancy period during winter months known as carnivorean lethargy or torpor. Denning by bears enhances survival during periods of food shortages and severe winter weather conditions (Stewart 2000). During this period black bears go through a number of physiological changes including decline in body temperature, decrease in metabolism, reduction in heart rate, loss of adipose tissue weight, and little or no excretion or defecation while denning. Black bears typically fast during this time period (Hock 1960, Nelson et al. 1973). Relatively high body temperatures during this denning period allow black bears to care for young in the den, and to arouse and abandon the den in response to danger (Pelton 1982).

There are a number of factors that determine the timing of denning for black bears including photoperiod, climate, food availability, energy balance, age, sex and reproductive status (Pelton 1982). Denning in the Deep South region of the southeastern U.S. is typically from late November through early January (Stewart 2000). Pregnant females have been recorded to enter dens as early as November 26, and to emerge as late as May 30 (186 day period). Median dates of den entrance and emergence were December 4 and April 24, respectively, for an average denning period of 142 days. Adult male black bears average denning entrance and emergence were January 28 and March 17, respectively, for an average denning period of 48 days. Sub-adult denning periods were similar to those for adults (Stewart 2000).

Black bears in the lower latitudes of the southeastern U.S., including the Louisiana black bear, typically have shorter denning periods and greater winter activity, than elsewhere, with the possible exception of pregnant females (Hellgren and Vaughn 1989a, Johnson and Pelton 1980, Smith 1985). This may be due to milder climates and greater food availability (Wooding and Hardisky 1992). In a study of bears in the Tensas River Basin, at least one-third of bears monitored were semi-active, and did not remain stationary for longer than two weeks during the denning period (Black Bear Conservation Committee 1997). A study of bears in the Atchafalaya River Basin during 1995-96, found that no radio-collared males denned (Pace 1996, personal communications). Female bears in the Tensas River Basin were found to enter dens earlier, and emerge later than other bears (Weaver and Pelton 1995, Marchinton 1995).

There is significant variability in the types of dens utilized by black bears. A study of black bear dens in the Atchafalaya River Basin in Louisiana recognized four types of dens used: ground nests (38%), tree dens (31%), dens with openings at the bases of trees (19%), ground burrows (6%), and no den (6%); (Reagan 1996, personal communication). Similar results were found in other studies in the Atchafalaya and Tensas river basins, and in a bottomland hardwood forest in Arkansas (Smith 1985, Pace et al. 1993, Marchinton 1995, Weaver and Pelton 1995).

There is a tremendous amount of variability in ground denning activity across the southeastern U.S., including ground nests, ground dens in openings at the bases of trees, ground burrows, and on the ground with no den. In wetland habitats in the Great Dismal Swamp and in north-central Florida, black bears denned almost exclusively on the ground (Hamilton and Marchinton 1980, Hellgren and Vaughan 1989a, Wooding and Hardisky 1992). In the Great Dismal Swamp, potentially suitable den trees were available in second-growth forest, but bears almost exclusively utilized ground nests in extremely dense vegetation (Hellgren and Vaughan 1989a). Adult males and sub-adults used ground nests more frequently than adult females; however, at least 2 adult females have been recorded as using brush piles as natal dens (Black Bear Conservation Committee 1997).

Ground dens were typically located in thick, brushy, dry ridges in recently logged areas. Brush pile dens were located in logged tree-tops and bull-dozed piles of logging slash that provided cover on top, and on at least three sides, (Figure 6). Ground nests were generally scooped out depressions lined with either vegetation litter from around the site and woven into a wreath-like nest, or a bed of palmettos, and offered no cover on top, or on more than two sides (Black Bear Conservation Committee 1997). Due to the frequent use of various types of ground dens, availability of denning sites does not appear to be a limiting factor for black bears (Black Bear Conservation Committee 1997).

Figure 6. ***U. a. luteolus*** **female with cubs in ground den in logging slash pile. (photo by Paul Davidson, Black Bear Conservation Committee).**

Tree dens utilized by black bears tend to be located in or along sloughs, lakes, bayous and bottomland hardwood forests (Black Bear Conservation Committee 1997). In the Tensas River Basin tree dens were primarily elevated cavities in bald cypress, overcup oak, and sycamore (Weaver et al. 1990). In a study in the Tensas River Basin, tree dens were utilized by 80% of adult females (Weaver et al. 1990). Tree dens can be very important to female reproductive success in areas subject to frequent flooding (Alt 1984, Smith 1985). Tree dens can isolate and seclude bears from human disturbance, and can be critical in areas where human use is frequent (Johnson and Pelton 1980). In a study of black bear denning in the southern Appalachians, tree dens were used extensively (Pelton et al. 1980, Eiler et al. 1989).

One critical component of denning sites, regardless of type used, is high quality cover for bedding, escape and denning (Pelton 1986, Rogers and Allen 1987). High quality natural cover can include dense understories of switch cane, palmetto, briars, vines and saplings. In addition, cover can be provided through silvicultural or forest management practices that result in fairly impenetrable thickets for a number of years following harvests (Black Bear Conservation Committee 1997). In telemetry research on black bears in the Tensas River Basin, bears in thick cutovers were virtually impossible to approach. This demonstrated the ability of thick cover to limit visibility, slow foot travel, and create considerable noise when humans approached; thus providing secure sites for bedding, denning, or escape (Weaver et al. 1990a,b). Black bears have been shown to be able to survive in close proximity to humans if afforded areas of retreat that ensure little chance of close contact or visual encounters with humans (Weaver et al. 1990). Therefore, quality cover is extremely important as forests become smaller, more fragmented, and as human encroachment and disturbance increases (Pelton 1986, Rogers and Allen 1987).

Garner (1996) performed habitat suitability analyses for the best remaining largely intact habitats in East Texas. He found that habitats within their study areas contained suitable food sources and protection and concealment cover. The presence of adequate cover indicates sufficient ground denning sites. However, none of the areas had any measurable large (36 inches at breast height (91.44 cm) older trees that could adequately serve as tree den sites.

Epps (1997) performed a fairly in-depth black bear habitat suitability analysis of the Neches Bottom and Jack Gore Baygall Units of Big Thicket National Preserve along the lower Neches River in southeast Texas. Epps (1999) stated that trees of suitable size (33.46 inches at breast height (85.0 cm)) for den trees were quite common. In addition, he found that hollow trees, and potentially suitable hollow trees were also present at measurable densities. Common species of suitable size included bald cypress (*Taxodium distichum*), various oak species (*Quercus* spp.), sweetgum (*Liquidambar styraciflua*), and water tupelo *(Nyssa aquatica)*. Bald cypress were the largest observed (up to 213 cm [83.86 inches], at seven feet above the ground, and 137 cm [53.94 inches] above the butt swell), and often had huge hollows. Five out of six potentially suitable den trees were bald cypress.

The effects of human disturbance on the population dynamics of denning black bears are poorly known, particularly in areas with unhunted bear populations according to literature search (Black Bear Conservation Committee 1997). In a study of black bears in the Tensas River Basin, bears using ground nests and brush pile dens seemed to be more vulnerable to disturbance than those in tree dens (Weaver and Pelton 1995). In one study, a little over two-thirds of denning bears utilized more than one site during the denning season; the majority of these bears were using ground dens. These bears could have been changing these sites naturally, or in response to human activities (Black Bear Conservation Committee 1997). Black bears on ground nests approached during telemetry studies often abandoned those nests; therefore, it is possible that hunting and other human activities can impact ground-nesting black bears (Black Bear Conservation Committee 1997). It is possible that black bears using ground dens are more susceptible to human disturbance with the exception of areas with thick impenetrable cover (Black Bear Conservation Committee 1997). Episodes have been recorded where all cubs died as a result of human caused den abandonment (Elowe and Dodge 1989).

Natural Mortality

In one study, cub mortality ranged from 12% to 41% (Rogers 1987), while Hebblewhite et al. (2003) found mortality to be 36% for cubs and 33% for yearlings. Most mortality (>90%) among cubs and yearlings appears to be due to natural causes (Rogers 1976, 1987). Nutrition appears to be the ultimate factor in natural mortality of young black bears. Lightweight individuals suffer greater mortality than heavier individuals. Cubs weighing less than 4 pounds in later March experienced approximately 4 times greater mortality prior to family breakup than did heavier cubs (Rogers 1976). In some cases cubs die of starvation (Rogers 1987), in other cases malnourishment may predispose them to die from other causes (Rogers 1976). Mortality also tends to increase with litter size (Rogers 1976). In contrast to cubs and yearlings, most mortality (>90%) among bears 2 years of age or older tends to be human-related (Rogers 1976). Although a number of neoplastic, rickettsial, viral, bacterial, and traumatic diseases have been reported for black bears, few seem to be major mortality factors (Pelton 2000). Clark et al. (1994) made a demographic comparison of two black bear populations in the interior highlands of Arkansas.

Conservation Status

The status of the Louisiana black bear is currently recognized as threatened by state and federal regulations in East Texas. Both state and federal laws provide protection for plant and animal species determined to be "threatened" or "endangered." Laws and regulations for Texas regarding threatened and endangered species, including criteria for listing and prohibitions, are detailed in the Texas Parks and Wildlife Code Chapter 68 and in Title 31 of the Texas Administrative Code. Regulations pertaining to federal threatened and endangered species are found in Title 50 of the Code of Federal Regulations.

State Status

The last native East Texas black bear was believed to have been killed in the 1950s (Fleming 1980). However, a significant number of bear sightings in the southeastern portion of the state occurred between 1965 and 1971, which is believed to be a result of the restocking of Minnesota bears in Louisiana (Texas Parks and Wildlife Department 1993). Restrictions on bear harvest in Texas began in 1973 and by 1983, hunting bear within the state was prohibited. In 1973, the Texas Parks and Wildlife Department received authorization from the State legislature to maintain a list of endangered animals occurring in the state. The entire black bear population in Texas was added to the state list of endangered animals in 1987. In 1996, the bear was down-listed to threatened status across the state. Black bears in Texas are currently protected and cannot be killed or harmed.

Federal Status

The Endangered Species Act of 1973, as amended (ESA), provides federal protection for plants and animals listed as threatened or endangered for the purpose of conserving the ecosystems on which they depend. The Louisiana black bear was first recognized as potentially warranting federal protection under the ESA with the December 30, 1982 publication of the U.S. Fish and Wildlife Service notice of review of candidate species (47 FR 58454). The bear was included in the review as a category 2 species in the original review, as well as subsequent reviews on September 18, 1985 (50 FR 37958) and January 6,

1989 (54 FR 554). Candidate species are not protected under the ESA, but are periodically reviewed as information on their status is made available.

On March 6, 1987, the U.S. Fish and Wildlife Service was petitioned to add the Louisiana black bear to the List of Threatened and Endangered species based on evidence that the subspecies still exists in the Tensas River Basin and the lower Atchafalaya River Basin of Louisiana. The U.S. Fish and Wildlife Service made a positive 90-day finding in July 1987, indicating the action requested in the petition may be warranted, although the notice of the finding was not published at that time. A 12-month finding was made on August 19, 1988 (53 FR 31723), which determined the listing action was warranted but precluded by species having a higher priority for listing. Included with the finding was a notice of agreement with the Tensas River National Wildlife Refuge and Louisiana Cooperative Fish and Wildlife Research Unit at Baton Rouge to develop additional information on the bear's taxonomic status and potential existence within the Tensas and Atchafalaya River Basins.

Petitions requesting actions found to be warranted but precluded by other listing actions require a subsequent finding to be made within 12 months of the initial finding. The second 12-month finding on the petition was published on August 10, 1989 (54 FR 32833). This finding reiterated the original warranted but precluded determination and updated efforts to resolve the bear's spatial distribution and taxonomic issues, which included the implementation of surveys and taxonomic analysis using blood proteins, mitochondrial DNA, and skull measurements.

The results of the taxonomic evaluation of *U. a. luteolus* were received by the U.S. Fish and Wildlife Service in July 1989, and were the basis for the proposed rule to list the bear as a threatened sub-species on June 21, 1990 (55 FR 25341). The proposed rule noted that the molecular analysis did not provide evidence that *U. a. luteolus* was genetically different from other subspecies of black bear; however, the multi-character cranial morphological examination supported its consideration for listing as a subspecies. The summary of factors affecting the species included habitat loss and fragmentation, potential illegal killing, and potential hybridization with the introduced *U. a. americanus* from Minnesota in the mid 1960s. Due to the potential for *U. a. americanus* to exist within the historic range of *U. a. luteolus* from the Minnesota introductions, the close proximity of *U. a. americanus* known from Arkansas and Oklahoma, and the difficulty in differentiating the subspecies of black bear, the proposed rule included a classification of threatened status to other free-living black bears of the species *U. americanus* occurring within the Louisiana black bear's historic range. The U.S. Fish and Wildlife Service also determined that designation of critical habitat for the bear was not prudent at that time.

Following the publishing of the proposed rule and at the request of concerned parties, the U.S. Fish and Wildlife issued a notice of public hearing and reopened the comment period (55 FR 37723, September 13, 1990). Questions regarding the validity of the taxon prompted the U.S. Fish and Wildlife Service to extend the deadline for the final action on the listing proposal and again reopen the comment period (56 FR 47732, September 20, 1991). The United States Fish and Wildlife initiated further assessments concerning the taxonomic status of the black bear during the extension period.

On January 7, 1992, the U.S. Fish and Wildlife published the final rule listing the Louisiana black bear as threatened, including all other bears of the species *U. americanus* occurring within its historic range

(57 FR 588). The final rule concluded that the additional evaluation of the taxonomic validity of the subspecies initiated during the extension of the final action was supported. Among the factors affecting the species, the U.S. Fish and Wildlife noted that, although it is acknowledged that the loss of occupied bear habitat has currently leveled off, past habitat loss alone meets the criteria for protection under the ESA. The listing included a special rule (50 CFR 17.40), which exempted normal forest management activities within the historic range of the bear except for activities causing damage to or loss of den trees, den tree sites or candidate den trees. Normal forest management activities are defined under the rule as "those activities that support a sustained yield of timber products and wildlife habitats, thereby maintaining forestland conditions in occupied habitat." Candidate den trees are considered to be "bald cypress and tupelo gum with visible cavities, having a minimum diameter at breast height of 36 inches, and occurring in or along rivers, lakes, streams, bayous, sloughs, or other water bodies." The final rule retracted the proposed rule's initial determination that the designation of critical habitat would not be prudent, finding that critical habitat may be prudent but is currently not determinable. The determination of critical habitat was postponed pending the completion of the recovery plan or the Black Bear Conservation Committee's restoration plan, and maps delineating occupied and potential habitat.

A proposed rule to designate approximately 1.25 million acres of critical habitat in Louisiana for the Louisiana black bear was published by the United States Fish and Wildlife on December 2, 1993 (58 FR 63560). The critical habitat is proposed in three areas identified as the Tensas River Basin, the Atchafalaya River Floodway, and the lower Iberia-St. Mary parish. Currently, a final rule designating critical habitat for the bear has not been issued.

The Black Bear Conservation Committee completed and adopted its third draft of the Black Bear Restoration Plan in 1994, which established objectives to restore the Louisiana black bear in portions of its historic range. In addition to the delisting of the bear, the objectives included the establishment of a regional metapopulation consisting of 5 subpopulations, each with 200 bears, potentially harvestable, and with connecting migration corridors between subpopulations. This objective requires that at least two of the subpopulations occur outside of the Tensas and Atchafalaya River Basins and could include suitable habitats in Texas (Black Bear Conservation Committee 1997). The final Black Bear Conservation Committee Black Bear Restoration Plan was completed in 1997.

The U.S. Fish and Wildlife approved the recovery plan for the bear in 1995, acknowledging much of the content was taken from the 1994 Black Bear Conservation Committee Restoration Plan. The criteria for delisting the bear include a minimum of two viable and connected subpopulations, one each in the Tensas and Atchafalaya River Basins in Louisiana (U.S. Fish and Wildlife Service 1995).

Other Non-regulatory Status

In addition to state and federal regulation, the conservation status of the Louisiana black bear is identified as "imperiled" by NatureServe, a non-profit organization that maintains information on the biodiversity of North America (NatureServe Explorer 2002). NatureServe uses a variety of sources, including U.S. Fish and Wildlife Service listing actions and state conservation databases, to develop a list of plant and animals of potential conservation concern. Information on NatureServe's species list is available to state, federal, and private agencies for the purpose of promoting the conservation of rare or imperiled species.

BORDERING STATES BEAR MANAGEMENT

Texas is currently engaged in the planning effort for the management of black bears. Due to the proximity of known bear populations to Texas, management objectives in bordering states will influence the Texas planning effort as these bear populations expand ever closer to our borders and Texas sightings of black bears increase. The portion of Texas encompassed by this plan is east of Interstate 35 and Interstate 37 and is bounded by Arkansas, Louisiana, and Oklahoma. Each of these states is engaged in active management of bear populations. Essentially, unoccupied, suitable habitat is available in East Texas which may be attractive to transient bears. As bear populations expand in these bordering states and displaced juvenile bears seek available suitable habitat, it is likely that Texas will see an increase in bear activity. As Texas develops its management guidelines, care must be taken that the general goals and objectives are not contradictory to those of neighboring states as wildlife resources do not acknowledge geopolitical boundaries.

Although the populations in Oklahoma and Arkansas are not delineated as being the Louisiana black bear, management strategies and population expansion in these states will impact management decisions in Texas due to the similarity of appearance of the subspecies in question. The primary state we must remain aware of is Louisiana due to the *U. a. luteolus* and the historic range of this animal encompassing the area delineated by this plan. The Louisiana bear management objectives are of critical concern due to the known presence of the *U. a. luteolus* and East Texas falling within its historic range.

An additional source of mutual concern among the states is the introduction of subspecies other than *U. a. luteolus* into a population derived exclusively of *U. a. luteolus* (Black Bear Conservation Committee 1997). This factor does not lead directly to mortality but rather to a hybridized animal and genetic degradation which renders the animal to be no longer exclusively *U. a. luteolus*.

Louisiana

The State of Louisiana is currently operating under the Black Bear Conservation Committee Black Bear Restoration Plan and the U.S. Fish and Wildlife Service Recovery Plan, as well as a Commission Approved Nuisance Bear Protocol. Due to the federal status of the Louisiana black bear, management decisions are primarily determined by and within the scope of the U.S. Fish and Wildlife Service Recovery Plan, however the goal of the Recovery Plan was to be complimentary to the Black Bear Conservation Committee plan and work toward integrated management objectives (U.S. Fish and Wildlife Service, 1995).

There are three sub-populations of black bears in Louisiana. These are restricted primarily to the eastern portion of the state and the central gulf coast. However, active repatriation projects are occurring in the state utilizing denning females and cubs. These projects are intended to initiate new breeding populations in suitable habitat. Louisiana populations seem to be expanding, however, there are questions regarding the status of the Atchafalaya population simply due to the complexities of the habitat (Black Bear Conservation Committee 2003).

Research is an active part of the Louisiana program. These projects are primarily conducted by graduate students from the University of Tennessee and Louisiana State University in coordination with the

Black Bear Conservation Committee, Louisiana Department of Wildlife and Fisheries and the U.S. Fish and Wildlife Service. The majority of the research has been conducted on the Tensas National Wildlife Refuge (Black Bear Conservation Committee 2003). Two current projects are expanding that effort. One study is focused on research/management objectives of repatriation in the "Three Rivers" study area between two extant sub-populations of bears attempting to facilitate genetic flow between the two populations (P. Davidson, Black Bear Conservation Committee, personal communication). Denning females with cubs are being moved during spring months to pre-constructed artificial den sites in the repatriation zone. This method has proven to be very successful not only in Louisiana, but also in Arkansas (Eastridge and Clark 2001). The other research effort involves hair traps in the Atchafalaya basin population in an attempt to quantify numbers of animals in that population using DNA analysis. This population seems to be expanding as noted in antidotal observations such as increased road kill bears in the area as well as increased nuisance complaints (P. Davidson, Black Bear Conservation Committee, personal communication 2003).

Habitat restoration activities are underway in Louisiana that the Natural Resource Conservation Service, U.S. Fish and Wildlife Service, Louisiana Department of Wildlife and Fisheries, Corp. of Engineers, and the Black Bear Conservation Committee are undertaking since the Louisiana black bear was listed in February 2002 as "federally threatened" subspecies. A summary of these habitat restoration activities in Louisiana are included in Appendix 2.

Arkansas

The state of Arkansas is currently operating under an Arkansas Game and Fish Commission approved Strategic Black Bear Management Plan implemented in July of 2000, (Eastridge et al. 2000), as well as a Commission Approved Nuisance Bear Protocol. This plan is a compilation of input from the Arkansas Bear Team which guides the management direction and decisions regarding management in that state. The plan delineates 7 Bear Management Zones (BMZ) within the state and outlines management objectives on both a statewide and BMZ management level. The plan is intended to be a guiding document allowing specific management decisions to be made and implemented through specific plans for each BMZ.

Bear populations in Arkansas appear to be stable to increasing (R. Eastridge, Arkansas Game and Fish Commission, personal communication). Arkansas monitors bear populations by a combination of bait station surveys, hunter harvest, models, den site visits, and prevalence of nuisance complaints. Management decisions regarding bear populations in the state are based on both biological and social carrying capacities.

There is a limited hunting season in the state based on a conservative harvest estimate of 10% of the population (Eastridge et al. 2000). The primary center for this harvest is the core bear population of the state centered in the Ozark and Ouachita mountains.

There also remains the pending question of the specific taxonomy of the White River National Wildlife Refuge population of bears in Arkansas. Current research is addressing this taxonomic question.

Oklahoma

The state of Oklahoma is currently managing bear populations under their own standard operational procedures. They intend to develop a statewide management plan pending completion of several phases of research on bear populations and reproduction in the state (J. Hemphill, Oklahoma Department of Wildlife Conservation, personal communication). Their bear population is restricted primarily to the eastern third of the state due to habitat. A habitat suitability study has been completed delineating which portions of the state have suitable habitat. As a result, research projects have been implemented in these areas.

Bear populations in the state are monitored through a combination of bait station surveys and by utilizing nuisance calls as an indicator. Based on these, the bear population in the state seems to be growing and expanding to areas of unoccupied suitable habitat (J. Hemphill, Oklahoma Department of Wildlife Conservation, personal communication). Oklahoma, based on proximity and bear immigration from Arkansas, has modeled many of their management strategies from the Arkansas model.

The next primary step in the management of the Oklahoma bear program would be the potential implementation of a limited hunting season to alleviate nuisance bear complaints in portions of the occupied habitat which have reached the social carrying capacity. This step will not be undertaken until further research is completed to determine recruitment and other population factors (J. Hemphill, Oklahoma Department of Wildlife Conservation, personal communication).

Research in Oklahoma currently includes a cooperative study between the Oklahoma Department of Wildlife Conservation, Oklahoma State University, and the United States Forest Service on the Ouachita National Forest in east central Oklahoma. This study included tracking radio collared female bears to determine habitat utilization, home range, and reproductive success (S. Bales, Oklahoma State University, personal communication). An additional study is due to start in 2003, which will include mark recapture methodology and DNA analysis utilizing hair follicle methods (J. Hemphill, Oklahoma Department of Wildlife Conservation, personal communication).

Oklahoma does operate under a Commission approved Nuisance Bear Protocol. This protocol has been modeled after that used by Arkansas (J. Hemphill, Oklahoma Department of Wildlife Conservation, personal communication).

CONSERVATION AND MANAGEMENT ISSUES

Habitat Management

As previously mentioned the black bear is a true opportunistic omnivore. While oaks are a preferred species in the Southeast, a variety of forest types, both young and mature, provide the diversity bears need for their opportunistic feeding habits (Vaughan, 2002). Forest management plans that protect oaks and other mast producing trees in streamside management zones (SMZs), aesthetic buffers, and wildlife corridors provide energy rich hard and soft mast. Marchinton (1995) noted that bears regularly used

wooded drains to travel between fragmented habitats. The Black Bear Conservation Committee (1996) in its black bear management handbook suggest that leaving land alone should be the first management option considered. However, if the landowner wishes to manage the land for timber production, timber management techniques such as improvement thins and shelterwood harvests can create good habitat for bears. Additionally, rotting timber slash left from timber harvests provides abundant sites for wood-dwelling insects, an excellent food source for bears (Jones 1999). Timber management practices that result in an open-canopy forest with a dense understory provide both escape cover and a plethora of natural foods.

In natural stands of bottomland hardwoods, thins or intermediate harvests should occur when silviculturally and economically appropriate and with 5 to15 year intervals (Black Bear Conservation Committee 1996). The objective of intermediate harvests should be to remove poor quality trees, promote regeneration, and to increase food and cover for bears (Stewart, 2000). Rotation age for regeneration in hardwoods should be a minimum of 50-60 years for adequate mast production, 70-100 years is even better (Goodrum et al. 1971, Mitchell et al. 1995, Black Bear Conservation Committee 1996). The overall objective of silvicultural applications targeted for improvement of black bear habitat in bottomlands should be diversity of mast producing hardwoods (Black Bear Conservation Committee 1997). Natural regeneration through group selection or small patch clear cuts is the preferred method of regeneration on bottomlands sites because it creates the greatest diversity (Black Bear Conservation Committee 1996). Additionally, switch cane thickets provide seasonal food and excellent cover for bears and should be favored when appropriate. This can be accomplished through overstory removal, restricted grazing, and the avoidance of frequent burning (Black Bear Conservation Committee 1996, Stewart, 2000).

When harvesting upland pines, irregular harvest shapes that promote a biologically diverse edge effect along harvest borders are recommended (Black Bear Conservation Committee 1996). Another timber management tool, prescribed fire, used periodically in conjunction with thinning and shelterwood cuts (low basal area and retention of mature seed trees), can enhance berry and other soft mast production (Van Lear and Brose 2002). Prescribed fire can also be used to maintain forest openings and control hardwood encroachment. Burning in upland sites should occur on a 3-5 year cycle, depending on soil types (Black Bear Conservation Committee 1996). Dryer sites can be burned less often. Woodland openings can be managed for soft mast production by burning open patches every 3-5 years. These openings can also be disked or shredded with a bush hog. Planting openings in clover or small grains can also be beneficial to bears (Black Bear Conservation Committee 1996).

Cypress/Tupelo swamps and significant bottomland hardwood forests can be managed to provide den trees for the bear by protecting all hollow trees that are 36 inches or greater in diameter. Natural regeneration from stump sprouting is recommended. Thinning operations should occur by age 20 if possible and should remove poor quality trees. The resultant stand should have about 80 trees per acre (Black Bear Conservation Committee 1996). For all timber types the Black Bear Conservation Committee also recommends that a minimum of 7 years difference in age classes be used to create the best age-class distribution between adjacent regeneration stands. Harvest plans should consider the retention of den trees where feasible. Wide roadsides can be used to increase soft mast crops but care should be given to minimize traffic (Black Bear Conservation Committee 1996).

As discussed earlier in this manuscript, remoteness of habitat is a major concern for black bears. One cannot discuss habitat management for Louisiana black bears without discussing remoteness and fragmentation. It is important to note that any forest land commercial, natural, upland, bottomland or otherwise, is preferred to non-forest development. Rudis and Tansey (1995) noted that corporate-owned timberlands were more remote on the average than were small private owned lands. Garner and Willis (1998) selected an area in East Texas they dubbed the middle Neches Corridor as the most suitable black bear habitat in East Texas. This area is primarily comprised of U.S. Forest Service land and corporately owned commercial timberlands and is relatively remote due to its low open road density and low levels of human/bear conflict zones. Any major efforts to improve habitat for black bears in East Texas should start with conservation agreements and long term plans for the preservation of forestlands.

Human Caused Mortality

Direct or indirect human caused mortality is the primary cause of loss of black bears throughout their range in North America (Rogers 2002). Indirect causes of mortality are directly linked to habitat modification or loss. Direct causes of human-induced mortality include hunting, trapping, poaching, automobile, train collisions, electrocution, disturbance, research, human/bear conflict, and environmental contaminates. The majority of mortalities attributed to adult and sub-adult bears are human derived (Costello, et. al. 2001). Outside of protected properties, there are few adult bears which die of natural causes (Rogers 2002). The approximated average age in populations of hunted black bears is three to five years of an estimated lifespan of 21 to 33 years (Rogers 2002). Wildlife populations must be maintained above a minimum population level. Any loss to the population as it nears that level becomes more significant to the population as a whole (U.S. Fish and Wildlife Service 1995). Population viability analysis on black bears indicates a minimum self-sustaining population level to be approximately 80 to 150 bears within the breeding population (Black Bear Conservation Committee 1997). Nearly all human-caused mortality derived from sources other than legal hunting and trapping can be alleviated through intensive education and outreach programs.

Research activities, if conducted improperly, can also induce direct or indirect mortality of this species. Mortality can include either stressing an individual animal or more commonly causing abandonment of nursing cubs by the denning female. This can be alleviated through proper research protocol and coordinating with other wildlife professionals well versed in black bear research.

Habitat Loss and Fragmentation

Conversion of forested land to agricultural, industrial, residential and commercial uses results in the direct loss of habitat and fragmentation of suitable bear habitat, and increases the likelihood of human-bear interactions. In addition, future water reservoir developments further threaten the highest quality bear habitat remaining in East Texas. Fragmentation has often been viewed as a combination of the removal of large areas of native vegetation and the fragmentation of the remainder into a range of remnant patches (Haila et. al. 1993).

Habitat fragmentation likely results in increased mortality of black bears because of their large home range size. This mortality may be a direct result of habitat loss, reduced food supplies, increased human-bear interactions or other causes. Approximately 11.8 million acres of the Pineywoods area of East Texas

is classified as forest (McWilliams and Lord 1988). Non-industrial private timberland owners (NIPF) control the largest share of timberland in this area with 61 percent of the total, or 7.0 million acres (McWilliams and Lord 1988). With the average NIPF parcel being less than 50 acres in size (Kelly 2000), habitat fragmentation is likely to be a serious issue facing black bears in East Texas. Furthermore, protected areas in southeast Texas have historically been buffered from encroaching development by neighboring lands in commercial timber production. However, since 2001, 1.5 million acres of industry-owned timberland has been earmarked for sale as two major corporations dissolved their holdings over much of southeast Texas. Further fragmentation may result from the subdivision and subsequent resale of these holdings (Gunter and Johnston, 2003).

Future major highway projects will further isolate patches of suitable bear habitat, hamper migration, and contribute to an increase in automobile-related mortality. Impacts from highway projects could be mitigated if wildlife crossing tunnels were constructed under the road bed, or if span lengths of bridges at stream and river crossings were increased (Black Bear Conservation Committee 1996). Environmental assessments or environmental impact statements will be released by the Texas Department of Transportation for public review and comment for future major highway projects.

Habitat fragmentation issues also affect the Big Thicket National Preserve which was created in 1974 to "assure the preservation, conservation, and protection of the natural, scenic, and recreational values of a significant portion of the Big Thicket area..."(16 USC 698). The Big Thicket is prized for its biodiversity, and is considered by many to have been the last "stronghold" of black bears in East Texas.

Though fragmented, the Big Thicket Preserve connects suitable bear habitats with river corridors (Figure 7). River corridors could be used throughout East Texas to connect other suitable bear habitats. The last remaining large expansive blocks of quality bear habitat in East Texas are located within major river basins.

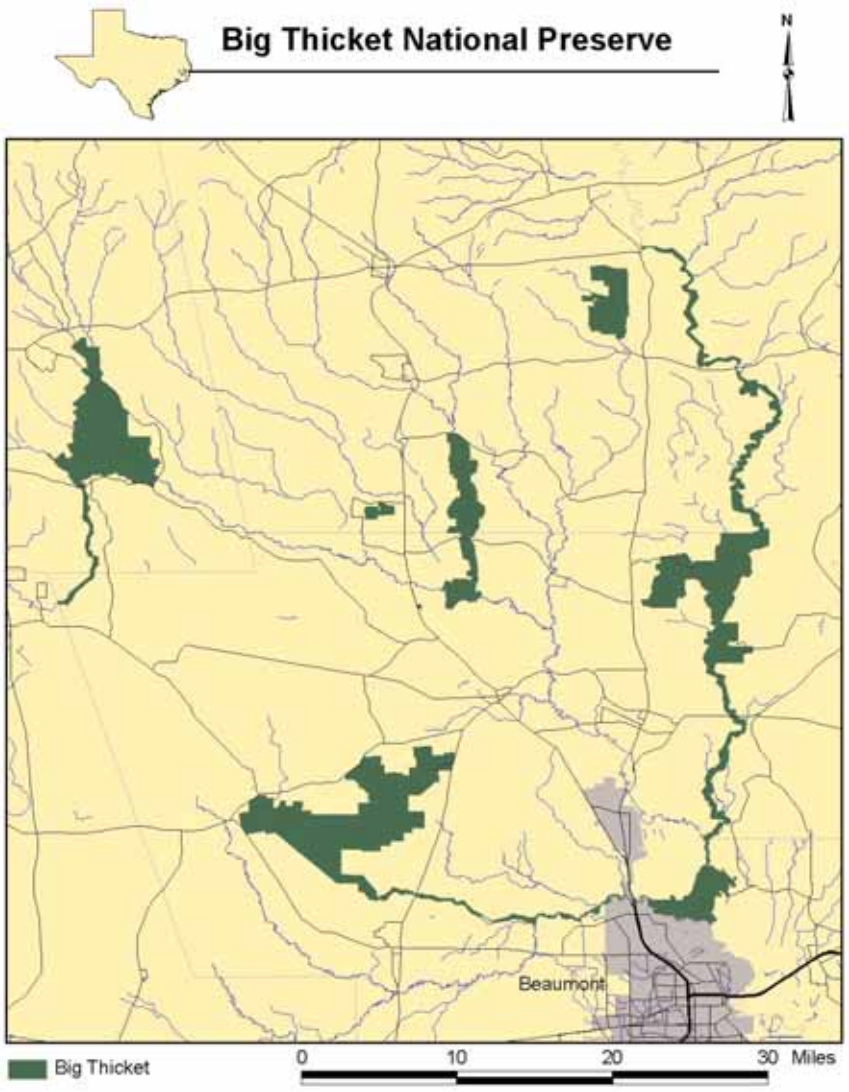

Figure 7. Big Thicket National Preserve, Texas.

Habitat fragmentation promotes the invasion of exotic species. The non-native Chinese Tallow (*Sapium sebiferum*) is the exotic plant species that poses the most immediate threat to black bear habitats in southeast Texas. Tallow reproduces and grows quickly, eventually resulting in large-scale ecosystem modification. Infestations often result in creation of monospecific tallow forests, totally replacing the native mast producing species in the affected areas.

Public and Political Support

Several factors should be addressed in any successful bear conservation program, including social and political factors. In fact, planning and implementation of successful bear conservation and management actions is fundamentally a problem-solving art requiring public and political support. Actions implemented by this plan must address the perceived threats felt by the public about bears and increase public support for the conservation and management of bears. In addition, actions need to be taken to assure government agency commitment to bear conservation and increase the depth of support in the political structure for the return of black bears to the forests of East Texas. A well designed and funded information and education campaign is necessary to gain public and political support for bears in East Texas.

Causes of Conflict

Managing human/wildlife conflict is potentially the greatest challenge to wildlife managers. The way in which the person perceives the species involved directly affects the outcome of the encounter. Cultural attitudes often create a pre-determined conviction about the wildlife species involved. This factor potentially leads to a "conflict" which is actually a chance encounter.

The greater the population of a wildlife species, the greater the possibility for human-wildlife encounters to occur. Additionally, as human populations continue to encroach into wildlife habitat, there will inevitably be more interaction with indigenous wildlife species. As these dynamics occur, conflict management becomes more critical. How a nuisance bear encounter is addressed becomes a vital part of the management of the species due to the high profile nature of these actions to the public (Dickson 2001).

Black bears are generally non-aggressive toward humans unless the human initiates the conflict (Yarrow and Yarrow 1999). Providing that suitable habitat is available for bear populations and humans are willing to modify their behavior, human/bear conflicts can be minimized, however; some interaction is inevitable and this will only increase improbability as bear populations increase due to restoration projects (Yarrow and Yarrow 1999). This will only become truer as bear populations increase due to restoration projects (Yarrow and Yarrow 1999). Approximately 80% of the nuisance calls in Arkansas are a result of a bear which is actually causing no problem at all (R. Eastridge, Arkansas Game and Fish Commission, personal communication). The remaining calls result almost categorically as a result of improper human garbage and food management. This trend also holds true in Louisiana (P. Davidson, Black Bear Conservation Committee, personal communication). Complaints on bears increase in drought years which often produce natural food shortages (Organ 2000).

Most encounters with wildlife result in no physical contact between the human and the wildlife species involved. However, there are approximately 36,000 people bitten annually by wildlife species in the United States with only approximately 10 to 20 of these resulting in human mortality (Conover 2002). Of this number there are approximately 25 non-fatal attacks on humans by black bears and 0.3 fatal attacks per year according to a study which covers the years 1960-1980 (Conover 2002). The number of people bitten annually by black bears ranks fifth behind rodents, venomous snakes, skunks, and foxes in that order (Conover 2002). Most conflict encounters by black bears occur in areas where the bear is habituated to human presence and result simply because the person got too near and the bear is attempting to protect personal space or obtain food (Conover 2002). Overall, encounters with bears rarely result in human injury and actually less than those inflicted by domestic dogs.

The majority of bear/human conflicts can be handled by education and outreach to the people affected and involved. This may require education to achieve human tendency modification. Other incidences may require intervention and capturing the bear involved. There are several human activities which are at risk for developing a nuisance situation including; human waste, feeding, apiaries, agricultural crops, livestock, and structures. In a recent survey of wildlife management agencies in the eastern United States, 15 of 16 (94%) surveyed indicated that nuisance management dictated a moderate to high portion of their decision making process when dealing with bears (Organ 2000). Of the complaints tallied, 49% were from property damage and 26% resulted in direct human health and safety concerns. The balance resulted from agricultural damage (Organ 2000).

Current Research

There is a rather large amount of research that has been performed on the American black bear (*U. americanus*) throughout its range in North America. There have been a significant number of research projects, particularly over the past few decades, done regionally on the Louisiana black bear. Most of the research on Louisiana black bear has been focused on the remaining populations within the Atchafalaya and Tensas River Basins in Louisiana (Taylor 1971, Hammond 1989, Weaver et al. 1990, Pace et al.1993, Pace and Wagner 1994, Weaver and Pelton 1994, Marchinton 1995, Nyland 1995, Stinson 1995, Wagner 1995, Stinson and Pace 1995, Wagner 1995, Stinson 1996, Anderson 1997, Nyland and Pace 1997, Pace et al. 1998, Beausoleil 1999, Weaver 1999, Pace et al. 2000, Boersen 2001, Triant 2001, Wagner et al. 2001, Hightower et al. 2002, Boersen et al. 2003, Hightower 2003, Van Why 2003, Van Why and Chamberlain 2003a.b., Wagner 2003). There are also a number of research projects on black bears in Arkansas, Mississippi and Oklahoma that will provide insight into black bear movements and subsequent behavior in East Texas. There are also a number of research projects on black bear populations in similar habitats within other states in the southeastern United States that can provide similar insights. A significant number of these studies have been cited in the various sections of this plan.

There have been relatively few efforts to perform research on black bears and their habitats specifically within East Texas. The Texas Parks and Wildlife Department has been formally evaluating and recording black bear sightings within Texas, including East Texas, since 1977. Data concerning these sightings has been maintained by Department personnel, and reported in Federal Aid Reports. A fairly in-depth discussion of the sightings from East Texas is contained in the Distribution section of this plan. Black bear sightings in Texas are also maintained as Element Occurrence Records in the Department's Biological and

Conservation Database in Austin. Detailed information concerning these sightings and records are maintained for East Texas in the Wildlife Division Region 3 Headquarters in Tyler, Texas, and in the Region 3 Wildlife Diversity Biologist's Office in Nacogdoches, Texas.

The Texas Parks and Wildlife Department has also performed field analyses of remaining potential black bear habitats within East Texas (Garner and Willis 1998, Texas Parks and Wildlife Department 1996). The purpose of the study was to determine if enough suitable habitat(s) remained in East Texas to support minimum viable black bear population(s) with minimal bear-human interactions. The basis for the study was a Habitat Suitability Index (HSI) model that was derived following a similar model used in the southern Appalachians (Van Manen 1991). The HSI model examined availability and structure of food, cover and potential human interaction.

The derived HSI for East Texas was applied to significant remaining contiguous forested habitats that were at least 50,000 acres in size with a suitable bottomland hardwood forest component. These study areas were primarily found on public lands and commercial forest product-corporation lands. Surveys were performed within four study units: Big Thicket National Preserve units in southeast Texas (29,467 ha.); U.S. Army Corps of Engineers and Texas Parks and Wildlife Department lands along the Sulphur River Basin and White Oak Creek in northeast Texas (20,639 ha.); U.S. Forest Service lands and Corporate forest lands along the Middle Neches River Corridor (99,836 ha.); other Corporate lands and National Park Service lands along the Lower Neches River Corridor (126,106 ha.).

Favorable HSI values were recorded for food and cover availability in each of the study areas. Favorable bear-human interaction HSI values were recorded in each of the study areas with the exception of Big Thicket National Preserve which had high potential for bear-human interaction. Combined overall HSI values indicated that the Middle Neches River Corridor contained the most suitable black bear habitat. The remaining habitats were ranked in descending order as follows; Lower Neches River Corridor, Sulphur River Basin/White Oak Creek, and Big Thicket National Preserve. Each of the four study areas scored HSI values indicating habitats that were well above marginally suitable for black bears.

Rice University also performed a habitat suitability study for potential black bear habitat in the Neches Bottom and Jack Gore Baygall Units of Big Thicket National Preserve along the Lower Neches River Corridor in southeast Texas (Epps 1997). This study area contained 5,600 contiguous hectares along the Neches River. The mature bottomland hardwood forests within these two units are of very high quality. This study examined carrying capacities of these units to provide two crucial black bear habitat needs: fall foods and den sites.

In the winter of 2004, Michigan State University conducted a public opinion survey in a 12-county area of southeast Texas. The survey focused on landowner opinion concerning the black bear, and will provide valuable insight into potential public reaction to possible black bear management actions (Morzillo, et al. 2005). In addition to the landowner survey, there will also be development of a GIS-based analysis of changes in composition and distribution of bottomland hardwood forest habitats in the region using Landsat imagery and aerial photography. This will involve use of both historic and recent imagery and photography.

The U.S. Fish and Wildlife Service and a myriad of cooperators including the Texas Parks and Wildlife Department, are currently engaged in the West Gulf Coastal Plain All-bird Species Conservation Initiative of the Lower Mississippi Valley Joint Venture (LMVJV) (formerly under the North American Waterfowl Management Plan). This effort is focused on identifying and conserving the most critical habitats within the landscape of the West Gulf Coastal Plain (Arkansas, Louisiana, Oklahoma and Texas). This effort is currently focused on development of a spatial database that includes all natural resource parameter data in a geographic information system (GIS). Ultimately this system will be utilized by planning entities at both federal and state levels to identify critical habitat areas and corridor linkages for all habitat types. Previous efforts by the LMVJV to identify habitats in Louisiana have been utilized extensively in planning for Louisiana black bear management in the Atchafalaya and Tensas river basins in Louisiana. This is basically, and realistically, a focused effort to perform ecosystem management on a landscape level.

CONSERVATION AND MANAGEMENT STRATEGIES

The Texas Parks and Wildlife Department and its cooperators need to continue to evaluate and record black bear sightings within the region (Appendix 1). Standardized protocols should be clearly provided to all involved in this task. A concerted effort to publicize this need to various interest groups is identified and discussed further in the Information and Education section of this plan. Clear reporting protocols should be developed at all levels of reporting.

Knowledge of public opinions and attitudes towards black bears and their management are needed across the landscape of East Texas. Michigan State University is currently working on this for an area of southeast Texas that encompasses approximately 20-25% of the entire landscape of East Texas. Similar efforts need to be expanded across the landscape due to cultural and demographic differences in the various regions of East Texas. This will ensure that a full picture of varying attitudes across the landscape will be represented; the work done in southeast Texas may not necessarily reflect attitudes in East Texas, or in northeast Texas.

One of the most critical management tasks in assuring conservation of black bears within East Texas is managing potential conflicts resulting from bear-human interactions. Information gleaned from attitude and opinion surveys in the region, combined with human demographic information gleaned from various sources including the West Gulf Coastal Plain Initiative will provide a basis for planning in this venue. Municipal, county, regional and state political infrastructures will ultimately become involved in this process, and should be brought in at the earliest reasonable date. These needs are discussed in more detail in the Conflict Management and Information and Education sections of this plan.

A consortium of GIS specialists will need to be brought together to focus on centralizing data necessary for black bear management planning. This will certainly include the West Gulf Coastal Plain Initiative, The Texas Parks and Wildlife Department, Big Thicket National Preserve, and corporate entities like Temple-Inland Forest Products Corporation. Areas of significant need include bottomland hardwood forest conservation, and bear-human interaction zones.

There are both potential advantages and disadvantages of habitat corridors. Advantages of habitat corridors include reducing the likelihood of inbreeding depression, allowing individual animals to move, which includes dispersal and maintaining more species within habitat patches (Simberloff et al. 1992), although it is unclear to what degree animals actually use corridors (Beier and Noss 1998). Potential disadvantages of habitat corridors include the possibility of loss of alleles to drift, spread of catastrophes, reservoirs of edge and introduced species, and serving as traps or sinks (Simberloff et al. 1992).

Continued bear dispersal into East Texas from neighboring states combined with possible introduction efforts will create a need for more direct research on black bears, their movements, reproduction and dispersal within the region.

Coordination and Communication

Goal #1: Implement the East Texas Black Bear Conservation and Management Plan

Objective 1: Establish East Texas Black Bear Task Force

Strategy 1: Form a cooperative alliance or task force that serves as an organizational focal point to implement all phases of the East Texas Black Bear Conservation and Management Plan over the next ten years. This group will be comprised of representatives from state and federal agencies as well as landowners and representatives from the private sector. The primary function of this group will be to coordinate and fund project proposals that meet the goals and objectives outlined in this plan, and to advise the regulatory authorities.

Habitat Management and Fragmentation

Goal #1: Develop technical guidance methods or tools to increase or enhance habitat for black bears

Objective 1: Develop Forest Management Handout or Pamphlet

Strategy 1: Develop handbook that educates foresters, biologists and land managers about bear-friendly management techniques.

Strategy 2: Develop program to educate private landowners and Commercial timber products companies about forest management prescriptions and sustainable forestry issues standards that not only minimize operational impacts, but also benefit the bear.

Strategy 3: Champion, develop and encourage the use of landowner incentive programs that help landowners participate in black bear conservation. Such programs include but are not limited to Landowner Incentive Program,

Partners for Wildlife, Farm Bill Programs, East Texas Wetlands Project, and Stewardship Grant Program, etc.

Goal #2: Develop informational material to educate landowners about habitat management practices that enhance bear habitat

Objective 1: Create handouts, fliers, and signs that promote habitat management measures that benefit bears or minimize negative impacts of land practices

Strategy 1: Provide information to Landowners at annual landowner association meetings, Civic organizational meetings like Lions Club, etc.

Strategy 2: Cooperate with other conservation groups to provide information to members of their organization, i.e. NWTF, DU, QU, etc. Share sign opportunities and costs of managing target habitat areas.

Goal #3: Integrate bear habitat management activities among agencies and landowners

Objective 1: Enlist state parks, wildlife management areas, NPS, TFS, USFS, U.S. Fish and Wildlife Service, USACOE, and landowner associations to enroll in support of bear habitats

Strategy 1: Encourage State and Federal agencies to include bear habitat management practices in their management plans.

Strategy 2: Encourage agencies and private landowners to form large cooperatives of adjacent lands that practice good bear habitat management.

Goal #4: To reduce and minimize habitat fragmentation and its impact on bears.
Habitat fragmentation can adversely impact bears in several ways. Fragmentation can result in direct loss of habitat for bears, increased human-bear interactions, increased mortality, and decreased dispersal which can result in inbreeding.

Objective 1: Promote maintaining large blocks of unfragmented bear habitat by using a landscape management approach.
To minimize the impacts of habitat loss and fragmentation on black bears, it may be necessary to use an approach of landscape management for the black bear. Landscape management works through a cooperative approach whereby various landowners and user groups work together to protect habitat and promote bear management over a large area (Yarrow and Yarrow 1999).

Strategy 1: Prevent further habitat fragmentation by encouraging government and private partners to work together to maintain large blocks of unfragmented habitat.

Strategy 2: Focus efforts of diverse user groups toward common management objectives.

Strategy 3: Develop mitigation banks, safe harbors, easements, and other voluntary incentives that enhance wetland mitigation and other land conservation measures by including acreage that offers good bear habitat, including movement corridors.

Objective 2: Integrating management among tracts to effectively use fragmented resources

Strategy 1: Promote the creation of corridors to connect patches of suitable bear habitat. Established corridors between existing fragmented habitat.

Information and Education

The purpose of the plan necessitates the development and implementation of an information and education campaign that would elicit strong public and political support. The recognition of stakeholder interests, experiences, preferences, and other related factors are essential for appropriately addressing public involvement and participation (Chase et al. 2002). This section also addresses bear mortality related to human factors to facilitate conservation efforts and reduce human/bear conflicts. The strategies involved with information and education should evolve with changing attitudes, the discovery of new concerns or interests, and resolution of conflicts. The campaign should also not be limited to ideas presented in this section, but may be extended as needed through amendments or supplementary agreements from participating parties. For these reasons, this section is divided into two broad and obtainable goals: 1) reduce and/or minimize human-induced mortality of bears, and 2) develop public awareness and conservation ethic for black bears and bottomland hardwood habitat through an intensive outreach program. Additionally, the campaign is intended to be a collaborative effort on the part of state, federal, municipal, and private agencies and use a variety of effective instruments or mechanisms to reach interested parties.

Goal #1: Reduce and/or minimize human-induced mortality of bears

Mortality of bears in Texas caused by human factors can be narrowed down to illegal shooting, transportation related, and other minor categories (electrocution, physical disturbance, etc.). Strategies to address this goal will attempt to create an awareness of the bear's presence and legal status to the appropriate stakeholders, as well as minimize the potential for human/bear encounters.

Objective 1: Promote the conservation status of the bear to outdoorsmen to reduce/minimize the intentional and unintentional shooting of bears

Hunting and trapping bear in Texas is illegal by both state and federal regulation. Poaching of game and non-game wildlife is currently a problem in portions of the Pineywoods of East Texas. Illegal take of bears could potentially be exacerbated due to the general regard for the bear as a trophy animal or

perceived threat to humans and/or property. In Louisiana, illegal killing may be as high as 12% based on radio telemetry data (Pace et al. 2000).

Strategy 1: Develop hunter education program designed to disseminate information on black bear presence, status, and distribution. The program would use a variety of channels to reach the public including, but not limited to hunter education programs, hunter check stations, information kiosks, state and federal parks, Public Hunting Lands Map Booklet, *Texas Parks & Wildlife* Magazine, TPWD's Outdoor Annual, and Web sites (TPWD, U.S. Fish and Wildlife Service, etc.).

Strategy 2: Provide the most current information on techniques for avoiding bear conflicts to sportsmen and landowners/managers. Information collected would include techniques for placement and use of feeders in bear habitat, identification tips for recognizing differences in bears and hogs. Avenues for reaching stakeholders includes: Texas Forestry Association landowner Associations, land management presentations, Texas Agricultural Extension Service, etc.

Strategy 3: Coordinate law enforcement activities. A centralized position should be created for the collection of sighting reports and dissemination of bear related information to law enforcement personnel. State Game Wardens, U.S. Fish and Wildlife Service Special Agents, County Sheriffs and other relevant law enforcement personnel should be educated on the status and biology of the bear in East Texas. New Game Wardens could be reached through the development of curricula for use at the State Game Warden Academy. Outreach and reporting forms should be created for law enforcement to distribute to sportsmen.

Objective 2: Work with transportation agencies to develop minimization measures to reduce transportation-related bear mortality

Several studies suggest that automobile collisions may be the primary source of human-induced mortality (Pace et al. 2000). Some of these accidents can be avoided through an aggressive media campaign similar to other awareness programs. However, direct action and initiative should be taken with coordination between the Texas Department of Transportation (TxDOT), TPWD, U.S. Forest Service, and the Department of Public Safety (DPS) to reduce many of these potential mortalities. Collisions with trains may also contribute to bear kills; however, train accidents are considerably lower due to the lesser amount of train traffic compared to automobile traffic.

Strategy 1: Work with transportation agencies to design and erect road signs at potential wildlife crossing areas and travel corridors. Providing signs at sensitive areas will raise public awareness of the potential for a collision

and may reduce actual incidents. Determining accident prone areas should be accomplished through coordination between local wildlife biologists, TxDOT District, and DPS for reports of vehicle/wildlife accident locations. This effort should also include an evaluation and potential modification of current wildlife related accident-reporting procedures.

Strategy 2: Work with transportation agencies to create wildlife travel corridors to funnel wildlife through designated crossings at highways. In areas where significant wildlife collisions are reported and signs may be ineffective, additional measures may be necessary. The development of artificial corridors that would direct wildlife into constructed crossings would reduce the amount of collisions on highways.

Strategy 3: Work with TxDOT to modify existing roadways during reconstruction. Major Texas thoroughfares are often modified or upgraded. A coordinated effort should be made between the resource agencies and TxDOT to address the incorporation of wildlife-friendly designs into road construction projects. These can include wildlife tunnels, culverts and other types of crossings at known travel corridors, plus bridge modifications to reduce barriers at streams and rivers.

Strategy 4: Work with transportation agencies on new highway construction to incorporate wildlife-friendly designs and crossings at areas identified as potential travel corridors. The early development phase of major highways is the critical time for addressing impacts to wildlife from right-of-way location, traffic accidents, and construction activities. Effective recommendation of design should be coordinated between the resource and transportation agencies.

Strategy 5: Work with TxDOT to provide information on wildlife to the traveling public. Educational information should be developed to address all transportation and wildlife issues, including the bear, and would be available to the public at rest stops, visitor centers, and *Texas Highways* magazine.

Goal #2: Promote public awareness and develop conservation ethic for black bears and their habitat through an intensive outreach program

The general public is largely unaware of the presence, needs, and status of the black bear in East Texas. It is equally important that the value of wildlife habitat and the need for its conservation be imparted in the underlying objectives. Strategies to address this goal will educate the general public on the history and status of the bear, and invite state, federal, and private agencies to use their programs and authorities to participate in the conservation and management goals of the plan.

Objective 1: Implement an outreach program for the general public to create an awareness of the presence of bears in East Texas, promote their ecological and historical importance, and provide information on bear facts and myths

The program should emphasize conservation ethics and the value of unfragmented habitat. Efforts should place emphasis on both the ecological and recreational value of high quality wildlife habitat.

Strategy 1: Develop and conduct public surveys to ascertain demographic attitudes towards bears. In order to develop an effective information and education campaign, current and future public attitudes toward bears and other wildlife must be characterized. The timing and content of questionnaires used to sample public opinion should continually be evaluated during the implementation of the plan.

Strategy 2: Develop a media promotion to disseminate information related to bear and habitat conservation. Positive media exposure is the most efficient mechanism to reach the general public. Constant exposure through a continual, successive promotion based on current public opinions will enhance public support. Multiple avenues such as television, magazines, radio, newspapers, and outreach shows should be used to distribute information.

Strategy 3: Work with public schools to develop an education program for children for use in environmental and science curricula. Educating children on our local conservation issues is extremely important in order to develop pubic support and create fundamental conservation ethics for the future. School programs should combine the use of state-of-the-art techniques, hands-on activities, and invite corporate sponsorship.

Objective 2: Disseminate information to state, federal, and private agencies and coordinate incentive-based programs available to private landowners for managing property for wildlife

Gaining public support will depend largely on the ability of government and non-government entities to provide information and technical and financial support to private landowners. As with the general public, an awareness campaign should be conducted for both government and non-government organizations.

Strategy 1: Develop an awareness program for appropriate government agencies. A list of government agencies should be created for distributing information and outreach materials concerning the black bear and bottomland hardwood habitat. Information could be distributed through brochures, meetings, or inter-agency correspondence.

Strategy 2: Provide information and outreach materials to non-consumptive conservation groups. Coordination which occurs between resource agencies and non-government conservation organizations may facilitate participation and implementation of portions of the plan. Conservation groups may also be a source of funding for meeting goals. Interested groups can be reached through local newsletters, chapter meetings, and local wildlife events.

Strategy 3: Work with resource agencies to establish a list of programs and authorities that provide incentives for landowners to manage land for wildlife. This strategy would identify potential funding sources and invite participation from government agencies. Agency responsibilities should also be coordinated, assigned, and evaluated through the duration of the plan.

Conflict Management

Should a conflict call result in the active intervention and capture of a black bear in Texas, a determination will have to be made regarding the disposition of the animal. Generally, there are three courses of action that personnel will have to evaluate. These three options are lethal removal, relocation, and aversive conditioning. Relocation and aversive conditioning are not mutually exclusive options. Each of the three options presents differing biological, social, and political opportunities or challenges. Conflict management issues have been identified by category, each with separate causes and potential strategies to assuage the source of the conflict. Following are the primary conflict scenarios and strategies to potentially alleviate the problems.

Goal #1: To reduce and minimize bear/human conflicts

STRUCTURES: Bear damage to structures can be a result of bears gnawing on the material for ingestion of salts used in the treatment process (Yarrow and Yarrow 1999) or for entry to obtain items stored inside.

Objective 1: To reduce/minimize impacts of bears to human structures

Strategy 1: Educate landowners regarding use of alternative building materials or coverings, storage of food stuffs, fencing, or alternative construction of windows or doors. Food storage includes those items used for human consumption, pet consumption, or livestock consumption.

LIVESTOCK: Livestock predation by black bears is rare though does occasionally occur.

Objective 2: To reduce/minimize impacts of bears to livestock

Strategy 1: Electric fencing should be installed. Other activities which will minimize conflict include removing animal carcasses quickly and properly disposing thereof, and regular inspection of the herd to remove possible

attractants. Short-term relief may be obtained by use of noise generators or light but will loose effectiveness as the animal is desensitized (Yarrow and Yarrow 1999).

AGRICULTURAL CROPS: Loss of and damage to agricultural crops can occur in occupied bear range.

Objective 3: To reduce/minimize impacts of bears to agricultural crops

Strategy 1: Electric fencing should be installed. Other activities which will minimize conflict include planting crops which are not attractive to bears and regular inspection of the crop to remedy problems as soon as located. Short term relief may be obtained by use of noise generators or light but will lose effectiveness as the animal is desensitized (Yarrow and Yarrow 1999).

APIARIES: Bear depredation on beehives can inflict large amounts of damage and monetary loss to the beekeeper. One bear can destroy or damage several hives or individual apiaries in a single night if they are within the home range of a single animal.

Objective 4: To reduce/minimize impacts of bears to apiaries

Strategy 1: Locate hives as far as possible from cover and travel corridors, harvest honey from hives as soon as possible, move apiary to a new location if bear activity is noticed in the vicinity, keep apiaries in compact arrangements, and proactively protect apiaries through use of electric fences, platforms, or potentially aversive training with the help of TPWD and USDA employees (Yarrow and Yarrow 1999).

WASTE MANAGEMENT: Management of human waste and garbage in an occupied bear range is a critical component in reducing human/bear conflicts. In Louisiana, nuisance complaints are derived almost categorically from either waste management problems or feeding of bears (P. Davidson, Black Bear Conservation Committee, personal communication). There is an attractiveness of human waste products (garbage, etc.) to an opportunistic omnivore such as a bear. An intensive education and outreach campaign to landowners and homeowners within the potential range of the species is needed. Teaching people about the attractiveness of human garbage to bears would alleviate most encounters. Modification of human activities such as not eliminating kitchen refuse outside, obtaining bear proof trash containers, and other activities will lessen most of these interactions. Information can be disseminated through such avenues as land management presentations, through Texas Forestry Association, county forest landowner associations, county landowners associations, Texas Agricultural Extension Service, newspapers, homeowners associations, and others.

Objective 5: Reduce human/bear conflict through proper waste management principles

Strategy 1: Provide education and outreach concerning managing waste in a manner which will not attract bears and will avoid many associated problems.

Strategy 2: Work closely with waste management businesses and governmental entities in occupied bear range to provide or assist in provisions to allow the public access to bear proof trash receptacles. Also provide information on keeping receptacles clean and reduce odor.

FEEDING: People can unknowingly create nuisance animal situations simply by a desire to observe or photograph wildlife. Feeding is sometimes employed to attract wildlife into viewing and photography range. This conditions the animal to associate human activity with easily obtained food, and negates the inherent fear of humans which wildlife typically exhibit. Other activities also unintentionally create the same situation such as livestock feeding, pet feeding and the well intentioned feeding of wildlife species. Additionally, feeders sometimes utilized to aid in hunting activities create an attraction for non-targeted species which the hunter then categorizes as a nuisance animal. This can lead to conflicts including illegal take of the species.

Objective 6: To reduce/minimize conflicts between bears and humans due to intentional or unintentional feeding

Strategy 1: An intensive educational and outreach program will be developed to reduce many of these conflicts simply due to ignorance of the public. Most well-intentioned feeding is for non-consumptive pleasure of wildlife with no knowledge of the potential consequences.

CONFLICT PROTOCOL: Development of a nuisance/conflict management protocol for black bears in Texas should be a priority outside of the constraints of this document. Conflict management protocol is and must remain a much more fluid situation than a 10-year planning document allows. Neighboring states operate under developed nuisance management protocols which allow the manager to make site specific decisions within the framework of the written guidelines. This document should be developed as an amendment to this document allowing for revisions to the protocol as needed. The different active conflict intervention methods should be further developed and documented specifically for East Texas.

Objective 7: To adequately handle nuisance bear complaints

Strategy 1: Develop and implement an official bear nuisance conflict protocol with state and federal agency partnerships and cooperation.

Strategy 2: Establish and train an official bear nuisance/conflict response team with state and federal agency participation and cooperation.

Other Research

Surveys of black bear occurrence within a few river basins of eastern and northeast Texas are needed. Surveys would basically replicate a successful survey effort performed by the Maryland Department of Natural Resources to survey black bears where bait stations with hair capture stations were used (Bittner et al. 2002). These studies would provide empirical data to determine if a certain river basin is currently occupied by black bears. Survey areas will be targeted using credible black bear sightings within the river basins of East Texas and northeast Texas.

Over the next 10 years, if public and political support exists, black bears could be introduced into the most suitable forested study area in deep East Texas as a highly controlled experimental population. Wooding et al. (1996) reported that East Texas contained the largest blocks of potential black bear range left in the Southeastern Coastal Plain of the U.S. Garner and Willis (1998, unpublished) identified the most suitable bear habitats remaining in East Texas. This introduction effort would be undertaken as a research project similar to repatriation efforts currently underway at Felsenthal National Wildlife Refuge in south-central Arkansas and the Three Rivers area of Eastern Louisiana. This research would be beneficial in determining the survivability and reproduction of black bears in the best remaining bear habitat in East Texas where the probability of bear-human conflicts in minimal.

Goal #1: Develop and organize information sources for black bear occurrences and availability of suitable habitat in East Texas

The success of conservation efforts will depend on a comprehensive effort to build an information base regarding the distribution of bears in East Texas, as well as the availability of suitable habitat. Currently, there is a paucity of information on black bear distribution and habitat in East Texas. This goal will ensure all available information is collected, improve the reporting system, and standardize available data on bear distribution and suitable black bear habitat.

Objective 1: Promote the documenting and reporting of bear sightings

A coordinated effort should be made to provide a system of reporting and verifying bear sightings in East Texas. This effort should involve state, federal, and private agencies, and be coordinated with local law enforcement.

Strategy 1: Evaluate and update the current system for reporting bear sightings, verifying reports, and distributing information to appropriate resource agencies. A central point of contact should be created and multiple mechanisms for reporting be produced to address different groups.

Strategy 2: A Geographic Information System (GIS) layer should be developed for documented bear reports. The GIS would use data from the reporting system and be coordinated through the appropriate resource agencies.

Strategy 3: Develop and implement guidelines to collect hair and tissue samples from bears (alive or dead) for genetic analyses and documentation.

Objective 2: Identify, evaluate, and delineate suitable black bear habitat in East Texas

Essential to the conservation of black bears in Texas is the determination of available habitat. Baseline habitat data currently exists with which to expand and direct new research proposals. This objective would utilize available funding sources and existing baseline data from resource agencies.

Strategy 1: Update the current system for evaluation of suitable bear habitat, bear sightings, verifying reports, and distributing the information to appropriate resource agencies. A central point of contact should be created and multiple mechanisms for reporting be produced to address different groups.

Strategy 2: A GIS layer should be developed to more readily identify suitable bear habitats and possible bear management units. The GIS would use data from the reporting system and be coordinated through the appropriate resource agencies.

Goal #2: To determine survivability and reproductive capacity of re-introduced *U. a. luteolus* in East Texas

Objective 1: To restore black bears to the most suitable habitat remaining in East Texas

Strategy 1: Develop an Introduction Plan for public review and comment to successfully relocate 30 adult females with their cubs during the winter months from appropriate out-of-state source populations using established winter den removal techniques. This would assist in the establishment of a small black bear population in the forests of East Texas where presently only a rare number of individual male bears periodically roam. This action would establish a "non-essential" black bear population segment under the current Federal Endangered Species Act for this federally listed sub-species within its historic range.

Strategy 2: Determine public and political support for the Introduction Plan.

Strategy 3: If strong (≥75%) public and political support exists, action would be taken to implement the Introduction Plan.

PARTNER RESPONSIBILITIES

To be recommended by the newly created East Texas Black Bear Task Force as progress is made among conservation partners working jointly to implement the goals, objectives, and strategies of this plan. Task Force representatives may include, but are not limited to, conservation partners from the following agencies, groups and organizations primarily in Texas that worked together to prepare this plan:

Alabama-Coushatta Tribe
Bear Trust International
Big Thicket Association
Black Bear Conservation Committee
Boone and Crockett Club
East Texas Bee Keepers Association
Heartwood Forest Fund
International Paper
Molpus Timberlands
National Park Service, Big Thicket National Preserve
Natural Resource and Conservation Service
Neches River Protection Coalition
Newton County Landowner and Leaseholder Association
Rice University
Sabine County Landowner and Leaseholder Association
Stephen F. Austin State University
Temple-Inland
Texas A&M University
Texas Committee on Natural Resources
Texas Department of Transportation
Texas Forest Service
Texas Forestry Association
Texas Parks and Wildlife Department
The Nature Conservancy
Tyler County Landowner and Leaseholder Association
United States Army Corps of Engineers
National Forests and Grassland
United States Department of Agriculture, Wildlife Services – Texas
United States Fish and Wildlife Service

IMPLEMENTATION SCHEDULE AND PLAN REVISIONS

The implementation schedule and associated costs of the goals, objectives and strategies of this plan will be determined by the proposed East Texas Black Bear Task Force in coordination and cooperation with the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service. A formal review of this document will take place every 3 to 5 years by the Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service in order to make needed changes and updates in accordance with the purpose of the plan.

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APPENDICES

APPENDIX 1

TEXAS PARKS AND WILDLIFE DEPARTMENT
BLACK BEAR INVESTIGATION REPORT

Instructions: Fill in all applicable data on both sides of form. Mail completed forms immediately to Wildlife Diversity Program Leader, TPWD, 3000 IH-35 South, Suite 100, Austin,Tx. 78704 or designated regional staff person.

INVESTIGATOR: _____ **DATE:** _____

OBSERVATION DATA

Report Classification (see back of form) I II III _____

Type of Report: Sighting ☐ Track ☐ Scat ☐ Other ☐

Observation Date: MM/DD/YY _____ Time: _____ AM/PM

County: _____ Location: Lat./Long _____

Ranch: _____ Distance/Direction from nearest town: _____

Nearest man-made structure/residence/potential conflict area (type/description): _____

Terrain: Mountain ☐ Rugged Hills ☐ Rolling Hills ☐ Undulating ☐ Flat ☐

Topographical Location: Ridge ☐ Hillside ☐ Bottom ☐ Drainage ☐ Other ☐ _____

Dominant Vegetation: _____

Observer/s (names/address/phone # of all): _____

Activity of observer/s: _____

Approximate Length of Observation: _____ minutes _____ seconds

Distance of Observation: _____

Activity of bear at time of observation: ☐ standing ☐ walking ☐ running ☐ digging ☐ grazing ☐ scavenging ☐ preying on ☐ otherÖÖ Ö _____

Did bear notice observer? ☐ Yes ☐ No

If yes, describe bears reaction: _____

Was more than one bear observed? ☐ Yes ☐ No

Were any cubs observed? ☐ Yes ☐ No

If yes, explain and describe: _____

Any identifying markers (ear tags, collars, chest blaze, etc) _____

Has any other bears been reported in this vicinity? ☐ Yes ☐ No

If yes, explain (date, distance, etc.) _____ _____

Have any depredations been attributed to this bear? _____ Officially Verified? _____

Explain: _____

Describe fate of this bear after observation (killed, trapped, unknown, etc): _____

What is your opinion of the origin of this bear (native, migrant, escaped zoo, released, etc.)?, explain:

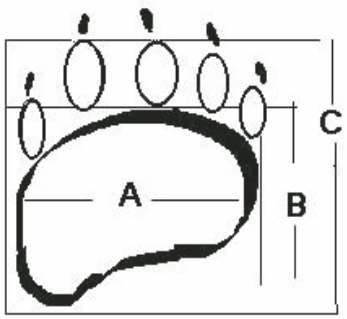
BLACK BEAR PHYSICAL INFORMATION

General Information: With the exception of foot data, this information are field estimates.
Actual data should be recorded on Black Bear Physical Data Form.

Sex:	Male ☐	Female ☐	Unknown ☐	Color _____	
Age:	Adult ☐	Subadult ☐	Cub ☐		
Weight (lbs):	10 - 50 ☐	51 - 100 ☐	101-200 ☐	201 - 300 ☐	300 + ☐
Apparent condition:	Excellent ☐	Good ☐	Fair ☐	Poor ☐	

Excellent: Skeleton cannot be felt, bear appears extremely fat.
Good: Skeleton is difficult to feel, bear appears healthy but not extremely fat.
Fair: Skeleton can be felt but is not prominent, bear appears thin but not emaciated.
Poor: Skeleton can be easily felt, bear appears to be a skeleton with skin over it.

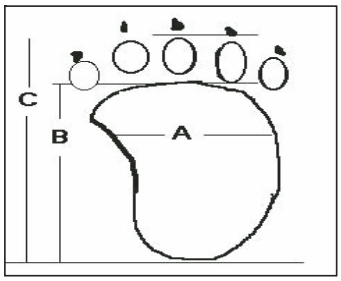
Front left foot (cm):	total length	_____	pad length	_____	pad width	_____
Front right foot (cm):	total length	_____	pad length	_____	pad width	_____
Rear left foot (cm):	total length	_____	pad length	_____	pad width	_____
Rear right foot (cm):	total length	_____	pad length	_____	pad width	_____



A. Pad width

B. Pad length

C. Total Length



Additional bear information (if a separate form is needed fill out and attach to this one, if not describe bear and its actions/relationship with this one): _____

Comments:

EVALUATION CLASSES:

`Class I:` Bear is in possession, seen, or tangible evidence documented by investigator. Bear is observed by more than two reliable individuals

`Class II:` Detailed desbription of event provided and the observer seems reliable or is experienced in the outdoors and accustomed to looking for details (I.e. biologist, trapper, bird watcher, game warden hunter).

`Class III:` Details of observation are vague and account is inconsistent or observation has questionable accounts or details. Desbription is not of bear or otherwise observation is of no value.

Terri Brown - Staff Services Officer
Region 3 Wildlife
Created: 11/21/2001

APPENDIX 2

Louisiana Black Bear Habitat Restoration
Summary for 1992 – 2001

In Louisiana (since 1992):

- 117,000 acres of WRP statewide
  - Over 67, 223 acres of WRP directly benefit bears (within 50 point zone)
  - Results in 47,056 acres reforested on WRP tracts
- 78,000+ acres of CRP benefit bears
- 9,500 acres Partners for Fish and Wildlife benefit bears
- 10,000+ acres NWR reforestation benefit bears
- 1,000+ acres state reforestation benefit bears
- 2,000+ acres reforestation on Corps lands benefits bears

In Mississippi:

- 58,334 acres of WRP within historic range of Louisiana black bear

FWS Louisiana Black Bear Habitat Protection Plan (85,500 acres)

- Bayou Teche NWR – 35,000 acres
- Glade Woods NWR – 13,000 acres
- Bayou Cocodrie NWR expansion – 5,000 acres
- Tensas River NWR expansion – 32,5000 acres

COE Atchafalaya Acquisitions (38,800 acres)

- Fee Title – 50,000 acres
- Easements – 338,000 acres

State WMA Acquisitions – 13,000+ acres

Status of Threats to Habitat

- Conversion of forests to agriculture
  - NRCS Study: clearing trends reversed
  - Swampbuster losses negligible
  - Future status of conservation programs within 2002 Farm Bill ??

- Extensive Reforestation and Acquisition
  - Private landowner incentives – WRP, CRP, PFW
  - Service, COE, and state programs
  - Carbon sequestration

- COE Easements in Atchafalaya Basin
  - Prevent clearcutting/conversion
  - Beneficial practices allowed
  - Camp owners educated on containment of garbage to minimize bear conflict