FLORIDA BLACK BEAR
MANAGEMENT PLAN

Ursus americanus floridanus

Approved June 27, 2012

Florida Fish and Wildlife Conservation Commission
620 South Meridian Street
Tallahassee, FL 32399-1600

CREATION OF THE BEAR MANAGEMENT PLAN

In May 2007, a team of staff from the Florida Fish and Wildlife Conservation Commission (FWC) were charged with developing a draft Bear Management Plan. Then FWC Division of Habitat and Species Conservation (HSC) Director, Tim Breault, sponsored the FWC team, which included staff from HSC, Division of Law Enforcement (LE), Office of Community Relations (CR), and Fish and Wildlife Research Institute (FWRI). HSC Deputy Director Thomas Eason led the team in completing its task to deliver a draft Bear Management Plan. The team consisted of the following FWC staff:

- Mike Abbott – HSC
- Brian Scheick – FWRI
- Jack Daugherty – LE
- Stephanie Simek¹ – HSC
- Judy Gillan – CR
- David Telesco – HSC
- Walter McCown – FWRI
- Adam Warwick – HSC

A new team of FWC staff was formed in August 2009 to collect public input, revise the plan as needed, and deliver the draft to FWC Commissioners. The new team was lead by HSC Section Leader Kipp Frohlich and FWRI Section Leader Tim O’Meara and included a member from the Office of the Executive Director (OED). The team consisted of the following FWC staff:

- Lee Beach – LE
- Mike Orlando – HSC
- Dennis David – OED
- Brian Scheick – FWRI
- Terry Doonan – HSC
- Billy Sermons – HSC
- Joy Hill – CR
- David Telesco – HSC
- Walter McCown – FWRI

The teams were supported by FWC and University of Florida (UF) staff:

- Sarah Barrett (HSC) – Administrative and editorial assistance
- Brian Beneke (FWRI) – Geographic Information System assistance

¹ David Telesco replaced Stephanie Simek during the draft plan process.
The team consulted regularly with a Technical Assistance Group (TAG) to seek their input on various drafts of this plan. TAG was composed of representatives from various stakeholder groups and varied in number from 12 to 22 at different stages of the plan. TAG members did not necessarily endorse all components of the plan nor does FWC imply a consensus was reached by all members. TAG included:

- Stephanie Boyles\(^2\) The Humane Society of the United States
- Austin Carroll PBSJ Corporation
- Amber Crooks Conservancy of Southwest Florida
- Chryl DeCrenza\(^2\) Kleinfelder
- Chuck Echenique Florida Hunting Guides/Public Land Hunters
- Jo Anna Emmanuel St. Johns Water Management District
- Manley Fuller Florida Wildlife Federation
- Phillip Gornicki Florida Forestry Association
- Raymond Hamlin\(^2\) Florida Bear Hunters Association
- Dennis Hardin Florida Forest Service
- John Hayes University of Florida
- Jennifer Hobgood The Humane Society of the United States
- Tom Hoctor University of Florida
- Joi Hosker Central Florida Bear Hunters Association
- Mickey Larkins Florida Bear Hunters Association
- Laurie Macdonald Defenders of Wildlife
- Jim Moyer St. Joe Company
- Carl Petrick U.S. Forest Service

\(^2\) Indicates TAG member who was replaced during the draft plan process with another representative from the same stakeholder group.
The team began a public input phase on the first draft of the Florida Black Bear Management Plan in May 2010. However, in September 2010, FWC passed Florida’s Endangered and Threatened Species rule that required biological status reviews and management plans for species currently listed as Threatened and Species of Special Concern in Florida, including the Florida black bear. As part of that process, FWC staff reviewed all available data and the listing criteria, and recommended that bears be removed from the State’s threatened species list. The Commission approved staff’s recommendation in June 2011; however, bears would not be removed from the list until the Commission approved a management plan. The public input process on the 2010 draft was suspended so that the plan could be revised to include the results of the biological status review and conform to the new listing rule requirements. The new draft plan and associated rule was open for public comment from November 10, 2011 to January 10, 2012. Public workshops on the plan were held in Bristol, Naples, Deland, and Gainesville. FWC received over 450 comments from 69 individuals and 17 stakeholder group representatives. In addition, Florida members of the Humane Society of the United States sent over 2,000 form letters via email to FWC Commissioners regarding the plan. FWC presented the plan and rule as well as a summary of the public comments to the Commission on February 9. The Commission directed staff to revise the plan as
appropriate and move forward with advertising the associated rule. The rule and revised plan were re-opened for public comment from April 13 to June 1, 2012. FWC received over 100 comments from 12 individuals and 13 stakeholder group representatives. Florida members of the Humane Society of the United States sent over 3,400 form letters via email to FWC Commissioners as well. FWC staff revised the plan based the comments they received and posted the plan with revisions on the FWC website on June 11, 2012. FWC brought the revised plan to the Commission for their consideration on June 27, 2012. FWC greatly appreciates all the time and effort Floridians provided to improve the Florida Black Bear Management Plan.
EXECUTIVE SUMMARY

The Florida black bear management plan is intended to create a common framework from which Florida Fish and Wildlife Conservation Commission (FWC) staff and stakeholders can work in a coordinated fashion to conserve bears and maintain their value to people. The goal of this plan is to “Maintain sustainable black bear populations in suitable habitats throughout Florida for the benefit of the species and people.” To accomplish this goal, objectives focusing on population, habitat, conflict management, and education were created.

The population objective is to maintain a sustainable statewide bear population. Several components are identified to accomplish this objective, including managing one bear subpopulation to be at least 1,000 individuals, ensuring that the smaller subpopulations are increased to a minimum of 200 bears each, and increasing genetic exchange between subpopulations.

The second objective is to maintain habitat in sufficient quantity, quality, and connectivity to meet the population objective. This will include habitat to accommodate at least one subpopulation of over 1,000 individuals and to provide sufficient habitat in the smaller subpopulations to allow for at least 200 bears each. In addition, the plan calls for increased connectivity between bear habitat areas to promote greater genetic exchange.

The third objective is to reduce human-bear conflicts. A measure of success for this objective will be to reduce the number of bear-related complaints to FWC to below the average number of complaints received annually between 2008 and 2010 levels (1,949). This will be done by coordinating with local government officials in primary bear range to implement methods for reducing conflicts; revising bear policies to create a comprehensive approach to human-bear conflict management; developing protocols to capture institutional knowledge, standardize response, and improve effectiveness in management; and creating partnerships that will help FWC resolve human-bear conflicts.
The last objective of the plan is to help Florida citizens have a better understanding of bears, support bear conservation measures, and contribute to reducing human-bear conflicts. This will be done by education and outreach programs; partnerships with government, non-governmental organizations, and other stakeholders; and developing “Bear Smart Communities” in areas of high bear activity. The objective’s aim is to have at least 75% of the people who contact FWC comply with our conflict resolution advice.

Shared ownership and responsibility for bear management by FWC staff and stakeholders, both regionally and within local communities, will be important to the successful implementation of this plan. To achieve this end, the plan proposes to divide the state into geographic areas known as Bear Management Units (BMUs). The seven proposed BMUs will allow for management issues and actions to be addressed differently across the state depending on the needs and characteristics of the area. The plan also calls for the development of Black Bear Assistance Groups across the state. Those groups would be composed of local stakeholders and would assist in scoping issues and identifying and implementing actions for bears within each BMU, thereby forming the basis for community co-management of bears.

In order to achieve the goal and objectives of the plan, appropriate rules and regulations are needed to provide adequate protection for bears. The plan includes a new rule to be adopted into the Florida Administrative Code that makes it unlawful to injure or kill bears. The rule also states FWC will continue to engage with landowners and regulating agencies to guide future land use so that it is compatible with the bear management plan objectives. While bears have rebounded from historic low numbers and no longer meet the biological criteria for designation as a threatened species in Florida, many conservation challenges remain. This plan is intended to address those challenges and ensure bears will never again need to be listed as a threatened species. Through implementation of the many conservation actions identified in this plan, Floridians can achieve a future that includes bears as a secure and valued wildlife species in our state.
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<td>Black Bear Assistance Group</td>
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<td>BMU</td>
<td>Bear Management Unit</td>
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<td>BRP</td>
<td>Bear Response Program</td>
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<td>BSC</td>
<td>Bear Smart Community</td>
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<tr>
<td>DOT</td>
<td>Florida Department of Transportation</td>
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<tr>
<td>FWC</td>
<td>Florida Fish and Wildlife Conservation Commission</td>
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<tr>
<td>GFC</td>
<td>Florida Game and Fresh Water Fish Commission (predecessor to FWC)</td>
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<td>LAP</td>
<td>Landowner Assistance Program</td>
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<td>NF</td>
<td>National Forest</td>
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<td>NWR</td>
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<td>U.S. Forest Service</td>
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<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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<tr>
<td>WMA</td>
<td>Wildlife Management Area</td>
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GLOSSARY OF TERMS

Black Bear Assistance Group (BBAG): A group of stakeholders solicited by FWC to provide local input on issues related to managing bears in Florida. This plan envisions one local group per Bear Management Unit (BMU).

Bear Management Unit (BMU): These areas are geographically delineated by county borders and divide the entire state (and subsequently the group of bears living there) into smaller areas to more appropriately manage and conserve bears in Florida based on the following criteria:

1) Commonality of geography and population dynamics for bears;
2) Human social components related to interactions and management;
3) Shared management characteristics, objectives, and response;
4) Logistics in oversight and management; and
5) Balance of geographic and issue scale – not so broad that the whole state is included, not so fine that every bear is treated differently.

Bear Smart Community (BSC): An area of human habitation (such as a subdivision, a municipality or a rural collective) within occupied bear range where the residents, businesses and government act to prevent human-bear conflicts and reduce risks to human safety and private property by eliminating access to human food sources, encouraging education and using appropriate waste management.

Biological Carrying Capacity: The maximum number of animals that a habitat in a specific area can sustain without negative impacts.

Carbon Banking: Carbon banking is the process of growing trees to capture and store carbon dioxide from the atmosphere. Energy companies pay money to landowners to create carbon banks so they can receive carbon credits that are traded on the open market.

Carnivore: 1. A species placed in the Order Carnivora by taxonomy, based on dentition and other skeletal characteristics. Although black bears are behaviorally omnivores, they are taxonomically classified as Carnivores. Note: references to the taxonomic order are always capitalized. 2. An animal whose diet consists almost entirely of meat. Note: references to the dietary term ‘carnivore’ are not capitalized.

Conservation Lands: Long term stability in habitat quantity or quality, regardless of whether publicly or privately owned, as measured by the managed lands category of the Florida Natural Areas Inventory in 2009.
Core Complaints: A subset of the all bear-related calls received by FWC that are thought to be complaints, used in this plan to measure change in complaint levels. Core complaints will consist of the following categories: Apiary, Attacked animal, In building, In crops, In feed, In feeder, In garbage, Killed animal, Property damage, Threatened animal, and Threatened humans. Categories of human-bear interactions not included as core complaints include: Dead bear, In area, In tree, In yard, Sick/injured bear, and Other.

Food Conditioned: The term describes the behavior of a bear which indicates it has had previous contact with people and was rewarded with food, resulting in the bear seeking human-sources of food.

Habitat: An area with sufficient food, water, cover, and security to support wildlife, including bears.

Habituated: The term describes the behavior of a bear which tolerates close proximity to people and has apparently lost its natural fear of humans.

Landscape Connection/Connectivity: Lands that allow several biological processes to occur, including movements among disjunct subpopulations that allow for genetic interchange as well as the necessities of finding food, cover, and mates.

Mast: A general term for edible fruit when eaten by wildlife. Hard mast includes acorn, hickory, pecan and other nuts while soft mast includes fleshy berries such as palmetto berries, blueberries, and grapes.

Metapopulation: A group of subpopulations that are separated from one another geographically but still interact at some level.

Occupied Range: The area of Florida where bears consistently occur, mapped at a state-wide scale as primary or secondary range. These areas have sufficient food, water, and cover to support bears but having bears in this location may not be desirable to people (i.e., Suitable). For example, bears live in neighborhoods with wooded areas scattered throughout towns close to Wekiva State Park, because they have access to trash and other human-provided foods. Normally such areas would not be considered bear habitat, but maps of occupied range may include some portions of it.

Omnivore: An animal whose diet consists of a mix of plant material and animals (i.e., insects or meat).

Phenology: The time when plants flower and bear fruit in response to climate and local weather patterns. Because Florida has highly variable seasonal and annual rainfall, the amount and distribution of fruiting plants is also highly variable.
**Population:** In this plan, the term population refers to all black bears living in Florida, as opposed to **subpopulation,** which are smaller groups of bears living and interacting in specific areas that, combined, make up the statewide population (see **Subpopulation** definition below).

**Potential Bear Habitat:** Areas with characteristics that make them more likely to have bears living there. As the name implies, however, potential bear habitat is not necessarily occupied by bears. The four characteristics of potential bear habitat are: 1) land cover type, 2) habitat size, 3) distance from high quality habitats, and 4) connectivity and size of large habitats across the landscape (see Appendix V).

**Primary Bear Range:** The portion of occupied range within Florida representing breeding range; containing documented evidence of consistent reproduction or the presence of female bears or cubs (mapped at the statewide scale).

**Project WILD:** An interdisciplinary conservation and environmental education program emphasizing wildlife. The program is designed for educators of kindergarten through 12th grade students. It capitalizes on the natural interest children and adults have in wildlife by providing hands-on activities that enhance student learning in all subject and skill areas.

**Secondary Bear Range:** The portion of occupied range in Florida where bears occur outside primary bear range; bears can be found consistently in secondary range but sightings of females or cubs are infrequent/inconsistent (mapped at the statewide scale).

**Social Carrying Capacity:** The upper limit of a population of wildlife based upon human society’s tolerance and acceptance of conflicts with wildlife.

**Subpopulation:** A grouping of wild black bears living in a specific area, often named for the large block of public land in which they live. For example, the Eglin subpopulation is named after Eglin Air Force Base, which comprises the main area on which most bears in the West Panhandle BMU reside. There are seven black bear subpopulations in Florida: Eglin, Apalachicola, Osceola, Ocala/St. Johns, Chassahowitzka, Glades/Highlands, and Big Cypress.

**Successional Sere:** Plant succession is the characteristic sequence of developmental stages in the composition of plant communities following a natural or human disturbance. A sere is one of those developmental stages.

**Suitable Habitat:** Habitat capable and large enough to support bears that is outside of towns or dense developments. Habitat patches surrounded by development that are so small as to preclude management would not be considered suitable habitat.
Sustainable: A statewide bear population that is healthy and able to persist over the long-term without the need for frequent intensive management actions.

Traversable: Lands with characteristics that allow movement of bears through them, but do not, in and of themselves, provide adequate habitat to sustain bears.

Umbrella Species: A species of animal that uses large natural areas of habitat containing many different kinds of plant and animal species. Thus, if habitat for the umbrella species is protected, habitat for the other species is protected as well.

Viable: Refers to either a population or subpopulation that contains an adequate number of individuals appropriately distributed to ensure a high probability of long-term survival, in spite of natural fluctuations in numbers, without significant human intervention.
CHAPTER 1: INTRODUCTION

The Florida black bear (Ursus americanus floridanus) is a unique subspecies of the American black bear (Ursus americanus) that historically ranged throughout Florida and the southern portions of adjoining states (Hall 1981, pg 451). Today, black bears occupy only a portion of their historic range in Florida (Figure 1). The State listed the black bear as Threatened in 1974.

Past and present human activity has impacted the Florida black bear population and the habitats upon which it depends. Black bear management has become increasingly complex with contentious issues surrounding human-bear interactions such as garbage and other human food attractants, feeding, and hunting. Human-bear encounters will likely continue to increase in number and intensity as both Florida’s human and bear populations grow and expand.

Therefore, managing bears requires understanding the interaction of biological and social components. A plan is needed to systematically address those concerns so that Florida’s citizens can live with and enjoy a healthy, sustainable bear population.

The large spatial requirements of bears, fragmented nature of the bear population, and increasing human development that leads to conflicts will play significant roles in the future of bears in Florida. In order to maintain a sustainable population of bears throughout Florida, we must provide adequate habitats, promote viable subpopulations, provide connections among subpopulations, manage human impacts, and influence human behavior. If a subpopulation drops below a certain level, it becomes increasingly susceptible to negative effects like inbreeding and environmental variability. Low bear subpopulations also reduce opportunities for people to enjoy observing them or their sign (i.e., tracks, scat). Therefore, staying above a certain lower population level is important from a biological, as well as a social perspective. There are also negative impacts if a population rises above a certain level. Increased negative human-

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3 Bolded terms are defined in the glossary.
Figure 1. Historic (pre-1800) and 2005 occupied bear range in Florida (from Simek et al. 2005).

bear interactions can result in a lower social acceptance of bears. This level of
tolerance, or **social carrying capacity**, refers to the maximum number of bears
that people will tolerate in an area (see Chapter 7: Social Impacts). In addition,
there is also a **biological carrying capacity** (see Chapter 7: Social Impacts),
which is the maximum number of bears that an area can support without
experiencing detrimental effects. High density deer populations can over-browse
their habitat; however, habitat quality is not strongly influenced by high bear
numbers. Rather, high bear densities can reduce litter size and cub survival and
displace bears into neighborhoods, increasing the likelihood of human-bear conflicts.

The exact point at which black bear populations reach biological and social
carrying capacity can vary by time and location depending on habitat availability
and quality, as well as public understanding and perception of bears. This level of
tolerance can be different for each year, region, and constituency. The impacts of
bears (both positive and negative) on humans and the benefits derived by people from bears results in the human tolerance of bears. Negative human-bear interactions still occur where bear populations are at low density; therefore, biological carrying capacity for bear populations may exceed the social carrying capacity. It is important to consider both the biological and social carrying capacity of an area when managing bears.

Determining social carrying capacity will involve economic, political, social, and biological input. Homeowners experiencing property damage from bears, for example, may conclude that bears have exceeded their social carrying capacity and therefore desire fewer bears. However, for the visitor traveling to Chassahowitzka Wildlife Management Area (WMA) hoping to see a bear, the current population level may be too low to provide sufficient viewing opportunities.

Management responsibility for Florida black bears falls largely on the Florida Fish and Wildlife Conservation Commission (FWC), but numerous agencies, organizations and individuals share responsibility for various aspects, such as habitat protection and management, resolution of human-bear conflicts, and education and outreach. While FWC may have much of the responsibility, many activities in this plan cannot be successfully accomplished without strong input and participation from partners.

Developing an integrated and comprehensive management plan requires broad thinking from several disciplines within the wildlife management field, and it must include input from members of the affected public (stakeholders). Significant stakeholder engagement and interaction has occurred and will continue to occur throughout these efforts. FWC recognized that diverse stakeholder involvement from the outset of the management planning process would provide balance and needed guidance. Given past stakeholder involvement in agency planning efforts, FWC agreed it was appropriate first to produce an internal draft while concurrently engaging with stakeholder groups referred to as the Technical Assistance Group (TAG). With completion of this draft plan, a comprehensive process for review and
comment was implemented with the public (see Preface: Creation of the Bear Management Plan).

This plan follows a format similar to other FWC management plans, including text on life history, population status and trends, and ecology; assessment of threats; conservation goals and objectives with recommended actions; an implementation strategy, and anticipated impacts. While this bear management plan is new, it builds on work others have done over the past few decades and considerable pre-work and scoping had been done through earlier FWC bear program efforts (GFC 1993, Eason 2003). The final, fully vetted Florida Black Bear Management Plan will serve as the blueprint for statewide black bear management. This plan provides a framework for local stakeholders to provide FWC with their input on managing bear populations, habitat, and human-bear interactions on a regional level.
CHAPTER 2: BIOLOGICAL AND MANAGEMENT BACKGROUND

Description

Merriam (1896) first described what he called the Everglades bear as a separate species, and suggested that its long skull and highly arched nasal bones distinguished it from other bears. Subsequent analysis by Hall and Kelson (1959) and Harlow (1961, 1962) identified the Florida black bear (*U. a. floridanus*) as one of 16 recognized subspecies of the American black bear and as one of three subspecies in the southeastern United States (Hall 1981). Although black bears are classified as *Carnivores* taxonomically because of their teeth and other skeletal characteristics, they are omnivorous in their diet, behavior, and ecological role.

Black bears are large-bodied mammals with short tails, prominent canine teeth, and feet with short, curved, non-retractable claws on each of the five digits (Figure 2). Black bears walk with the entire sole of their feet touching the ground. Bears use a pacing stride, where both legs on the same side move together so that the hind foot is placed in or slightly in front of the track of the forefoot; the smaller (inner) toe occasionally does not register in the track. Eyes are small, and ears are round and erect. Pelage color is consistently black in Florida, but summer molting of guard hair may cause them to look brown. The muzzle is usually tan but may be darker; 25 to 33 percent of individuals in Florida possess a white chest blaze (FWC, unpublished data, 2004).
Adult (≥ three years old) male bears in Florida typically weigh 250 to 350 lbs (average = 270) and adult females weigh 130 to 180 lbs (average = 166) although with Florida’s long growing season and availability of calorie-rich human foods, bears can become larger. The largest bears on record in Florida are a 624 lb. male killed on a county road in Collier County and a 383 lb. female killed on a roadway in Liberty County.

**Reproduction**

Female bears in Florida become sexually mature at three to four years of age (Garrison 2004). Breeding occurs from mid-June to mid-August (Garrison 2004, Land et al. 1994) and coital stimulation is required in order to induce ovulation (Pelton 1982). Black bears experience delayed implantation, where fertilized eggs temporarily cease development after a few divisions, float free in the uterus and do not implant until late November or December (Pelton 1982). This adaptation allows bears to synchronize reproduction with annual food cycles. Lowered nutritional levels caused by poor acorn or berry production can result in delayed first breeding, decreased litter sizes, and increased incidence of barren females (Pelton 1982).

Reproductive females enter winter dens in mid- to late December and emerge in early to mid-April after a mean denning period of 100 to 113 days (Garrison 2004, Dobey et al. 2005). Actual gestation is 60 days, and cubs are born in late January to mid-February. Most studies in Florida (Dobey et al. 2005, Garrison 2004, Land et al. 1994) have documented an average litter size of approximately two cubs, although Garrison et al. (2007) documented greater productivity in Ocala National Forest (NF) in older females and females with previous litters. At birth, cubs weigh approximately 12 ounces and are partially furred but blind and toothless. Neonatal growth is rapid and cubs weigh six to eight pounds by the time they leave the den at about ten weeks of age. Cubs stay with their mother and may den with her the following year. Family dissolution usually occurs between May to July when cubs are 15 to 17 months old. Females generally form a home range overlapping their natal range (Moyer et al. 2006) while young males disperse to new areas.
**Subpopulation Density and Abundance**

Bears are solitary, reclusive and live at relatively low densities over large landscapes – characteristics that make a direct count of bears infeasible. However, mark-recapture techniques to estimate subpopulation abundance do not require direct counts, and are reliable and scientifically sound (Williams et al. 2002). Simek et al. (2005) used these techniques to estimate the densities of six bear subpopulations in Florida (Eglin, Apalachicola, Osceola, Ocala, St. Johns and Big Cypress). Based on genetic analyses (Dixon et al. 2007), this plan combined the Ocala and St. Johns subpopulations into one subpopulation (Ocala/St. Johns). The density estimate from each subpopulation was then extrapolated across the primary ranges of that subpopulation to estimate bear abundance in the primary range. Subpopulation abundance estimates ranged from 82 bears in Eglin to 1,025 bears in Ocala/St. Johns (Simek et. al. 2005; Table 1). The estimate of bear abundance in the five subpopulations, with 95% statistical confidence, was 2,628 bears (+118).

Chassahowitzka and Glades/Highlands subpopulations may be too low to estimate based on mark-recapture models, but long-term research suggests that the Chassahowitzka subpopulation has about 20 bears (Orlando 2003, Brown 2004) and that the Glades/Highlands subpopulation contains approximately 175 bears (J. Cox, University of Kentucky, 2009, personal communication). Adding these approximations to the Simek et al. (2005) estimates provided a statewide estimate of 2,705 to 2,941 bears in 2002. This estimate was for bears in primary range only; it does not include bears in secondary range. Bears consistently occupy secondary range, but at a lower and more variable density than primary range, which makes estimating their abundance difficult. Population estimates of Florida black bears outside the state are 50 to 100 for Alabama (Hristienko et al. 2010) and 700 to 800 for southern Georgia (Greg Nelms, Georgia Department of Natural Resources, 2009, personal communication).
Table 1. Estimates of density and abundance for five Florida black bear subpopulations in primary range in 2002 extrapolated from bear density estimates (from Simek et al. 2005).

<table>
<thead>
<tr>
<th>Subpopulation</th>
<th>Density (acres/bear)</th>
<th>Abundance Estimate (Mean)</th>
<th>Abundance Estimate (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apalachicola</td>
<td>4,140</td>
<td>568</td>
<td>443–693</td>
</tr>
<tr>
<td>Big Cypress</td>
<td>1,884</td>
<td>697</td>
<td>513–882</td>
</tr>
<tr>
<td>Eglin</td>
<td>5,985</td>
<td>82</td>
<td>63–100</td>
</tr>
<tr>
<td>Ocala/St. Johns</td>
<td>1,029/3,699</td>
<td>1,025</td>
<td>825–1,225</td>
</tr>
<tr>
<td>Osceola</td>
<td>1,767</td>
<td>256</td>
<td>201–312</td>
</tr>
</tbody>
</table>

Habitat Use and Home Range

Black bears are adaptable and inhabit a variety of forested habitats. Habitat selection by bears is a function of nutritional needs and spatially fluctuating food sources. The Florida black bear thrives in habitats that provide an annual supply of seasonally available foods, secluded areas for denning, and some degree of protection from humans. Harlow (1961) described optimal bear habitat in Florida as “a mixture of flatwoods, swamps, scrub oak ridges, bayheads and hammock habitats, thoroughly interspersed.”

Self-sustaining and secure subpopulations of bears in Florida are typically found within large contiguous forested tracts that contain understories of mast or berry-producing shrubs or trees. Large parcels of public land with habitats as diverse as the seasonally inundated pine flatwoods, tropical hammocks and hardwood swamps of the Big Cypress National Preserve (Maehr et al. 2001) and the xeric sand pine-scrub oak community growing on relic sea dunes in Ocala NF (McCown et al. 2009) support large and healthy subpopulations of bears. Smaller subpopulations are associated with less expansive habitats that tend to be highly fragmented and tightly bound by urban areas and highways (Larkin et al. 2004).

Variation in home range size and shape is influenced by the timing and location of nutritional resources, subpopulation density, reproductive status, as well as human influences such as habitat fragmentation. Female black bears select a home range based on availability of resources with smaller home ranges found in more
optimal habitat. Male black bears establish a home range in relation to the
presence of females (Sandell 1989) and their home ranges are usually three to eight
times larger than those of females (Pelton 1982). Florida black bears exhibit a wide
variety of home range sizes based on the diversity of habitats and habitat quality
found in their location (Table 2).

Female bears with cubs have smaller summer home ranges than females
without cubs but much larger fall home ranges than females without cubs (Moyer et
al. 2007). The larger fall home range is a response to the nutritional needs of
rapidly growing cubs. Genetically related females establish annual and seasonal
home ranges closer to each other than do unrelated females, and females with
overlapping home range cores are more closely related than females without
overlapping home range cores (Moyer et al. 2006).

Bears in natural habitats are generally most active at dawn and dusk but
occasionally make extensive movements during daylight hours, especially during
fall when bears consume large quantities of food. Black bears daily caloric intake
can increase from an average of 5,000/day to 20,000/day in fall (Jonkel and Cowan
1971). Bears that live close to urban and suburban areas tend to be more active at
night. Dispersing males and bears seeking food may travel extensively. A two-
year-old male bear was documented moving a minimum of 87 miles from the
vicinity of Naples to Lake Placid, Florida (Maehr et al. 1988). Maehr et al. (1988)
and Moyer et al. (2007) noted enlarged home ranges and more extensive movements
by females during a year in which severe drought significantly limited the
availability of food.

**Food Habits**

Although members of the Order Carnivora, black bears evolved as omnivores
at latitudes and under climate regimes that caused dramatic fluctuations in the
seasonal availability of food. As a result, even bears in Florida exhibit an annual
cycle of feasting and fasting. In fall, bears wander widely and forage extensively in
order to accumulate enough energy in the form of fat to survive the winter. Adult
Table 2. Annual home ranges of female Florida black bears within the range of the subspecies.

<table>
<thead>
<tr>
<th>Location</th>
<th>Annual Home Range (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile, AL</td>
<td>2,989</td>
</tr>
<tr>
<td>Ocala NF, FL</td>
<td>5,062</td>
</tr>
<tr>
<td>Wekiva River Basin, FL</td>
<td>6,178</td>
</tr>
<tr>
<td>Chassahowitzka NWR, FL</td>
<td>6,178</td>
</tr>
<tr>
<td>Osceola NF, FL</td>
<td>7,488</td>
</tr>
<tr>
<td>Okokanokee NWR, GA</td>
<td>13,811</td>
</tr>
<tr>
<td>Big Cypress National Preserve, FL</td>
<td>14,106</td>
</tr>
<tr>
<td>Eglin Air Force Base, FL</td>
<td>21,619</td>
</tr>
</tbody>
</table>

a. Edwards 2002  
b. McCown et al. 2004  
c. Roof and Wooding 1996  
d. NWR = National Wildlife Refuge  
e. Orlando 2003  
f. Scheick 1999  
g. Dobey et al. 2005  
h. Land et al. 1994  
i. Stratman 1998

Bears may increase their body weight by 25 to 40 percent in fall (Jonkel and Cowan 1971). In winter, the consumption of food by bears is greatly reduced and reproductive females may spend many weeks in the natal den with little or no additional nutrition.

Bears are opportunistic foragers, taking advantage of seasonally abundant/available fruits, nuts (especially acorns), insects, and increasingly, anthropogenic (produced by humans) foods such as garbage and pet, bird and livestock feed. Because of natural fluctuations in phenology, a food item that is very abundant one year may not be available at all the following year. Given the nonspecific food habits of the Florida black bear and the diversity of habitats in the state, the list of food items consumed is lengthy (Maehr and DeFazio 1985). However, approximately 80 percent of the natural bear foods in Florida are plant material (Maehr and DeFazio 1985). Although 66 different plant species have been identified in bear diets, the fruits and fiber of saw palmetto are important throughout Florida and throughout the year (Maehr et al. 2001). Insects make up around 15 percent of Florida black bear diets, usually in the form of colonial insects.
(e.g., ants, termites) and beetles (Maehr and Brady 1984). The remaining five percent of a typical bear diet in Florida is animal matter, which includes medium-sized mammals like raccoons, opossums, and armadillos as well as small livestock and white-tailed deer. Deer in Florida black bear diets ranges between zero and three percent (Land et al. 1994, Maehr and Brady 1982, Maehr and Brady 1984, Maehr and DeFazio 1985, Roof 1997, Dobey et al. 2005). While black bears will prey on deer fawns, most studies have shown bears are opportunistic rather than active predators and that animal matter in their diet typically comes from scavenging dead animals (Pelton 1982).

**Mortality**

Aside from other bears, adult Florida black bears have few natural predators. Adult males opportunistically kill cubs and occasionally kill and eat denning adult females and their young (Garrison et al. 2007). Most mortality occurs from birth to age one year and can exceed 60 percent (Garrison et al. 2007). Annual female survivorship typically exceeds 90 percent while that of males is 15 to 20 percent lower (Hostetler et al. 2009, Wooding and Hardisky 1992). Males experience lower survival rates because they have larger home ranges and are more mobile which exposes them to greater risks especially to collisions with vehicles (McCown et al. 2009). The oldest wild bear documented in Florida was a 24-year-old female from the Apalachicola subpopulation.

Known mortality of adult bears is caused largely by humans (i.e., vehicle collisions, illegal kill, euthanasia). In highly fragmented habitat, bears have more frequent interactions with humans and human-related sources of mortality can be significant. Bears living near towns bordering Ocala NF experienced anthropogenic mortality of adult females at a level that would be unsustainable if the subpopulation was isolated (McCown et al. 2004). A similar rate would be catastrophic to the smaller, isolated subpopulations like Chassahowitzka or Eglin. Vehicle collisions are the leading known cause of death for bears in Florida (McCown et al. 2001). From 2000 to 2010, FWC documented an average of 136
bears hit and killed by vehicles each year. In 2002, vehicle collisions resulted in an
annual mortality rate of 4.8 percent on the overall statewide bear population.
Although vehicle collisions are a significant source of mortality, subpopulations
above 200 individuals with the reproductive characteristics common to most
subpopulations of Florida black bears (e.g., females reproduce at three years old and
produce two cubs every two years) can sustain a maximum annual mortality of up
to 23 percent (Bunnell and Tait 1980) without experiencing a decline. Many bears
survive collisions with vehicles but sustain significant injuries. Out of 92 juvenile
and adult bears captured in Ocala NF, twelve (13%) had one or more healed
skeletal injuries and/or primarily limb fractures that were likely a result of
vehicular collision (McCown et al. 2001).
Illegal killing (i.e., poaching) of bears is a regular, though relatively low,
mortality factor. Bears are illegally killed because of conflicts with livestock or
other property damage and for sale of bear parts on the black market. However, the
number of documented bears killed illegally in Florida each year is fairly low. From
1990 to 2010, FWC documented 147 illegally killed bears. Most studies involving
radio-collared bears in Florida (Wooding and Hardisky 1992, Land et al. 1994,
McCown et al. 2004) have reported the incidence of illegally killed bears to be
relatively low within large contiguous land parcels and substantially higher within
the fragmented habitats bordering urban and suburban areas.
FWC attempts to capture and euthanize any bears that could be a threat to
public safety. Between 2007 and 2011, FWC euthanized an average of 15 bears per
year due to the bear’s conflict behavior. Of the bears euthanized during that time
period, 68% were associated with seeking out unsecured garbage or other human-
provided food sources. Bears that are euthanized have typically lost all their
instinctive fear of people and in some cases approached people for food.
Serious diseases are uncommon in black bears. There are no reports of rabid
black bears in Florida and few from elsewhere. Demodetic mange resulting in
generalized hair loss to adult females is relatively common (78%; McCown et al.
2001) in one locale on the western border of Ocala NF. Few cases have been
observed in any other subpopulation in Florida although one case has been reported from outside of Florida (Foster et al. 1998). Demodetic mange is transmitted from sow to cub but males recover by their second year (Cunningham et al. 2007).

Twenty-five other species of parasites have been reported from Florida black bears including 17 nematodes, two trematodes, one protozoan, and five arthropods; however mortality caused by parasites has not been documented (Forrester 1992).

**Distribution**

Historically, black bears ranged throughout the southeastern United States with the Florida subspecies inhabiting all of Florida (except the lower Keys) and southern portions of Georgia and Alabama (Hall 1981). However, the distribution of the subspecies has been significantly reduced and fragmented to one subpopulation each in Alabama (near Mobile) and Georgia (in and around the Okefenokee National Wildlife Refuge [NWR]), and in Florida to seven subpopulations (Eglin, Apalachicola, Osceola, Ocala/St. Johns, Chassahowitzka, Glades/Highlands and Big Cypress; Figure 3). **Occupied range** occurs in 48 of the 67 Florida counties (Appendix I, Table 15) and covers approximately 17,500 square miles (10,000 square miles of primary range and 7,500 square miles of secondary range). Bears currently occupy 31 percent of their historic range in Florida, an expansion from the 17 percent occupied almost 20 years ago (GFC 1993). Early range maps were based on the subjective opinion of experienced biologists. Bear ranges were difficult to estimate with accuracy, as evidenced by the production of three differing bear range maps within a four year period (GFC 1975, GFC 1977, Brady and McDaniel 1978). Modern genetic analyses indicate that some individual bears must have persisted in the Eglin and Glades/Highlands subpopulations in the late 1970’s (Dixon et al. 2007), although perhaps there were so few that their range could not be mapped at that time. Despite the challenges in mapping historical bear distribution, all accounts support bears have been expanding their range since the mid-20th century (Frye et al. 1950, GFC 1975, GFC 1977, Brady and McDaniel 1978, Maehr and Brady 1985; Figure 4).
Figure 3. The range of the Florida black bear subspecies. Primary range is a contiguous area that has documented evidence of female bears and reproduction; whereas secondary range includes areas where bears consistently occur but has infrequent evidence of females or reproduction (Florida range map produced by FWC [Simek et al 2005]; Alabama and Georgia range maps by Clark et al. 2006).
Figure 4. Changes in black bear distribution in Florida from before 1800, 1978 (Brady and Maehr 1985), and 2005 (Simek et al. 2005).

Genetic Profile

Bears are particularly vulnerable to habitat loss and fragmentation because of their low numbers, low densities, large home ranges, low productivity, poor colonization abilities, and increased interactions with humans brought about by habitat alterations. Habitat fragmentation and degradation in Florida reduced what was once a single large population of bears that roamed virtually the entire state into several smaller, largely isolated subpopulations. Habitat fragmentation can lead to isolation of subpopulations and reduction of subpopulation size which may cause a decrease in genetic variation (Frankham 1996). Loss of genetic variation may reduce the ability of individuals to adapt to changes in the environment, cause inbreeding depression (Ebert et al. 2002), and increase the probability of extinction (Westemeier et al. 1998). Small, isolated subpopulations are at a higher risk of extinction than large, genetically-connected subpopulations.
Black Bear Management Plan  Chapter 2: Biological and Management Background

(Frankham et al. 2002). The impacts of inbreeding caused by small subpopulation size have been documented in black bears in Alabama, including kinked tail vertebrae, lack of external tails, cryptorchidism (lack of external scrotum or testes or 1 descended testicle), and a prolapsed rectum (Kasbohm and Bentzen 1998). Florida panthers (*Puma concolor coryi*) suffered similar defects prior to the release of eight Texas puma (*Puma concolor*) females into the Florida panther population. The symptoms of panther inbreeding included such congenital abnormalities as lethal heart defects, cryptorchidism, sperm malformation and lack of sperm motility. Subsequent to the genetic rescue efforts for the Florida panther, congenital abnormalities have decreased significantly (Mansfield and Land 2002; D. Onorato, FWC, personal communication, 2010).

An analysis of the genetic structure of Florida’s black bears indicated that many of the state’s bear subpopulations have been isolated from one another long and completely enough that genetic differentiation between them is measurable (Dixon et al. 2007). This plan combined the former Ocala and St. Johns subpopulations because the genetic analysis found the subpopulations to be genetically indistinguishable. Although the analysis treated Aucilla as a separate subpopulation, it is considered a part of the Apalachicola subpopulation in this document because the ranges are contiguous.

Genetic differentiation was most evident in the Chassahowitzka, Glades/Highlands, and Eglin subpopulations (Figure 5). Because the degree of genetic differentiation exceeded that which would be explained by distance alone, it was thought that isolation was caused by people (i.e., major highways block movements). Additionally, the genetic variation within the Chassahowitzka and Glades/Highlands subpopulations are among the lowest reported for any bear population (Dixon et al. 2007). These two smaller subpopulations were apparently so small that they were not mapped in 1978 (Brady and McDaniel 1978).
Figure 5. An unrooted phylogenetic tree depicting the genetic relationships among Florida black bear populations (from Dixon et al. 2007). Branch lengths correspond to genetic distance. Subpopulations are Eglin (EG), Apalachicola (AP), Aucilla (AU), Osceola (OS), Ocala (OC), St. Johns (SJ), Chassahowitzka (CH), Highlands/Glades (HG), and Big Cypress (BC).

Ecological Significance of Bears

Black bears are recognized as an umbrella species, a species whose habitat requirements encompass those of many other species. Given the large area requirements of bears and the diversity of habitats they use, many species are protected under the umbrella of bear conservation. The black bear has been an instrumental species in conserving natural habitats; the presence of bears is occasionally cited as justification for land protection efforts in Florida. Although land management activities specifically targeted to benefit bears are uncommon, such efforts would benefit many other species. Additionally, because bears are seed dispersers, they may have a significant impact on plant distribution, particularly for large-seeded species such as saw palmetto (Maehr 1984, Auger et al. 2002).

Land Use and Bear Populations

At the time of the first European contact in what is now Florida, it was estimated there could have been over 11,000 bears sharing their space with 350,000 native inhabitants (GFC 1993, Milanich 1995). With such low numbers, it is unlikely that humans had significant direct impacts on bears. Native Americans cleared forests for villages and agriculture and set fires to improve hunting and
increase security from hostile tribes (Milanich 1995). The cumulative effect of fires such as those set by Native Americans over many millennia, as well as those caused by lightning, created conditions that encouraged the growth of longleaf pine-wiregrass communities over other forest types (Meyers 1985, Cowell 1998).

Reported bear densities in longleaf pine-wiregrass habitat, such as in Apalachicola NF, (Simek et al. 2005) are much lower than most other forest communities in Florida. Although Native Americans modified their habitat and used bears for a variety of reasons, large-scale impacts to natural communities by humans did not begin until European settlement of Florida.

With the arrival of the Europeans, extensive clearing of Florida’s forests began in earnest and bear numbers likely declined. Most early settlers depended on agriculture for their livelihood and cleared vast areas of forest for farming and cattle production through the use of fire – a practice that reduced understory vegetation and negatively impacted bears. Additionally, bears were killed indiscriminately by residents for meat and fur, to protect livestock, and as vermin.

By the 18th century, enough commercial ports had been developed to permit the economic exploitation of the state’s longleaf and slash pine forests by the turpentine and timber industries. Construction of railroads in the 19th century increased the efficiency and reach of those industries. Because the lower surfaces of trees producing turpentine were coated in this highly flammable substance, they were extremely vulnerable to wildfire. To prevent fires, turpentine workers reduced understory vegetation manually and with controlled fires. Most commonly, after several years, turpentine production began to lag and the forest was cut for timber with a “cut out and get out” philosophy. Few attempts were made to replant forests and the debris created during logging operations provided fuel for devastating wildfires (Kendrick and Walsh 2007). Within wooded habitats, the open range laws in Florida meant cattle grazed extensively on forest understory and setting fires was a common practice by cattlemen to improve forage. Additionally, more than 62,000, mostly subsistence farms (only 10% had tractors), were operating by the early 20th century (US Census Bureau 2009). An estimate of bear numbers by the
first Commissioner of the short-lived Department of Game and Fish suggested the state's bear population may have declined to approximately 3,000 by 1915 (Jones 1915).

The impacts on the composition and structure of Florida's landscape from the practices associated with farming, ranching, and the naval stores industries were significant. Pyne (1982, p. 144) estimated that 105 percent of Florida was burned in one year (some areas burned more than once) by the combination of those land uses. Furthermore, by the early 20th century, “several hundred” mills processed turpentine from what must have been many thousands of turpentine camps and turpentine production in Florida eventually accounted for approximately 27 percent of the US total (Kendrick and Walsh 2007). Additionally, by 1940, approximately 24 percent of Florida's landmass was being farmed (US Census Bureau 2009). The result of these land-use practices was to promote an open landscape with a sparse understory that likely supported few bears and is plainly evident in the aerial photographs of Florida taken from 1935 to 1950 (SUS 2005). In 1950, Frye et al. (1950) considered bears to be “...still fairly well distributed throughout Florida....but nowhere numerous” and “...badly depleted.”

The end of the naval stores industry in the 1940s and the passage of Florida’s first mandatory statewide fence law in 1950 brought an end to frequent fires and open-pasture grazing. Those land-use changes had a noticeable effect on forest stand composition in the state. Additionally, rapid growth of the human population in Florida and the conversion of natural landscapes to roads and towns created fire breaks that reduced the frequency and extent of most fires. Analysis of the differences between present day and pre-settlement forests has revealed that present day forests have lower fire frequencies and a denser understory with greater shrub cover (Myers and Ewel 1990). Forests with this type of structure provide good habitat for bears.

The bear population was generally estimated at 500 to 1,000 in the 1960s and 1970s (Harlow 1962, Pelton and Nichols 1972, McDaniel 1974, Brady and Maehr 1985) with an estimate as low as 300 bears in 1974 (GFC 1974; Table 3). However
Table 3. History of published reports on Florida black bear numbers from 1700 to 2002. Note: Different methods with varying degrees of confidence were used to estimate populations over time; therefore a comparison of estimates among years may not be appropriate.

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimate</th>
<th>Source</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700</td>
<td>11,500</td>
<td>GFC 1993</td>
<td>Assumed density of bears statewide is equal to density found in a study area in Ocala National Forest</td>
</tr>
<tr>
<td>1914</td>
<td>3,051</td>
<td>Jones 1915</td>
<td>Surveyed state personnel on how many bears they thought might be in each county</td>
</tr>
<tr>
<td>1940</td>
<td>300</td>
<td>GFC 1940</td>
<td>Unknown</td>
</tr>
<tr>
<td>1950</td>
<td>500</td>
<td>Frye et al. 1950</td>
<td>Unknown</td>
</tr>
<tr>
<td>1961</td>
<td>530–860</td>
<td>Harlow 1961</td>
<td>Based on calculations using estimates of both legal and illegal kills</td>
</tr>
<tr>
<td>1962</td>
<td>800–1,000</td>
<td>Harlow 1962</td>
<td>Based on calculations using estimates of both legal and illegal kills</td>
</tr>
<tr>
<td>1969</td>
<td>1,000</td>
<td>USDOI 1969</td>
<td>Unknown</td>
</tr>
<tr>
<td>1971</td>
<td>500–600</td>
<td>GFC 1971</td>
<td>Unknown</td>
</tr>
<tr>
<td>1972</td>
<td>500</td>
<td>Pelton and Nichols 1972</td>
<td>Surveyed state game and fish personnel in the southeastern U.S.</td>
</tr>
<tr>
<td>1974</td>
<td>300</td>
<td>McDaniels 1974</td>
<td>Unknown</td>
</tr>
<tr>
<td>1977</td>
<td>500</td>
<td>East 1977</td>
<td>Unknown</td>
</tr>
<tr>
<td>1993</td>
<td>1,000–1,500</td>
<td>GFC 1993</td>
<td>Based on bear densities and habitat acreages calculated from several previously completed studies</td>
</tr>
<tr>
<td>1998</td>
<td>1,280</td>
<td>Bentzien 1998</td>
<td>Based on using bear densities and habitat acreages calculated from several previously completed studies</td>
</tr>
<tr>
<td>2002*</td>
<td>2,569–2,687</td>
<td>Simek et al. 2005</td>
<td>Estimated using mark-recapture models based on DNA collected from 2001 to 2003; densities from study areas were assumed to represent the density of bears within primary bear ranges in those areas</td>
</tr>
</tbody>
</table>

*2002 is the only population estimate with statistical confidence intervals.
the regrowth of forests, the exclusion of fire, and increased protection began to benefit bears. The extensive development that occurred in Florida during the latter half of the 20th century meant less available habitat and severe fragmentation of what remained. However, with reduced fire frequency, habitat conditions improved overall for bears in the remaining range. Bears were reported to occupy 50 of 67 Florida counties in fragmented, insular, and resident subpopulations by 1984 (Brady and Maehr 1985). GFC staff used previously documented densities and approximations of occupied range to estimate the statewide black bear population as 1,000 to 1,500 bears in the 1990s (GFC 1993, Bentizen 1998; Table 3).

The Florida Department of Transportation partnered with FWC to examine the effects of roads on bear populations across the state between 2001 and 2003. As part of this study, FWC mapped primary and secondary bear range in Florida (Figure 3). Primary range represents areas occupied by a relatively high density of resident bears and where breeding activity was documented. Secondary range represents areas where resident bears consistently occur, but at lower densities, with inconsistent evidence of breeding, and typically more fragmented habitat.

FWC set up study areas within the primary ranges of five of the seven bear subpopulations and estimated there were 2,569 to 2,687 bears (Simek et al. 2005, Appendix II). Because the estimate was only for bears in the primary ranges of five of seven subpopulations, this number was conservative and likely low. The remaining Florida subpopulations include bears in and around Chassahowitzka WMA and in Glades and Highlands counties. The Chassahowitzka subpopulation was estimated to be around 20 bears based on research conducted in Citrus and Hernando counties (Brown 2004, FWC, unpublished data, 2010). The Glades/Highlands subpopulation was estimated to be 175 bears based on data from an ongoing bear research project in this area (John Cox, University of Kentucky, personnel communication, 2010). A more formal population estimate will be produced from the Glades/Highlands study in 2013. With the addition of the
Chassahowitzka and Glades/Highlands subpopulation estimates, the most current estimate available of the statewide bear population in Florida is 2,705 to 2,941 bears (Simek et al. 2005).

Ideally, population estimates for long-lived species would be updated each generation. The Florida black bear has an average generation length of eight years (FWC, unpublished data, 2010), thus the 2002 population estimate is appropriate to use in this plan as a benchmark to measure population change over time. There are many indications that the number of Florida black bears and their range has continued to increase since the 2002 population estimate. FWC estimates at least two subpopulations are showing positive growth rates. Hostetler et al. (2009) estimated annual population growth of up to 10% in the Ocala/St. Johns subpopulation. However, the growth rate was partially offset by higher mortality along the perimeter than in the central portions of the Ocala/St. Johns subpopulation range. Dobey et al. (2005) estimated the Osceola subpopulation could have been growing up to 18% per year between 1995 and 1999. However, that growth was somewhat dampened because bears from Osceola NF were regularly traveling into neighboring Okefenokee NWR in Georgia. FWC also collects data annually on bear population trends in the form of bear-related calls from the public, bear captures, and vehicle-killed bears. Those data indicate the number of bears and their range is increasing in most areas. FWC has no data to indicate the statewide Florida black bear population is declining.

**Status, Management, and Hunting**

Regulations and the legal status of bears have changed many times over the past several decades (Table 4). Until the mid-1930s, bears were not assigned any official status and were unprotected throughout Florida (GFC 1935). The Florida Game and Fresh Water Fish Commission (GFC) classified bears as a fur-bearing animal and initiated the first regulated harvest season in 1936. GFC changed the bear to a game animal in 1950, which afforded new legal protections. After population assessments indicated further decline in bear numbers, the bear hunting
Table 4. Chronological history of events regarding Florida black bear management.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1913</td>
<td>Florida creates a short-lived Department of Game &amp; Fish (DGF).</td>
</tr>
<tr>
<td>1915</td>
<td>DGF estimated bear’s have a “value” of $25 each; DGF is abolished (Jones 1915).</td>
</tr>
<tr>
<td>1915–1925</td>
<td>Local laws were enacted for protection of game and freshwater fish.</td>
</tr>
<tr>
<td>1925</td>
<td>Law passed creating Department of Game and Fresh Water Fish; leaving in effect 130 local laws which conflicted with general law.</td>
</tr>
<tr>
<td>1927</td>
<td>Law from 1925 rewritten to change Department into a Commission of Game and Fresh Water Fish (GFC); all local laws are repealed.</td>
</tr>
<tr>
<td>1931</td>
<td>Chapter 15721 of the Commission of GFC Laws – Local Law of Volusia County makes it unlawful to kill or take bears.</td>
</tr>
<tr>
<td>1936</td>
<td>The bear is defined as a “fur-bearing animal” permissible for harvest between December 1st – March 1st with no bag limit.</td>
</tr>
<tr>
<td>1945</td>
<td>Apalachicola WMA opens 2 consecutive 3-day bear hunts held Nov. 18–23; only one bear killed.</td>
</tr>
<tr>
<td>1947–1948</td>
<td>Apalachicola WMA bear hunt extended to 6 3-day hunts with 3 bears taken during 1947 and none in 1948. One and 2 bears, respectively, are taken on the Ocala WMA.</td>
</tr>
<tr>
<td>1950</td>
<td>GFC defines bears as “Protected Fur-bearing Animals” in NFs, WMAs and Eglin Field Military Reservation and “Unprotected Fur-bearing Animals” elsewhere. In 1950, the bear is designated as a game animal with no bag limit and harvest dates coinciding with deer season statewide. Special GFC managed hunts continue on Ocala WMA (1 bear bag limit) and Apalachicola and Osceola WMAs (2 bear bag limit)</td>
</tr>
<tr>
<td>1951</td>
<td>Definitions changed in Wildlife Code of the State of Florida for GFC; bears defined as a Game Animal.</td>
</tr>
<tr>
<td>1958–1961</td>
<td>Bear hunting was closed on Eglin WMA in 1958, Big Cypress WMA in 1960, and Ocala NF in 1961</td>
</tr>
<tr>
<td>1969</td>
<td>Special managed bear hunts on Tomoka WMA began during 1969–1970 hunting season</td>
</tr>
<tr>
<td>1971–1972</td>
<td>GFC closes hunting season statewide except in Baker Co. and Columbia Co. and during GFC managed hunts on Apalachicola NF, Osceola NF (or by special permit; Rule 16E-10.08 allowed Commission Director to issue special permits to run or chase bears during closed seasons); Tomoka WMA hunt discontinued in 1972</td>
</tr>
<tr>
<td>1974</td>
<td>GFC created definition and list of Threatened Species under Chapter 16E-3 of the Florida Wildlife Code and includes bears as a Threatened Species</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>1977</td>
<td>FAC Rule 16E-10.01, general methods of taking game changed to include the prohibited taking of bear cubs and female bears with cubs.</td>
</tr>
<tr>
<td>1978</td>
<td>Threatened designation removed from bears in Baker and Columbia counties and Apalachicola NF.</td>
</tr>
<tr>
<td>1979</td>
<td>Listed Species Rules 39-27.01 to 39-27.05 established, including general prohibitions on harming or killing a listed species (GFC 1979).</td>
</tr>
<tr>
<td>1990</td>
<td>USFWS petitioned to list the Florida black bear as Threatened under the Endangered Species Act (Bentzen 1990).</td>
</tr>
<tr>
<td>1991</td>
<td>USFWS determined threatened status is “warranted but precluded by other higher priority listing actions” (Bentzen 1991).</td>
</tr>
<tr>
<td>1993</td>
<td>GFC recommended closing bear hunting statewide; creates management strategy for bears (GFC 1993); 1993–1994 season on Osceola NF closed.</td>
</tr>
<tr>
<td>1994</td>
<td>GFC closed remaining bear hunting seasons statewide.</td>
</tr>
<tr>
<td>1997</td>
<td>Conserve Wildlife Tag featuring a bear was created by GFC and the Wildlife Foundation of Florida; portion of funds go to bear conservation.</td>
</tr>
<tr>
<td>1998</td>
<td>Florida Constitution Revision 5 passed to combine staff from the Marine Fisheries Commission, elements of the Divisions of Marine Resources and Law Enforcement of the Florida Department of Environmental Protection and GFC to become the Florida Fish and Wildlife Conservation Commission (FWC); USFWS finds “listing of the Florida black bear is not warranted at this time” (Bentzen 1998). Conservation organizations sue USFWS; Bentzen (1998) estimates 1,280 bears in Florida.</td>
</tr>
<tr>
<td>2002</td>
<td>FWC passed wildlife feeding restriction (F.A.C. 68A-4.001(3)) that makes it illegal to intentionally or unintentionally feed bears where they can cause a public nuisance.</td>
</tr>
<tr>
<td>2004</td>
<td>Court ordered USFWS to re-examine the inadequacy of 1998 regulatory mechanisms. Service determined “existing regulatory mechanisms are not inadequate so as to warrant listing the Florida black bear under the Endangered Species Act” (Kasbohm 2004).</td>
</tr>
<tr>
<td>2005</td>
<td>FWC released report assessing the impacts of roads on bears, including population estimates for bears in six subpopulations (Simek et. al. 2005).</td>
</tr>
<tr>
<td>2007</td>
<td>FWC creates Bear Action Team to draft statewide bear management plan with assistance of a team representing stakeholder groups.</td>
</tr>
<tr>
<td>2010</td>
<td>Draft 5.1 of bear management plan opens for public review and comment; Florida’s Endangered and Threatened Species rule FAC 68A-27 approved; Draft 5.1 revised to comply with FAC 68A-27.</td>
</tr>
</tbody>
</table>
Biological status review indicates the bear does not meet any criteria for high risk of extinction; Commission agrees with staff recommendation to remove bears from State Threatened Species list in June 2011; Draft 6.1 of bear management plan and rule open for public review and comment Nov. 10, 2011 to Jan. 10, 2012; Draft plan presented to Commission Feb. 9, 2012; Plan revised and Draft 7.0 was opened for public comment April 13 to June 1, 2012; Plan revised and Draft 7.1 was posted on the FWC website June 11, 2012; Plan returned to Commission for final review June 27, 2012.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011–2012</td>
<td>Biological status review indicates the bear does not meet any criteria for high risk of extinction; Commission agrees with staff recommendation to remove bears from State Threatened Species list in June 2011; Draft 6.1 of bear management plan and rule open for public review and comment Nov. 10, 2011 to Jan. 10, 2012; Draft plan presented to Commission Feb. 9, 2012; Plan revised and Draft 7.0 was opened for public comment April 13 to June 1, 2012; Plan revised and Draft 7.1 was posted on the FWC website June 11, 2012; Plan returned to Commission for final review June 27, 2012.</td>
</tr>
</tbody>
</table>
maximum biological carrying capacity so they would be “resilient against
decimating factors” (GFC 1993, p. 14).

The U.S. Fish and Wildlife Service (USFWS) was petitioned to list the Florida
black bear under the Endangered Species Act in 1990 (Kasbohm 2004; Table 4). Factors considered for listing the species were: habitat destruction, road mortality, hunting, and poaching. USFWS reviewed all available scientific information on the Florida black bear and considered the threats were moderate to low magnitude for the species statewide. USFWS concluded that Federal listing was warranted but precluded by higher priority species (Kasbohm 2004). USFWS determined the Florida black bear did not merit Federal listing as a threatened or endangered species in 1998 (Kasbohm 2004). The decision not to list the Florida black bear was challenged in court in 1999, and the USFWS was ordered to clarify and further determine whether the “inadequacy of existing regulatory mechanisms” warranted listing. USFWS concluded existing regulatory mechanisms were adequate and that “the positive changes in the bear’s situation from 1992 to 1998 supported a ‘not warranted’ finding,” and that “the overall effects of habitat loss and isolation, roadkill, and hunting would not likely result in the bear becoming endangered in the foreseeable future” and therefore did not warrant listing the Florida black bear under the Endangered Species Act in 2004 (Kasbohm 2004).

FWC passed Florida’s Endangered and Threatened Species rule (68A-27, Florida Administrative Code [F.A.C]) to conserve and manage rare species in Florida in September 2010. The new rule required that biological status reviews (BSRs) be completed on all the State’s species that were classified as Threatened or Species of Special Concern. The BSR assessed the Florida black bear population based on available data on abundance, trends, extent of range, and the results of quantitative analyses and indicated that the bear did not meet any of the listing criteria for threatened species status (Appendix II). The initial BSR findings were reviewed by five independent scientists who have experience in black bear research or management. While peer reviewers had differing opinions on the details included in the preliminary BSR, all agreed that the bear did not meet any of
Florida’s new listing criteria (Appendix II). The final report of the BSR was presented to the Commission for their consideration in June 2011. The Commission approved staff’s recommendation to delist the black bear in June 2011; however the bear would remain a threatened species until a management plan is approved.

Management actions and a changing landscape have allowed bear subpopulations to rebound in many parts of the state. Florida’s bear population has tracked bear population trends in the rest of the southeastern United States (Maehr et al. 2001). In the mid-1900s, bear numbers were at their lowest points, and management was focused on recovering declining populations. As bear populations began to rebound, states struggled with the transition to manage increasing bear populations, which were often coupled with growing human populations. Currently, 32 of the 41 states with resident black bear populations have a regulated hunting season (Appendix IV, Table 17). Despite its common use as a management tool, bear hunting remains a complex issue in Florida requiring extensive stakeholder engagement. Because the purpose of this plan is to establish the conservation measures necessary to ensure that the bear does not meet the threatened criteria in the future, addressing the prospects of bear hunting is outside the plan’s scope. Any further consideration of bear hunting after the approval of this plan would require additional direction from the Commission. If directed by the Commission to consider hunting, FWC staff would explore options and develop proposals in an open and transparent process for further consideration.

Current management efforts in Florida include continued habitat conservation, documentation of population parameters, reduction of vehicle-bear collisions, development of educational programs, response to human-bear conflicts, and coordination among stakeholders. Presently, management efforts are aimed at collaborating with all levels of government to develop solutions to human-bear conflicts. A primary focus is to reduce the level of negative human-bear encounters associated with garbage in residential and commercial areas. The need for public outreach and education regarding coexistence with black bears has become an increasingly important management issue.
CHAPTER 3: THREAT ASSESSMENT

Black bears in Florida face an array of threats that vary in their significance and intensity. Prior to the 1950s and wide-spread development, the greatest threat to bears was persecution and unregulated hunting, resulting in significant population decline and a restriction of bear range to a few, scattered and isolated areas. As development in Florida increased, habitat loss became a growing concern. Bear hunting became regulated in the early 20th century and more detailed conservation efforts were initiated in the 1970’s, including increased protections, more restrictive hunting regulations, and habitat protection (Table 4). Today, the greatest threat to the long term survival of Florida black bears is habitat loss and fragmentation, exacerbated by incompatible habitat management in areas where subpopulations are very small. Negative interactions with people and human-caused mortality are also important concerns for bear management.

Habitat loss and fragmentation have greatly impacted bears in Florida. Although bear numbers and range have rebounded, bears do not currently occupy all available habitat. Male bears travel widely, often through low quality habitat, however expansion of occupied range is driven by female movements. The loss of habitat and disconnections between large habitat patches caused by development and roads make occupying the high quality but unoccupied bear habitat, such as the Big Bend region, more difficult for bears. Increasing human development, including highways, reduces the ability of bears to travel between, or even find, isolated habitats.

Human population growth and expanding bear populations have led to increasing contact between people and bears. Many of these interactions are positive or neutral in outcome (e.g., sightings that lead to excitement or presence that leads to no response), but some lead to conflicts. FWC classifies the types of calls it receives from the public about bear interactions into categories based on the caller’s description (Figure 6). A substantial proportion of the calls refer to bears in the area, a yard, or up a tree (38%), which can typically be resolved when callers
follow the technical advice provided by FWC. Human-bear interactions have
increased considerably in recent years and negative encounters will continue to be a
challenging management issue and potential threat to bears and people (Figure 7).
Interactions with humans can lead to the death of the bear either through illegal
killing, vehicle collisions or euthanasia. Additionally, increasing frequency of
conflicts with bears can lead to the devaluation of bears as negative experiences
overshadow the respect and wonder most people initially have for bears. If current
trends in human-bear interactions continue, these issues may become the foremost
management challenge for bears in Florida.

Currently, direct mortality caused by humans is a chronic threat to bears but
does not appear to have much of a dampening effect on bear population growth (see
Chapter 2: Mortality). While recent levels of documented illegal kill and
Figure 7. Number of reports relating to bears received by the Florida Fish and Wildlife Conservation Commission from 1990 to 2010 (n = 25,249; one report may include several telephone calls).

euthanasia are low, collisions with vehicles accounted for approximately 81 percent (2,057 of 2,544) of known bear mortalities from 1990 to 2010 (Figure 8). Although the incidence of vehicle-killed bears has increased significantly through time, the impacts to subpopulations are relatively low. In 2002, 126 bears were killed on the state’s roadways. Based on bear population estimates for 2002, that level of vehicle-related mortality was equivalent to an annual mortality rate of approximately 4.8 percent for the statewide population, and varied from less than one percent in the Osceola subpopulation to ten percent for bears in Chassahowitzka (Brown 2004, Simek et al. 2005). Vehicle-collisions were particularly concentrated in the Ocala/St. Johns subpopulation, where approximately 44 percent (1,111 of 2,544) of the vehicle-killed bears in the state from 1990 to 2010 occurred (FWC, unpublished data, 2010). Despite this concentration, Ocala/St. Johns vehicle-related mortality equaled eight percent of overall annual mortality (Simek et al. 2005). While the
Figure 8. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year from 1990 to 2010 in Florida (n = 2,057).

2002 vehicle-related mortality rate in all subpopulations was below the maximum 23 percent total mortality level that most Florida black bear subpopulations can sustain without experiencing a decline (Bunnell and Tait 1980), continued increases of vehicle-related mortality can pose a major threat to fragmented and isolated subpopulations. While part of the trends in vehicle-caused mortality is attributable to increases in the volume of road traffic (Figure 9), it also is influenced by increasing trends in bear population numbers (Table 4).

Habitat degradation through incompatible land management has the potential to threaten bears in Florida. Bears are adaptive generalists and therefore well suited to use a variety of habitats, even those in change. However, large wildfires may temporarily remove forest cover and food sources bears need to survive.
Additionally, prescribed fire at frequent intervals or performed during winter seasons may decrease food production and cover for bears at the local level (Maehr et al. 2001). These impacts must be weighed against the greater threat related to the loss of functional fire-maintained ecosystems upon which numerous other species depend. Palmetto berry harvest for commercial purposes has the potential to remove important food sources for bears (Maehr et al. 2001), particularly in poor mast years. In isolation, these issues do not pose grave threats to the statewide bear population. However, these threats can lower the biological carrying capacity for bears in an area and when occurring in conjunction with each other or with other threats, they could have interactive negative effects for individual bear subpopulations.
CHAPTER 4: CONSERVATION FOCUS AREAS

Conservation Goal

The goal of a plan is the overarching aim and is intended to be general in nature without providing specific details or timeframes. The goal of this management plan is to:

Maintain sustainable black bear populations in suitable habitats throughout Florida for the benefit of the species and people.

A sustainable statewide bear population is healthy and able to persist over the long-term without the need for frequent intensive management actions. An important element to ensure genetic health over the long-term is to have interconnections among several subpopulations that would allow them to function as one large statewide population. Subpopulations should be distributed appropriately across the state in suitable habitats. Suitable habitats are areas large enough to support bears and are outside of towns and other densely developed areas.

FWC wants to keep bears in the areas where they now exist and work toward creating more functional landscape connections among them. It is important to note that the goal identifies management for the good of both the species and people. Therefore, FWC wants to strike the appropriate balance between what the species needs to exist in a viable state and what people need and gain from bears.

Objectives, Strategies, Actions, Research, Monitoring, and Resources

The objectives, strategies, actions, research, monitoring and resources subsections represent a consensus of FWC staff that developed this plan, with stakeholder input from TAG. There are four major objectives in this management plan: Population Conservation, Habitat Conservation, Human-Bear Conflict Management, and Education and Outreach. Each objective addresses a specific conservation focus area and is intended to be specific and measurable. The ten-year timeframe used in the objectives begins when the Commission approves this plan.
Strategies are the broad categories under which similar actions are grouped. Some objectives only have one strategy, while others have several. Actions are discrete and measurable, describing specific activities that will be taken to meet the objectives of the management plan. Research and Monitoring identifies actions that will fill information gaps or maintain information important for making management decisions.

FWC staff reviewed the actions within this plan and estimated which could be done with existing resources and which would need other resources. Other resources could come in the form of redirecting existing resources within FWC, or new resources that are not currently in place. While many staff and funds from across FWC participate at some level in bear management, there currently are not enough resources dedicated to bears to fully implement all of the actions in this management plan. Some of the actions identified in this plan have been occurring for many years; however, they could be enhanced with other resources.

**Bear Management Units**

Objectives of the Florida Black Bear Management Plan are designed to be statewide in nature; however, FWC recognizes the need to have actions that effectively address threats that can differ dramatically from one part of the state to another. In order to have a statewide plan that is flexible enough to accommodate for those differences, the state was divided into geographic areas known as **Bear Management Units (BMUs)**; Figure 10 which are centered on bear subpopulations. The statewide plan offers a framework under which the BMUs will manage bears. Those BMUs will allow FWC to manage bears based on the specific characteristics of both the bear and human populations that are unique to different areas of the state. Three of the four objectives have sub-elements that break down the measurable objectives by BMU.

As the plan progresses, currently separated subpopulations from two BMU’s may begin to interact and function as one large subpopulation. In that event, FWC would likely still manage the BMU’s separately because the bear subpopulation is
only one of several elements that vary between the BMUs. The North and Central BMUs, for example, have an active connection where the two subpopulations are clearly interacting with one another. However, the amount and distribution of human development in the North BMU is dramatically different than in the Central BMU. Human development and other differences between these two BMU’s lend themselves to different management approaches.
FWC created profiles for each of the seven proposed BMUs. The profiles depict the current subpopulation estimates, population and habitat information, bear-related reports and core complaints, vehicle-related mortality, and a summary of the threats to bears in each BMU. The profiles identify potential bear habitat and the amount of that habitat within conservation lands. Potential bear habitats are areas with characteristics that make them more likely to have bears living there. As the name implies, however, potential bear habitat is not necessarily occupied by bears. The four characteristics of potential bear habitat are: 1) land cover type, 2) habitat size, 3) distance from high quality habitats, and 4) connectivity and size of large habitats across the landscape (Hoctor 2006, Endries et al. 2009; see detailed description in Appendix V). Conservation lands were identified by Florida Natural Areas Inventory as lands managed for wildlife in public ownership or private ownership in easements or similar agreements in 2009. BMU profiles can be found at the end of Chapter 4.
Objective 1: Population Conservation

Maintain a sustainable statewide population of Florida black bears by:

- Maintaining a stable or increasing statewide population of Florida black bears;
- Maintaining subpopulations that are estimated to be above 200 individuals at or above their current levels (Table 5);
- Maintaining at least one subpopulation at or above 1,000 individuals;
- Increasing subpopulations that are estimated to be below 200 individuals; and
- Increasing genetic exchange among subpopulations.

FWC will manage for a statewide population of Florida black bears that is not at risk of extinction over the long term. Florida’s Endangered and Threatened Species rule (68A-27, F.A.C.) provides a detailed set of criteria by which species are evaluated to assess if they are at a high risk of extinction and subsequently need to be designated as State Threatened or a Species of Special Concern (see Appendix II). Of the five criteria, the Florida black bear is closest to meeting two factors relating to population size and trend (Criterion C; Appendix II). While the objective is to maintain or increase the statewide bear population, the larger subpopulations may need to be managed near the levels indicated in Table 5 as there is a finite amount of suitable habitat. In suitable habitat areas, bear subpopulations will likely be managed to reach their biological carrying capacity. In human-dominated areas, however, bears may be managed below biological carrying capacity to reduce human-bear conflicts, which may be closer to social carrying capacity (see Chapter 7: Social Impacts).

Cox et al. (1994) and Dixon et al. (2007) determined that each subpopulation should have at least 200 mature individuals to maintain genetic health and chances for survival over the long term. Therefore, for those subpopulations currently estimated to be below 200 individuals FWC will seek to increase bear numbers in that BMU to at least 200 mature individuals among which gene flow is possible. For those subpopulations that are currently above 200, FWC will manage at or
Table 5. Abundance estimates and minimum population objectives for each Bear Management Unit (BMU).

<table>
<thead>
<tr>
<th>Bear Management Unit (BMU)</th>
<th>Subpopulation Name</th>
<th>Abundance Estimate</th>
<th>Minimum BMU Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Mean&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>West Panhandle</td>
<td>Eglin</td>
<td>63–100</td>
<td>82</td>
</tr>
<tr>
<td>East Panhandle</td>
<td>Apalachicola</td>
<td>443–693</td>
<td>568</td>
</tr>
<tr>
<td>Big Bend</td>
<td>Chassahowitzka</td>
<td>12–28</td>
<td>20</td>
</tr>
<tr>
<td>North</td>
<td>Osceola</td>
<td>201–312</td>
<td>256</td>
</tr>
<tr>
<td>Central</td>
<td>Ocala/St. Johns</td>
<td>825–1,225</td>
<td>1,025</td>
</tr>
<tr>
<td>South Central</td>
<td>Glades/Highlands</td>
<td>150–200</td>
<td>175</td>
</tr>
<tr>
<td>South</td>
<td>Big Cypress</td>
<td>513–882</td>
<td>697</td>
</tr>
<tr>
<td>Statewide</td>
<td></td>
<td>2,207–3,440</td>
<td>2,823</td>
</tr>
</tbody>
</table>

<sup>a</sup> All subpopulations in BMUs were estimated in primary bear range by Simek et al. (2005), with the exception of subpopulations in Big Bend and South Central BMUs. The Big Bend BMU used two annual estimates as the population estimate range for the Chassahowitzka subpopulation in Hernando and Citrus counties (Brown 2004). The South Central BMU estimate for the Glades/Highlands subpopulation was based on field data from an ongoing bear research project in this area (Wade Ulrey, University of Kentucky, personnel communication, 2010).

<sup>b</sup> Mean estimates, calculated based on Simek et al. (2005), were not available for subpopulations in the Big Bend or South Central BMUs, so the average of low and high estimates were used.

<sup>c</sup> Minimum subpopulation levels are set at 200 or the subpopulation estimate mean (rounded to nearest 10), whichever is larger.

above the current mean subpopulation estimates (Table 5). The once-statewide bear population has been fragmented long enough that each subpopulation is genetically identifiable and has lowered genetic diversity (Dixon et al. 2007). Genetic health and persistence of subpopulations are increased when individual bears can move from one subpopulation to another. FWC is not seeking to preserve the genetic differences among subpopulations; rather, the objective is to achieve increased genetic diversity among all subpopulations by increasing interchange between subpopulations so that they can function effectively as a single statewide population (i.e., **metapopulation**). Recent genetic analysis identified bears from
the Ocala/St. Johns subpopulation within the Chassahowitzka subpopulation (FWC, unpublished data, 2010). It is unclear whether the Ocala/St. Johns bears moved into Chassahowitzka on their own or were released during FWC conflict management actions. While this example could be seen as a hopeful sign that dispersing bears in some areas might be able to increase genetic diversity naturally, a substantial increase in diversity may require management actions in some areas. Encroaching development and related human infrastructure likely will continue to impact bears in Florida for the foreseeable future. Vehicle collisions with bears has become more of a concern with the expanding bear population and increased traffic volumes. Between 2005 and 2010, 152 bears on average were killed annually by vehicles statewide, ranging from 141 in 2006 to 170 in 2007. Maintaining a statewide bear mortality database provides critical data to make informed decisions regarding issues such as development, road design and human-bear encounters. In response to increasing vehicle-related mortality, FWC will continue to cooperate with the Florida Department of Transportation (DOT) to provide solutions towards stabilizing or reducing vehicle-related wildlife deaths and increasing human safety. Wildlife crossing structures have proven very effective in reducing wildlife-vehicle collisions. McCollister and van Manen (2009) found underpasses reduced vehicle-related wildlife mortalities by 58% along a recently upgraded section of US Highway 64 in North Carolina. When 2-lane State Road 84 (i.e., Alligator Alley) was converted to 4-lane Interstate 75 in South Florida, 24 underpasses and associated fencing were installed to reduce wildlife-vehicle collisions. While the underpasses were designed primarily with Florida panthers in mind, many other species, including black bears, have been using those structures to safely cross the interstate (Foster and Humphrey 1995). Florida’s first wildlife underpass specifically for bear crossings was built in 1994 on State Road 46 and is reducing vehicle-related mortalities in this area. FWC and DOT have had good success in reducing vehicle collisions when fencing is used to help guide animals to cross under bridges and underpasses, as has been seen in many other areas (Forman et al. 2003). FWC will continue to provide minimum standards for road projects,
evaluate development projects on bear habitat, and develop effective alternative methods to reduce bear presence in areas prone to bear-vehicle strikes.

If larger bear subpopulations continue to grow at their current rates, at some point they may exceed what suitable habitat can support. There are several options to stabilize subpopulations. Strategies may include translocation to areas below the minimum population objective, reduction of understory vegetation to reduce habitat quality for bears or regulated hunting. Recent translocation projects have established new subpopulations in low density areas by capturing females with cubs before they emerge from their dens (Eastridge and Clark 2001, Clark et al. 2002, Benson and Chamberlain 2007). Another potential source for females could be to use other opportunities when FWC catches females without documented human-bear conflict behavior. A female bear captured inadvertently, for example, while attempting to capture another bear involved in a conflict could be translocated to an area with low bear densities. While not as successful as moving a female with dependent cubs, some of those females could become established in new areas. Additionally, orphaned cubs that have been rehabilitated for release can be released in areas with potential bear habitat but have a low density of resident bears (Stiver et al 1997). Releasing rehabilitated cubs into areas with low resident bear populations reduces the risk of mortality caused by other adult black bears (Beecham 2006).

**Research and Monitoring for Population Conservation**

Survival and reproduction should be tracked periodically to assess whether subpopulations are sustainable. Management measures should be implemented to ensure the bear subpopulation levels are maintained or increased where desired (Table 6). If the BMU subpopulation is significantly below the minimum population objective (i.e., objective is outside the estimate’s 95% confidence interval) actions such as habitat improvement should be considered to increase the subpopulation. Subpopulations should be monitored periodically to assess whether interchange (i.e., natural dispersal or resulting from management actions) has improved genetic
diversity where needed. Such research will be more important for the smaller
subpopulations. Occupied range should be updated periodically and can include
both FWC-generated data as well as public input.
Table 6. Strategies and actions involving the Population Conservation Objective, with estimates of resources available to implement the action, and associated timeframes for implementation.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Can be done</td>
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<tr>
<td></td>
<td></td>
<td>with</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>resources</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR requires</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>resources</td>
<td>2</td>
</tr>
<tr>
<td>1.1.1</td>
<td>Estimate population trend and update occupied range in each subpopulation every</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10 years.</td>
<td></td>
<td></td>
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<tr>
<td>1.1.2</td>
<td>Establish bear demographic parameters such as survival, fecundity and population</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>growth for each subpopulation.</td>
<td></td>
<td></td>
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<tr>
<td>1.1.3</td>
<td>Develop partnerships within each BMU to assist with monitoring distribution and</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>abundance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4</td>
<td>Maintain statewide database for bear vehicle collisions and other sources of mortality.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>1.1.5</td>
<td>Assess the current and anticipated future impacts of development, roads, and habitat</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>conditions upon bear subpopulations.</td>
<td></td>
<td></td>
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<tr>
<td>1.1.6</td>
<td>Update population viability analyses for all subpopulations using data from Actions</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.1.1 and 1.1.2.</td>
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Strategy 1.1: Collect data to monitor bear subpopulations.
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<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.7</td>
<td>Establish a minimum criterion for genetic diversity within individual subpopulations.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>1.1.8</td>
<td>Estimate degree of connectivity among all subpopulations statewide every 10 years.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Strategy 1.2: Manage bear subpopulations to maintain their numbers at or above current levels.**

| 1.2.1  | Determine the most significant needs of the bear subpopulations estimated to have less than 200 bears. | Other     |              |
| 1.2.2  | Augment bear numbers in subpopulations within BMUs that have less than 200 bears using bears from high-density subpopulations as donors. | Other     |              |
| 1.2.3  | Use habitat modification to increase bear numbers in selected subpopulations. | Other     |              |
| 1.2.4  | Reduce illegal killing of bears through education, incentives, increased enforcement, or additional regulations. | Existing  |              |
| 1.2.5  | Explore options to slow population growth in larger subpopulations, including the use of hunting and habitat modification. | Existing  |              |
### Table: Conservation Focus Areas

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.6</td>
<td>Monitor effectiveness of bear cub rehabilitation protocol, including rehabilitation facility compliance and rehabilitated cub survival.</td>
<td>Can be done with Existing resources: 2 2 2 2 2 2 2 2 OR requires Other resources: 0 0 0 0 0 0 0 0</td>
<td>2 2 2 2 2 2 2 2</td>
</tr>
<tr>
<td>1.2.7</td>
<td>Establish Black Bear Assistance Groups in each BMU and solicit local stakeholder input on bear population management activities.</td>
<td>Other</td>
<td>2 2 2 2 2 2 2 2</td>
</tr>
</tbody>
</table>
**Objective 2: Habitat Conservation**

Maintain habitat of sufficient quality, quantity, and connectivity to support the statewide population of Florida black bears in the Population Conservation Objective by:

- Maintaining habitat capable of sustaining a stable or increasing statewide population of Florida black bears;
- Maintaining habitat in at least one subpopulation capable of sustaining 1,000 or more individuals;
- Ensuring sufficient habitat to support subpopulations above 200 bears at current levels
- Ensuring sufficient habitat to support at least 200 bears in subpopulations currently below 200 bears; and
- Improving habitat connectivity to promote genetic exchange among subpopulations.

The Habitat Conservation Objective was designed to provide the habitat needed to support the Population Conservation Objective. Conservation actions are not likely to return black bears to their full historic range, but it is possible to improve the current situation. Ideally, each bear subpopulation in Florida would be large enough to be independently viable and interconnected by a network of habitat that would allow dispersal events often enough to maintain genetic health, thus operating similar to a metapopulation. Habitat management can affect population abundance by increasing habitat quality and occupied range or decreasing the opportunities for dispersal to other subpopulations. Habitat fragmentation in some areas will challenge conservation efforts to move beyond managing habitat only within occupied bear range to areas with the potential to link bear subpopulations.

Bear habitat usually is described as large, publicly owned forestlands because most subpopulations are centered on public lands, but it is important to acknowledge that bears occupy habitat regardless of ownership. Bear habitat can be defined in a number of ways. Occupied range is defined as the areas where bears
consistently occur, so by definition it is capable of sustaining bears at some scale even if the land-use types are not normally considered bear habitat. For example, bears regularly occur in residential neighborhoods in several towns near Wekiwa Springs State Park because scattered woodlots and human-provided foods offer adequate food, water, and shelter that define an area as habitat. Such “urban bears” cause many of the human-bear conflicts. FWC can identify areas beyond whether they are simply occupied by bears, but rather, whether the area they occupy is suitable. FWC intends to manage bears at their biological carrying capacity in suitable habitat, whereas management efforts in human-dominated areas will be influenced more by social carrying capacity that may keep bear subpopulations below their biological carrying capacity (see Chapter 7: Social Impacts).

There are many private and commercial land uses that can provide suitable bear habitat, including forestry and agriculture. Managed lands can increase the amount of habitat diversity that is preferred by bears. Timber harvests can benefit bears by offering a diverse suite of food and cover associated with multiple stages of forest growth (Clark et al. 1994, Jones and Pelton 2003). Row crops such as corn and wheat are common foods in bear diets in the southeastern US (Maddrey 1995, Maehr et al. 2001, Benson and Chamberlain 2006). Large cow-calf operations that have a mix of pasture and woodlands provide important bear habitat in south central Florida (Wade Ulrey, University of Kentucky, unpublished data, 2010).

Suitable habitat can include private or commercial lands with uses compatible with wildlife, private lands under some type of conservation easement, government-owned land managed for wildlife, or even undeveloped and unmanaged lands that become bear habitat by default. Bear conservation efforts likely will rely on suitable habitat in all ownership types, including land management regimes that provide suitable bear habitat but are not enrolled in official agreement or easement programs. At this time, however, we do not have an adequate measure of those lands. However, we can measure potential bear habitat and conserved lands (i.e., government-owned land managed for wildlife and private lands under a
conservation easement) as maintained by the Florida Natural Areas Inventory (FNAI; Table 7).

To identify BMUs with higher priority needs for bear habitat, Table 7 compares the area needed to sustain the minimum population objective with the estimated density of the bear subpopulation in current occupied range (Simek et al. 2005), the amount of potential bear habitat, and the amount of that habitat that exists on conserved lands (FNAI 2009). Potential bear habitat meets or exceeds the amount of habitat needed to support the minimum bear population objective in each BMU (Table 7). While the Central and South Central BMU’s conserved lands exceed the total acreage necessary to support the minimum population objective, those areas may still need habitat connections to ensure long term persistence of bears in the BMU. Additionally, some areas (e.g. Big Bend BMU) have sufficient potential bear habitat on conservation lands but most of it is unoccupied by bears.

Defining a BMU-specific habitat objective is complicated because it relies on estimates of occupied range and density as correlates of what bears are actually doing. Occupied range can only be measured across the state imprecisely and at a large scale, therefore the current occupied range (Figure 1) is an over-estimate because it includes towns and other land-use types that, at a small scale, are not actually occupied by bears. For this reason, occupied bear range should be considered a general, large-scale representation of the extent of occurrence of the species in Florida. The only available estimates of bear densities were calculated from high quality, protected habitat within primary bear range. However, accurate density estimates for secondary range are not possible given the fragmented nature and variability of both habitat and bear densities in this range type.

The Habitat Conservation Objective of this plan seeks to conserve suitable bear habitat (i.e., areas both capable of maintaining bears and desirable from a management perspective) and promote connectivity between subpopulations. Helping bears re-colonize unoccupied habitat will support both the Population and Habitat Conservation Objectives. Whether an area is occupied by bears is often
Table 7. Area needed to meet the minimum population objective, potential bear habitat, potential bear habitat predicted to remain in the year 2020, and potential bear habitat in Conservation Lands for each Bear Management Unit in Florida.

<table>
<thead>
<tr>
<th>Bear Management Unit</th>
<th>Area to support minimum population objective&lt;sup&gt;a&lt;/sup&gt; (acres)</th>
<th>Area of Potential Bear Habitat&lt;sup&gt;b&lt;/sup&gt; (acres)</th>
<th>Area of Potential Bear Habitat predicted to remain in the year 2020&lt;sup&gt;c&lt;/sup&gt; (acres)</th>
<th>Area of Potential Bear Habitat in Conservation Lands&lt;sup&gt;d&lt;/sup&gt; (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Panhandle</td>
<td>1,198,461</td>
<td>1,887,021</td>
<td>1,832,956</td>
<td>723,051</td>
</tr>
<tr>
<td>East Panhandle</td>
<td>2,359,856</td>
<td>4,279,835</td>
<td>4,241,027</td>
<td>1,229,916</td>
</tr>
<tr>
<td>Big Bend</td>
<td>549,809</td>
<td>1,625,766</td>
<td>1,589,627</td>
<td>478,042</td>
</tr>
<tr>
<td>North</td>
<td>457,145</td>
<td>1,741,602</td>
<td>1,689,505</td>
<td>411,541</td>
</tr>
<tr>
<td>Central</td>
<td>1,062,553</td>
<td>3,531,133</td>
<td>3,376,929</td>
<td>1,310,191</td>
</tr>
<tr>
<td>South Central</td>
<td>580,698</td>
<td>2,478,299</td>
<td>2,412,166</td>
<td>883,270</td>
</tr>
<tr>
<td>South</td>
<td>1,322,014</td>
<td>1,606,476</td>
<td>1,563,962</td>
<td>1,173,756</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,530,537</td>
<td>17,150,132</td>
<td>16,706,172</td>
<td>6,209,766</td>
</tr>
</tbody>
</table>

<sup>a</sup> Minimum Population Objectives are listed in Table 5.

<sup>b</sup> Potential bear habitat are areas with characteristics that make them more likely to have bears living there. As the name implies, however, potential bear habitat is not necessarily occupied by bears. The four characteristics of potential bear habitat are: 1) land cover type, 2) habitat size, 3) distance from high quality habitats, and 4) connectivity and size of large habitats across the landscape (see Appendix V).

<sup>c</sup> The area of Potential Bear Habitat was reduced in areas where it was predicted to be converted to development in the year 2020 identified in Zwick and Carr (2006).

<sup>d</sup> Conservation Lands include publicly-owned conservation lands as well as easements and other less-than-fee private properties in conservation identified by Florida Natural Areas Inventory as managed areas in 2009.
a product of distance from currently occupied habitat and management more than ownership. Maintaining and linking bear subpopulations will require quality habitat of sufficient quantity and in the right areas. To successfully accomplish the Habitat Conservation Objectives, occupied bear habitat cannot be restricted to public lands; bears must be able to live on and traverse private lands. Potential bear habitat exists in large quantities on private lands, therefore FWC must work with private landowners to assist and encourage them to continue the management practices that are benefiting bears. FWC can provide landowners with habitat management information for creating favorable or unfavorable bear habitat, depending on the landowner’s interests. In areas prone to human-bear conflicts where habitat structure and spatial positioning are exacerbating the problem, for example, habitat management techniques should be employed to minimize negative impacts. Techniques such as frequently clearing or burning a perimeter area surrounding the developed area could be employed. FWC can identify ways to make the presence of bears a benefit rather than a liability for landowners. Landowner incentive programs that can be used to establish or manage quality bear habitat, from short term cost-share agreements to perpetual conservation easements, can be conveyed through FWC’s Landowner Assistance Program (LAP; see Private Landowners in Education and Outreach Objective).

FWC and its partners must continue to proactively engage private landowners and encourage land-use practices compatible with suitable bear habitat. Interested landowners may benefit by participation in programs that retain their desired use of the property while restricting or mitigating future development potential. FWC and its partners should use and expand on programs that assist private landowners in continuing to use their lands in ways that result in suitable bear habitat, with an eye for bringing multiple landowners together around a common purpose of habitat connectivity. Vital to the success of this objective is cooperation from private landowners, especially regarding the use of conservation agreements, easements, conservation and mitigation banks, less-than-fee simple, and fee simple acquisition. Areas under public management or conservation easements can be mapped, but it is
equally important to identify how much additional privately-owned lands are
currently managed under suitable habitat conditions within each BMU.
Habitat that provides important resources for bears regardless of ownership
needs to be mapped in each BMU. Similarly, important corridors with suitable
habitat must be identified and efforts made to work with landowners for mutually
beneficial land management practices. Existing bear habitat and compatible land
management regimes need to be evaluated and ranked for their quality and
suitability for bears. A monitoring protocol for habitat quality should be established
to assist interested landowners.

The bear is often identified as an umbrella species for many conservation efforts
because a diverse array of wildlife and plant species benefit when protected habitat
is expansive enough to allow bears to persist in an area. Maintaining a diversity of
habitat types over extensive acreage is important because it provides black bears
with the nutritional requirements over all seasons. An important element in this
regard is identification of a regional conservation vision (Keddy 2009) and
coordination with other large-scale conservation efforts. For example, habitats
needed for bears overlap heavily with those needed for gopher tortoise conservation
and lands identified as part of Florida’s Ecological Network (see Chapter 6:
Coordination with Other Efforts). This overlap of priority landscapes should lead to
improved conservation and leveraging of resources. Consideration should be given
to areas that presently have suitable bear habitat as well as areas that can be
restored. Many areas have been conserved to increase and enhance black bear
habitat. Corkscrew Regional Ecosystem Watershed located in Collier and Lee
counties, for example, was acquired with the purpose of protecting habitat for
wildlife, particularly bears. Areas identified through efforts by The Nature
Conservancy such as Yellow River Ravines and Gulf Coast Plain Ecosystem
Partnership have been marked as areas important for bears. The 600-acre Searcy
Estate purchase in Apalachicola NF identified the black bear as an important
species. Public lands purchased primarily for conserving black bears should be
reviewed and monitored to make certain the management regimes are compatible
with the needs of bears and the many other species associated with their habitat.

Such a review and monitoring systems will need to be established.

**Habitat Connectivity**

*Landscape connectivity* is an important component of habitat conservation in bear management because bear movements are so extensive that their habitats must be evaluated and managed at the landscape scale. Noss and Cooperrider (1994) discuss connectivity as they relate to movements within home ranges (p. 153), dispersal, including estimates of dimensions (p. 154), and in response to climate change (p. 156). Landscape connectivity related to bears in Florida is explained in great depth in Maehr et al. (2001, p. 29–35).

Landscape connectivity that allows movement among bear subpopulations is crucial for genetic integrity and population viability. It is important to maintain existing connections, augment near connections, and establish connectivity among isolated habitats. The intended outcome is an interconnected network of bear subpopulations that form a functional metapopulation. While the range of the Florida black bear is fragmented into subpopulations that look similar to metapopulations (Maehr et al 2001, p. 40), poor connectivity among subpopulations may prevent them from truly functioning as such (Clark et al. 2006). Hoctor (2003) and Larkin et al. (2004) ran several “least cost pathway” simulations to model landscape connectivity between each subpopulation. Those simulations revealed obstacles to bear movements between distant subpopulations that help focus conservation planning. Managing lands between subpopulations to encourage natural interchange will result in a more functional statewide population (Maehr et al. 2001, p. 42).

FWC’s objective is to maintain existing connections [e.g., Okefenokee NWR to Osceola NF], solidify and strengthen near connections (e.g., Ocala NF to Osceola NF), and work toward creating more distant connections (e.g., Chassahowitzka WMA to Lower Suwannee NWR). Creating these connections will be challenging, especially for the more distant ones, but as an umbrella species, efforts to improve
connectivity for bears also should improve landscape connectivity for many other species.

As human development continues to impact natural systems, landscape connectivity among bear populations will be important to retain genetic integrity and population viability. Landscape connections should allow for several biological processes (Clevenger and Wierzchowski 2006) including the necessities (e.g., food, mates) and movements within and among subpopulations (i.e., dispersal and genetic interchange). Factors that impact whether a connection is functional include habitat quality and distance between habitat patches. Roads are impediments to connectivity for bears at local and landscape levels; wildlife structures can decrease those barrier effects (Clevenger and Wierzchowski 2006).

Development directly reduces habitat and, depending on its shape, can impede bear movements. Habitat types that are avoided by bears also affect their movements. Maehr et al. (2001) provides an excellent summary of landscape ecology in relation to bear management.

Connectivity as a concept is “entirely scale and target dependent” (Crooks and Sanjayan 2006, p. 3), ranging from small scale “patch connectivity” to large scale “landscape connectivity” (Tischendorf and Fahrig 2001). Local movements to obtain food and other necessities occur daily and seasonally; moderate movements in response to dispersal events or natural disasters might occur every few years; and longer movements allowing genetic interchange between distant subpopulations might only occur occasionally, perhaps once each generation (Harris and Scheck 1991). Harrison (1992) suggested one home range as the minimum width of landscape connections so the area would contain enough suitable habitat for the animal to occupy it rather than just pass through it. If this approach were applied in Florida, the minimum corridor width would equal 4.37 miles, representing the diameter of the average annual adult female Florida black bear’s home range (FWC, unpublished data, 2010). Developments often have “green spaces” that are considered corridors for wildlife. Although the term corridor has been used for all
scales of connectivity, in this context the phrase equates to patch connectivity. Short, local connections between habitat patches require cover that is traversable by bears, but not necessarily habitat suitable for occupancy. If they are functional, those corridors are important for local bear movements that occur within a subpopulation.

This plan seeks to maintain or improve the patch connectivity within subpopulations and improve the landscape connections among subpopulations. High landscape connectivity allows larger, stable subpopulations to sustain smaller subpopulations (e.g., Ocala NF connection with Wekiva River Basin). Currently, the most important landscape connections to improve for bears are for the Chassahowitzka, Glades/Highlands, and Eglin subpopulations because they are small and isolated. These landscape-sized connections are often envisioned as complete swaths of habitat, but other ways to increase long-distance movements of bears include habitat mosaics, improving the permeability of surrounding property, and to create islands of habitat that allow bears to move from one patch to another like stepping stones (Crooks and Sanjayan 2006, p. 12, Noss and Daly 2006). While the dispersal ability of male bears is high, females seldom disperse far from their natal areas; therefore, bears are slow to colonize empty habitats (Costello et al. 2008). While long-distance movements have been documented in black bears (Maehr et al. 1988, Stratman et al. 2001), conservation efforts should not rely upon these rare examples for connectivity or range expansion.

Habitat Management

The use of fire by land managers to promote restoration and maintenance of fire climax communities provides well-established benefits. The frequent application of fire creates a plant community structure and successional sere that is beneficial to an array of wildlife. However, bears and many other species benefit from habitat patches with prolonged fire intervals. Several studies have indicated the importance of saw palmetto and oak mast for food (Maehr and Brady 1982, Land et al. 1994, Roof 1997, Stratman and Pelton 2007) and the use of dense understory
including palmetto as concealing cover for natal dens (Garrison et al. 2007).

However, fire can be fatal to oaks (Garren 1943) and reduce fruiting of palmettos
when burned more frequently than every five years (Hilmon 1968, Carrington and
Mullahey 2006). Consequently, bears in Florida use areas that have at least five
years between burns more frequently than they do areas with shorter burn cycles
(Stratman and Pelton 2007). Land management compatible with bear needs would
include a diverse mosaic of forest communities where some forest compartments are
burned less frequently than every five years. Conversely, the frequent application
of fire could help reduce the abundance of bears in areas where that is a
management objective.

Long-term conservation of the Florida black bear will be dependent upon
prudent management of large contiguous woodlands which are unlikely to be under
a single ownership. With some consideration for bear habitat needs, landscape
level, multi-species management regimes can be compatible with quality bear
habitat. Present efforts to enhance red-cockaded woodpecker populations, for
example, involve controlled burns and longleaf pine restoration; however, frequent,
large-scale winter burning may reduce the diversity and abundance of foods
available to bears and kill cubs in dens. A coordinated management effort will
provide much needed habitat for bears, scrub-jays, snakes and other wildlife species
that will require alternate habitats while burns are underway. Therefore,
coordinating land-management activities that span the landscape, address the
seasonal conditions, and the varying requirements of individual species is
important for establishing successful habitat conservation efforts for bears and
other wildlife species.

Management goals and desired conditions for other wildlife species, particularly
listed species, may not always result in prime bear habitat. However, many species
with seemingly divergent needs can be accommodated if a variety of land
management regimes are used to provide diverse forest communities at the
landscape level.
Research and Monitoring for Habitat Conservation

Information is needed on how habitat quality, quantity, and connectivity can be measured at appropriate scales and managed to affect bear numbers in specific areas (Table 8). Research may be needed to provide land managers with habitat management practices to increase or decrease bear numbers where needed or to determine why specific areas of seemingly high quality bear habitat are not occupied. Potential quantitative and qualitative impacts of management actions (e.g., herbicides, prescribed fire, timber harvest, palmetto berry harvest) should be identified, and results offered to private landowners interested in preferred land management practices for bears.

A system will need to be implemented to map suitable bear habitats, including privately owned lands that are not in agreement or easement programs but still provide for bear habitat. Conversely, conservation planning can be better focused if areas that no longer provide suitable habitat because they are isolated by large-scale human development are removed from further consideration. Development of methodologies that can assess the cumulative impacts of habitat declines will be necessary.

Research should also categorize habitat characteristics that promote landscape permeability so the most important landscape connections can be identified. Where high quality, suitable bear habitat is far from occupied bear range, research may be needed to determine the feasibility and acceptance of restocking bears. Similar budget and stakeholder work would be needed to augment bears in areas where their density is very low. For conservation lands where bears are a target species, results of management actions should be monitored to ensure they benefit bears.
Table 8. Strategies and actions involving the Habitat Conservation Objective, with estimates of resources available to implement the action, and associated timeframes for implementation.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
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<td></td>
<td></td>
<td>Can be done with Existing resources</td>
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<td>OR requires Other resources</td>
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<td></td>
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<td>2</td>
</tr>
<tr>
<td>2.1.1</td>
<td>Develop criteria to evaluate and categorize the quality of bear habitat by a combination of existing habitat models at statewide and BMU levels.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>2.1.2</td>
<td>Designate suitable bear habitat by habitat type, ownership, and land management regime within each BMU.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>2.1.3</td>
<td>Develop fine scale bear habitat quality measures in each BMU.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>2.1.4</td>
<td>Determine the amount and distribution of suitable bear habitat within each BMU needed to meet minimum population objectives.</td>
<td>Existing</td>
<td></td>
</tr>
</tbody>
</table>

Strategy 2.1: Determine clear criteria for categorizing habitat quality and then assess the current quality, at an appropriate scale, of occupied and unoccupied but potentially suitable bear habitat in each BMU.
<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.5</td>
<td>Assess the current and projected impacts of development, including transportation corridors, land-use conversion, and land-management practices on bear habitat quality in each BMU.</td>
<td>Can be done with Existing resources OR requires Other resources</td>
<td>2011</td>
</tr>
<tr>
<td>2.1.6</td>
<td>Identify areas where development is currently significantly impacting the ability of bears to use the habitat for occupation or travel and remove them from further consideration as suitable bear habitat.</td>
<td>Other</td>
<td>2012</td>
</tr>
<tr>
<td>2.1.7</td>
<td>Evaluate areas of unoccupied, but potentially suitable habitat in each BMU (e.g., Green Swamp, Blackwater River State Forest) to identify any habitat-based reasons for the absence of bears in those areas.</td>
<td>Other</td>
<td>2013</td>
</tr>
<tr>
<td>2.1.8</td>
<td>Coordinate with partner agencies and organizations to identify and integrate bear habitat conservation priorities that are shared with other existing landscape-level planning and management efforts (e.g., Gopher Tortoise Management Plan, The Nature Conservancy’s Florida Assessment).</td>
<td>Existing</td>
<td>2014</td>
</tr>
<tr>
<td>Action</td>
<td>Description of Action</td>
<td>Resources</td>
<td>Year</td>
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<td></td>
<td>Can be done with Existing resources</td>
<td>Year</td>
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<tr>
<td></td>
<td></td>
<td>OR requires Other resources</td>
<td></td>
</tr>
<tr>
<td>2.2.1</td>
<td>Work with the FWC Landowner Assistance Program to identify opportunities for landowners to help increase habitat quality to increase bear numbers and connectivity.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>2.2.2</td>
<td>Collaborate with public and private partners to use habitat incentive programs, less-than-fee-simple conservation easements, and fee-simple acquisitions to enhance conservation of large, high-priority tracts of good quality bear habitat within each BMU.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>2.2.3</td>
<td>Work with FWC Landowner Assistance Program biologists to develop habitat management techniques and best management practices specific to bears and voluntary, incentive-based programs to assist willing landowners in restoring or managing bear habitat to enhance long-term conservation of quality bear habitat on their lands.</td>
<td>Existing</td>
<td></td>
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</table>

**Strategy 2.2: Conserve or increase good quality bear habitat to meet objectives within each BMU.**
<table>
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<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
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<td></td>
<td>Can be done with Existing resources</td>
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<td></td>
<td></td>
<td>OR requires Other resources</td>
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<tr>
<td>2.2.4</td>
<td>Promote use of the comprehensive conservation planning tools incorporated in the Florida Wildlife Conservation Guide to more effectively address potential impacts of development, including transportation corridors, land-use conversion, and land-management projects on bear habitat.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>2.2.5</td>
<td>Rank mitigation banks by bear habitat quality to offer interested landowners options for mitigating bear habitat loss.</td>
<td>Other</td>
<td></td>
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<tr>
<td><strong>Strategy 2.3: Manage bear habitat on public and private lands.</strong></td>
<td></td>
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</tr>
<tr>
<td>2.3.1</td>
<td>Identify practices to minimize potential negative impacts on habitat quality for bears, in quantitative and qualitative terms, from management actions (e.g., herbicides, prescribed fire, timber harvest, palmetto berry harvest).</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>2.3.2</td>
<td>Work with partners to develop protocols for monitoring habitat quality for bears at fine scales within each BMU.</td>
<td>Existing</td>
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<td>Action</td>
<td>Description of Action</td>
<td>Resources</td>
<td>Year</td>
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<tr>
<td>2.3.3</td>
<td>Develop a system to identify and review all public lands that have been purchased primarily to conserve bears and promote application of best management practices in bear habitat.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>2.3.4</td>
<td>Engage the Black Bear Assistance Groups in each BMU to assist private landowners and other organizations who are seeking assistance with comparison and selection of landowner incentive programs or other programs for enhanced conservation of high quality bear habitat on their lands.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

**Strategy 2.4: Promote connectivity within and among Florida black bear subpopulations by maintaining, improving, and/or creating landscape connectivity.**

<p>| 2.4.1  | Determine landscape connectivity characteristics (e.g., habitat type, length, width) that facilitate movement of individual bears within and among subpopulations.                                                      | Other          |      |</p>
<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4.2</td>
<td>Identify and prioritize existing landscape connections used by bears to move within and among subpopulations; determine ownership and land management approaches for individual parcels of land that make up each connection; work with private landowners to promote land management practices that offer suitable bear habitat.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>2.4.3</td>
<td>Evaluate landscape connections to identify full or partial barriers (e.g., roads, lack of corridors) to bear movement and determine where additional infrastructure (e.g., fencing, clear road shoulders) is needed to overcome those barriers.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>2.4.4</td>
<td>Evaluate the compatibility of long-term highway use and traffic projections with landscape connectivity.</td>
<td>Other</td>
<td></td>
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</tbody>
</table>
# Chapter 4: Conservation Focus Areas

<table>
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<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
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<tbody>
<tr>
<td>2.4.5</td>
<td>Coordinate with and provide minimum standards for projects to Florida departments of Environmental Protection and Transportation, Division of Community Planning, and other relevant agencies to ensure that bear habitats and landscape connections are known and considered in state and regional conservation planning.</td>
<td>Can be done with Existing resources</td>
<td>2 0 1 2 0 1 2 0 1 2 0 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR requires Other resources</td>
<td>2 3 4 5 6 7 8 9 0 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td></td>
</tr>
</tbody>
</table>
Objective 3: Human-Bear Conflict Management

Reduce human-bear conflicts as measured by bear-related calls to FWC at or below average 2008 to 2010 levels (1,949 annual core complaints) and near or below the corresponding levels for each BMU (Table 9) by:

- Coordinating with local government officials in bear range to implement methods for reducing conflicts;
- Revising FWC bear policies to create a comprehensive approach to human-bear conflict management;
- Creating protocols to capture institutional knowledge, standardize response, and improve effectiveness in conflict management; and
- Create partnerships that will help FWC resolve human-bear conflicts.

The intent of this objective is to achieve the delicate balance between the needs of bears and the needs of people. FWC will work with communities to promote local actions that result in meaningful solutions. Many techniques that facilitate the peaceful coexistence of humans and bears exist and promotion of these methods can help avoid or reduce human-bear conflicts.

There is an overlap between the Conflict Management and Education and Outreach Objectives, because both center on human-bear interactions. The main difference is the Education and Outreach Objective approaches conflicts through education and responsible human behavior to avoid human-bear conflicts while the Conflict Management Objective focuses more on direct actions responding to bear behavior and human-bear conflicts. FWC acknowledges several actions within each objective contain aspects that will help achieve the other objective.

FWC staff decided a reasonable approach to measure success in conflict management would be to examine bear-related calls to FWC. Core complaints, a subset of calls, were used instead of all calls because some calls are informative (e.g., sick/injured bear), some are complaints, and some can be either depending on
Table 9. Number of core complaints for each Bear Management Unit, 2008-2010.

<table>
<thead>
<tr>
<th>Bear Management Unit</th>
<th>Subpopulation Name</th>
<th>Number of Core Complaints</th>
<th>Year</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>West Panhandle</td>
<td>Eglin</td>
<td>286</td>
<td>543</td>
<td>597</td>
</tr>
<tr>
<td>East Panhandle</td>
<td>Apalachicola</td>
<td>223</td>
<td>383</td>
<td>511</td>
</tr>
<tr>
<td>Big Bend</td>
<td>Chassahowitzka</td>
<td>14</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>North</td>
<td>Osceola</td>
<td>7</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Central</td>
<td>Ocala/St. Johns</td>
<td>925</td>
<td>879</td>
<td>1239</td>
</tr>
<tr>
<td>South Central</td>
<td>Glades/Highlands</td>
<td>3</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>South</td>
<td>Big Cypress</td>
<td>32</td>
<td>81</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>Statewide</td>
<td>1,490</td>
<td>1,931</td>
<td>2,425</td>
</tr>
</tbody>
</table>

the caller (e.g., a bear in the area; Figure 6). Core complaints included the following call types: In Building, In Crops, In Feed, In Feeder, In Garbage, Property Damage, Apiary, Threatened/Attacked/Killed Animal, and Threatened Human. Core complaint levels closely follow the same annual trends as overall levels (Figure 7). Current levels of core complaints strain both FWC’s resources as well as community tolerance, and increases in complaints may lead to decreased ability to respond by FWC and a devaluation of bears by citizens, which would negatively impact bear conservation efforts.
The number of bear-related reports to FWC has been increasing over the past 20 years (Figure 7). Statewide, core complaints have increased 106% from 2006 to 2010 (Figure 7). If this level of conflict continues in high complaint areas, there is concern it could create broad public antagonism towards bears, increase fear of bears, and promote a perception of bears as vermin. Education, waste management, technical assistance, trapping, relocation, and euthanasia will all have to be used to help mitigate complaints.

Increasing human-bear conflicts are a concern in Florida as both human and bear populations increase, occupied bear range expands, and human development continues to reduce and encroach upon bear habitat. “Urban bears” are becoming more prevalent in many areas of Florida as the edge of occupied bear range moves from rural areas into suburban or even urban locations. Managing black bears in residential areas is especially complex; bears in close proximity to humans create a range of issues from perceived threats (e.g., seeing a bear on the edge of the forest) to relatively serious issues (e.g., a bear in a city center disrupting traffic).

Capturing and relocating bears usually is not effective because there are few remote places in Florida where relocated bears will not come into contact with humans. It has become increasingly important to provide government officials and other decision makers with practical and effective management approaches to reduce human-bear conflicts.

Eliminating food sources that attract bears is the first and most important action to resolve problems. When bears forage on garbage, pet food, and other attractants, they learn to ignore the close proximity of humans (i.e., become habituated) and to seek human-sources of food (i.e., food conditioned); such bears may become a threat to human safety. The current FWC Nuisance Black Bear Policy relies heavily on complainant’s personal responsibility for eliminating attractants and thereby reducing or eliminating bear problems.

The public needs to have reasonable access to a wide variety of tools to secure their garbage and other attractants. Currently, FWC offers several options to
secure attractants; however, commercially manufactured bear-resistant residential trashcans have not been widely available to Floridians. There are only two counties (Franklin and Wakulla) that offer over 100 bear-resistant trashcans to their residents. In 2010, those two counties were among 10 Florida counties responsible for 88% of all core complaints FWC received statewide (each county received over 80 core complaints; Appendix I). FWC will continue to assist citizens and local governments in identifying waste management companies that can provide bear-resistant dumpsters and residential trashcans and encourage local governments to acquire those services for their residents.

Many problems are resolved by individual citizens taking personal responsibility and securing their attractants; however, relying solely on voluntary actions has not been sufficient because it requires continued vigilance and nearly 100% compliance across entire neighborhoods to succeed in preventing bears from lingering in neighborhoods. FWC has been working with municipalities and developers to address this issue by incorporating language that would require people to secure garbage and other attractants in their charters, homeowner association covenants, and development orders (Appendix VI). Ultimately, FWC will need to work with local governments and law enforcement agencies to draft ordinances and statutes in areas with chronic human-bear conflicts.

Residents and visitors are also encouraged to try and scare bears out of their neighborhoods. FWC advises people to get in a secure location (e.g., on porch, in car), make sure the bear has a clear escape route, and then scare the bear away by yelling, honking horns, banging pots and pans, and threatening in other ways that do not involve physical contact with the bear. People can also scare bears remotely by using motion sensitive alarms and water sprinklers. Bears that approach those devises are scared away by loud noises, lights or a spray of water. Many bears can be scared away using methods FWC advocates for use by the public. Unfortunately, large dominant males and bears that have become dependent on human food can be more difficult to scare away. Enhanced methods for scaring bears that can
include the use of slingshots, paintball guns, pyrotechnics, and non-lethal shotgun rounds are currently reserved for FWC staff and partnering law enforcement, military, and natural resource agencies who go through a training course and apply for a permit from FWC.

Management actions will be required to reduce human-bear conflicts, particularly in and around urban settings. Bears frequenting urban areas are more likely to become habituated and pose more of a public safety risk due to the volume of encounters with humans compared to bears in rural areas. A multi-tiered response to human-bear conflicts could be employed, with the level of response partially dependent upon where conflicts would be most likely to occur. While residents living in rural areas within primary bear range will need the knowledge and willingness to take the necessary steps to coexist with bears, a lower expectation might be appropriate for urban residents.

Depredation of livestock has become an increasing concern, with documented bear attacks on animals such as hogs, goats and chickens. The plan calls for an evaluation of the potential use of black bear depredation permits to address bears that repeatedly kill livestock. This permit could also be evaluated for use in other human-bear conflict situations including other types of property damage or human safety issues. While used by other states and on other species, a depredation permit system for bears would have to be fully reviewed and structured to prevent misuse and undue harm to the local subpopulation. FWC would continue to emphasize preventive measures and personal responsibility for securing attractants and likely issue permits only after all other viable deterrent methods had been exhausted.

FWC field response to human-bear conflicts (i.e., site visits with residents, trapping efforts, and retrieving vehicle-killed bears) is currently conducted by either FWC biologists or private contractors with FWC’s Bear Response Program (BRP). Human-bear conflict response is only one of the many job duties of FWC biologists. As the need for bear response continues to increase, FWC has relied heavily on the BRP to prevent bear responsibilities from overly interfering with other FWC staff
duties and keeping response times appropriate. Quick response to human-bear conflicts is considered an important element for successful coexistence with bears by many stakeholders in Florida (McDonald 1998). The plan proposes to continue to adapt and transition field response responsibilities from general FWC staff to Bear Management Program personnel and contractors. FWC could expand the duties of BRP to allow contractors to handle more of the workload in the field, potentially decreasing response time and increasing the efficiency of complaint resolution. An additional option is to increase Bear Management Program staffing to a level where they could take on the role of coordinating human-bear conflict response and other bear management duties (see Chapter 6: Resources for Implementation). As this transition continues, it will be important to revise the current FWC Nuisance Black Bear Policy to provide a more comprehensive set of guidelines that will increase the effectiveness and standardization of FWC’s response to human-bear conflicts. FWC personnel charged with implementing bear policies currently attend a bear workshop training to encourage information exchange and ensure more uniform understanding and execution. Revised policies should provide guidance to staff on standard responses to typical situations while leaving some level of flexibility with field staff. Further knowledge and experience can be gained by coordinating and sharing information among other local, state, and federal agencies experiencing similar human-bear conflicts.

**Research and Monitoring for Human-Bear Conflicts**

Research is needed to address the Conflict Management Objective and includes improving techniques to alter bear and human behaviors and monitoring characteristics affecting human-bear conflicts (Table 10). FWC needs to examine the effectiveness of specific hazing or aversive conditioning techniques. Outreach efforts, ordinances, and policies should be reviewed to determine which approach or combination of approaches results in the most citizen participation in reducing attractants. Monitoring local abundance of natural foods would help managers understand and anticipate fluctuations in the numbers and intensity of human-bear
conflicts and tailor agency responses accordingly. Determining which natural foods and food availability cycles (i.e., bumper crop and mast failure) most affect human-bear conflicts and how best to monitor the abundance of these foods will be important. Research is also needed to determine the most effective habitat management techniques to reduce or exclude bears from areas where the severity and frequency of human-bear conflicts exceed Conflict Management Objectives.
<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
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<tbody>
<tr>
<td></td>
<td><strong>Can be done with</strong></td>
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<td><strong>Existing resources</strong></td>
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<td><strong>OR requires Other</strong></td>
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<td><strong>resources</strong></td>
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<tr>
<td>3.1.1</td>
<td>Work with local</td>
<td>Existing</td>
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<td>governments to pass</td>
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<td>ordinances that</td>
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<td>reduce human-bear</td>
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<td>conflicts, habituation</td>
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<td>and food conditioning</td>
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<td></td>
<td>of bears to humans.</td>
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<td>3.1.2</td>
<td>Review the prohibition</td>
<td>Existing</td>
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<td>on feeding bears rule</td>
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<td>changes could make</td>
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<td>effective.</td>
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<td>3.1.3</td>
<td>Coordinate with</td>
<td>Existing</td>
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<td></td>
<td>local, state, and</td>
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<td>experiencing similar</td>
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<td>human-bear conflicts</td>
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<td>to exchange knowledge</td>
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<td></td>
<td>and resources.</td>
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<td>3.1.4</td>
<td>Explore the</td>
<td>Other</td>
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<td></td>
<td>capabilities of the</td>
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<td></td>
<td>Bear Response Program</td>
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<td>to handle more</td>
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<td>responsibilities,</td>
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<td>increase efficiency,</td>
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<td></td>
<td>and reduce FWC staff</td>
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<td></td>
<td>time.</td>
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<td>3.1.5</td>
<td>Continue use of</td>
<td>Existing</td>
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<td></td>
<td>euthanasia in</td>
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<td></td>
<td>human-bear conflict</td>
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<td>situations according</td>
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<td>to FWC policy.</td>
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</tbody>
</table>

**Strategy 3.1: Mitigate human-bear conflicts.**
## Chapter 4: Conservation Focus Areas

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1.6</td>
<td>Assess the effectiveness of different methods for securing attractants and deterring bears and promote the most effective techniques.</td>
<td>Other</td>
<td>2012</td>
</tr>
<tr>
<td>3.1.7</td>
<td>Encourage businesses experiencing human-bear conflicts to secure their waste and other attractants.</td>
<td>Existing</td>
<td>2013</td>
</tr>
<tr>
<td>3.1.8</td>
<td>Develop and implement land-management techniques to deter bear presence in areas prone to human-bear conflicts.</td>
<td>Other</td>
<td>2014</td>
</tr>
<tr>
<td>3.1.9</td>
<td>Identify areas of high human-bear conflict, rank areas in order of conflict levels, and use ranked areas to help guide management actions.</td>
<td>Existing</td>
<td>2015</td>
</tr>
<tr>
<td>3.1.10</td>
<td>Evaluate and recommend effective, safe and humane bear hazing techniques that can be used by the public to reduce the likelihood of bears becoming acclimated to people and causing a conflict or safety threat.</td>
<td>Other</td>
<td>2016</td>
</tr>
<tr>
<td>Action</td>
<td>Description of Action</td>
<td>Resources</td>
<td>Year</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>3.1.11</td>
<td>Provide training, materials, and a permit system to partner agency staff, the Bear Response Program contractors, and FWC staff to better understand bear behavior, and to use hazing or other methods to discourage bears from interacting with people.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.12</td>
<td>Develop bear-response zones in areas heavily populated by people where levels of human-bear conflicts are high and bear habitat availability is low. Implement a multi-tiered response to handling human-bear conflicts dependent on the location of the complaint.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.13</td>
<td>Explore options regarding use of depredation permits to address human-bear conflicts.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.14</td>
<td>Continue to seek grants and partner with not-for-profit organizations, local governments, and waste service providers to increase availability of bear resistant cans and technical assistance.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.15</td>
<td>Update FWC Nuisance Bear Policy and guidance documents to create a comprehensive approach to managing human-bear conflicts.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Description of Action</td>
<td>Resources</td>
<td>Year</td>
</tr>
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<td>---------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>3.1.16</td>
<td>Revise the Bear Incident Response Plan to include descriptions of bear behaviors and the estimated risk levels to human safety that may be associated with each behavior.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.17</td>
<td>Develop practical solutions for public recreation areas in primary bear range that are experiencing human-bear conflicts.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>3.1.18</td>
<td>Work with Black Bear Assistance Groups in each BMU to solicit local stakeholder input and cooperation in reducing human-bear conflicts.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
Objective 4: Education and Outreach

Increase public understanding of bears, support for bear conservation, and a willingness to coexist with bears by:

- Engaging, educating and informing residents, visitors and businesses through ongoing education, information and outreach programs;
- Maintaining existing, and developing new partnerships with federal, state, county and local governments, non-governmental organizations and other stakeholders to meet the objectives of this plan;
- Assisting communities in areas of high bear activity to become Bear Smart Communities; and
- Achieving compliance from at least 75% of the people who receive FWC advice on human-bear conflict resolution.

It is vital that the people of the state of Florida, including residents, visitors, stakeholders and governmental entities, understand, support, and, where applicable, integrate components of this plan into their daily lives, programs and management practices. The Education and Outreach Objective develops and delivers the tools and messages necessary to accomplish this challenging task. The objective integrates the communication components necessary to support bear conservation measures addressed in the Population Conservation and Habitat Conservation Objectives, and conflict resolution in the Conflict Management Objective. Achieving all of those objectives requires a strong, unified, and effective education and outreach effort. Success on the Education and Outreach Objective will be measured in part by monitoring the amount of people who follow FWC’s advice on human-bear conflict resolution. FWC receives thousands of bear-related calls each year (Figure 7). The Bear Management Program surveys a sample of callers to find out how FWC's advice is received and the results of that advice. Currently, more than 75% of callers surveyed follow FWC advice, and of those
callers, 70% report that their bear conflicts were resolved (FWC, unpublished data, 2011). Therefore, FWC will strive to maintain or increase the current level of compliance among callers to FWC.

Support for Black Bear Population and Habitat Conservation

Over the last decade, there has been an increase in public awareness that black bears exist in Florida, from 67% in 1993 (Duda and Young 1993) to 93% in 2008 (Miller et al. 2008). While those surveys differed in methods and demographics, it is practical to assume that there has been a notable increase in awareness of bears in Florida. Strong, effective education programs foster support for black bear conservation. FWC has found that Floridians in general value black bears and want to conserve them (McDonald 1998, Miller et al. 2008; Table 11). Maintaining this broad-based support of conservation will be crucial to any bear population or habitat management efforts to be successful.

Fortunately, most Floridians agree wildlife education is important (91%) and find learning about wildlife enjoyable (89%; Miller et al. 2008). FWC will build on those values by continuing to design outreach efforts that address the differing beliefs and needs of rural, suburban and urban communities regarding bears and bear conservation. While there is clearly support in Florida for bear conservation (McDonald 1998, Miller et al. 2008), it cannot be assumed that target audiences will always understand, value, or instantly accept FWC’s message or advice. Education and outreach must be continuous, sustained and systemic to achieve desired outcomes.

Proposed projects in this plan target many age levels, backgrounds and outcomes. Research indicates that children who participate in conservation education programs before the age of 12 are more likely to become environmentally responsible adults (Kellert and Westervelt 1983, Jaus 1984, Iozzi 1989). It is important that education and outreach efforts include youth as well as the current adult population.
Table 11. Percentage of Floridians who had some level of agreement (Agree or Strongly Agree) with selected statements regarding Florida black bears (from Miller et al. 2008).

<table>
<thead>
<tr>
<th>Agree</th>
<th>Selected Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>93%</td>
<td>Florida black bears should be protected so future generations will see them.</td>
</tr>
<tr>
<td>92%</td>
<td>It is important to know black bears exist in Florida, even if I never see one.</td>
</tr>
<tr>
<td>86%</td>
<td>Black bears are an important part of our ecosystem.</td>
</tr>
<tr>
<td>84%</td>
<td>I think seeing a black bear increases my appreciation of nature.</td>
</tr>
<tr>
<td>84%</td>
<td>Black bears are part of our heritage in Florida.</td>
</tr>
<tr>
<td>74%</td>
<td>I enjoy seeing black bears in Florida.</td>
</tr>
<tr>
<td>64%</td>
<td>People should learn to live with black bears near their homes.</td>
</tr>
</tbody>
</table>

Decades of research have clearly shown that in order to promote ecological literacy and conservation-oriented behavior, educational programs should focus on five major outcomes: awareness, knowledge, attitudes, problem solving and decision making skills, and opportunities for individual and group action (UNESCO 1997, NAAEE 1998). In addition, short-term awareness level messages do not always result in long-term sustained changes in environmental behavior. While awareness level messages can promote simple changes in behavior, significant lifestyle changes only occur when individuals are exposed to programs specifically designed to result in additional outcomes such as knowledge and attitudes (NEETF 2001). This plan attempts to address all five outcomes.

Education and outreach efforts designed to promote a basic understanding of the biology and ecological role of bears as well as appropriate actions are powerful tools for bear conservation. These actions are based on receptive, willing learners and voluntary participation. However, support for bear conservation is a combination of sound management, education, and at times, regulation with enforcement that gives the greatest chance of success (Peine 2001). If the plan is to be effective, all available management tools must be used.
Managing black bears becomes increasingly challenging as both human and bear populations increase, and human development expands and encroaches on bear habitat. Bears and humans share much of the same space in Florida and the two must be able to live with minimal conflict. Unfortunately, resolving conflicts is much more complicated than simply managing the bears and their habitat. Managing human impact involves understanding target audiences, fostering positive attitudes, and building knowledge and skills that ideally result in practices that will minimize conflict.

It is vital that people understand how their behavior can significantly influence bear behavior, and what can be done to minimize conflict. One objective of outreach and education outlined in this plan is to reduce the negative interactions between humans and bears. In order to be successful, the actions associated with this objective prescribe continuously and effectively engaging specific stakeholder groups, particularly those that are affected by black bears.

Education and outreach actions focus on: 1) attaining public support and acceptance of bear densities and distributions needed to achieve conservation objectives, 2) minimizing human-bear conflicts, 3) working with citizen groups to develop locally relevant education and outreach methods, 4) building partnerships, and 5) educating youth. Assessing these actions is essential to improving and refining future education and outreach efforts. Where feasible, an assessment tool will be developed and implemented.

The ultimate goal of FWC’s education and outreach efforts is a bear-literate, supportive citizenry that voluntarily participates in practices that benefit both people and bears. Different outreach strategies and actions are necessary for different groups, therefore the education and outreach efforts have been separated into four major audiences: 1) Communities, 2) Private Landowners, 3) Governmental, Nongovernmental and Business Organizations, and 4) FWC Staff.
Communities

One of the most effective ways to reduce human-bear conflicts is to engage citizens in community-wide efforts like the Bear Smart Community (BSC) program. The mission of this program is to influence and guide communities to accept personal and communal responsibility for reducing human-bear conflicts. A BSC is a specific and defined geographical area where the residents, local government, businesses, and schools engage in behaviors that will resolve their human-bear conflicts.

Becoming a BSC is a rigorous process and takes substantial time and effort. BSCs include an educational component, provisions for bear-resistant solid waste handling and containers, appropriate governance (e.g., ordinances, covenants, bylaws; see sample in Appendix VI), and assessment measures to determine success (Davis et al. 2002). A detailed explanation of the BSC program, case studies, and strategies on how to engage communities can be found in Appendix VII.

U.S. Air Force Hurlburt Field in Okaloosa County, FL incorporated many aspects of a Bear Smart Community, resulting in a dramatic reduction in their human-bear conflicts. Hurlburt Field replaced all of their trashcans and dumpsters with bear-resistant models and instructed all base personnel in their proper use. FWC conducted multiple bear response trainings with military security personnel to assist them with understanding bear behavior and how to respond appropriately to human-bear conflicts. Hurlburt Field’s Natural Resources personnel had an active education program where they engaged multiple times a year with everyone who lived or worked on base about how to live in bear country. Hurlburt Field’s combined efforts resulted in a 70% reduction in human-bear conflicts from 2009 to 2011.

Volunteers who are trained, interested and enthusiastic are an invaluable resource in education and outreach efforts. Establishing an FWC-supported volunteer program where trained, local residents act as volunteer liaisons between FWC and their neighbors could assist in reducing human-bear conflict and the resulting bear complaints. Volunteer liaisons could provide information to fellow
residents about seasonal increases or decreases in bear activity, make literature
available to new residents regarding preventable bear problems, and be a point of
contact to suggest common strategies for problem resolutions. This community-
based approach can be successful because it promotes ownership, and residents may
be more likely to follow advice from a neighbor than from a government official.

FWC has an effective educational tool to reach elementary school students.

Originally published in 1999, the Florida Black Bear Curriculum Guide (Guide) has
recently been updated with 2010 data and two additional lessons that focus on
avoiding human-bear conflicts. In addition, each lesson in the Guide now refers
teachers to specific video segments of the recently produced DVD “Living with
Florida Black Bears.” The updated Guide was tested in the classroom, and is
anticipated to be released for teachers in 2012. FWC will market the updated
Guide to educators and their third to eighth grade students within the areas of high
human-bear interaction. Educators will receive the Guide and supporting materials
including the “Bears and You” activity book and “Living with Florida Black Bears”
DVD. Project WILD and other staff will hold workshops for interested teachers so
they can experience implementing the Guide activities before bringing them into
the classroom.

Private Landowners

Private landowners are essential to bear conservation by providing habitat for
bears while meeting their own land use objectives. Numerous government and
private conservation programs offer landowners assistance to enhance wildlife
habitat. However, the many programs, different easement types, cost-share plans,
and lengthy decision-making processes may dissuade landowner involvement.
Interested landowners may be unfamiliar with programs and selecting the most
appropriate program for their needs could be overwhelming. Interested stakeholder
groups can partner with FWC’s LAP to provide landowners with a summary of the
different assistance programs offered by State and Federal agencies as well as
private organizations. LAP can help private landowners navigate through the
numerous programs that award preference to parcels if they either have or potentially could have certain types of wildlife habitat. This process could help elevate parcels that contain bear habitat above those without bear habitat. This summary should identify programs that best suit landowners’ needs and qualifications, assist in finalizing conservation agreements, and act as a liaison between the landowner and LAP.

Habitat management practices for bears are often similar to those practices that benefit deer, turkey, and other forest species. One difference, however, is bears do not need large areas of open habitat. Bears require extremely dense habitat at ground level for dens and diverse types and ages of habitats for foraging. Specific practices can be recommended to those who want to manage habitat for bears.

Habitat management practices specific to bear denning or foraging habitat can be added to LAP, and those could then be added to the land-use planning and habitat management plans created for landowners participating in incentive programs. FWC will use a GIS (Geographic Information Systems) computer model to numerically rank properties, which includes land cover imagery, current listed species habitats, wildlife occurrence data, and potential listed species habitat models. Because bears are an umbrella species, FWC could recommend that lands supporting bears should receive a higher score and be distinguished from other species when ranking a property. The U. S. Department of Agriculture’s Natural Resources Conservation Service provides several incentive programs to restore or improve wildlife habitat, including the Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program (WRP), Environmental Quality Incentives Program (EQIP), Healthy Forests Reserve Program (HFRP), and Conservation Reserve Program (CRP). The U.S. Department of Agriculture’s Farm Service Agency offers the Debt for Nature Program (DNP), which allows forgiveness of farm debt in exchange for putting lands into conservation. In addition, U.S. Fish and Wildlife Service offers the Partners for Fish and Wildlife Program (Partners) and the Internal Revenue Service offers a Federal Reforestation Tax Credit and Amortization program. At the state level, the Florida Forest Service offers the
Forest Stewardship Program (FSP), which helps private landowners create a management plan for their forests by drawing on a team of natural resource professionals. FWC offers the Landowner Incentive Program (LIP), which distributes funds to private landowners whose properties have the greatest potential benefits for rare species. In addition to government programs, some private conservation organizations work with landowners to develop conservation easements or other financial or technical assistance to restore or enhance wildlife habitat on their property. Carbon banking could create important economic opportunities for private landowners as well as opportunities to create and restore black bear habitat.

Another option for Florida landowners is the property tax break that became available after January 2010 (HB 7157 2009) for privately-owned conservation lands. The amendment provides property tax relief to landowners managing for conservation in certain situations. Landowners with a permanent conservation easement and meeting other requirements (e.g. not gaining income from conservation activities) could have reduced, or be exempt from, property taxes. Also, those landowners choosing to manage for conservation through pre-approved activities could receive a conservation assessment from their property appraiser, thus being eligible for a partial tax exemption.

Governmental, Nongovernmental, and Business Organizations

While FWC is the State agency constitutionally responsible for managing and protecting fish and wildlife resources, they must engage both public and private partners in order to be successful. Local and State government agencies play pivotal roles in land-use planning, acquisitions and easements, waste management and conflict resolution. Private businesses need to be part of any discussion of large-scale conservation efforts, and organizations such as non-profit groups have the ability to gauge their supporters’ opinions on different management options and elicit their support for action.
It will be important to engage local interest in bear management and solicit stakeholder input on FWC actions in BMUs. FWC proposes to create a **Black Bear Assistance Group (BBAG)** in each BMU that would be composed of representatives from local stakeholder groups. Each BBAG will consist of a variety of stakeholders which could include representatives from local, State, and/or Federal government agencies, non-governmental organizations, and concerned citizens. Since the issues within each BMU vary due to differences in bear abundance, human populations, available habitat and social attitudes, the composition of each BBAG will likely vary by BMU.

BBAGs would facilitate community input and involvement in bear management decisions, resulting in more acceptance, compliance, and support of bear management activities. BBAGs could engage the community in local bear management and conservation efforts through regularly-scheduled meetings, coordinating presentations on black bear behavior and conflict avoidance, and introducing the *Florida Black Bear Curriculum Guide* to local schools. BBAGs would possess a wealth of local knowledge and, along with other public input, could assist FWC’s efforts to monitor occupied bear range in the state. BBAGs could also assist FWC in improving and retaining habitat at the local level by promoting conservation agreements, easements, and other options for interested private landowners. Through the BBAGs, local communities would provide their input into FWC’s decision-making process regarding land management, education and outreach, best waste management practices, and human tolerance to bears (i.e., social carrying capacity), but the final decisions would rest with FWC.

In areas of growing human and/or bear populations, local and county law enforcement, parks and environmental staff, and animal control providers are increasingly involved in human-bear conflicts. In order to respond effectively to those situations, it is imperative that local government staff are aware of pertinent FWC regulations, bear management policies, and FWC resources available to them. To address this need, FWC’s Bear Management Program offers Bear Response Training to local government partners. From 2007 to 2010, FWC held 20 trainings.
around the state for 171 individuals from local government agencies. This successful program will be updated and expanded to create a new resource manual and training DVD for government agencies, and make these resources available in an online version for portions of the program.

**FWC Staff**

FWC’s Community Relations Office (CRO) is the agency’s communications branch and is instrumental in developing protocols and standards for consistent messaging, delivering those messages, and providing products and services for the agency’s divisions in support of their programs. In order to ensure quality and consistency, this plan calls for actions requiring education and outreach products, including DVD, photographic, and electronic and print literature, to be coordinated through the CRO. Coordination and collaboration with CRO will be employed whenever possible to draw on their expertise to enhance outreach efforts.

FWC staff from many different disciplines within the agency is often involved with bear issues. It is essential that staff responsible for communicating information about bears or performing bear management duties understand and speak uniformly about statewide bear management policies, protocols, and procedures. To facilitate internal communication, information updates and training will continue to be provided to a wide range of employees including, but not limited to, customer service personnel, public information coordinators, law enforcement officers, biologists, managers and others where appropriate.

From 2007 to 2010, the Bear Management Program trained 356 FWC employees, including law enforcement, biological and public information employees, through 23 Bear Response Trainings. A modified version of the training is now offered to all FWC Division of Law Enforcement cadets as part of their regular courses at the Florida Public Safety Academy. FWC Bear Management and Research Program biologists developed the *Bear Management Handbook* (Handbook) to capture the wealth of institutional knowledge and experiences regarding bear management practices in Florida. The Handbook will help the
agency be more effective and consistent in implementing bear management activities and messaging by serving as a living reference guide for biologists who perform bear management activities. The Handbook is designed to be revised as new ideas and issues arise. Updates to the Handbook are facilitated through annual workshops that bring together FWC staff directly involved in bear management across the state. Once the majority of FWC staff involved in bear management activities have participated in workshops (expected in 2012), the Handbook will be distributed to the regions for use as a reference manual for new regional staff.

Research and Monitoring for Education and Outreach

It is important to measure people’s behavioral changes in response to education and outreach efforts. FWC will attempt to monitor the effects of their education and outreach efforts on people’s behavior (Table 12). FWC is interested in how both traditional and more recent approaches to reaching people about bears. For example, FWC has recently engaged in social media with its own YouTube channel. FWC’s YouTube channel currently features nine bear-related video clips that have generated over 36,000 views as of December 31, 2011. FWC would like to know what effect those videos have on people’s behavior in bear country.

The Bear Management Program surveys a sample of people who call FWC about bears to find out how FWC’s advice is received and the results of that advice. FWC will continue surveying callers, and will adapt outreach approaches based on information gained from the surveys. For example, survey respondents indicated they were wary of using electric fencing, one of the most effective deterrents for bears. In response, the Bear Management Program developed a video segment “How to Use Electric Fencing to Secure Your Outdoor Attractants” in order to walk people through the process and put them more at ease. The video was posted on FWC’s YouTube website and has received over 10,000 views from October 20, 2010 to December 31, 2011. The survey results can be used to examine whether FWC’s recent efforts have resulted in increased use of electric fencing among the public.
Additional research will focus on identifying specific factors that influence behavior and public perceptions and attitudes towards bears and bear conservation. FWC and its partners can tailor programs and messages to address specific informational gaps and build support for bear conservation and management. Although it is expected that this will be an ongoing effort, it will focus each year on specific communities with acute human-bear conflicts. Repeating those surveys following management actions will allow FWC and its partners to monitor changes in public awareness of bears and bear issues. The surveys also will help FWC assess existing programs and focus efforts on areas of greatest need.
Table 12. Strategies and actions involving the Education and Outreach Objective with estimates of resources available to implement the action, and associated timeframes for implementation.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Can be done with Existing resources</td>
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<td></td>
<td></td>
<td>OR requires Other resources</td>
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</tbody>
</table>

Strategy 4.1: Education and Outreach for Citizens

4.1.1 Attend and/or organize local stakeholder group meetings to assess opportunities for change in local behaviors, policies, rules and ordinances that could support bear management goals.

4.1.2 Maintain and regularly update the FWC's black bear website and social media outlets.

4.1.3 Identify key communication message(s) and target audiences. Develop and implement an educational campaign using a variety of electronic and print media outlets to prepare residents and visitors for likely encounters with bears.
<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.4</td>
<td>Continue as an active partner in the Florida Black Bear Festival in Umatilla and the Forgotten Coast Black Bear Festival in Carrabelle, and look for additional opportunities to establish new bear festivals in other locations. Explore methods to evaluate festival impact on education and outreach objectives.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.5</td>
<td>Seek out and participate in existing festivals and other outreach events</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.6</td>
<td>Continue to work with FWC Community Relation Office to develop and implement informational news releases as appropriate to promote bear conservation and conflict management activities.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.7</td>
<td>Work with Black Bear Assistance Groups to identify site-specific outreach needs and the most effective methods to address them.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>4.1.8</td>
<td>Implement Bear Smart Communities program in high human-bear conflict areas.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
### Action 4.1.9
**Description of Action:** Develop and implement community-based Bear Smart education and outreach materials and activities that target residents, landowners and businesses with information and resources that result in an increased use of Bear Smart practices.

**Resources:** Other

**Year:**
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020

### Action 4.1.10
**Description of Action:** Create an action checklist for Bear Smart activities that can be used by existing communities to attain Bear Smart status.

**Resources:** Existing

**Year:**
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020

### Action 4.1.11
**Description of Action:** Provide template language for Bear Smart practices that municipalities and residential developers can incorporate into local charters, statutes, or ordinances.

**Resources:** Existing

**Year:**
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020

### Action 4.1.12
**Description of Action:** Create and implement a branded Bear Smart educational campaign to support Bear Smart Communities.

**Resources:** Other

**Year:**
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020

### Action 4.1.13
**Description of Action:** Explore partnership with the University of Florida’s Institute of Food and Agricultural Sciences county extension agents to provide assistance in developing and delivering educational materials and programs.

**Resources:** Existing

**Year:**
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.14</td>
<td>Coordinate with FWC’s Wildlife Friendly Designation initiative. Include a requirement to become a Bear Smart Community when developments are located in bear range.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.15</td>
<td>Expand use of the <em>Florida Black Bear Curriculum Guide</em> and continue to train educators in target areas to incorporate it into their lesson planning.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.16</td>
<td>Work with interested schools in areas of high human-bear conflict to implement a bear education family science night.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.1.17</td>
<td>Provide bear-oriented materials for students, parents, and teachers to build knowledge, use of Bear Smart practices and increase appreciation for bears.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>Action</td>
<td>Description of Action</td>
<td>Resources</td>
<td>Year</td>
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</tr>
<tr>
<td>4.1.18</td>
<td>Coordinate with FWC’s Landowner Assistance Program biologists to educate private landowners about bears, habitat management techniques, voluntary best management practices for bears, incentive programs, easements, and fee simple acquisition to enhance long-term conservation of quality bear habitat on their lands. (see Action 2.2.3)</td>
<td>Existing</td>
<td>2 2 2 2 2 2 2 2 2 2 2 2 2 2</td>
</tr>
<tr>
<td>4.1.19</td>
<td>Advertise the penalties for feeding bears and promote the Wildlife Alert Hotline phone number and reward program.</td>
<td>Other</td>
<td>2 2 2 2 2 2 2 2 2 2 2 2 2 2</td>
</tr>
<tr>
<td>4.1.20</td>
<td>Actively engage with external partners located in areas of high bear activity to identify and resolve issues that prevent implementation of initiatives to reduce human-bear conflict.</td>
<td>Existing</td>
<td>2 2 2 2 2 2 2 2 2 2 2 2 2 2</td>
</tr>
<tr>
<td>4.1.21</td>
<td>Continue existing bear internship program to conduct outreach activities and other bear management projects.</td>
<td>Existing</td>
<td>2 2 2 2 2 2 2 2 2 2 2 2 2 2</td>
</tr>
</tbody>
</table>
### Chapter 4: Conservation Focus Areas

#### Strategy 4.1.22

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.22</td>
<td>Continue to survey individuals and agencies/organizations who call FWC with human-bear conflict complaints to measure satisfaction with technical advice and assess compliance with FWC's technical assistance.</td>
<td>Can be done with Existing resources OR requires Other resources</td>
</tr>
</tbody>
</table>

#### Strategy 4.2: Education and Outreach for Governmental, Nongovernmental, and Business Organizations

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.1</td>
<td>Work with Black Bear Assistance Groups in each BMU to assist with bear education outreach.</td>
<td>Other</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Develop community bear conservation programs that are supported and funded by local sources.</td>
<td>Other</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Regularly update state and local elected officials and law enforcement leadership in bear range on bear research, management, and public education efforts in their area.</td>
<td>Existing</td>
</tr>
<tr>
<td>4.2.4</td>
<td>Develop and distribute an information resource packet to public information sections of appropriate local, state, and federal agencies.</td>
<td>Existing</td>
</tr>
<tr>
<td>4.2.5</td>
<td>Develop DVD and online version of Bear Response Training for external agencies.</td>
<td>Other</td>
</tr>
</tbody>
</table>
### Strategy 4.3: Education and Outreach for FWC Staff

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.1</td>
<td>Provide materials, training, and messaging to FWC employees who are involved with bear management to ensure agency policies and protocols are implemented correctly and consistently statewide.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.3.2</td>
<td>Develop DVD and online version of FWC employee bear training.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>4.3.3</td>
<td>Continue to update existing <em>Bear Management Handbook</em> and provide to employees as reference guide.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.3.4</td>
<td>Regularly update agency leadership on human-bear conflict mitigation and resolution.</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>4.3.5</td>
<td>Develop opportunities for Bear Response Program contractors to provide outreach in addition to site visits and canvassing.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

### Strategy 4.4: Education and Outreach Research and Monitoring

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.1</td>
<td>Create tools to assess the effectiveness of education and outreach actions where appropriate.</td>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>
## Chapter 4: Conservation Focus Areas

<table>
<thead>
<tr>
<th>Action</th>
<th>Description of Action</th>
<th>Resources</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4.2</td>
<td>Conduct community level surveys in areas targeted for interventions to assess the public's knowledge, attitudes, and willingness to cooperate in achieving management objectives and implementing conservation plans.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>4.4.3</td>
<td>Conduct focus group sessions within communities to provide a qualitative complement to the survey in Action 4.4.2.</td>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>4.4.4</td>
<td>Measure effect of canvassing events and talks to communities on human-bear conflicts.</td>
<td>Existing</td>
<td></td>
</tr>
</tbody>
</table>
Bear Management Unit Profiles

West Panhandle Bear Management Unit

*Florida Counties:*
- Escambia, Holmes, Okaloosa, Santa Rosa, and Walton (Figure 11)

**Subpopulation Size:**

Bears in the West Panhandle BMU are part of the Eglin subpopulation, named after the Eglin Air Force Base that represents the majority of occupied bear range in this BMU. The subpopulation estimate is below the minimum subpopulation objective, and therefore the management objective is to increase the current bear subpopulation. However, Eglin Air Force Base is probably at or near its biological carrying capacity, and therefore increases in bear numbers would likely occur in suitable habitats in other parts of the BMU.

<table>
<thead>
<tr>
<th>Minimum subpopulation objective</th>
<th>200 bears</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated subpopulation in primary range</td>
<td>63–101 bears</td>
</tr>
<tr>
<td>Potential bear habitat in Conserved Lands could support</td>
<td>121 bears</td>
</tr>
</tbody>
</table>

**Habitat:**

Currently, potential bear habitat in conserved land is approximately 74 percent of that needed to support the minimum subpopulation objective. Habitat conservation efforts should seek to expand *occupied range* and create the following critical landscape connections: along the Yellow River to Blackwater River State Forest; with the Apalachicola population by building on existing conserved habitat toward the Choctawhatchee River; and Alabama’s Mobile bear population through Cunecuh NF (Figure 11). Increasing genetic interchange with the bears in Alabama would benefit both of these small subpopulations.
Figure 11. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the West Panhandle Bear Management Unit.
Habitat needed for 200 bears

Potential Bear Habitat

Potential Bear Habitat in Conservation Lands

Total area of the BMU

Human-Bear Conflicts:

Residential development expansion in recent years has contributed to a rapid increase in bear reports to FWC (Figure 12). The West Panhandle BMU had the highest percentage of reports related to bears getting into garbage (44%) of all the BMUs (Figure 13). Over 27% of statewide core complaints in 2010 came from this BMU (Appendix I, Table 15). FWC will take actions to reduce human-bear conflicts in this BMU, however, keeping complaints at the three-year average (2008–2010) of 475 core bear complaints will be challenging (Figure 12).

Threats:

This area is experiencing rapid human population growth and habitat conversion, making this small subpopulation of bears vulnerable to demographic variability and genetic isolation. Creating and maintaining habitat connections to encourage movements between Eglin Air Force Base and other suitable areas will be very important for the long-term survival of this bear subpopulation. Mortality associated with vehicles has been increasing in recent years (Figure 14).
Figure 12. Bear-related reports received by FWC in the West Panhandle Bear Management Unit between 1990 and 2010 (n = 3,584).

Figure 13. Bear-related report types received by FWC in the West Panhandle Bear Management Unit between 1990 and 2010 (n = 3,584).
Figure 14. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the West Panhandle Bear Management Unit between 1990 and 2010 (n = 98).
East Panhandle Bear Management Unit

**Florida Counties:**
Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Madison, Taylor, Wakulla, and Washington (Figure 15)

**Subpopulation Size:**
Bears in the East Panhandle BMU are part of the Apalachicola subpopulation, named after the Apalachicola NF which encompasses a large portion of occupied bear range in this BMU. The current estimate of bears in the East Panhandle BMU is above the minimum subpopulation objective, and therefore the management objective is to maintain or increase the current bear subpopulation.

Minimum subpopulation objective: 570 bears
Estimated subpopulation in primary range: 411–653 bears
Potential bear habitat in Conserved Lands could support: 297 bears

**Habitat:**
Currently, potential bear habitat in conserved lands are insufficient to maintain or increase the minimum subpopulation objective. Habitat conservation efforts should seek to create two primary landscape connections: one with the West Panhandle BMU that incorporates Econfina Creek Water Management Area and Choctawhatchee River conservation areas, among others; and one with the Big Bend BMU using coastal conservation lands (Figure 15). Continuing to manage St. Marks NWR and Aucilla WMA to provide bear habitat would help support bear numbers for expansion into the Big Bend BMU.

Habitat needed for 570 bears: 2,359,856 acres
Potential Bear Habitat: 4,278,290 acres
Potential Bear Habitat in Conservation Lands: 1,229,916 acres
Total area of BMU: 5,830,664 acres
Figure 15. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the East Panhandle Bear Management Unit.
**Human-Bear Conflicts:**

Human-bear interactions have increased substantially since 2000 and need to be reduced (Figure 16). Over 23% of statewide core complaints in 2010 came from this BMU (Appendix I, Table 15). The three-year average (2008–2010) of core complaints was 372 (Figure 16). The relatively high percentages of reports of bears in garbage (34%) and property damage, in crops, or in apiary (11%) received from this BMU are indicative of a bear population that has regular access to human-provided foods (Figure 17).

**Threats:**

Increasing human-bear conflicts and habitat fragmentation that can sever connections with other BMUs are threats in the East Panhandle BMU. Vehicle-related deaths continue to rise in this BMU (Figure 18).

**Figure 16.** Bear-related reports received by FWC in the East Panhandle Bear Management Unit between 1990 and 2010 (n = 3,705).
Figure 17. Bear-related report types received by FWC in the East Panhandle Bear Management Unit between 1990 and 2010 (n = 3,705).

Figure 18. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the East Panhandle Bear Management Unit between 1990 and 2010 (n = 499).
Big Bend Bear Management Unit

**Florida Counties:**
Citrus, Dixie, Gilchrist, Hernando, Lafayette, Levy, and Pasco (Figure 19)

Subpopulation Size:
Bears are absent or nearly so throughout most of the Big Bend BMU with the exception of a remnant group of bears in and around Chassahowitzka WMA at the southern extent of the BMU (Orlando 2003, Brown 2004, Wooding 2007, FWC Unpublished Data, 2010). The Chassahowitzka bears have one of the lowest reported levels of genetic variability (Dixon et al. 2007) and are in need of genetic interchange and connectivity. The current estimate of bears in the Big Bend BMU is far below the minimum subpopulation objective, and therefore the management objective is to increase the current bear subpopulation. While significant growth within the Chassahowitzka subpopulation is unlikely because it is surrounded by development, this area could represent the southern extent of a growing bear subpopulation in the Big Bend BMU.

Minimum subpopulation objective 200 bears
Estimated subpopulation in primary range 12–28 bears
Potential bear habitat in Conserved Lands could support 174 bears

Habitat:
Currently, the total acreage of potential bear habitat in conserved lands is almost sufficient to achieve the minimum subpopulation objective. However, conserved lands are highly fragmented (Figure 19). Habitat conservation should focus on establishing landscape connectivity between the Chassahowitzka bears and unoccupied, quality habitat in Withlacoochee State Forest and Green Swamp Conservation Area and north to the Apalachicola subpopulation using landscape
Figure 19. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the Big Bend Bear Management Unit.
connections such as the Lower Suwannee NWR, Big Bend WMA, and other conservation lands. If landscape connectivity can be improved, existing conservation lands provide additional opportunities to connect with occupied habitat in other BMUs. Occupied habitat in the East Panhandle BMU already connects with the Big Bend BMU, and improving habitat conditions in existing secondary range, including the large tracts of commercial forests, would promote natural re-colonization in this BMU. Although existing development in the southern portion of the Big Bend BMU makes habitat connections tenuous, the Chassahowitzka bears would benefit from any connection to the Ocala subpopulation, even if only from an occasional dispersing animal. Such a connection might be possible through Marjorie Harris Carr Cross Florida Greenway State Recreation and Conservation Area. The Suwannee River and conservation lands toward the Osceola subpopulation could also allow for occasional dispersals.

| Habitat needed for 200 bears | 549,809 acres |
| Potential Bear Habitat | 1,625,339 acres |
| Potential Bear Habitat in Conservation Lands | 478,042 acres |
| Total area of BMU | 2,970,423 acres |

**Human-Bear Conflicts:**

Low bear numbers and a relatively dispersed human population in much of this BMU contribute to the low number of complaints (Figure 20). The Big Bend BMU has a high percentage of reports related to bears being in the area, yard, or tree (56%; Figure 21). A high percentage of reports in those categories, coupled with a relatively low percentage of reports of bears in garbage (13%) typically indicates bears are passing through rather than residing near developed areas. Stabilizing or reducing core complaints to the three-year average (2008–2010) of 15 will be manageable (Figure 20).
Threats:
Parcels of conserved habitat within the BMU are fragmented and small, and many are not occupied. Habitat fragmentation in the southern portion of the unit causes increased mortality and limits colonization of suitable habitat. Development could impede natural re-colonization from occurring. The Chassahowitzka bears (< 20) are genetically isolated and require connections with other bears to survive and represent the southern extent of a bear subpopulation in the Big Bend BMU. While vehicle-related deaths are negligible in this BMU (Figure 22), poaching and general intolerance of bears by residents may be limiting range expansion south from Apalachicola.

Figure 20. Bear-related reports received by FWC in the Big Bend Bear Management Unit between 1990 and 2010 (n = 203).
Figure 21. Bear-related report types received by FWC in the Big Bend Bear Management Unit between 1990 and 2010 (n = 203).

Figure 22. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the Big Bend Bear Management Unit between 1990 and 2010 (n = 14).
North Bear Management Unit

Florida Counties:
Baker, Columbia, Duval, Hamilton, Nassau, Suwannee, and Union (Figure 23)

Subpopulation Size:
Bears in the North BMU are concentrated in and around Osceola NF which encompasses most of the occupied bear range in this BMU. The current estimate of the Osceola subpopulation is above the minimum subpopulation objective, and therefore the management objective is to maintain or increase the current bear subpopulation. Bears in the Osceola subpopulation are part of a larger subpopulation that includes bears in the Okefenokee Swamp NWR in Georgia, which has an estimated 700 to 800 bears (Greg Nelms, Georgia Department of Natural Resources, personal communication, 2010).

Minimum subpopulation objective 260 bears
Estimated subpopulation in primary range 200–313 bears
Potential bear habitat in Conserved Lands could support 233 bears

Habitat:
Currently, potential bear habitat in conserved lands is almost sufficient to support the minimum subpopulation objective. The Osceola subpopulation is connected genetically and spatially through conserved habitat connectivity with a larger subpopulation in Georgia. Habitat conservation efforts should focus on preserving the functionality of the landscape connection with the Ocala subpopulation. A landscape connection south toward the Big Bend BMU could aid periodic dispersals if habitat was traversable.

Habitat needed for 260 bears 457,145 acres
Potential Bear Habitat 1,741,615 acres
Figure 23. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the North Bear Management Unit.
Potential Bear Habitat in Conservation Lands 411,541 acres
Total area of BMU 2,795,156 acres

Human-Bear Conflicts:
While there has been a gradual increase in bear complaints in this BMU (Figure 24), stabilizing or reducing annual core complaints to the three-year average (2008–2010) of eight per year should be manageable. The North BMU has the highest percentage of reports related to bears being in the area, yard, or tree (71%) of all the BMUs (Figure 25). A high percentage of reports in those categories coupled with a relatively low percentage of reports of bears in garbage (10%) typically indicates bears are passing through rather than residing near developed areas.

Threats:
Catastrophic fires and increasing development are threats in the North BMU.
Maintaining the current connection with Ocala NF and Okefenokee NWR is vital to the long-term survival of this subpopulation. Few vehicle-related deaths occur in this BMU (Figure 26).

Figure 24. Bear-related reports received by FWC in the North Bear Management Unit between 1990 and 2010 (n = 297).
Figure 25. Bear-related report types received by FWC in the North Bear Management Unit between 1990 and 2010 (n = 297).

Figure 26. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the North Bear Management Unit between 1990 and 2010 (n = 70).
Central Bear Management Unit

Florida Counties:
Alachua, Bradford, Brevard, Clay, Flagler, Lake, Marion, Orange, Putnam,
Seminole, St Johns, Sumter, and Volusia (Figure 27)

Subpopulation Size:
Bears in the Central BMU are part of the Ocala/St. Johns subpopulation, named
after the Ocala NF and St. Johns River watershed which encompasses a large
portion of occupied bear range in this BMU. The Central BMU is the only BMU
with a subpopulation estimated to be 1,000 bears, which is one of the criteria that
determines a specie’s risk for extinction. The management objective is to maintain
or increase the current bear subpopulation in this BMU.

Minimum subpopulation objective 1,030 bears
Estimated subpopulation in primary range 825–1,225 bears
Potential bear habitat in Conserved Lands could support 1,273 bears

Habitat:
Currently, potential bear habitat in conserved lands is sufficient to maintain or
increase bear numbers above the minimum subpopulation objective. Habitat
conservation efforts should focus on maintaining the landscape connectivity
between the North and Central BMUs. In addition, attention should be given to
maintaining the connections within the Ocala subpopulation, specifically between
the Wekiva and St. Johns areas (Figure 27). Wildlife crossing structures planned
for Interstate Highway 4 east of Deland may increase primary range
southeastward. Further habitat conservation efforts to link the Central BMU to the
Big Bend BMU would be an important step in sustaining the Chassahowitzka
bears.
Figure 27. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the Central Bear Management Unit.
Habitat needed for 1,030 bears 1,062,553 acres
Potential Bear Habitat 3,531,735 acres
Potential Bear Habitat in Conservation Lands 1,310,191 acres
Total area of BMU 6,999,201 acres

_Human-Bear Conflicts:_

Human-bear conflicts in the Central BMU have increased at a faster rate than FWC resources have been available to respond in the most effective and timely manner possible (Figure 28). Over 45% of statewide core complaints in 2010 came from this BMU (Appendix I, Table 15). The relatively high percentages of reports of bears in garbage (28%) and property damage, in crops, or in apiary (12%) received from this BMU are indicative of a bear population that has regular access to human-provided foods (Figure 29). FWC will continue to focus efforts on reducing bear complaints in this BMU to try and stabilize or decrease annual core complaints to the three-year average (2008–2010) of 1,014 per year.

_Threats:_

Increasing frequency and severity of human-bear interactions are serious threats in this BMU. In addition, habitat fragmentation has the potential to isolate portions of the Ocala/St. Johns subpopulation. Vehicle-related bear deaths are exceptionally high (Figure 30), with a large proportion of deaths occurring on state roads within Ocala NF.
Figure 28. Bear-related reports received by FWC in the Central Bear Management Unit between 1990 and 2010 (n = 15,558).

Figure 29. Bear-related report types received by FWC in the Central Bear Management Unit between 1990 and 2010 (n = 15,558).
Figure 30. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the Central Bear Management Unit between 1990 and 2010 (n = 1,146).
South Central Bear Management Unit

Florida Counties:
Charlotte, De Soto, Glades, Hardee, Highlands, Hillsborough, Indian River,
Manatee, Martin, Okeechobee, Osceola, Pinellas, Polk, Sarasota, and St Lucie
(Figure 31)

Subpopulation Size:
Bears in the South Central BMU exist mostly in Glades and Highlands counties of
this BMU. The current estimate of bears in the South Central BMU is at the
minimum subpopulation objective, and therefore the management objective is to
maintain or increase the current bear subpopulation. However, methods used for
this estimate were not as rigorous as those of other BMUs, and so the needed action
is to increase the subpopulation until the FWC receives more precise estimates
(expected in 2013).

Minimum subpopulation objective 200 bears
Estimated subpopulation in primary range 150–200 bears
Potential bear habitat in Conserved Lands could support 342 bears

Habitat:
This is the most fragmented subpopulation of bears in Florida and the only one that
does not have a large block of public land as its center (Figure 31). Many parcels of
conserved lands are small, isolated and of little value to bears. Habitat
conservation should focus on increasing suitable bear habitat by working with local
agricultural interests and creating or increasing connectivity between islands of
habitat within the subpopulation, particularly toward Avon Park Air Force Range
and the Kissimmee River Basin. Establishing landscape connections with the
South, Central, and Big Bend BMU’s are also priorities.
Figure 31. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the South Central Bear Management Unit.
Habitat needed for 200 bears 580,698 acres
Potential Bear Habitat 2,477,753 acres
Potential Bear Habitat in Conservation Lands 883,270 acres
Total area of BMU 8,299,619 acres

*Human-Bear Conflicts:*
FWC should be able to stabilize or reduce core complaints to the three-year average (2008–2010) of ten per year in this BMU (Figure 32). The South Central BMU has a high percentage of reports related to bears being in the area, yard, or tree (44%; Figure 33). A high percentage of reports in those categories, coupled with a relatively low percentage of reports of bears in garbage (19%) typically indicates bears are passing through rather than residing near developed areas.

*Threats:*
The population inhabits mostly non-conservation lands making it vulnerable to habitat conversion. Genetic isolation increases the risk of genetic drift. Significant parcels of conserved lands remain unoccupied and are of little value to bears. Vehicle-related bear deaths are low and do not show a consistent pattern over time in this BMU (Figure 34).
Figure 32. Bear-related reports received by FWC in the South Central Bear Management Unit between 1990 and 2010 (n = 430).

Figure 33. Bear-related report types received by FWC in the South Central Bear Management Unit between 1990 and 2010 (n = 430).
Figure 34. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the South Central Bear Management Unit between 1990 and 2010 (n = 78).
South Bear Management Unit

Florida Counties:
Broward, Collier, Hendry, Lee, Miami-Dade, Monroe, and Palm Beach (Figure 35)

Subpopulation Size:
Bears in the South BMU are part of the Big Cypress subpopulation, named after the Big Cypress National Preserve which encompasses a large portion of occupied bear range in this BMU. The current estimate of bears in the South BMU is above the minimum subpopulation objective, and therefore the management objective is to maintain or increase the current bear subpopulation.

Minimum subpopulation objective 700 bears
Estimated subpopulation in primary range 516–878 bears
Potential bear habitat in Conserved Lands could support 622 bears

Habitat:
Currently, potential bear habitat in conserved lands is almost sufficient to meet the minimum subpopulation objective. Habitat conservation should focus on establishing a landscape connection northward with the Glades/Highlands subpopulation (Figure 35). Habitat and connectivity efforts for bears should be combined with similar initiatives for Florida panthers.

Habitat needed for 700 bears 1,322,014 acres
Potential Bear Habitat 1,604,232 acres
Potential Bear Habitat in Conservation Lands 1,173,756 acres
Total area of BMU 6,756,711 acres
Figure 35. Bear range (Simek et al. 2005) and Conserved Lands (FNAI 2009) in the South Bear Management Unit.
Human-Bear Conflicts:

While overall bear complaint levels are relatively low in this BMU (Figure 36), FWC will continue efforts to reduce human-bear conflicts in locally acute areas (e.g., Golden Gate Estates). The relatively high percentages of reports of bears in garbage (31%) and property damage, in crops, or in apiary (8%) received from this BMU are indicative of a bear population that has regular access to human-provided foods (Figure 37). Stabilizing or reducing core complaints to the three-year average (2008–2010) of 53 per year should be manageable.

Threats:

If habitat fragmentation and degradation from residential and roadway development continues, it could further isolate subpopulations. Vehicle-related bear deaths are low and do not show a consistent pattern over time in this BMU (Figure 38).

Figure 36. Bear-related reports received by FWC in the South Bear Management Unit between 1990 and 2010 (n = 1,444).
Figure 37. Bear-related report types received by FWC in the South Bear Management Unit between 1990 and 2010 (n = 1,444).

Figure 38. Number of bears killed by vehicles, or euthanized due to vehicle injuries, documented each year in the South Bear Management Unit between 1990 and 2010 (n = 147).
CHAPTER 5: REGULATION AND ENFORCEMENT

Regulations

The major threats to long-term survival of bears are habitat loss and fragmentation and uncontrolled human-caused mortality. Prior to the delisting of the Florida black bear, four portions of Florida Administrative Code (F.A.C.) specifically addressed bears in an attempt to minimize those threats to the species.

68A-4.001(3), F.A.C., makes it illegal to feed bears if that behavior can cause conflicts with people. 68A-12.004(12), F.A.C., restricts the sale or possession of bear parts. 68A-9.010(1), F.A.C., excludes black bears from qualifying as “nuisance wildlife” (i.e., wildlife causing property damage, posing a threat to safety, or causing an annoyance in a building) eligible to be taken pursuant to the rule. 68A-27.003, F.A.C., prohibits the take, possession, or sale of any species classified as Federally Endangered or Threatened or State Threatened. While the other provisions discussed above remain in effect, 68A-27, F.A.C., no longer applies to Florida black bears subsequent to the removal of the species from the State Threatened species list.

In order to meet the objectives of this management plan and ensure that the bear will not again be classified as a State Threatened species, a new rule is proposed (68A-4.009, F.A.C.; Appendix VIII). This rule will prohibit unauthorized take of bears and establish the management plan as the guidance document for future habitat conservation and protection. The proposed rule makes it unlawful to take, possess, injure, shoot, wound, trap, collect, or sell bears or their parts except as specifically provided by FWC’s rules. “Take” for the purposes of 68A-4 is defined in 68A-1 and includes “attempting to take, pursuing, hunting, molesting, capturing, or killing” by any means. Given the potential for illegal trade in bear parts and bear hides, the level of specificity and detail in this rule are considered necessary to aid in successful enforcement and prosecution. The proposed rule provides criteria that FWC considers in the authorization of intentional take that will allow the continuation of local governments and other partners assisting FWC in bear
management. The rule also affirms that FWC will continue to engage with private landowners and regulating agencies to guide future land use so that it is compatible with the goal and objectives of this plan.

In order to ensure that the bear remains off Florida’s Threatened Species list, sufficient quantity of habitat that is interconnected to allow for interaction among bear subpopulations will be essential to support stable or increasing bear numbers. To accomplish this aim, the rule ensures that FWC will continue to work with State regulatory agencies to avoid, minimize, and mitigate impacts to bear habitat from land development. FWC currently comments on land use changes to reduce negative impacts on wildlife species. There are a number of statutes and rules that relate to FWC’s role in providing comments to regulatory agencies. FWC has and will continue to provide comments and technical assistance regarding bears and bear habitat to State regulatory agencies such as the departments of Environmental Protection and Transportation, Division of Community Planning, water management districts, as well as counties and municipalities.

Section 20.331 of Florida Statutes (F.S.) provides FWC with commenting authority and requires that comments be “…based on credible, factual, scientific data…”. While statutes make clear that FWC’s comments are not binding on the regulatory agencies, they also indicate that comments from FWC are to be considered for consistency with the Florida Coastal Management Program under subsections 373.428, 380.23, and 403.507.

The goal and objectives of the plan will be considered in development of agency technical assistance, best management practices, and formal comments. Proposed projects will be evaluated on how they might affect the ability to achieve conservation objectives of a related Bear Management Unit(s). Particular attention will be given to areas where bear subpopulations are not meeting stated conservation objectives.
Penalties

The Florida Constitution provides that penalties for violating FWC rules are established by the Legislature, which has been done in Part VIII of F.S. Chapter 379. Most relevant for this subject, F.S. §379.401 lays out a tiered system under which various violations are grouped and the applicable penalty is prescribed. The tiers are designated as Levels One through Four, with Level One equating to noncriminal infractions for which civil penalties can be levied by a court of law and Level Four representing those violations the Legislature has determined warrant punishment as a third degree felony.

Unless otherwise specifically provided for, violations of FWC rules or orders constitute a Level Two violation. Therefore, violation of the new rule is considered a Level Two violation and as such is a misdemeanor. The specific fines and/or prison time is dependent on the specifics of the case and records (if any) of prior violations. Generally, the penalty for violation of this rule is less severe than the penalties for intentionally wounding or killing a State Threatened species, which is a felony. It is not anticipated that the change in penalty for intentionally killing or wounding a bear from the present felony to a misdemeanor will have a significant impact on illegal take of bears. In fact, in some jurisdictions it may prove to be easier to successfully prosecute a misdemeanor violation under the new rule given that some state attorneys are reluctant to prosecute for a possible felony conviction. If there is evidence that the reduced penalty is hindering the protection of bears, or undermining achieving the objectives of this plan, FWC will work with stakeholders to address possible statutory changes if they are deemed necessary and appropriate.

Enforcement

FWC’s Division of Law Enforcement (LE) has the primary responsibility for enforcing conservation laws related to bears. Consistent and fair enforcement of regulations is important in helping the public and local governments share responsibility for reducing human-bear conflicts. The key to accomplishing this
task is good communication and training for the involved agencies by FWC. The
establishment of agency subject matter experts that will work and share
responsibility with FWC under this plan is also important.

Illegal intentional take of bears as defined in this plan and under the proposed
bear rule could include such activities as poaching, shooting, chasing with dogs,
illegal possession, or trafficking in bear parts. FWC LE works cooperatively with
other sworn officers from counties and municipalities in investigating and
prosecuting such cases. FWC LE and Bear Management Program staff will
continue to work with local law enforcement officials to provide training and
information regarding enforcement of the black bear rule.

Of the four rules that apply directly to bears, the prohibition against feeding
bears presents a particular challenge for enforcement. The purpose of this rule is to
reduce the likelihood of conflict with bears and the creation of potential human
safety risks. Unfortunately, people continue to intentionally and unintentionally
feed bears, demonstrating a need to develop more effective approaches to address
this issue. Both internal and external discussions regarding the specific language of
the feeding prohibition rule have led FWC to add an action to this plan to determine
if any changes in the rule could make it more effective (Table 10, Action 3.1.2).

Effective and consistent enforcement, whether it comes from city, county or
State regulations, will be paramount in achieving compliance at a level that will
successfully reduce human-bear conflicts. In addition to the existing agency feeding
rule (68A-4.001(3), F.A.C.), changes in local law enforcement and regulations need
to be considered. City and county ordinances will be needed to ensure the level of
responsibility by the public is both recognized and adequate to deter bears from
seeking garbage or other attractants (see sample ordinance in Appendix VI).
Existing regulations through local sanitation departments or public health entities
can be used as well. Additionally, FWC’s Wildlife Alert Hotline (1-888-404-3922)
should be more widely advertised for people to report individuals in their
community whose actions attract bears. Increasing awareness with a strong
outreach effort and accountability practices will be critical in convincing area residents to recognize their role in reducing human-bear conflicts as well.

Establishing an initial education phase in the enforcement philosophy provides individuals with a fair warning system. The initial phase is followed by management practices to increase the level of enforcement based on the violation and the true intent of the violator. Additionally, direct and constant coordination with the local jurisdiction and the judicial courts system with a complete understanding of the regulations, enforcement practices, and penalties are paramount in the accountability efforts needed to achieve effective, community-oriented enforcement practices.

**Permitting Framework**

FWC currently issues the following bear related permits and licenses: 1) Scientific Collection (Research/Salvage), 2) Permanent Possession of Captive Wildlife, 3) Wildlife Exhibit, 4) Rehabilitation Permits, and 5) Aversive Conditioning and Hazing. Those permits will continue to be issued under this plan.

Permits and licenses associated with bears are processed and issued through several programs within FWC and therefore are maintained in separate databases. This process can create confusion for users and administrators of these permits and licenses. Additionally, several of the licenses are not linked to permits, which can create further confusion. A need exists to review, refine and update the existing policies, procedures, and guidelines for permits and licenses related to bears.

Bear-related permits and licenses should be consolidated where applicable. Procedures should be developed that outline how to permit and/or license individuals or entities both internal and external to FWC. Additionally, permit and license timetables, expiration dates, inspections, and reviews should be reviewed and synchronized where feasible. New methodologies should be considered in an effort to encompass needed components for permitting or licensing. Those may include shifting staff resources to allow actions that have a clear and desired
conservation benefit and value, recognizing new permits or licenses needed (e.g., depredation permits), or designating a fee schedule. FWC has initiated a permit and licensing web application system that could minimize FWC staffing requirements and provide optimal customer service. Efforts such as the web-based system could streamline the bear-related permit and license processes, thereby reducing FWC staff time and improving the end user’s perspective of the system and the agency.

An additional enforcement need is to provide FWC staff, contracted individuals, and response partners with training so that FWC policies and protocols are administered correctly and uniformly statewide. These actions may require the creation of permits or licenses to involve contractors and response partners to assist FWC with responding to incidents involving bears and developing Bear Smart Communities.
CHAPTER 6: IMPLEMENTATION STRATEGY

The bear management plan is for all of Florida, not just FWC. Complex natural resource problems cannot be solved by one government agency, or by government alone. Non-governmental organizations, business interests, and the citizens of Florida will play a significant role in implementing the bear management plan.

While FWC’s Bear Management Program will be responsible for overseeing implementation, FWC must coordinate and work together with others outside the agency for successful implementation of this management plan.

Implementation Schedule

This plan will commence the year in which it is adopted by FWC and was designed to be in use for ten years. The plan’s goal and objectives (Chapter 4) are long term; therefore, actions may be adjusted to extend the life of the plan if it still meets the state’s bear management needs at the end of the ten-year period.

All of the actions located in Chapter 4 have attached timeframes from one to ten years. The action tables indicate the year(s) in which the action should be implemented and the anticipated completion year. Some of the actions are on a recurring schedule and will take place throughout the timeframe. Many of the actions depend on the completion of other actions before they can be implemented. Actions supporting the Habitat Objective, for example, are aimed at identifying functioning bear corridors between BMUs. Once these areas have been identified and prioritized, other actions may be implemented to investigate the conservation status of those areas, conduct outreach to private landowners, and explore long term conservation actions. Not all of the actions identified in this plan can be initiated or worked on simultaneously. It is important to note that many of the actions which can be implemented with existing resources could be enhanced and completed sooner if other resources were made available. While fully establishing and working with BBAGs in each BMU will require other resources, for example,
there are some components of establishing these groups that can be accomplished in a few BMUs with existing resources (Table 12).

Current Resources for Implementation

FWC has been successful in bear conservation efforts by maximizing existing resources, and it is expected that many priority actions in this plan will be implemented with existing resources. FWC will continue to make appropriate efforts to secure additional resources to enhance and accelerate execution of this plan. FWC’s Bear Management and Research Programs have four full-time employees and three temporary part-time employees that work solely on black bears with an operating budget of approximately $143,000 per year. The Bear Management Program also has an internship program that hosts 15 to 20 students from local universities each year to complete management projects, perform outreach, and assist in database maintenance. Grants from the Conserve Wildlife Tag (CWT) license plate fund support the Bear Response Program, which is a group of 10 contracted, private individuals who assist with human-bear conflict management. In addition to the Bear Response Program, the CWT also funds other important bear management and research projects.

Outside of the bear programs, there are many other Division, Section, and Office personnel involved in bear management. Over 40 FWC employees in the Terrestrial Habitat Conservation and Restoration Section (THCR) are available to respond to human-bear conflicts. The Northwest Region, for example, currently spends the equivalent to one full-time employee spread across 14 staff dealing with bears in some capacity each year. FWC also employs five temporary wildlife assistance biologists to assist the thousands of people who call FWC each year with questions or concerns about bears and other wildlife. Those positions form an information hub between the office and field personnel, relaying information to senior staff and dispatching employees when necessary. FWC’s Office of Conservation Planning employs six staff members who review and draft comments on land use changes for review by Bear Management Program staff. Numerous
officers with FWC Division of Law Enforcement provide critical outreach to the
public about bears in addition to their enforcement roles. Staff with the Office of
Community Relations is regularly involved with outreach efforts related to bears
through press releases, media interviews, and creation of outreach materials.

**Resource Considerations**

The temporary and part-time staff currently involved in bear management
activities provide critical services to FWC’s bear program. Those positions are
currently funded either from CWT funds or state trust funds, neither of which are
dedicated to bears. The undedicated funding sources and high turnover rates for
those positions create a challenge for FWC. If additional or redirected resources
were available, changing those positions from temporary part-time to full-time
would increase the positions’ job security and benefits, which could reduce turnover
and allow FWC to attract and maintain experienced staff in these important
positions. Similarly, the contractors hired under the Bear Response Program do not
have a dedicated funding source. The program has been funded with CWT grants
since 2009, but has no assurances that those funds will remain available for this
program.

The bear program is fortunate it can rely on such a large number of FWC staff
to be involved with bear management activities. In particular, the large number of
THCR staff allows for an efficient statewide response to human-bear conflicts.
However, THCR staff members have multiple job responsibilities and, under the
current agency structure, cannot be expected to dedicate a large amount of their
time on bear management activities on a regular basis.

The plan calls for the creation of seven BMUs across the state to accommodate
the different characteristics and issues of each of the main bear subpopulations.
The plan proposes the creation of a BBAG for each of the seven BMUs. The BBAG
would be a forum within which interested stakeholder groups could meet with FWC
and provide their input on bear management issues. Resources will be required to
create and staff BBAGs. There are a number of ways FWC could redirect internal programmatic resources to accomplish effective plan implementation without a significant increase in new resources. FWC could decide, for example, to consolidate bear management activities into a few staff positions. Those positions would have an increase in time dedicated to bear management while significantly reducing the amount of time the majority of other staff would spend on bear management activities. This approach would take advantage of existing experience with the local area and bear management issues while freeing up many more employees to focus on their workloads associated with their assigned wildlife management areas. An alternative strategy is to use a matrix management approach, where staff supervision changes depending on what activities they are conducting. An FWC staff person conducting a prescribed burn, for example, would be supervised under THCR. When that same person is trapping a bear, they would be supervised under the Bear Management Program. This approach allows staff to complete a variety tasks with confidence that their supervisor will have the expertise to guide them.

Depending upon the level of implementation, the actions identified in the plan could cost the bear program an additional $300,000 annually. Those costs could be met using additional funds or from reprioritizing existing funding within FWC. The action tables indicate which actions can be implemented with existing resources and which may require other resources. A fully detailed budget based on this plan will be developed at a later date; however, the plan offers four examples of action items, one from each of the four objectives, that would benefit from other resources (Table 13). Each project has a firm basis to estimate costs and is also a high priority action. Costs are estimated over the ten-year timeframe of the plan, although not all projects would be active in each of the ten years.

There are several avenues of securing additional resources outside of FWC if deemed appropriate for plan implementation. The first step is to propose a comprehensive budget with estimates on both staff and resources needed for full implementation of the actions listed in this plan. The plan would provide a
Table 13. Ten-year cost estimates for one action item from each objective that would benefit from other resources for implementation of the Florida Black Bear Management Plan.

<table>
<thead>
<tr>
<th>Objective</th>
<th>Description</th>
<th>Ten-Year Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>Subpopulation abundance estimates&lt;sup&gt;a&lt;/sup&gt;</td>
<td>$600,000</td>
</tr>
<tr>
<td>Habitat</td>
<td>Identify and prioritize landscape connections among subpopulations</td>
<td>$100,000</td>
</tr>
<tr>
<td>Conflict Management</td>
<td>Bear Response Program annual contractor costs</td>
<td>$500,000</td>
</tr>
<tr>
<td>Education and Outreach</td>
<td>Identify, recruit and assist communities in becoming Bear Smart Communities&lt;sup&gt;b&lt;/sup&gt;</td>
<td>$70,000</td>
</tr>
</tbody>
</table>

<sup>a</sup> There are five subpopulations that will not have had abundance estimates within two years of the plan approval, and each estimate costs $120,000 and takes three years to complete.

<sup>b</sup> Implementation of the Bear Smart Community (BSC) program assumes FWC can identify, within each of the seven BMUs, four candidate areas and will assist at least one community in meeting the BSC criteria.

blueprint with which a detailed proposal can be built that will be part of more formal requests to external funding sources. The approach most likely to be successful in obtaining funds in the near term would be seeking various foundation grants for specific bear management and research projects. Implementation of long-term management or research projects described in this plan, however, would only be sustainable if the funds were either dedicated or in multi-year grants. For long-term projects and sustained programs, FWC could submit a funding request for increased legislative spending authority for bear conservation.

FWC also can seek greater collaboration with public and private partners to complete actions currently lacking outside support. FWC can implement specific actions increasing existing external resources for FWC’s partners in bear conservation. FWC can develop a strategy to increase sales of the CWT license plate, for example, or steer corporate sponsorships, endowments, and donations to the Wildlife Foundation of Florida’s ‘bear account’. These actions center on creating formal partnerships to perform certain actions and finding funding to implement them. Defenders of Wildlife, for example, has been a very active partner with FWC on many occasions to assist with projects, but these funds are, of course, not
dedicated and therefore cannot be relied on to support regular conservation activities. FWC can also attempt to match local sources of funding with localized bear conservation activities, like the Bear Smart Community program (Chapter 4, Education and Outreach).

**Coordination with Other Efforts**

Bears require large areas for sustainable populations, thus their needs overlap with hundreds of other species and therefore serve as an *umbrella species* in habitat conservation efforts. Coordination across various planning and conservation efforts will be critical to ensure effective use of limited resources. The additional 1.3 million acres of bear habitat needed to meet the minimum population objectives identified in this plan (Table 7) falls well within the range of acreages designated in other Florida planning efforts (Table 14). Many to nearly all of these bear habitat acres overlap with those in other plans. The Gopher Tortoise Management Plan (FWC 2007), for example, calls for the preservation of an additional 615,000 acres of habitat. This acreage, while not explicitly demarcated, falls largely within the same areas needed for bears. Careful consideration should be given to overlap priorities of proposed lands to maximize resources. FWC’s bear programs, as currently staffed and funded, can perform some of the necessary duties, but more resources will be needed to fully coordinate with landscape conservation endeavors.
**Table 14. Landscape-scale wildlife habitat planning efforts in Florida.**

<table>
<thead>
<tr>
<th>Effort / Plan</th>
<th>Total Acres</th>
<th>Total Private Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWC Gopher Tortoise Management Plan</td>
<td>1,955,000</td>
<td>615,000</td>
</tr>
<tr>
<td>Florida Forever</td>
<td>2,009,182</td>
<td>2,009,182</td>
</tr>
<tr>
<td>FWC Black Bear Management Plan</td>
<td>7,530,536</td>
<td>1,263,944</td>
</tr>
<tr>
<td>FWC Closing the Gaps Report</td>
<td>11,700,000</td>
<td>4,820,000</td>
</tr>
<tr>
<td>FWC Integrated Wildlife Habitat Ranking System</td>
<td>14,628,639</td>
<td>6,054,082</td>
</tr>
<tr>
<td>The Nature Conservancy Florida Assessment</td>
<td>15,861,368</td>
<td>6,901,622</td>
</tr>
<tr>
<td>Critical Lands &amp; Waters Identification Project (P1&amp;P2)</td>
<td>25,093,930</td>
<td>10,709,354</td>
</tr>
<tr>
<td>Greenways and Trails Ecological Network</td>
<td>25,601,250</td>
<td>14,615,212</td>
</tr>
</tbody>
</table>
CHAPTER 7: ANTICIPATED IMPACTS

Humans and bears have interacted with one another throughout Florida's history. Florida's bears generally try to avoid contact with people but encounters do occur as a result of bears' large home ranges and adaptable behavior, and the land-use and lifestyle decisions of people. The development of residential communities in close proximity to bear populations and expanding bear range has created the potential for increased human-bear interactions. Negative human-bear interactions can occur when preferred bear foods are planted or maintained near homes, and when human food (e.g., unsecured garbage) is made easily available to bears. Interactions are more likely when natural bear foods become scarce, such as during years of drought or mast failure. This management plan addresses managing the impacts of society on bears as well as the effects bears have on people. In this section of the plan, the social, economic, and ecological impacts of implementing or not implementing this management plan will be considered.

Social Impacts

People value wildlife, including bears, for many reasons and their perspectives vary according to individual interests (Kellert 1980). Bears are charismatic animals and many people enjoy the opportunity to view bears (Kellert 1994, Jonker et al. 1998, Bowman et al. 2001, Morzillo et al. 2007, Miller et al. 2008). Kellert (1994) offers that the positive attitudes people have about bears could be because bears are ‘phylogenetically similar to humans, intelligent, and aesthetically pleasing.’ The overall impact of bears on society depends on how individuals with differing interests perceive and experience human-bear interactions (Kellert 1994).

The European settlers in Florida valued bears mostly for practical reasons. They were used for their meat, hides, and other products but otherwise treated as vermin because people considered bears a threat to livestock and a competitor with humans for food. This viewpoint dominated people’s interactions with bears well into the 20th century and likely resulted in severe reductions in the abundance of bears. In the second half of the 20th century, however, several factors led to a more
positive attitude towards wildlife and predators in particular: a shift in the economy (from less to more sustainable); greater understanding of the ecological importance of predators (Bjerke and Kaltenborn 1999); and the listing of bears as a State Threatened species (GFC 1974). Despite this overall shift in the public opinion of bears, a wide range of attitudes towards bears still exists in Florida because of people’s differing experiences with bears and varying interests in them (McDonald 1998, Miller et al. 2008). Balancing such viewpoints in a management plan is challenging.

The frequency and nature of a person’s interactions with bears influences their opinion of those interactions as good or bad, and ultimately leads to an overall positive or negative view towards bears (Kellert 1994). For example, a beekeeper with an apiary near a forest might have low personal tolerance for bears, if bears caused severe and costly damage to the bee yard. On the other hand, urban residents traveling to the same forest to view black bears might perceive the bear population as too small if a bear is not seen while visiting. Determining the social carrying capacity for bears requires balancing benefits people gain from bears against human tolerance for negative human-bear interactions. Lower tolerance for bears in areas of higher human populations will limit bear populations before available resources become a limiting factor or the biological carrying capacity is reached (Kellert 1994). Measurements of social carrying capacity are somewhat subjective and involve a combination of social, economic, political and ecological perspectives.

Implementation of this plan should result in fewer negative human-bear interactions and a higher social carrying capacity for bears. Residents may have a sense of ownership and increased responsibility for bears in their area if they are allowed to provide input into local bear management activities through programs such as BBAGs. Habitat conservation efforts on behalf of bears will provide many additional direct benefits to residents while negative human-bear interactions should decline as a result of changes in waste management policies by local governments and the potential relocation or removal of bears from areas of dense
human populations. Education and outreach regarding living with bears is critical
to the success of this plan. Although there has never been a life threatening injury
or predatory attack by a black bear on a human in Florida, there have been over a
doen reported incidents of bears biting or scratching people. In those incidents, the
bears were defending cubs, food, or themselves. Educating the public about bear
behavior and what people can do to reduce bear activity in their neighborhoods
should increase public safety.

If, however, the management practices outlined in this plan are not
implemented, there is a high likelihood of increasing negative interactions between
bears and people. Without an outreach campaign to educate people on successfully
living near bears, human food will continue to be available to bears, thus creating
potential public safety issues. If current trends continue, the number of negative
human-bear interactions may increase and could lead to a diminished opinion of
bears by Floridians and subsequent lack of support for bear conservation. If
residents are not allowed to be involved in local bear management decisions
through practices such as BBAGs, there could be a lower social carrying capacity.

Economic Impacts

Positive economic benefits of bears may include the stimulation of local
economies near bears and conservation easements for owners of occupied bear
habitat, while negative economic impacts include property damage (including
damage caused by vehicle-bear collisions) and the cost of bear management.

Educational events such as the Florida Black Bear Festival in Umatilla attract
visitors to rural areas. Such festivals can boost the local economy by providing
opportunities for vendors to sell merchandise and promote their businesses. Bear-
related activities can lead to the creation of private sector jobs and increase the
sales of equipment, food, fuel, and lodging at local businesses, which then provides
revenue to the State via sales taxes.

The designation of bear scenic byways may further develop local economies by
increasing the standing of an area and attracting more visitors. In February 2008,
portions of State Roads 40 and 19 were designated as the Florida Black Bear Scenic Byway through a cooperative effort among Marion, Lake, Putnam, and Volusia county government officials, Ocala NF staff, and businesses, land owners, and local residents along the corridor. Byways such as this are eligible to receive Federal funding for the construction of informational kiosks and interpretive areas, and to apply for status as a National Scenic Highway.

Another benefit of following the habitat conservation and management recommendations in this plan may be the economic stimulation of local communities through bear viewing opportunities. People enjoy visiting areas that afford opportunities to see bears. Surveys show visitors in the Great Smoky Mountains National Park preferred seeing a bear to seeing any other wildlife species (Burghardt et al. 1972). This attraction of people to bears can lead to positive economic impacts. In Florida, ecotourism near black bear populations may stimulate rural economies by attracting a portion of the State’s annual 82 million tourists (Visit Florida 2009).

Implementation of this plan also can result in economic benefits for large landowners of suitable bear habitat or who have bears on their land. FWC and members of BBAGs can assist landowners with negotiating conservation easements (i.e., tax saving programs associated with keeping their land in a natural state).

Bears may be a financial liability when they interact negatively with humans, particularly if the interaction results in property damage. Property damage was reported in approximately 11 percent of complaints to FWC from 1980 through 2010 (FWC, unpublished data, 2010). Vehicle-bear collisions are of particular concern because they not only result in property damage, but can also pose a human safety issue. Conservation actions such as warning signs, slower posted speed limits, fencing, and wildlife underpasses or elongated bridges reduce the risk of such collisions. The frequency and severity of other negative human-bear interactions can be reduced if the number of human-habituated bears declines. This can be achieved by decreasing the availability of human-provided foods. As the number of
negative interactions between bears and humans drops, economic costs associated
with property damage should also decline.

The cost to agencies and local economies of implementing this plan is another
potentially negative economic impact of bears. If meeting plan objectives requires
large amounts of habitat to be purchased and placed in conservation, significant
resources will be required. Alternatively, not implementing various aspects of this
management plan could also result in significant economic costs to agencies and
local economies. Without organized management efforts, bear ecotourism will be
minimized, whereas human-bear conflicts will likely increase, particularly among
rural communities and large landowners in bear range. Those individuals will have
to incur the cost of repeated conflicts with bears, yet will receive limited economic
benefits from them. An increase in human-bear conflicts will prove costly to
agencies responsible for handling those complaints and is a significant threat to
bear conservation efforts.

Ecological Impacts

Bears are an umbrella species because they require large home ranges and
diverse natural plant communities, so preserving and managing healthy bear
populations provides habitat for many other species as well. Additionally, corridors
established and maintained for bears can be used by other species, either as
corridors or as habitat. Bears also may serve an important ecological role in their
communities as seed dispersers (Auger et al. 2002). Conserving bears and bear
habitat ensures bears can continue such meaningful ecological roles.

Although bears compete with other animals for certain foods such as acorns,
and occasionally kill individual palms or small mammals, they are nutritional
generalists that feed on a wide variety of foods based on seasonal availability
(Maehr and Brady 1984). While there may be localized or seasonal impacts from
increased bear numbers, no single plant or animal species would be considered
vulnerable to an increased statewide bear population. Additionally, no species is
reliant on bears as their primary source of prey.
It is important to examine the likely ecological consequences of not implementing this management plan. Considering the high rate of urbanization and human population growth in Florida, a concerted effort is required to conserve native habitat and decrease habitat loss, degradation, and fragmentation. In addition to providing wildlife habitat, large forests offer benefits to people, which can include groundwater recharge, long-term storage of carbon dioxide, water filtration, flood water storage, wood products, and recreational opportunities (Allen et al. 2001). If the conservation actions detailed within this management plan are not acted on and adequate bear habitat is not conserved, bear subpopulations may decline and spatial and genetic isolation will increase. Populations of other flora and fauna reliant on the same intact habitat as bears will suffer similar fates, and the ecological services that benefit people will be reduced.

As additional habitat is degraded and fragmented, bears will likely be forced to forage closer to human dwellings. Bears will become more habituated and food conditioned to people, causing the frequency and severity of human-bear conflicts to increase. Because those outcomes collectively could lead to a significant reduction in public support for bears, consequences to statewide conservation efforts could be far-reaching and drastic.

Implementation of this plan should not only result in a healthy and genetically-connected bear population in Florida, it should also enhance the populations of a wide variety of other plants and animals.
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APPENDIX I. BEAR MANAGEMENT UNIT, BEAR RANGE AND CORE COMPLAINTS IN FLORIDA COUNTIES.

Table 15. Florida counties identified by Bear Management Unit (BMU), whether in primary (1) and/or secondary (2) or in neither bear range, and the number of core complaints received from the public by Florida Fish and Wildlife Conservation Commission in 2010.

<table>
<thead>
<tr>
<th>County</th>
<th>BMU</th>
<th>1</th>
<th>2</th>
<th>2010 Core Complaints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alachua</td>
<td>Central</td>
<td>No</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Baker</td>
<td>North</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Bay</td>
<td>E. Panhandle</td>
<td>Yes</td>
<td>Yes</td>
<td>47</td>
</tr>
<tr>
<td>Bradford</td>
<td>Central</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Brevard</td>
<td>Central</td>
<td>No</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Broward</td>
<td>South</td>
<td>No</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Calhoun</td>
<td>E. Panhandle</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Charlotte</td>
<td>S. Central</td>
<td>No</td>
<td>No</td>
<td>7</td>
</tr>
<tr>
<td>Citrus</td>
<td>Big Bend</td>
<td>Yes</td>
<td>Yes</td>
<td>8</td>
</tr>
<tr>
<td>Clay</td>
<td>Central</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Collier</td>
<td>South</td>
<td>Yes</td>
<td>Yes</td>
<td>55</td>
</tr>
<tr>
<td>Columbia</td>
<td>North</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>De Soto</td>
<td>S. Central</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Dixie</td>
<td>Big Bend</td>
<td>No</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Duval</td>
<td>North</td>
<td>No</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Escambia</td>
<td>W. Panhandle</td>
<td>No</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Flagler</td>
<td>Central</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Franklin</td>
<td>E. Panhandle</td>
<td>Yes</td>
<td>No</td>
<td>118</td>
</tr>
<tr>
<td>Gadsden</td>
<td>E. Panhandle</td>
<td>Yes</td>
<td>Yes</td>
<td>33</td>
</tr>
<tr>
<td>Gilchrist</td>
<td>Big Bend</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Glades</td>
<td>S. Central</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
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<tr>
<td>Gulf</td>
<td>E. Panhandle</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Hamilton</td>
<td>North</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Hardee</td>
<td>S. Central</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Hendry</td>
<td>South</td>
<td>Yes</td>
<td>Yes</td>
<td>0</td>
</tr>
<tr>
<td>Hernando</td>
<td>Big Bend</td>
<td>Yes</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>Highlands</td>
<td>S. Central</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>S. Central</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
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APPENDIX II. FLORIDA BLACK BEAR BIOLOGICAL STATUS REVIEW REPORT

Biological Status Review
for the
Florida black bear
(Ursus americanus floridanus)
March 31, 2011

EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) directed staff to evaluate all species listed as Threatened or Species of Special Concern as of November 8, 2010 that had not undergone a status review in the past decade. Public information on the status of the Florida black bear was sought from September 17 to November 1, 2010. The members of a Biological Review Group (BRG) met on November 3-4, 2010. Group members were Walter McCown (FWC lead), Mel Sunquist (University of Florida, Emeritus), and Bill Giuliano (University of Florida) (Appendix 1). In accordance with rule 68A-27.0012, Florida Administrative Code (F.A.C.), the BRG was charged with evaluating the biological status of the Florida black bear using criteria included in definitions in rule 68A-27.001, F.A.C., and following the protocols in the Guidelines for Application of the IUCN Red List Criteria at Regional Levels (Version 3.0) and Guidelines for Using the IUCN Red List Categories and Criteria (Version 8.1). Please visit http://myfwc.com/wildlifehabitats/imperiled/listing-action-petitions/ to view the listing process rule and the criteria found in the definitions. Rule 68A-27.003, F.A.C., designates Florida black bears as State-designated threatened throughout the State, but excludes those found in Baker and Columbia counties and in Apalachicola National Forest. For the purposes of this review, however, we evaluated the taxon’s status on a statewide basis, as the bears within these counties and national forest are not biologically distinguishable from those outside these areas, nor are they isolated by these areas’ political boundaries.

In late 2010, staff developed the initial draft of this report which included BRG findings and a preliminary listing recommendation from staff. The draft was sent out for peer review and the reviewers’ input has been incorporated to create this final report. The report, peer reviews, and information received from the public are available as supplemental materials at http://myfwc.com/wildlifehabitats/imperiled/biological-status/.

The BRG concluded from the biological assessment that the Florida black bear did not meet listing criteria. Based on the literature review, information received from the public, and the BRG findings, staff recommends that the Florida black bear not be listed as a Threatened species.
This work was supported by a Conserve Wildlife Tag grant from the Wildlife Foundation of Florida. FWC staff gratefully acknowledges the assistance of the biological review group members and peer reviewers. Staff would also like to thank Karen Nutt who served as a data compiler on the species and contributed to this report.

**BIOLOGICAL INFORMATION**

**Taxonomic Classification** – The Florida black bear was initially described by Merriam (1896) as a separate species based on its long skull and highly arched nasal bones. Subsequently, Hall and Kelson (1959) and Harlow (1961) recognized the Florida black bear as one of 16 subspecies of the American black bear.

**Life History** – Florida black bears are uniformly black except for a tan or brown muzzle and occasionally a white chest patch (Maehr and Wooding 1992). Adult females weigh 130 to 180 lbs., and adult males usually weigh 250 to 350 lbs.

The habitat used by Florida black bears is diverse and ranges from temperate plant communities in northwestern Florida to subtropical communities in southern Florida (Maehr and Wooding 1992, Land et al. 1994). Bears inhabit cypress swamps, cabbage palm forests, pine flatwoods, mixed hardwood swamps, sand pine scrub, mixed hardwood hammocks, mixed hardwood pine forests, oak scrub, pine plantations, upland hardwood forests, bay swamps, sandhill communities, and mangrove swamps (Hoctor 2003, Maehr and Wooding 1992). Bears are opportunistic omnivores, eating a wide variety of plant material including soft fruits, hard mast, and herbaceous material but also including insects and some vertebrates, (Maehr and Wooding 1992). Bears will alter their habitat use and home range size seasonally depending on food availability and reproductive status (Maehr and Wooding 1992, Ulrey 2008, Moyer et al. 2007).

Florida black bear females become sexually mature between 3 and 4 years of age (Garrison 2004). Mating takes place in June or July and females may mate with several males (Maehr and Wooding 1992). Reproductive females den for an average of 113 days beginning in mid-December to mid-January, emerging in late March to late April (Garrison 2004, Dobey et al. 2005). Dens are usually shallow depressions on the ground in dense thickets of shrubs and vines (Garrison 2004, Maehr and Wooding 1992). Cubs are born in January or February in litters of two to four offspring (Maehr and Wooding 1992, Dobey et al. 2005, Garrison et al. 2007). Cubs weigh six to eight pounds when they leave the den at ten weeks old (Garrison et al. 2007). Cubs remain with their mother until they are 15-17 months old. Males disperse but females generally form a home range that overlaps their natal home range (Moyer et al. 2006). Variation in home range size and shape is influenced by the temporal and spatial distribution of food, reproductive status, and human influences. Annual home ranges of female Florida black bears vary from 3.8 km² to
126.9 km² (Dobey et al. 2005, Moyer et al. 2007). Home range size for male black bears generally varies from 94 km² to 185 km² (Land et al. 1994, McCown et al. 2004, Ulrey 2008).

**Geographic Range and Distribution** – The Florida black bear was historically widespread throughout mainland Florida and the southern portions of Georgia and Alabama (Maehr and Wooding 1992). Currently, there is one subpopulation in and around the Okefenokee National Wildlife Refuge in Georgia; one subpopulation near Mobile, Alabama; five large Florida subpopulations (Ocala/St. Johns, Osceola, Eglin, Apalachicola, and Big Cypress), and two small, remnant subpopulations in Florida (Chassahowitzka and Glades/Highlands) (Figure 1). This report assesses the portion of the Florida black bear population within the state of Florida.

Bear range in Florida was estimated (Simek et al. 2005) by dividing the state into a systematic grid of 4,447 ha (10,000 ac) cells based on estimates of minimum patch size needed for bears (Cox et al. 1994, Maehr et al 2001). The presence of bears was determined within each cell using 1999–2003 locations of nuisance and roadkill bears, captures, telemetry data, FWC’s Wildlife Observation Data Base, observations from FWC personnel, and interviews with owners or managers of large land holdings. Based on these data, each grid cell was coded to document the distribution of bears as either breeding range (females present) or non-breeding range (no females documented). The extent of the calculated breeding range was 26,099 km² and the nonbreeding range was estimated to be 19,306 km². Within this document, breeding range is considered to be equivalent to the IUCN term Area of Occupancy (AOO), and the breeding range and the non-breeding range combined (45,405 km²) are considered to be equivalent to the IUCN term Extent of Occurrence (EOO).

Within Florida the largest expanse of virtually unoccupied, but apparently suitable, bear habitat is in the Big Bend Region. Deforestation and persecution by humans in the early to mid-1900s were probably the primary factors contributing to the extirpation of bears there. Subsequent regrowth and replanting of forest cover, however, has improved the potential habitat quality for bears in the area. Hoctor (2006) modeled the probability of occupancy of black bear habitat in Florida based upon land cover type, patch size, distance from habitat patches, and connectivity and size of large habitat mosaics. A conservative estimate of potential density (0.08 – 0.10 bears/km²) for the 5,949 km² of the best bear habitat in the Big Bend suggests this area could support 475 – 590 bears. It currently supports < 100 bears (FWC unpublished data). Although female bears normally establish home ranges that overlap their natal home ranges (Moyer et al. 2006) and thus are poor dispersers, the Big Bend shares a landscape connection with currently occupied bear range in Apalachicola National Forest and is likely to support more bears over time.
Although the black bear is widespread in Florida, its distribution is fragmented with limited landscape connectivity or genetic exchange between subpopulations (Dixon et al. 2007, Maehr and Wooding 1992). Black bears in Florida currently inhabit 18% of their historic range totaling approximately 45,405 km$^2$ (17,531 mi$^2$) (EOO), within which reproduction occurs on approximately 26,000 km$^2$ (10,077 mi$^2$) (AOO) (Figure 1).

**Population Status and Trend** – The full black bear species, *Ursus americanus*, is currently listed as Least Concern by the IUCN because “this species is widespread, with a large global population estimated at more than twice that of all other species of bears combined. Moreover, in most areas populations are expanding numerically and geographically. Threats exist only in a few isolated places” (Garshelis et al. 2008).

The sub-species of black bear in Florida became listed as a state Threatened species in 1974 but remained a game animal on private lands in Baker and Columbia counties, on the Osceola and Apalachicola national forests, and on Tyndall Air Force Base (through 1976). The threatened designation was removed from bears in Baker and Columbia counties and Apalachicola National Forest in 1978 and regulations were established prohibiting the hunting of threatened species in 1979 (GFC 1993). As a result, the black bear is currently listed as a Threatened species by the State of Florida except in Baker and Columbia counties and Apalachicola National Forest.

For the purposes of this review, however, we evaluated the taxon’s status on a statewide basis as the bears within these counties and national forest are not biologically distinguishable from those outside these areas, nor are they isolated by these areas’ political boundaries.

Obtaining a reliable population estimate of black bears is challenging. They are reclusive animals with large home ranges and inhabit remote, densely forested habitats making direct counts impractical. Mark-recapture population estimation techniques, however, are available that are reliable and scientifically sound (Williams et al. 2002). These techniques have been used in combination with genetic analyses that allow identification of individual animals to provide accurate population estimates of a wide array of species (Luikart et al. 2010, Guschanski et al. 2009). This approach was used to estimate abundance of bears in the breeding range (AOO) of five subpopulations in the state in 2002. Study areas within representative habitat were selected in the Eglin, Apalachicola, Osceola, Ocala/St. Johns, and Big Cypress subpopulations. Mark-recapture techniques provided an abundance estimate for each study area, and, using the effective study area size, a density estimate was obtained. The density estimate for each study area was then extrapolated across the previously identified breeding range (AOO) to obtain an abundance estimate for each subpopulation. The abundance of bears outside of the breeding range (AOO) was not estimated. Resulting abundance estimates for 2002 were: Apalachicola 568 bears; Big Cypress 697 bears; Eglin 82 bears; Ocala/St.
Early estimates of black bear abundance in Florida (Figure 2) were primarily opinions of FWC species experts with input from local staff and, therefore, may not have been as reliable as the 2002 estimates. The various estimates do, however, suggest an increase in bear numbers over the past three decades. This apparent increase is corroborated by the increase in nuisance bear calls during that time (Figure 3) and by the increase in distribution (Figure 4). It is likely the black bear population in Florida will continue to increase over the next 24 years due to extensive conservation efforts and suitable habitat (Hoctor 2006) that is currently unoccupied but adjacent to occupied range.

Quantitative Analyses – Maehr et al. (2001) used the program VORTEX 8.21 (Lacy et al. 1995) and data from individual subpopulations to predict a zero (0.0) probability of extinction for the Eglin, Apalachicola, Osceola, Ocala and Glades-Highlands populations and 0.2 – 0.4 percent chance of extinction for the Chassahowitzka population within the next 100 years. Hostetler et al. (2009) used specific demographic data gathered from long term research to estimate that the Ocala subpopulation was growing at 1-2% per year.

BIOLOGICAL STATUS ASSESSMENT

Threats – The greatest threats to Florida black bears are habitat loss and degradation and negative interactions with people. The Florida black bear is particularly vulnerable to habitat loss because of its large home range sizes, low population size and density, and low productivity (Hostetler et al. 2009, Maehr and Wooding 1992). Its habitat is also degraded by fragmentation from roads and development, which results in additional threats from increased interactions with humans and their vehicles (Hostetler et al. 2009, Maehr and Wooding 1992). Incompatible land management can also result in degradation of habitat quality. Commercial saw palmetto (Serenoa repens) berry harvesting and fire management regimes benefitting other species may remove important resources utilized by black bears (Maehr et al. 2001, Stratman and Pelton 2007). Although these practices do not threaten black bear populations statewide, they may lower the biological carrying capacity of some local areas.

The FWC addresses habitat loss and degradation in a number of ways. FWC employees provide comments and information to other agencies and non-governmental organizations to help identify and conserve parcels of high value to bears. They provide comments on county comprehensive plans and developments of regional impact in bear range and have published a wildlife conservation guide for
planners, developers, and consultants seeking to reduce impacts of development on bears. They periodically update and refine bear distribution maps for use in conservation planning, have identified landscape level corridors between bear subpopulations and promoted their conservation, and will begin research in 2011 to identify high-value conservation lands in the Ocala to Osceola corridor. They have identified FWC-managed lands that support bears, produced a priority list of areas to be managed to benefit bears, and incorporated conservation measures in the Wildlife Conservation Prioritization and Recovery Plans for these areas. FWC bear staff provides guidelines for managing bear habitat to land managers and is cooperating with plant monitoring staff to develop quantitative descriptions of optimal conditions for bears in major plant communities in Florida that will be provided to managers of critical bear habitat. The FWC funded a synthesis of available literature on management of saw palmetto and scrub palmetto (Sabal etonia), critical components of Florida black bear habitat. FWC bear staff also provides instruction on managing habitat to benefit bears at multi-agency prescribed fire workshops.

Human-bear interactions have increased in Florida due to greater populations of both bears and humans (Figure 3). Although some human/bear encounters are positive or neutral in their outcome, many are negative and can lead to death of the bear through vehicle collisions, illegal killing, or euthanasia (Annis 2008, Hostetler et al. 2009, Maehr et al. 2004, McCown et al. 2009). Furthermore, increased conflicts between humans and bears could lead to devaluation of the bear among Florida citizens, which could threaten bear conservation efforts in the State.

Documented bear mortality is largely due to human factors (Hostetler et al. 2009, Land et al. 1994). Bears are illegally killed or hit by vehicles. Bears come into contact with humans more frequently in highly fragmented habitat, and human-caused mortality in such habitat can be significant (Brown 2004, Hostetler et al. 2009). For example, adult female bears living adjacent to Ocala National Forest experienced levels of mortality that would not have been sustainable in a smaller, isolated population (McCown et al. 2004). Although the FWC documented 140 bears illegally killed in Florida between 1989 and 2009, a rate of 7 bears per year, the total number of bears killed each year is unknown. The statewide mortality rate due to roadkill was 4.8% in 2002 (Simek et al. 2005). Roadkills can be significant to small isolated populations but do not limit larger populations. Populations of black bears that are demographically similar to Florida black bears (breed at 3 years of age, females have 2 cubs every other year) can sustain an absolute annual mortality of up to 23% before the populations begin to decline (Bunnell and Tait 1980).

FWC staff works to reduce human/bear conflicts with multiple partners on a number of fronts. In 2010, staff and contract employees responded to more than 4,000 bear-related calls from the public with technical assistance, site visits, bear
deterrent equipment loans, or, when warranted, trapping and removing problem
bears (translocation or euthanasia). Responses included canvassing neighborhoods
with frequent bear interactions and meeting one-on-one with residents to provide
information on avoiding conflicts. FWC staff provides bear aversive-conditioning
training to municipal, county, and state law enforcement personnel to enlist their
help in deterring problems. Staff works with stakeholders to produce bear festivals
in areas of high human-bear interactions and provides bear educational
presentations to schools and civic groups. The FWC produced a video, “Living with
the Florida Black Bear,” to allow educators and civic groups to share the message
with their students and constituents. Staff worked with Defenders of Wildlife to
produce and update the Black Bear Curriculum Guide, which helps elementary
school students learn math, science, and history while learning about bears. The
FWC has partnered with local governments and waste management companies to
make garbage less accessible to bears and bear-resistant trash containers more
available to homeowners and create and enforce a wildlife feeding rule. The draft
black bear management plan, currently in preparation, calls for the creation of
“Bear Smart” communities where the FWC will work with local governments,
businesses, and residents to reduce bear conflicts and serve as a model for other
communities.

In an effort to reduce bear mortality resulting from vehicle collisions, the FWC
maintains a database of all roadkills. Staff uses this information to coordinate with
the Florida Department of Transportation (FDOT) to identify and mitigate chronic
roadkill hot spots and provide comments on road projects in bear range. The FDOT
has constructed more than 24 large wildlife underpasses along highways targeting
Florida panthers and/or black bears as a result. These structures have proven
effective in reducing mortality of bears from vehicular collisions. Additionally,
plans for future traffic enhancement projects in critical bear roadkill areas have
incorporated wildlife underpasses that target bears in the design phase.

FWC documents basic demographic parameters of black bear subpopulations. Bear
staff works to update and refine bear distribution. FWC provides guidelines for
managing bear habitat to land managers. FWC bear staff has identified landscape
level corridors between bear populations and promoted their conservation. FWC
will begin research in 2011 to identify high-value conservation lands in the Ocala to
Osceola corridor.

Population Assessment – Findings from the Biological Review Group are
included in the Biological Status Review Information Findings and Regional
Assessment tables following.
LISTING RECOMMENDATION

The BRG concluded that the Florida black bear did not meet listing criteria. Staff, therefore, recommends that the black bear not be listed as a Threatened species.

SUMMARY OF THE INDEPENDENT REVIEW

Comments were received from five reviewers: Dr. Dave Garshelis, Minnesota Department of Natural Resources, co-chair IUCN Bear Specialist Group; Dr. Madan Oli, Professor, Department of Wildlife Ecology and Conservation, University of Florida; Dr. Michael Pelton, Professor Emeritus, Department of Forestry, Wildlife and Fisheries, University of Tennessee; Dr. Frank van Manen, US Geological Survey, University of Tennessee, President International Association for Bear Research and Management; and Stephanie Simek, Mississippi State University and former FWC Bear Management Section leader. Their reviews can be found at MyFWC.com. All of the reviewers supported the findings of the BRG. Appropriate editorial changes were made and additional information was added as suggested by the reviewers. Specific comments and staff’s responses are as follows:

Three reviewers questioned the validity of the population viability analysis (PVA) conducted by Root and Barnes (2006) because it used inappropriate parameters and because it modeled one connected statewide population instead of individual subpopulations.

Discussion of the results from this PVA was removed. References to results from one other PVA based on subpopulations and a specific population model were added.

One reviewer suggested that more detail be provided on parameter estimates, assumptions, data, etc. used in the models.

This detail is available in the cited references, and its inclusion would be beyond the scope of this report.

Two reviewers suggested caution in interpreting estimates of bear abundance prior to 2002 because the methods used were subjective and not scientifically valid.

Staff acknowledges the limitations of these estimates and provided comments in the report to reflect this.

Two reviewers noted the trend in nuisance bear incidents might support the contention that bear numbers had increased.

A figure reflecting the increase in calls concerning bears received by the FWC was added to the report.
One reviewer noted that the number of bears killed on highways over time was not included in the report but may be an indicator of population status.

When staff examined the trend of bears killed on the highways, it was more suggestive of traffic level trends than of bear abundance trends.

Two reviewers noted that the method used to estimate 2002 bear abundance likely provided a conservative estimate, and one suggested re-analysis of the data using alternative methodologies.

Staff concurs with these comments. The FWC only estimated bear numbers within five breeding ranges (AOO), and thus it was not an estimate of all bears in Florida. Text was added to emphasize that bears outside of these areas were not estimated.

Further, staff notes that male bears comprised 55% of all sampled bears despite the fact that males experience a higher mortality rate than female bears and, as a result, there should be fewer of them. Correction factors to account for this gender-based behavioral response would likely result in an increase in the estimate and, therefore, would not change the findings of this report. Also, time did not allow re-analysis of the mark-recapture data for this review.

Two reviewers noted that the IUCN criteria rely on an estimate of the number of mature (capable of reproduction) individuals while FWC estimates of bear abundance do not distinguish mature individuals from immature individuals.

Due to their small stature, cubs were unlikely to leave hair tufts on barbed-wire strands 25 and 50 cm. above the ground and, therefore, were unlikely to be included in the population estimates. Staff acknowledges that reproductively immature animals (1-2 year old bears) were included in the estimates. However, we note that, overall, the technique provides a conservative estimate (as two reviewers noted).

Although generating a revised estimate based upon an untested correction factor to include only mature individuals would reduce the population estimate, it likely would not change the population trend or the finding of this report (i.e., it is unlikely the population estimate would be fewer than 1,000 mature individuals).

One reviewer recommended an alternative method for calculating and presenting variation in the statewide population estimate.

Calculations were revised as recommended and changes were made to the document.

Two reviewers noted there was no mention of habitat management conducted to benefit bears.

A summary of habitat management efforts by FWC to benefit bears was added.
One reviewer suggested that the document should explain why the black bear is not listed as Threatened in Baker and Columbia counties and Apalachicola National Forest.

Staff was unable to find documentation as to why bears in these areas were not listed as Threatened.

One reviewer suggested the variation between the criteria used to initially list the sub-species and the current IUCN criteria be reviewed.

The criteria used to initially list the sub-species are not available.

One reviewer suggested that, because the population of bears in Florida is fragmented into several subpopulations, the IUCN criteria may be too lax to provide any meaning for the long-term conservation of black bears within the State, and suggested a few of the subpopulations might meet the IUCN criteria for listing if the criteria were applied to them.

The IUCN criteria were developed by numerous experts and tested worldwide on 30,000 species. The decision to use these criteria to assess the biological status of 61 state-listed species was a result of extensive stakeholder involvement in development of the listing process. The task assigned to the BRG of evaluating the status of the black bear statewide in Florida was based on this process as specified in rule 68A-27.0012, F.A.C. The criteria include measures of geographic range, fragmentation, and subpopulation structure. Staff, therefore, believes application of these criteria to assess the status of the Florida black bear on a statewide basis is appropriate.

Supplemental Report is available at:
MyFWC.com/wildlifehabitats/imperiled/biological-status/

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animal populations: modeling, estimation, and decision making. Academic Press.
San Diego, California, USA.
## Biological Status Review Information Findings

**Species/taxon:** Florida black bear (*Ursus americanus floridanus*); Entire population.

<table>
<thead>
<tr>
<th>Date:</th>
<th>11/3/2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessors:</td>
<td>Walter McCown, Mel Sunquist, and Bill Giuliano</td>
</tr>
<tr>
<td>Generation length:</td>
<td>8.0 (based on ~ 500 ♀ in FWC database &gt; 4.0 y.o. = 7.4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criterion/Listing Measure</th>
<th>Data/Information</th>
<th>Data Type*</th>
<th>Criterion Met?</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(A) Population Size Reduction, ANY of</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a)1. An observed, estimated, inferred or suspected population size reduction of at least 50% over the last 10 years or 3 generations, whichever is longer, where the causes of the reduction are clearly reversible and understood and ceased</td>
<td>Numbers have been increasing over the past 24 years (3 generations)</td>
<td>S</td>
<td>No</td>
<td>GFC Historical population estimates, Pelton and Nichols 1972, Kasbohm 2004, and others (see Figures 2-4).</td>
</tr>
<tr>
<td>(a)2. An observed, estimated, inferred or suspected population size reduction of at least 30% over the last 10 years or 3 generations, whichever is longer, where the reduction or its causes may not have ceased or may not be understood or may not be reversible</td>
<td>Numbers have been increasing over the past 24 years (3 generations)</td>
<td>S</td>
<td>No</td>
<td>GFC Historical population estimates, Pelton and Nichols 1972, Kasbohm 2004, and others (see Figures 2-4).</td>
</tr>
</tbody>
</table>

*Data Types - observed (O), estimated (E), inferred (I), suspected (S), or projected (P). Criterion met - yes (Y) or no (N).*
### (a)3. A population size reduction of at least 30% projected or suspected to be met within the next 10 years or 3 generations, whichever is longer (up to a maximum of 100 years) \(^1\)

| Expected to increase over next 24 years due to conservation efforts and suitable vacant habitat | P | No | Hoctor 2006 |

### (a)4. An observed, estimated, inferred, projected or suspected population size reduction of at least 30% over any 10 year or 3 generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased or may not be understood or may not be reversible.\(^1\)

| Numbers have been and continue to increase due to conservation efforts and suitable vacant habitat. | P | No | Hoctor 2006 |

\(^1\) based on (and specifying) any of the following: (a) direct observation; (b) an index of abundance appropriate to the taxon; (c) a decline in area of occupancy, extent of occurrence and/or quality of habitat; (d) actual or potential levels of exploitation; (e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

#### (B) Geographic Range, EITHER

| (b)1. Extent of occurrence < 20,000 km\(^2\) (7,722 mi\(^2\)) OR | EOO > 7,722 mi\(^2\) (17,531 mi\(^2\)) | E | No | Simek et al. 2005 |

| (b)2. Area of occupancy < 2,000 km\(^2\) (772 mi\(^2\)) | AOO > 772 mi\(^2\) (10,077 mi\(^2\)) | E | No | Simek et al. 2005 |

AND at least 2 of the following:

| a. Severely fragmented or exist in ≤ 10 locations |

<p>| b. Continuing decline, observed, inferred or projected in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent, and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals |</p>
<table>
<thead>
<tr>
<th>c. Extreme fluctuations in any of the following: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>(C) Population Size and Trend</td>
</tr>
<tr>
<td>Population size estimate to number fewer than 10,000 mature individuals AND EITHER</td>
</tr>
<tr>
<td>2,212 – 3,433 bears</td>
</tr>
<tr>
<td>(c)1. An estimated continuing decline of at least 10% in 10 years or 3 generations, whichever is longer (up to a maximum of 100 years in the future) OR</td>
</tr>
<tr>
<td>Has increased for more than last 24 years. Expected to increase over next 24 years due to conservation efforts and suitable vacant habitat.</td>
</tr>
<tr>
<td>(c)2. A continuing decline, observed, projected, or inferred in numbers of mature individuals AND at least one of the following:</td>
</tr>
<tr>
<td>Has increased. Expected to increase over next 24 years due to conservation efforts and suitable vacant habitat.</td>
</tr>
<tr>
<td>a. Population structure in the form of EITHER</td>
</tr>
<tr>
<td>(i) No subpopulation estimated to contain more than 1000 mature individuals; OR</td>
</tr>
<tr>
<td>(ii) All mature individuals are in one subpopulation</td>
</tr>
<tr>
<td>b. Extreme fluctuations in number of mature individuals</td>
</tr>
<tr>
<td>(D) Population Very Small or Restricted, EITHER</td>
</tr>
<tr>
<td>Population estimated to number fewer than 1,000 mature individuals; OR</td>
</tr>
<tr>
<td>2823 + 59 bears</td>
</tr>
<tr>
<td>(d)2. Population with a very restricted area of occupancy (typically less than 20 km² [8 mi²]) or number of locations (typically 5 or fewer) such that it is prone to the effects of human activities or stochastic events within a short time period in an uncertain future</td>
</tr>
<tr>
<td>(E) Quantitative Analyses</td>
</tr>
<tr>
<td>e1. Showing the probability of extinction in the wild is at least 10% within 100 years</td>
</tr>
<tr>
<td>Initial Finding (Meets at least one of the criteria OR Does not meet any of the criteria)</td>
</tr>
<tr>
<td>Does not meet any criteria</td>
</tr>
<tr>
<td>Is species/taxon endemic to Florida? (Y/N)</td>
</tr>
</tbody>
</table>

If Yes, your initial finding is your final finding. Copy the initial finding and reason to the final finding space below. If No, complete the regional assessment sheet and copy the final finding from that sheet to the space below.

Final Finding (Meets at least one of the criteria OR Does not meet any of the criteria) | Reason (which criteria are met) | | | |
| The Florida black bear does not meet any of the criteria. | | | | |
**Additional information:** In regards to Criterion C2, the team recognized and discussed the potential for habitat loss predicted by Wildlife 2060 to affect the finding for this criterion. Bear populations are centered on large parcels of conserved public lands. However, the predicted loss of non-conserved habitat will be significant and will negatively impact currently occupied bear range and, we inferred, bear numbers. Hard boundaries between bear range and urban development will be created which will increase human-bear interactions which will increase the mortality rate of bears on the fringe of conserved bear habitat. This situation would likely contribute to a reduction in bear numbers from current estimates. Since the 2002 estimate for our largest subpopulation (Ocala) currently straddles the 1,000 mature individuals trigger for c2a(i), a reduction in bear numbers in the future could cause this criterion to be met. However, there is no current decline in bear numbers occurring, thus a decline cannot continue (since it does not now exist) (IUCN guidelines p. 26). The team thought that if a decline occurs due to the events predicted by Wildlife 2060, the full impact will occur further out than the specified time horizon of 3 generations. Further, the team thought the potential future reduction in bear numbers would be mitigated somewhat by the occupancy over time of > 1 million acres of currently unoccupied and under-occupied but suitable bear habitat (Hoctor 2006) in the Big Bend region. The Big Bend region is adjacent to currently occupied bear range (Apalachicola) and not predicted to be greatly affected by potential 2060 impacts. Additionally, the potential loss should be mitigated by the current and planned conservation efforts outlined in **Current Management** (above) and in the black bear management plan which is under development. After the discussion the team was unanimous that bears did not meet this criterion.
<table>
<thead>
<tr>
<th></th>
<th>Biological Status Review Information Regional Assessment</th>
<th>Species/taxon: Florida black bear (Ursus americanus floridanus) Entire population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Date: 11/3/10</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Assessors: Walter McCown, Mel Sunquist, and Bill Giuliano</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Initial finding</td>
<td>Supporting Information</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2a. Is the species/taxon a non-breeding visitor? (Y/N/DK).</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>If 2a is YES, go to line 18. If 2a is NO or DO NOT KNOW, go to line 11.</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2b. Does the Florida population experience any significant immigration of propagules capable of reproducing in Florida? (Y/N/DK).</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>If 2b is YES, go to line 12. If 2b is NO or DO NOT KNOW, go to line 17.</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>2c. Is the immigration expected to decrease? (Y/N/DK). If 2c is YES or DO</td>
<td></td>
</tr>
<tr>
<td>Line</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>NOT KNOW, go to line 13. If 2c is NO go to line 16.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2d. Is the Florida population a sink? (Y/N/DK). If 2d is YES, go to line 14. If 2d is NO or DO NOT KNOW, go to line 15.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>If 2d is NO or DO NOT KNOW - No change from initial finding</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>If 2c is NO or DO NOT KNOW - Downgrade from initial finding (less imperiled)</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>If 2b is NO or DO NOT KNOW - No change from initial finding</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>2e. Are the conditions outside Florida deteriorating? (Y/N/DK). If 2e is YES or DO NOT KNOW, go to line 24. If 2e is NO go to line 19.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>2f. Are the conditions within Florida deteriorating? (Y/N/DK). If 2f is YES or DO NOT KNOW, go to line 23. If 2f is NO, go to line 20.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2g. Can the breeding population rescue the Florida population should it decline? (Y/N/DK). If 2g is YES, go to line 21. If 2g is NO or DO NOT KNOW, go to line 22.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>If 2g is YES - Downgrade from initial finding (less imperiled)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>If 2g is NO or DO NOT KNOW - No change from initial finding</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>If 2f is YES or DO NOT KNOW - No change from initial finding</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>If 2e is YES or DO NOT KNOW - No change from initial finding</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Final finding</td>
<td></td>
</tr>
</tbody>
</table>

Final finding: No change
Figure 1. The 2002 range of the Florida black bear (From Simek et al. 2005).
Figure 2. Estimates of black bear abundance in Florida.

2002: From Simek et al. 2005, Orlando 2003 (Chassahowitzka), and J.J. Cox, University of Kentucky, 2009, personal communications (Glades Highlands).
Figure 3. Number of calls received by the Florida Fish and Wildlife Conservation Commission concerning bears and human population levels in Florida 1978 – 2010.
Figure 4. Black bear distribution in Florida in 1978 and 2002.


2002: Simek et al. 2005
BSR APPENDIX 1. Brief biographies of the Florida black bear Biological Review Group members.

Walter McCown has a B.S. in Biology from Columbus State University. He has worked on a variety of wildlife issues with FWC and since 2004 has been a biologist in FWC’s Terrestrial Mammal Research Subsection. Mr. McCown has over 14 years experience in research and conservation of black bears in Florida.

Mel Sunquist has a Ph.D. in Wildlife Ecology from the University of Minnesota. He is currently a Professor Emeritus with the University of Florida. Dr. Sunquist has 20 years teaching and research experience in the UF Department of Wildlife Ecology and Conservation and has more than 30 years experience working on the behavior, ecology, and conservation of mammalian carnivores, in Florida and worldwide.

Bill Giuliani has a PhD from Texas Tech University in Wildlife Science, a MS from Eastern Kentucky University in Biology, and a BS from the University of New Hampshire in Wildlife Management with a Minor in Zoology. He currently serves as the Professor and State Extension Specialist in the Department of Wildlife Ecology and Conservation at the University of Florida. He has researched and developed management programs for a variety of wildlife species for more than 20 years such as black bears, jaguars, fishers, pine martens, raccoons, coyotes, hogs, rabbits, squirrels, and various rodents, among others.

(BSR) APPENDIX 2. Summary of letters and emails received during the solicitation of information from the public period of September 17, 2010 through November 1, 2010.

- Betsy R. Knight, Big Bend Wildlife Sanctuary, Inc. 1. Protect enough land for the survival of the Florida Black Bear and you protect enough land to support protection of most all Florida Species. There should be a corridor from Big Cypress Swamp to Eglin Air Force Base for these large mammals to range, breed and maintain a healthy population. When you divide the State in to segments you end up with bits and pieces of bear habitat such as the Chassahowitzka population where inbreeding is occurring. 2. The answer is education, education and more education; I have been signed up as a volunteer for about a year, have received my DVD for educational programs, but haven't been asked to go to one single program. We need to utilize all volunteers and saturate the State with education on the Florida Black Bear. Hunting of the Florida Black Bear should be prohibited. In an effort to compromise, I might suggest in healthy populations such as the Apalachiola National Forest, you might suggest allowing dogs to run a bear a day for a ten day period, but the dogs would not be able to continue to run the same
bear continuously for days. The Florida Black Bear needs to be kept on the Threatened Species list!!!

• Chris Papy commented on the large number of bears in Aucilla WMA.

• David Dapore commented on the large number of bears and bear sign in numerous wildlife management areas in central Florida. During an outing he often sees more bears than any other species of wildlife. He considers the restoration of bears to have been successful.

• James Aldridge commented on the large number of bears he sees in Ocala National Forest.

• Kitty Loftin saw 2 bears in Wakulla County, Florida.

• Meagin Jackson commented on the large number of bears in northern Osceola National Forest and mentioned several encounters with bears in the area and believes that the area has as many bears as it will hold.

• Dick Kempton has seen bears on several occasions in the Big Cypress National Preserve, 12-15 miles north of Oasis Visitor Center.


<table>
<thead>
<tr>
<th>Year</th>
<th>Apalachicola WMA (AWMA)</th>
<th>Osceola WMA (OWMA)</th>
<th>Baker and Columbia Co. (BCC)</th>
<th>Statewide</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># Male</td>
<td># Female</td>
<td>% Female</td>
<td># Male</td>
</tr>
<tr>
<td>81/82</td>
<td>8</td>
<td>8</td>
<td>50%</td>
<td>16</td>
</tr>
<tr>
<td>82/83</td>
<td>2</td>
<td>1</td>
<td>33%</td>
<td>3</td>
</tr>
<tr>
<td>83/84</td>
<td>5</td>
<td>11</td>
<td>69%</td>
<td>16</td>
</tr>
<tr>
<td>84/85</td>
<td>15</td>
<td>11</td>
<td>42%</td>
<td>26</td>
</tr>
<tr>
<td>85/86</td>
<td>9</td>
<td>14</td>
<td>61%</td>
<td>23</td>
</tr>
<tr>
<td>86/87a</td>
<td>12</td>
<td>8</td>
<td>40%</td>
<td>20</td>
</tr>
<tr>
<td>87/88</td>
<td>12</td>
<td>6</td>
<td>33%</td>
<td>18</td>
</tr>
<tr>
<td>88/89</td>
<td>13</td>
<td>5</td>
<td>28%</td>
<td>18</td>
</tr>
<tr>
<td>89/90</td>
<td>27</td>
<td>7</td>
<td>21%</td>
<td>34</td>
</tr>
<tr>
<td>90/91</td>
<td>11</td>
<td>4</td>
<td>27%</td>
<td>15</td>
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<tr>
<td>91/92</td>
<td>24</td>
<td>3</td>
<td>11%</td>
<td>27</td>
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<tr>
<td>92/93</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>93/94</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>30</td>
</tr>
</tbody>
</table>

* Major regulatory changes in bear hunting season to reduce females and young in the harvest started in 1987.
**APPENDIX IV. Status of black bears in states with resident bear populations.**

Table 17. Population estimates, trends and hunting status of the 41 states with resident black bear populations (compiled from Spencer et al. 2007, Hristienko et. al. 2010, Lackey and Beausoleil 2010, and state agency websites/personnel).

<table>
<thead>
<tr>
<th>State</th>
<th>Population</th>
<th>Species Status</th>
<th>Hunting Season</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>Trend</td>
<td></td>
</tr>
<tr>
<td>Alabama</td>
<td>50–100</td>
<td>Stable</td>
<td>State List</td>
</tr>
<tr>
<td>Alaska</td>
<td>72,500</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Arizona</td>
<td>2,500</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Arkansas</td>
<td>3,500–4,500</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>California</td>
<td>34,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Colorado</td>
<td>12,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Connecticut</td>
<td>300–500</td>
<td>Up</td>
<td>State List</td>
</tr>
<tr>
<td>Florida</td>
<td>2,500–3,000</td>
<td>Up</td>
<td>State List</td>
</tr>
<tr>
<td>Georgia</td>
<td>2,300–2,500</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Idaho</td>
<td>20,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Kentucky</td>
<td>&lt;500</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Louisiana</td>
<td>500–700</td>
<td>Up</td>
<td>Federal List</td>
</tr>
<tr>
<td>Maine</td>
<td>23,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Maryland</td>
<td>600+</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>2,900–3,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Michigan</td>
<td>18,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Minnesota</td>
<td>15,000</td>
<td>Down</td>
<td>Game</td>
</tr>
<tr>
<td>Mississippi</td>
<td>120</td>
<td>Up</td>
<td>Federal List(^c)</td>
</tr>
<tr>
<td>Missouri</td>
<td>350</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Montana</td>
<td>16,500</td>
<td>Unknown</td>
<td>Game</td>
</tr>
<tr>
<td>Nevada</td>
<td>200–400</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>4,900</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>State</td>
<td>Population</td>
<td>Species Status</td>
<td>Hunting Season</td>
</tr>
<tr>
<td>------------------</td>
<td>------------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Estimate</td>
<td>Trend</td>
<td></td>
</tr>
<tr>
<td>New Jersey</td>
<td>1,800–3,200</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>New Mexico</td>
<td>5,500</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>New York</td>
<td>5,000–8,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>North Carolina</td>
<td>9,000–12,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Ohio</td>
<td>50–100</td>
<td>Up</td>
<td>State List</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>200</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Oregon</td>
<td>25,000–30,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>15,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>&lt;20</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>South Carolina</td>
<td>1,800</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Tennessee</td>
<td>3,000–6,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Texas</td>
<td>80–100</td>
<td>Up</td>
<td>Federal List(^c)</td>
</tr>
<tr>
<td>Utah</td>
<td>2,250</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Vermont</td>
<td>4,500–6,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Virginia</td>
<td>8,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Washington</td>
<td>25,000</td>
<td>Stable</td>
<td>Game</td>
</tr>
<tr>
<td>West Virginia</td>
<td>10,000–12,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>23,000</td>
<td>Up</td>
<td>Game</td>
</tr>
<tr>
<td>Wyoming</td>
<td>Unknown</td>
<td>Stable</td>
<td>Game</td>
</tr>
</tbody>
</table>

\(^a\) Excludes interior Alaska.  
\(^b\) Hunts opened on/after 2009-2010 season.  
\(^c\) Either federal or state listed, depending on location.
Appendix V. Description of Potential Bear Habitat

Hoctor (2006) created a model of potential bear habitat for the *Wildlife Habitat Conservation Needs in Florida* report (Endries et al. 2009). Potential bear habitat is based on four primary factors including: 1) land cover type, 2) habitat size, 3) distance from primary habitat areas, and 4) connectivity and size of large habitats. These factors were used to create three categories of habitat: primary, secondary and traversable. FWC did not use the traversable habitat category when calculating potential bear habitat. The following is a summary of Hoctor (2006) as it relates to the potential bear habitat model:

1) **Land Cover Type** - Primary and secondary bear habitat was delineated from the FWC land cover/land use maps (Cox et al. 1994, Maehr et al. 2001, Wooding and Hardisky 1988; Table 18), using methods similar to Cox et al. (1994). Secondary habitat differs from primary in that bears may use secondary frequently, but use of such areas depends to some degree on nearby land cover (Cox et al. 1994, p. 50). Traversable areas may not serve as habitat for bears but can be crossed to reach other patches of primary and secondary cover. Traversable areas include all other habitats except urban and extractive land uses and open water (Larkin et al. 2004). FWC updated this element of the map by excluding all areas that was classified as developed in 2009 (FNAI 2009).

2) **Habitat Size** - The model begins by identifying “seed” areas of primary habitat (Cox et al. 1994). Seed areas had >37 acres (15 ha) of primary habitat. The 37 acre seed area size was identified as an important component of bear habitat in Osceola National Forest (Cox et al. 1994, Kautz and Cox 2001, and Mykyta and Pelton 1989). The 37 acre seed area size falls within USFWS recommended guidelines for stand sizes of 25 to 99 acres (10 to 40 ha) to promote stand diversity and mast production for black bears (USFS 1981, 1985).

3) **Distance from Primary Habitat Areas** - All additional primary and secondary habitat within 0.6 mile (1 km) of the seed patches are identified in blocks that contain at least 10,000 acres (4,000 ha) of primary and secondary cover. This procedure enabled small patches in close proximity to larger habitat areas to be included as habitat areas (Cox et al. 1994). The 10,000 acre size was selected to identify areas that are more likely to be large enough to serve as minimum functional habitat units for black bear (Hellgren and Maehr 1992) and represents the average area of adult female black bear home ranges. The connectivity component allows the inclusion on smaller habitat areas that are close to larger habitat areas.

4) **Connectivity and Size of Large Habitats** – see description for 3)
Table 18. Land cover/land uses identified as primary, secondary, or traversable habitat for Florida black bears (Endries et al. 2009).

<table>
<thead>
<tr>
<th>Primary Habitat</th>
<th>Secondary Habitat</th>
<th>Traversable Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xeric oak scrub</td>
<td>Coastal strand</td>
<td>Sand/beach</td>
</tr>
<tr>
<td>Sand pine scrub</td>
<td>Sandhill</td>
<td>Sawgrass marsh</td>
</tr>
<tr>
<td>Mixed hardwood–pine forest</td>
<td>Dry prairie</td>
<td>Cattail marsh</td>
</tr>
<tr>
<td>Hardwood hammocks and forest</td>
<td>Commercial pinelands</td>
<td>Saltmarsh</td>
</tr>
<tr>
<td>Natural pinelands</td>
<td>Tropical hardwood hammock</td>
<td>Mangrove</td>
</tr>
<tr>
<td>Cabbage palm–live oak hammock</td>
<td>Freshwater marsh and wet prairie</td>
<td>Scrub mangrove</td>
</tr>
<tr>
<td>Bay swamp</td>
<td>Shrub swamp</td>
<td>Tidal flat</td>
</tr>
<tr>
<td>Cypress swamp</td>
<td>Scrub mangrove</td>
<td>Grassland</td>
</tr>
<tr>
<td>Cypress/pine/cabbage palm</td>
<td>Shrub and brushland</td>
<td>Bare soil/clearcut</td>
</tr>
<tr>
<td>Mixed wetland forest</td>
<td>Exotic plants</td>
<td>Improved pasture</td>
</tr>
<tr>
<td>Hardwood swamp</td>
<td>Australian pine</td>
<td>Unimproved pasture</td>
</tr>
<tr>
<td>Hydric hammock</td>
<td>Melaleuca</td>
<td>Sugar cane</td>
</tr>
<tr>
<td>Bottomland hardwood forest</td>
<td></td>
<td>Citrus</td>
</tr>
<tr>
<td>Brazilian pepper</td>
<td></td>
<td>Row/field crops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other agriculture</td>
</tr>
</tbody>
</table>
APPENDIX VI. SAMPLE ORDINANCE TO REDUCE WILDLIFE ATTRACTIONTS

City Ordinance 2188 of Gatlinburg, Tennessee

Section 8-111 Animal Resistant Garbage Collection Devices
From and after June 1, 2000, all garbage, containers, dumpsters or equipment used to store garbage, not otherwise located within an approved enclosure prior to municipal or private pick-up in the areas described as follows: The entire area within the city limits on the west side of the Foothills Parkway: the area north of the National prong of the Little Pigeon River between Parkway and the Foothills Parkway boundary bounded on the north by LeConte Street and the Skyland Park and the Winfield Heights Subdivisions: the entire area between the National Park Service boundary on the South and Southeast city limits from Low Gap Road on the east and to the South of Highway 321 and Parkway, and as shown on a map dated December, 1998 on file at the offices of the City Manager and incorporated herein by reference, shall be of a type which shall be resistant to animals being able to open, overturn or remove garbage from them. Each type of container shall be of a design approved by the City Building Official. This requirement shall not apply to containers that are also enclosed within fences or other enclosures which do not allow entry by scavenging animals or are located inside a structure such as a house, building or other enclosed structure and are taken to a City or County approved garbage collection site by the owner.

Section 8-112. Enclosures
All garbage containers in said areas of a type which do not meet City standards as being animal resistant shall be fully enclosed in a manner to prevent entry by animals. Such enclosures shall be approved in advance by the City Building Official. Any enclosure which does not prevent the entry of animals and removal of garbage from the enclosure shall be modified by the owner to prevent such entry and removal. Owners who are notified of a deficient enclosure shall have 60 days to cure such deficiency. All garbage containers of a type not resistant to animals shall be so enclosed by June 1, 2000. Every animal resistant enclosure shall be properly secured. Failure to keep such enclosure secured and closed shall also be a violation of this section.

Section 8-113. Grease
The provisions of Sections 8-111 and 8-112 shall also apply to containers and enclosures used to store grease and the contents of grease traps.

Section 8-114. Restaurants
All restaurants within the city limits of the City of Gatlinburg shall be required to comply with the provisions of 8-111 through 8-113 with regard to garbage containers and/or enclosures for the storage of garbage containers and grease.
Section 8-115. Garbage Collection
The City will not collect garbage which is not placed in an animal resistant container unless it is placed within an approved enclosure, as required in Sections 8-111 through 8-114. The provisions of Sections 8-111 and 8-112 shall not apply to curbside garbage collection containers within the downtown business district.

Section 8-117 Injunctive or Other Relief
In addition to any penalty, violation of the provisions of this chapter may be remedied by obtaining injunctive relief, or by a restraining order, or other appropriate equitable remedy by the city.

Section 8-118 Penalty
Every person who shall violate any provision of this chapter shall be punished by a fine not to exceed $500 per offense. Each day that a violation shall occur shall be a separate offense.
APPENDIX VII. DESCRIPTION OF BEAR SMART COMMUNITIES PROGRAM

The objective of Strategy 4.1 is to reduce human-bear conflicts by providing the right materials and messages in the form of a Bear Smart Community (BSC) Program. The BSC program was developed by British Columbia’s Ministry of Environment, and a representative of the Ministry has granted the FWC permission to use the name, program elements and materials.

The overarching mission of the BSC program is to influence and guide communities to accept personal and communal responsibility for reducing human-bear conflicts. A BSC is a specific and defined geographical area where the residents, local government, businesses and schools take responsibility to resolve their human-bear conflicts. A BSC can be as small as a group of homes in a certain area or as large as an entire county and would include homeowner associations, municipalities, and county governments. A community or area achieves BSC status when it has met the six defining criteria (see below) and will, at a minimum, include an educational component, provisions for bear–resistant solid waste handling and containers, appropriate governance (ordinances, covenants, bylaws) and assessment measures to determine success.

Steps for creating a BSC include:

1. Prepare a bear conflicts assessment of the community and surrounding area.
2. Prepare a human-bear conflict management plan that is designed to address the bear and land-use conflicts identified in the previous step.
3. Revise planning and decision-making documents to be consistent with the bear-human conflict management plan.
4. Implement a continuing education program, directed at all sectors of the community.
5. Develop and maintain a bear-proof municipal solid waste management system (See Human-Bear Conflicts objective).
6. Implement appropriate ordinances or bylaws prohibiting feeding bears by intent, neglect, or irresponsible management of attractants (See Human-Bear Conflicts objective).
Achieving BSC status is rigorous and takes time. How much time it takes varies by community. In British Columbia, for example, many communities have made exemplary strides toward BSC status, with only one or two achieving the goal. It takes time, leadership and dedication to coordinate a community team, enact ordinances, achieve voluntary compliance and change waste management practices, and implement an education program. While achieving BSC status is rigorous, it is a positive community-based approach that has been proven effective in British Columbia and several states in the US.

In total or in-part, the six steps required to create a BSC work to minimize human-bear conflicts and the number of bears killed as a result of human habituation and food-conditioning. Florida already has a State law which prohibits feeding bears (F.A.C. 68A-4.001(3)). Those who are found guilty of violating this law are subject to criminal prosecution. However, implementing municipal or county ordinances, or community bylaws which prohibit feeding bears intentionally, unintentionally or through neglect, or irresponsible management of attractants will take time and may be the most difficult to achieve. In the meantime, any non-regulatory measures taken to eliminate or bear-proof food attractants is a positive step toward solving this complex issue.

The BSC Program Background Report (Davis et al. 2002) profiles four case histories as examples of communities proactively working to eliminate food attractants or access to them in their communities. While each community did not implement the BSC program exactly as designed, each community did attempt to develop bear-proofing systems to reduce the number and extent of human-bear conflicts. Each community profiled took several years to achieve success.

One community that stands out as exemplary model of a BSC is Whistler in British Columbia. Whistler began to take steps to become a BSC in 1997 and by 2000 they had become completely bear-proof. In 1999 they initiated an aversive conditioning program and a comprehensive education program targeting residents, businesses, and visitors. This process took a minimum of three years to accomplish. Keeping a community bear-proof is an ongoing process with vigilant maintenance
and education. Peine (2001) describes several complex cases in which it took some communities ten to 25 years to formulate and enact effective policies and programs addressing their human-bear conflicts.

FWC will work with BBAGs to locate interested communities willing to become a BSC. Initial efforts to create BSCs will focus on places where human-bear conflict is relatively high. Based on call data and citizen and staff information, FWC will identify and offer those communities information on how to become a BSC. BBAGs involvement can expedite cooperation among the public, local businesses, nongovernmental organizations, local governments and agencies, and local law enforcement entities. BBAGs can more easily identify local problems and conservation opportunities, and therefore facilitate changes in local policies and ordinances regarding bears.

Through statewide education and outreach activities, other communities may take their own initiative to self-organize and become BSCs. Ideally, communities experiencing undesirable bear interactions will strive to become a BSC but realistically that may not always happen. In those cases, individual and community level behavioral changes are essential in reducing conflicts with bears. Residents and visitors will receive information and be asked to voluntarily take actions that improve waste management practices in order to reduce or eliminate attractants. Homeowner associations and residential management groups will be encouraged to employ recommended actions such as community-wide education, attractant prevention and waste storage solutions. Template documents for BSCs will be provided to homeowner associations, and they will be encouraged to include BSC practices in their covenants. Educational presentations, community events and supporting materials will be developed and introduced to residents in areas of high human-bear conflict.

Based on the established BSC program, FWC can develop an appearance that is unique and brands the program in Florida. Key messages and materials will be developed for use in BSCs but also will be used to inform audiences statewide about BSC practices. Initial outreach will be within the 35 counties identified as
containing primary bear range (Appendix I). As resources allow, outreach efforts may expand beyond primary range. Methods for message delivery may include newspaper feature articles, pre-show programming in movie theatres, a DVD program, billboards, fliers on community bulletin boards, radio announcements, or short spots for cable, public television or YouTube and other social media. FWC’s black bear web site (http://www.MyFWC.com/bear) will include relevant information about BSCs, as well as natural history, distribution and range, current and historical management, human-bear conflict and avoidance, popular and scientific publications, and a special section for youth and educators.
APPENDIX VIII. PROPOSED RULE

Rule 68A-4.009

(1) No person shall take (as that term is defined in 68A-1.004), possess, injure, shoot, wound, trap, collect, or sell Florida black bears (*Ursus americanus floridanus*) or their parts or to attempt to engage in such conduct except as authorized by Commission rule or by permit from the Commission.

(2) The Commission will issue permits authorizing intentional take of bears when it determines such authorization furthers scientific or conservation purposes which will benefit the survival potential of the species. For purposes of this rule, a scientific or conservation purpose shall mean activities that further the conservation or survival of the species, including:

1. Collection of scientific data needed for conservation or management of the species;

2. Removing bears from situations that constitute a human safety risk or a risk to the well being of the bear;

(3) The Commission will provide technical assistance to land owners and comments to permitting agencies in order to minimize and avoid potential negative human bear interactions or impacts of land modifications on the conservation and management of black bears. The Commission will base its comments and recommendations on the goals and objectives of the approved Florida Black Bear Management Plan. This plan can be obtained at [http://myfwc.com/bear/](http://myfwc.com/bear/).