BEFORE THE SECRETARY OF THE INTERIOR

Photo credit: Florida Fish and Wildlife Conservation Commission

PETITION TO LIST THE FLORIDA BLACK BEAR (*Ursus americanus floridanus*) UNDER THE ENDANGERED SPECIES ACT

Notice of Petition:

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Petitioners:

Center for Biological Diversity ("Center") is a nonprofit, public interest environmental organization dedicated to the protection of imperiled species and the habitat and climate they need to survive through science, policy, law and creative media. The Center is supported by more than 990,000 members and activists throughout the country. The Center works to secure a future for all species, great or small, hovering on the brink of extinction. With its Southeast office in St. Petersburg, Florida, the Center and its thousands of Florida members support the strongest protections for the Florida black bear.

Animal Legal Defense Fund ("ALDF") is a national nonprofit organization that has been working to protect the lives and advance the interests of animals through the legal system for more than three decades. ALDF files high-impact lawsuits to protect animals from harm, assists prosecutors in holding animal abusers accountable for their crimes, supports strong animal protection legislation, and provides resources and opportunities in animal law to law students and professionals. ALDF has over 4,400 members and 15,500 online supporters in Florida. ALDF members care deeply about the conservation and humane treatment of wildlife, and are concerned about threats to the Florida black bear population.

Animal Hero Kids fosters empathy and kindness in children and youth by encouraging and recognizing compassionate and courageous acts that help all species of animals, and offering complimentary, interactive, humane education programs highlighting stories of the rescue and aid of animals in need. Its programs reach 30,000 students each year.

Animal Rights Foundation of Florida ("ARFF") was founded in 1989 to promote and protect the rights of animals in Florida. Today, ARFF has more than 5,000 members across the state. ARFF has a longstanding interest in the protection of wildlife in Florida. ARFF was involved in the debate leading up to the 1993 decision to halt hunting of Florida's black bear. ARFF members have expressed opposition to reopening a bear hunt by speaking at meetings of the Florida Fish and Wildlife Conservation Commission and attending public demonstrations.

Animal Welfare Institute ("AWI") works to minimize the impacts of all human actions detrimental to endangered species, including the destruction of natural forests containing ancient trees, and pollution of the oceans destroying every kind of marine life.

Big Cat Rescue is one of the largest accredited sanctuaries in the world dedicated to abused and abandoned big cats. Its mission is to provide the best home they can for the cats in their care, end abuse of big cats in captivity, and prevent extinction of big cats in the wild.

Guillaume Chapron, Ph.D., is an associate professor at the Grimsö Wildlife Research Station in the Department of Ecology at the Swedish University of Agricultural Sciences. His research focuses on quantitative ecology applied to conservation, with special

emphasis on modeling and large carnivores. His research includes developing models linked to field-collected data to design better management and conservation strategies.

Compassion Works International is a nonprofit animal advocacy organization focused on creating a more compassionate world for all beings by mobilizing effective activism, undertaking cruelty investigations, and engaging with other organizations in wildlife conservation efforts.

Environmental Action was founded at the first Earth Day with a mission to protect the planet and all of us who live on it. Environmental Action stands up to big polluters, takes on the corrupt politicians and gives everyone in America a chance to be an environmentalist with simple, powerful actions.

The Humane Society of the United State ("HSUS") is a nonprofit organization that promotes the protection of all animals. It is the largest animal protection organization in the United States, with several staff members and thousands of members in Florida. Since 1952, HSUS has worked to foster the humane treatment of wildlife through various programs, including initiatives to protect threatened native wildlife like the Florida black bear, whose removal from the state threatened species list in 2012, it worked to oppose. Its affiliate, the South Florida Wildlife Center in Fort Lauderdale, rehabilitates and cares for more than 12,000 wild animals annually.

Jungle Friends Primate Sanctuary provides permanent high-quality sanctuary care for New World monkeys being retired from laboratory research, ex-pets, or monkeys who have been confiscated by authorities. It is also committed to advocacy and education on behalf of all captive non-human primates, and to provide assistance to improve the circumstances of captive primates wherever possible.

Miha Krofel earned his Ph.D. at University of Ljubljana (Slovenia) in 2012 and is now an assistant professor of Wildlife management, Conservation and Ecology at University of Ljubljana and University of Primorska, as well as visiting researcher at Leibniz Institute for Zoo and Wildlife Research in Berlin, Germany. His research focuses on management, conservation and ecology of large carnivores in human-dominated landscapes of Europe and Africa, with special attention given to human-bear conflicts.

The League of Women Voters of Florida is a nonpartisan political organization that encourages informed and active participation in government, works to increase understanding of major public issues, and influences public policy through education and advocacy.

Lobby For Animals works to raise awareness and educate people on the issues facing animals and the environment and to help them effectively address these issues with their legislators. Lobby For Animals offers training videos, a bi-weekly legislative report highlighting current legislation throughout the United States, resource links and templates for constituent use. Lobby for Animals supplies the tools necessary and encourages all interested parties to learn about the importance of becoming proactive citizens within

their communities and learn how to effectively speak up for animals and the environment that we all share.

Paul C. Paquet, Ph.D., is an adjunct professor of biology and associate professor of environmental design at the University of Calgary. He is also an adjunct professor at University of Saskatchewan College of Veterinary Medicine, Brandon University, University of Manitoba, and faculty associate at Guelph University and University of New Brunswick. Dr. Paquet, who has studied wolves and coyotes from more than 35 years, obtained his PhD degree from the University of Alberta, Canada. He is an internationally recognized authority on mammalian carnivores, has research experience in several regions of the world, and has published more than 100 peer-reviewed reports and articles. Dr Paquet serves on various international government and NGO advisory committees dedicated to conservation of carnivores, including the Species Survival Commission (SSC) of IUCN-World Conservation Union (Gland, Switzerland), the Large Carnivore Initiative for Europe, WWF International, and the European Union. He is a long-time fellow of World Wildlife Fund Canada, and Senior Science Advisor with the Raincoast Conservation Society. He was founder and director of the Central Rockies Wolf Project, Canmore, Alberta, Canada, and the Conservation Biology Institute, Corvallis, Oregon, USA.

Stuart Pimm is the Doris Duke Chair of Conservation at the Nicholas School of the Environment at Duke University. He is a world leader in the study of present day extinctions and what can be done to prevent them. Pimm received his BSc degree from Oxford University in 1971 and his Ph.D. from New Mexico State University in 1974. He is the author of over 300 scientific papers and four books, and wrote the highly acclaimed assessment of the human impact to the planet: The World According to Pimm: a Scientist Audits the Earth in 2001. His work has covered elephants, reintroductions of large mammals and most recently lions for National Geographic's Big Cat Initiative. It has always been on topics that relate to the conservation of wildlife and the ecosystems on which they depend. Other research areas include the Everglades of Florida and tropical forests in South America. His international honors include the Tyler Prize for Environmental Achievement (2010, the Dr. A.H. Heineken Prize for Environmental Sciences from the Royal Netherlands Academy of Arts and Sciences (2006), the Society for Conservation Biology's Edward T. La Roe III Memorial Award (2006), and the Marsh Award for Conservation Biology, from the Marsh Christian Trust (awarded by the Zoological Society of London in 2004). Sigma Xi, The Scientific Research Society, awarded him the William Proctor Prize for Scientific Achievement in 2007. Pimm has observed the Florida black bear in the wild and cares deeply about its continued survival.

Preserve Our Wildlife is dedicated to the preservation of wildlife and the various habitats they require, including the Florida panther, Florida black bear, gopher tortoise, and other notable species. It is organized as an advocacy group to assist in this stated function.

Sierra Club Florida Chapter is made up of volunteer leaders and activists from all over the state. Its mission is to enjoy and protect the natural places in Florida, to teach others

to understand and respect the fragile environment in which we live, and to practice and promote the responsible use of Florida's ecosystems and resources.

South Florida Wildlands Association ("SFWA") works to protect habitat and wildlife in the Greater Everglades. SFWA carries out this work inside public and private lands alike. In 2012, SFWA was one the environmental organizations leading the charge to keep the Florida Black Bear on Florida's Imperiled Species List. With a total population of approximately 3,000 bears living in geographically and genetically isolated pockets, SFWA believes then and now that Florida's bear population would continue to benefit from a ban on hunting and non-development of available bear habitat. SFWA reaches tens of thousands of South Floridians through its email list, posts on social media, and frequent coverage of its work in local news outlets.

Speak Up Wekiva was formed in 2013 to stop the sale of state park and wildlife conservation land by the Florida Department of Environmental Protection. It also filed a lawsuit against the Florida Fish and Wildlife Conservation Commission to stop the ill-conceived and unscientific hunt of the Florida black bear.

Stop The Florida Bear Hunt is an organization opposed to the undemocratic, unscientific, and immoral hunt of Florida's black. With over 4,100 members, Stop the Florida Bear Hunt has actively participated in opposing the bear hunt by raising awareness of the importance of the Florida Black Bear, participating in available public processes and engaging in lawful protests across the state of Florida including in St. Augustine, Fort Myers, Jacksonville, Tampa, West Palm Beach, Sarasota, Tallahassee, St. Petersburg, Orlando, Gainesville, Melbourne, and Miami.

Adrian Treves earned his Ph.D. at Harvard University in 1997 and is now an associate professor of Environmental Studies at the University of Wisconsin-Madison. His research focuses on agroecosystems where crop and livestock production overlap carnivore habitat. He and his students work to understand and manage the balance between human needs and carnivore conservation. With his students, he investigates conservation and ecology of large carnivores, as well as the attitudes and behaviors of the people who live alongside those carnivores.

John A. Vucetich, Ph.D., is an associate professor at Michigan Technological University's School of Forest Resources and Environmental Science. He has authored or co-authored over 60 peer-reviewed articles that have been collectively cited more than 700 times. He has also co-authored 9 invited book chapters. His work focuses on population biology, wolves and moose of Isle Royale, and conservation ethics.

Robert B. Wielgus, Ph.D., is a professor in the School of Environment at Washington State University and is the director of the Large Carnivore Lab. He has authored 30 publications on carnivore management issues in North America. The mission of the Large Carnivore Conservation Lab is to research and help maintain viable, large carnivore populations and predator – prey communities in the Pacific North West and worldwide. It specializes on sensitive, threatened, and endangered large mammals and the ecosystems in which they reside.

Submitted this 17th day of March, 2016:

Pursuant to Section 4(b) of the Endangered Species Act ("ESA"), 16 U.S.C. § 1533(b), Section 553(3) of the Administrative Procedures Act, 5 U.S.C. § 553(e), and 50 C.F.R. §§ 424.14 and 424.20, the Center for Biological Diversity, Animal Legal Defense Fund, Animal Hero Kids, Animal Rights Foundation of Florida, Animal Welfare Institute, Big Cat Rescue, CompassionWorks International, Environmental Action, Florida League of Women Voters, The Humane Society of the United States, Jungle Friends Primate Sanctuary, Lobby for Animals, Preserve Our Wildlife, Sierra Club Florida Chapter, South Florida Wildlands Association, Speak Up Wekiva, Stop the Florida Bear Hunt, and Drs. Stuart Pimm, Adrian Treves, Miha Krofel, Paul Paquet, Guillaume Chapron**,** John A. Vucetich, and Robert Wielgus formally petition the Secretary of Interior to list the Florida black bear as a threatened or endangered species and to designate critical habitat concurrent with listing pursuant to 16 U.S.C. § 1533(a)(3)(A) and 50 C.F.R. § 424.12.

The U.S. Fish and Wildlife Service ("Service") has jurisdiction over this petition. This petition sets in motion a specific process placing definite response requirements and time restraints on the Service. Specifically, the Service must issue an initial finding as to whether the petition "presents substantial scientific or commercial information indicating that the petitioned action may be warranted" (16 U.S.C. § 1533(b)(3)(A)). The Service must make this initial finding "[t]o the maximum extent practicable, within 90 days after receiving the petition" (*Id.*).

2015 was a deadly year for the Florida black bear. Collisions with vehicles killed at least 169 Florida black bears, wildlife managers killed at least 108 Florida black bears that were considered nuisances or threats to human safety, at least 9 were killed illegally, and in October hunters killed at least 304 Florida black bears in the first Florida black bear hunt in 20 years (FWC 2015d at 3, FWC 2016d, FWC 2016e at 1-2). Meanwhile, the human population in Florida is expected to increase by nearly 50 percent by 2060, and human development will continue to negatively impact bears by degrading and fragmenting their habitat, creating attractive nuisances that ultimately lead to their demise, and creating more roads and vehicles that result in their deaths. Compounding these threats, the Florida Fish and Wildlife Commission has authorized a hunt on the Florida black bear, which last year alone killed approximately 10 percent of the estimated population of 3,000-3,500 bears. Without Endangered Species Act protection, the Florida black bear could once again find itself on the precipice of extinction.

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I. EXECUTIVE SUMMARY

The Florida black bear, Florida's largest land mammal, once roamed widely throughout the southeast. It now occupies only 18 percent of its original range, in seven highly isolated subpopulations. Land use decisions, hunting, and human population growth cut the bear population from an estimated 11,000 to just 300 several decades ago. For several years, state protections, principally a prohibition on hunting, helped bring bears back from the brink of extinction. The population is now estimated at 3,000-3,500, but threats loom large.

The 3,000-3,500 estimate is based on surveys of subpopulations taken in 2002, 2011, 2014, and 2015, and does not take into account the high rates of mortality some of the subpopulations have been experiencing. For example, the Apalachicola subpopulation was estimated at 438-695 in 2002. Since 2002, 833 bears in that subpopulation have been killed by collisions with vehicles, illegal hunting, management actions, and an authorized hunt, and likely many more have been killed but not reported, or have died of natural causes. Meanwhile, the Ocala/St. Johns subpopulation was estimated to have 825-1,206 bears in 2015; however, this total does not include the 259 bears that were killed by humans in Florida, nor does it include bears killed in the 2015 Georgia bear hunt, unreported kills, or other natural mortality. The major causes of mortality in all wild carnivore populations worldwide are the direct result of human actions (Woodroffe 1998 entire) and recent work indicates illegal take (poaching) accounts for the majority of human-caused mortality (Treves 2015a entire).

Outside of habitat loss, vehicle collisions have for years been the leading known cause of death of Florida black bears. Vehicle collision mortality has consistently increased from 33 in 1990 to 170 in 2014, with the peak of 285 bear deaths in 2012. Another increasingly common threat is human garbage and other human food sources that attract so-called "problem bears," resulting in wildlife managers removing or killing them to prevent future conflict. Wildlife managers killed 108 Florida black bears for this reason in 2015 alone. Recent research calls into question the effectiveness of this practice for preventing future bear conflicts and mortalities. With Florida's human population expected to increase by nearly 50 percent by 2060, and at higher rates surrounding some of the subpopulations, these threats will only worsen. Unfortunately, Florida's response has been to hunt the bears, completely misunderstanding the problem and solutions.

The 2015 Florida black bear hunt had near disastrous results. The kill quota was exceeded in two of the four units, over three hundred bears were killed, and 21 percent of the female bears killed were lactating mothers. Without current complete population counts or accurate measures of illegal take, FWC's hunt quota and execution likely harmed several subpopulations. Moreover, with the bear's very isolated populations, some with fewer than 200 individuals, and high levels of human-caused mortality, this hunt and future hunts put the bear at risk of extinction and could further set back recovery. In addition to the ill-conceived and poorly executed hunt, other regulatory mechanisms that would have provided some protection for the bear have eroded over the last twenty years and show no signs of improvement – the same mechanisms that the

Service relied on when it decided not to list the Florida black bear in 2004. These threats coupled with saw palmetto berry shortages and mismanagement, the Florida black bear's small subpopulation sizes, climate change, and fire mismanagement threaten the Florida black bear with extinction in all or a significant portion of its range.

The Endangered Species Act states that a species shall be determined to be endangered or threatened based on any one of five factors. 16 U.S.C. § 1533(a)(1). These factors include: 1) the present or threatened destruction, modification, or curtailment of its habitat or range; 2) overutilization for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) the inadequacy of existing regulatory mechanisms; and 5) other natural or manmade factors affecting its continued existence. The Florida black bear is threatened by these factors and thus warrants protection under the Act.

II. INTRODUCTION

The Florida black bear is a symbol of wild Florida. First classified by C. Hart Merriam in 1896, the once popularly known "everglade bear" roamed all across the state, from swamps to scrub to pine forests. However, the Florida black bear, like Florida's remaining wild lands, is under threat. Today, only 18% of the bear's historic habitat remains. Relentless development continues to squeeze the remaining seven subpopulations scattered throughout the state. Bears are losing their genetic diversity, vehicle collisions have increased steadily, and human-bear encounters are at an all-time high as bears rummage through unsecured garbage in residential areas, leading state wildlife managers to kill bears that have lost their natural fear of humans.

Despite the visible impacts of habitat loss and fragmentation, the Florida Fish and Wildlife Conservation Commission ("FWC") in 2012 removed the bear from the state's threatened species list, calling its management of the species a success story. This resulted in the loss of several key environmental resource permitting considerations afforded to state listed species. The removal of the bear from the state list of threatened species also followed significant legislative changes just a year earlier to Florida's growth management laws. These changes included limitations on the state's ability to review, comment on, and challenge comprehensive plan amendments, sector plans, and developments of regional impact. And in 2015, FWC sanctioned its first hunt in more than two decades, resulting in the death of at least 304 bears in just two days, including more than 30 lactating females, leaving an additional undetermined number of cubs orphaned going into the winter. Harvest objectives were exceed in two of the four bear management units where hunting was permitted, with the harvest objective exceeded nearly three-fold in the East Panhandle unit.

All the while, Florida's legislature has drastically cut funding to Florida's premier land acquisition program "Florida Forever," by 94% since 2008. In 2012-2013, for instance, the State acquired just 2,637 acres across the entire state while spending $0 on conservation easements, which could have been acquired to protect agricultural lands that serve as important corridors between increasingly isolated Florida black bear subpopulations. To put these funding cuts in context, the home range of one Florida black bear is 25,000 acres and that same 25,000 acres could also be the home for 60 bobcats,

165 foxes, 580 deer, 1,250 Northern bobwhites, 2,000 cardinals, 2.5 million trees, and 6,975 trillion insects (Cerulean 2008 at 5). The conservation implications of the state's failure to adequately protect the habitat of this umbrella species are profound (Suraci 2016 entire).

The Florida black bear faces a number of significant threats and the state has failed to take the actions necessary to truly conserve the species. FWC's decision to remove the bear from the state list of threatened species has resulted in a chain of events that have put the bear on a collision course towards extinction. The prospect of annual hunts, the state's failure to examine the impact of these hunts on the bear, the loss of state wetlands permitting considerations once afforded to the bear as a state listed species, and the continued failure of the state legislature to adequately fund land acquisition and conservation easement programs despite an overwhelming 75% of voters passing a constitutional amendment to provide for a long-term funding mechanism, all threaten the bear's long term survival.

Using information limited to 1998, and following a federal court ruling which criticized the agency for improperly evaluating the adequacy of speculative state protections for the Florida black bear, the U.S. Fish & Wildlife Service in 2004 determined that listing the Florida black bear was not warranted. That finding relied heavily on the strength of state regulatory mechanism protecting the Florida black bear, in particular its status as threatened under Florida state law and the prohibition on its hunting in Florida and Georgia, to justify not listing the subspecies. But those protections have since eroded – along with other key state protections ranging from changes in development of regional impact laws to the systemic failures of compensatory mitigation programs. Additionally, a number of threats have worsened since then, including habitat destruction and modification, overutilization, disease and predation, and other natural or human caused factors (e.g., saw palmetto berry shortages to changes in prescribed fire practices).

These threats were made painfully evident in 2015 which was a deadly year for the Florida black bear. Collisions with vehicles killed at least 169 Florida black bears, wildlife managers killed at least 108 Florida black bears that were considered nuisances or threats to human safety, at least 9 were killed illegally, and in October hunters killed at least 304 Florida black bears in the first Florida black bear hunt in 20 years (FWC 2015d at 3, FWC 2016d).Therefore, known, human-caused mortality totaled at least 590 Florida black bears last year, equating to 17 to 20 percent of the total estimated population. The status of the Florida black bear is anything but a "success story" and this petition presents substantial scientific information indicating that listing the Florida black bear and designating its critical habitat is warranted.

III. NATURAL HISTORY

A. Taxonomy

Merriam (1896) first described the Florida black bear as the "everglade bear," determining it was a separate species from American black bear because of its long skull and highly arched nasal bones (Merriam 1896, Turner 1896). It has since been referred to

as the Florida black bear (*U.a. floridanus*), one of 16 recognized subspecies of American black bear and one of three subspecies in the southeastern United States (Hall 1981, Hall 1959, Harlow 1962, Harlow 1961).

B. Species Description

The Florida black bear is the largest land mammal in Florida and has a short tail, prominent canine teeth, and feet with short, curved, non-retractable claws on each of its five digits (FWC 2012 at 5). It walks with the entire sole of its feet touching the ground, using a pacing stride, where the hind foot is placed in or slightly in front of the track of the forefoot and the smaller, inner toe not registering in the track (FWC 2012 at 5). It has small eyes and round, erect ears. Its pelage is black, except in the summer when molting of guard hair may cause it to appear brown. Its muzzle is tan, and 25 to 33 percent of Florida black bears have a white chest blaze (FWC 2012 at 5).

The Florida black bear is classified as a carnivore taxonomically because of its teeth and other skeletal characteristics (FWC 2012 at 5); however, it is omnivorous in its diet, behavior, and ecological role (FWC 2012 at 5).

Adult (at least three years old) males weigh 250-350 pounds and adult females weigh 130-180 pounds, but can be larger. Mortality is highest from birth to one year (Garrison 2007 at 722-726), and females have higher survival rates due to their smaller range size which exposes them to fewer risks such as vehicle collisions than male bears (McCown 2009 entire).

C. Reproduction

Females become sexually mature at three to four years of age (Garrison 2004 at 11). Breeding is mid-June to mid-August (Garrison 2004 at 11, Land 1994). Coital stimulation is required to induce ovulation (Pelton 1982). Females experience delayed implantation, where the fertilized egg temporarily ceases development after a few divisions, floats freely in the uterus and does not implant until late November or December, allowing them to synchronize reproduction with annual food cycles (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 at 45, Dobey 2005 at 3).

Gestation is 60 days and cubs are born late January to mid-February (FWC 2012 at 6). Most litters have two cubs (Garrison 2004 at 12, Dobey 2005 at 3, Land 1994, Garrison 2007 at 720-726). At birth, cubs weigh 12 ounces, have fur, are blind and are toothless (FWC 2012 at 6). Cubs weigh 6-8 pounds by the time they leave the den at ten weeks, and will stay with their mother and may den with her the following year (FWC 2012 at 6). Cubs usually leave their mothers May to June the following year, or at 15 to 17 months old (infrequently up to 24 months), with female cubs establishing an overlapping range with their natal range, and male cubs dispersing to new areas (FWC 2012 at 6, Seibert 1997 entire).

One study found that Florida black bears' reproductive rates are comparable to those reported for other black bear populations from eastern United States, but that cub survival rates are lower than those reported for most black bear populations – with less than half of cubs reaching 9 months (Garrison 2007 at 723). The study found that the leading causes of cub death were infanticide by other males and collisions with vehicles. The study speculated that the high rate of infanticide could be due to higher bear density. However, more recent studies have determined that the overall density of the Osceola and Ocala/St. Johns subpopulations are low compared to bear densities from other bear populations in the southeast (Humm 2015 at 5). In the case of vehicle collisions, the cubs died either directly from collisions with cars or of malnutrition when their mothers were hit by cars.

Females often den in ecotones with dense vegetation from late December to mid-April. One study comparing Florida black bear denning in Ocala National Forest and in Lynne (an unincorporated community in Marion County), found that Florida black bears denning in Ocala National Forest prefer sand pine, and secondarily, swamp and pine flatwoods (Garrison 2012 entire). In Lynne, no such preference was determined, though the majority denned in swamp. Lynne was also found to be more fragmented, consisting of smaller patches that were more dispersed than in Ocala National Forest, and also experienced a greater degree of anthropogenic activities (Hostetler 2009 entire).

Florida black bears depend on saw palmetto for cover when they give birth to their cubs (Maehr 1996 at 10). They frequently give birth to their young in beds nestled among the dense palmetto fronds and rhizomes. Such thickets also provide important winter cover to males and non-breeding females (Maehr 2001 at 1).

D. Diet

Florida black bears are omnivorous and forage in a wide range of habitats (Maehr 1982 at 566-569). They are opportunistic foragers, eating fruits, nuts, insects, garbage, pet food, bird and livestock feed. Eighty percent of their diet comes from plants, and the most important plant appears to be the fruit and fiber of the saw palmetto (Maehr 2001 at 1). Poor acorn or berry production can result in delayed first breeding, decreased litter sizes, and increased incidence of barren females due to lowered nutritional levels (Pelton 1982). In one study, drought leading to forest-wide acorn mast failure in Ocala National Forest led to females without cubs having larger home ranges than normal (Moyer 2004 at ix-x). About 15 percent of their diet is from colonial insects and beetles (Maehr 1984b), and about 5 percent from animal matter, including raccoons, opossums, armadillos, livestock, and white-tailed deer (Land 1994, Maehr 1982 at 567, Maehr 1985 at 9-11, Maehr 1984a at 230-233, Dobey 2005 at 3). And while Florida black bears have few natural predators, adult males will kill and eat denning adult females and cubs (Garrison 2007 at 725). Florida black bears' daily caloric intake can increase from 5,000/day to 20,000/day in fall, increasing their body weight 25 to 40 percent (Jonkel 1971 at 773, 750).

The Florida black bear depends on saw palmetto likely more than any other Florida animal (Maehr 2001 at 1). Saw palmettos are the most common native palm in the U.S. (Bennett 1998 at 381). They are the dominant ground cover in some southeastern pine

forests, sometimes covering hundreds of acres (Van Deelen 1991 at 4-5). In Florida, saw palmettos cover about 10 percent of the state (Green 2014 at 4). The shrubby palms reach heights of 2 to 8 feet and are found along sandy ridges, flatwood forests, coastal dunes, islands near marshes, hardwood hammocks (Van Deelen 1991 at 3-4, Duever 2011 at 23, Green 2014 at 5). They are amazingly long-lived plants, commonly living 10,000 years (Duever 2011 at 5). Flowering of saw palmetto occurs February to April with berries ripening in September and October. Saw palmettos provide food or cover for some 100 birds, 27 mammals, 25 amphibians, 61 reptile species and hundreds of insect species (Green 2014 at 4, Bennett 1998 at 383, Maehr 1996 at 9, Carrington 2003 at 1).

The Florida black bear and the saw palmetto (*Serenoa repens*) are interrelated in so many important ways that they can be regarded as co-evolved keystone species of the flatwoods ecosystem (Duever 2011 at 27). Florida black bears rely on saw palmetto for food, including their berries, their tender sprouts, and the insects attracted to the plants, as well as for cover. Saw palmetto is the single-most important food that is also common in all of the Florida black bear's subpopulations (Maehr 2001 at iii). In a study of the Florida black bear's diet, saw palmetto was the most frequently identified component in the 244 scat and stomach samples analyzed (Maehr 1985 at 9-10). Numerous studies have demonstrated the importance of saw palmetto to Florida black bears (Maehr 1982 at 567, Maehr 1984a at 231-232, Roof 1997 at 93-94, Stratman 1999 entire).

Bears can eat a half-ton of saw palmetto berries in a three-month time period (Van Deelen 1991 at 3). The annual production of saw palmetto berries is closely linked to the breeding and overwintering success of Florida black bears (Maehr1996, Maehr 2001 at 13). Maehr (1984b) explains that, although a palmetto mast failure would have minimal impact on Apalachicola bears, who could turn to other fall foods, it would cause hardship for Osceola bears, who rely more exclusively on saw palmetto. The Ocala population is similarly vulnerable, whether the berry shortage is due to natural or manmade causes (Duever 2011 at 29).

Bears also eat the young saw palmetto shoots (or "palmetto heart"), which sprout after winter fires in the Florida flatwoods (Van Deelen 1991 at 3). Bears sometimes flatten acres of palmetto by systematically extracting one tender bud after another (Maehr 1996 at 6). Bears utilize this resource most heavily in the spring (Maehr 1984a at 233), when the starch content of the foliage is decreasing and the sugar content is increasing (Stratman 1999 at 99, Duever 2011 at 26). The bears also feed upon insects that are drawn to saw palmettos, including adult and larval palm weevils (*Rhynchophorus cruentatus*).

E. Habitat Requirements

Optimal Florida black bear habitat is a mixture of flatwoods, swamps, scrub oak ridges, bayheads and hammock habitats, thoroughly interspersed. The Big Cypress National Preserve is an example of a large stretch of public land supporting Florida black bears with diverse habitats including seasonally inundated pine flatwoods, tropical hammocks and hardwood swamps (Maehr 2001 entire). The Ocala National Forest is another large

swath of public land supporting Florida black bears with xeric sand pine-scrub oak communities growing on relic sea dunes (McCown 2001 entire).

Home range size and shape appears to be influenced by the timing and location of nutritional resources, subpopulation density, reproductive status, and anthropogenic factors like habitat fragmentation (FWC 2012 at 8). Florida black bears have relatively large home ranges, averaging 40 km^2 for females and 65 km^2 for males (FWC 2012 at 9). Male black bears establish a home range in relation to the presence of females (Sandell 1989). Females with cubs have smaller summer home ranges than females without cubs, but larger fall home ranges than females without cubs (Moyer 2007 entire). Females with overlapping home range cores are more closely related than females without overlapping home range cores (Moyer 2006 entire). Florida black bears may expand their home range when natural food sources become scarce (Moyer 2007 at 470, Lindzey 1986 entire, Maehr 1988 entire). Such shifts can sometimes increase bears' reliance on anthropogenic food sources (Beckmann 2003 at 207-211).

Location	Annual Home Range (acres)
Mobile, AL	2,989
Ocala NF, FL	5,062
Wekiva River Basin, FL	6,178
Chassahowitzka NWR, FL	6,178
Osceola NF, FL	7,488
Okefenokee NWR, GA	13,811
Big Cypress National Preserve, FL	14,106
Eglin Air Force Base, FL	21,619

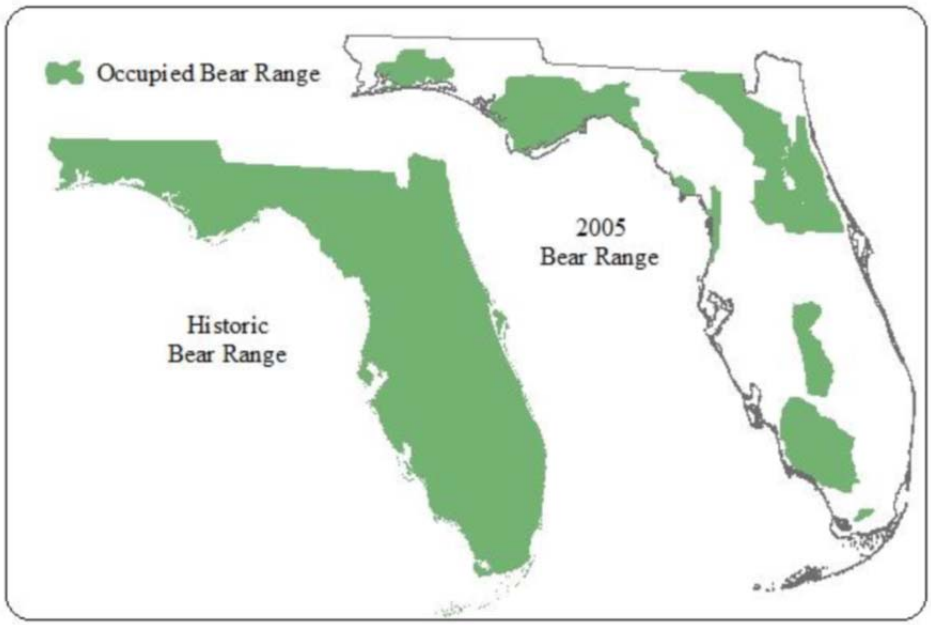
(FWC 2012 at 10).

In Ocala National Forest, at the scale of home range selection within the population range, Florida black bears show a preference for xeric habitats (xeric oak scrub and *Pinus clausa* – sand pine forest) during the summer, with no evidence of habitat selection during the fall (Moyer 2008 at 111, Wooding 1994 entire). At the scale of home range selection within the home range, Florida black bears show a preference for mesic (pine flatwood and swamp forest) and preference against xeric (xeric oak scrub and sand pine forests) habitats, with no evidence of habitat selection during fall.

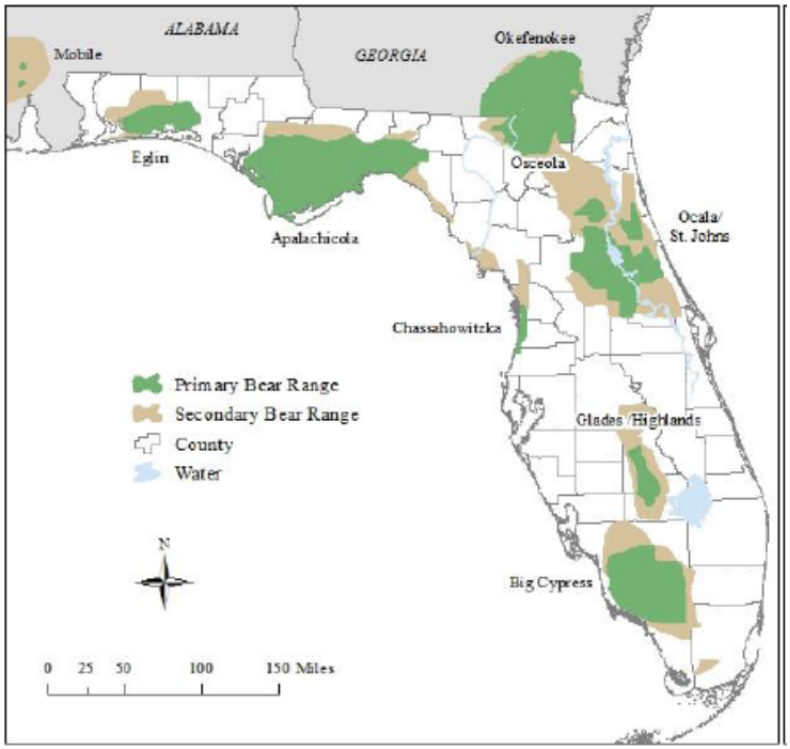
F. Current and Historic Distribution

Only 18 percent of the Florida black bear's original habitat remains (FWC 2016?). Its remaining habitat is degraded and fragmented, resulting in high rates of vehicle collisions and smaller, more isolated populations (Dixon 2007 at 455-464). The Florida black bear historically roamed throughout all of Florida and southern portions of Georgia, Alabama and Mississippi (Brady 1985 at 2-3), but habitat loss and fragmentation as well as unregulated hunting significantly reduced bear numbers from an estimated 11,000 in the 1800s to 300 by the 1970s (Hendry 1982). By the time the Florida Game and Freshwater Fish Commission (now the Florida Fish and Wildlife Conservation Commission)

classified the Florida black bear as a threatened species in most Florida counties in 1974, there were only an estimated 300-500 bears left (McDaniel 1974, Brady 1985 at 3). Today, the Florida black bear's population is estimated at 3,000-3,500 and its occupied range occurs in 48 of Florida's 67 counties, covering 17,500 miles^2 (FWC 2012 at 13).



(FWC 2012 at 2).



(FWC 2012 at 35).

FWC compiled the following history of published reports on Florida black bear numbers from 1700 to 2002:

Year	Estimate	Source	Methods
1700	11,500	GFC 1993	Assumed density of bears statewide is equal to density found in a study area in Ocala National Forest
1914	3,051	Jones 1915	Surveyed state personnel on how many bears they thought might be in each county
1940	300	GFC 1940	Unknown
1950	500	Frye et al. 1950	Unknown
1961	530–860	Harlow 1961	Based on calculations using estimates of both legal and illegal kills
1962	800–1,000	Harlow 1962	Based on calculations using estimates of both legal and illegal kills
1969	1,000	USDOI 1969	Unknown
1971	500–600	GFC 1971	Unknown
1972	500	Pelton and Nichols 1972	Surveyed state game and fish personnel in the southeastern U.S.
1974	300	McDaniels 1974	Unknown
1977	500	East 1977	Unknown
1993	1,000–1,500	GFC 1993	Based on bear densities and habitat acreages calculated from several previously completed studies
1998	1,280	Bentzien 1998	Based on using bear densities and habitat acreages calculated from several previously completed studies
2002*	2,569–2,687	Simek et al. 2005	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

(FWC 2012 at 20).

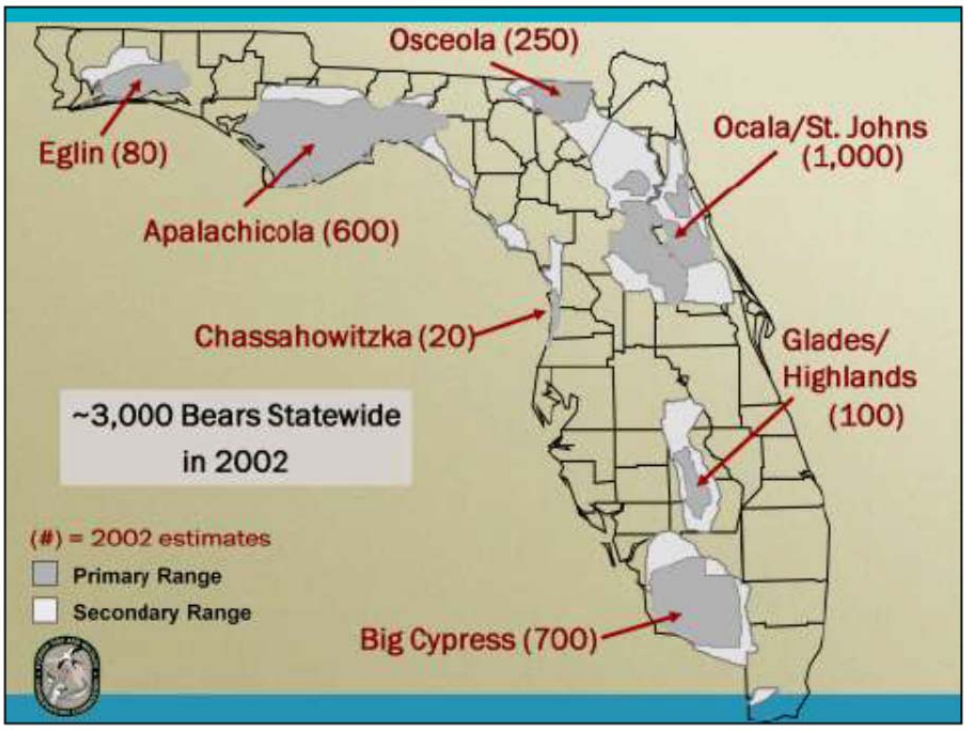
Historic and ongoing habitat fragmentation and destruction have reduced the Florida black bear distribution to seven disjunct and isolated subpopulations: Eglin, Apalachicola, Osceola, Ocala/St. Johns, Chassahowitzka, Highlands/Glades, and Big Cypress (Dixon 2007 at 455-464).

IV. POPULATION STATUS

While the overall population of the Florida black bear is not known, the FWC estimates the population to be 3,000-3,500 based on subpopulation estimates from 2002, 2011, 2014, and 2015. However, that estimate does not take into account mortality since the estimates were made.

Using data collected in 2002, Simek (2005a at 1-4) estimated densities of six bear subpopulations in Florida: Apalachicola, Big Cypress, Eglin, Ocala/St. Johns, and Osceola. Based on genetic analyses by Dixon (2007 at 455-464), FWC combined the

Ocala and St. Johns subpopulations into one subpopulation (Dixon 2007 at 455-464, FWC 2012 at 38-39). FWC used the Simek (2005a) study and a combination of other resources to produce a statewide estimate of 2,705 to 2,941 bears as of 2002 (FWC 2012 at 7).



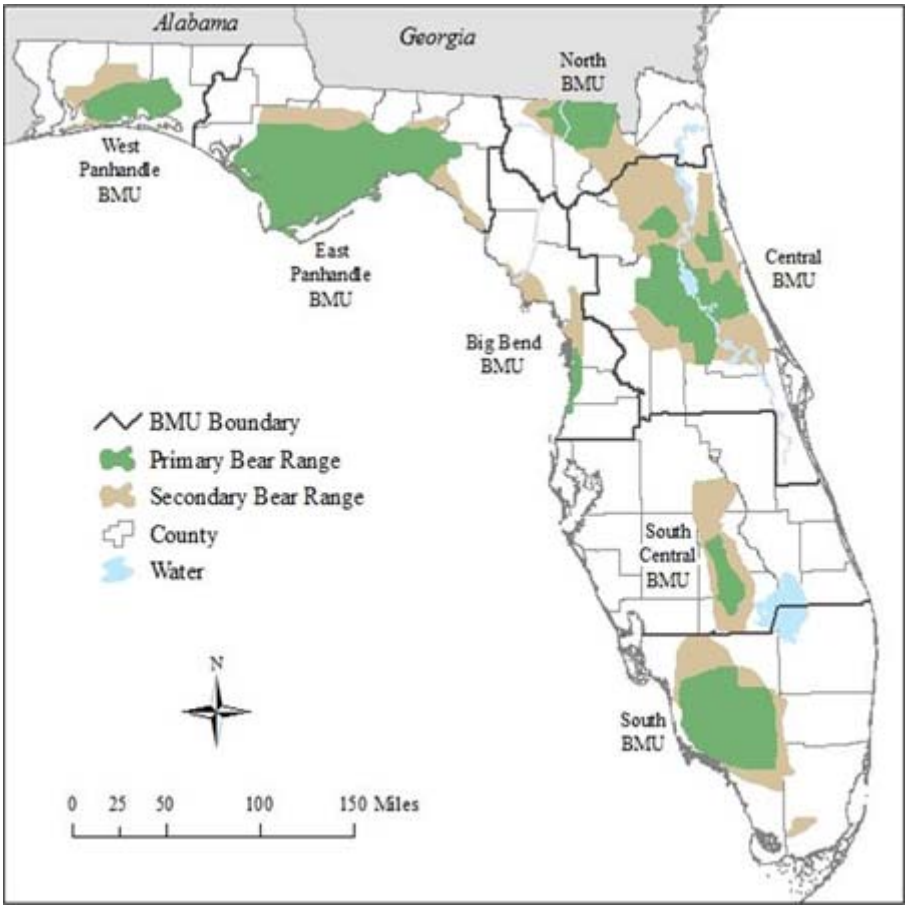
(FWC 2015a at 9).

In 2013, FWC commissioned studies to estimate Florida black bear abundance in and around the areas of Ocala, Osceola, Apalachicola National Forests, Eglin Air Force Base, Big Cypress National Preserve, and for the bears east of the St. Johns River in Flagler and Volusia counties (i.e. the St. Johns subpopulation) (FWC 2013a entire). Estimates of bear abundance were assessed indirectly via capture-recapture methods that incorporate baited hair snares. The captured hairs were DNA analyzed, identifying individual bears and making a record of their "capture," from which mark-recapture models are used to estimate population density and abundance (FWC 2015a at 15).

Ocala/St. Johns and Osceola subpopulation estimates were completed in September 2015, and FWC expects estimates for Apalachicola, Big Cypress, and Eglin by September 2016 (FWC 2015a at 15). The Ocala/St. Johns estimate of 825-1206 marked little increase from the 2002 estimate of 1,000. The Osceola estimate of 550 marked a more than 100 percent increase from 250 in 2002. Therefore, it is difficult to predict growth rates in any given subpopulation. Separately, FWC conducted population estimates for Chassahowitzka in 2011 and Glades/Highlands in September 2014.

Sub-population/Bear Management Unit ("BMU")	Year Estimated	Extrapolated Population Estimate	Known Mortality Since Estimates
Apalachicola/East Panhandle BMU	2002	438-695	833
Big Cypress/South BMU	2002	516-878	189
Chassahowitzka/Big Bend BMU	2011	20	4
Eglin/West Panhandle BMU	2002	63-101	162
Glades/Highlands/South Central BMU	2014	100	22
Ocala/St. Johns/Central BMU	2015	825-1206	259
Osceola/North BMU	2015	550	35
ESTIMATED TOTAL		2,512-3,550	1,504

The FWC manages these subpopulations in seven bear management units ("BMUs"): West Panhandle (Eglin), East Panhandle (Apalachicola), North (Osceola), Big Bend (Chassahowitzka), Central (Ocala/St. Johns), South Central (Glades/Highland), and South (Big Cypress).



In addition to the subpopulations in Florida, Georgia and Alabama may support Florida black bears (Cook 2007 at 1-115, Sanderlin 2009 entire). A recent count estimates the bear population in Georgia to be down to 140 from 300 (Crenshaw 2015 at 1-3). The total

black bear population in Alabama is unknown, but scientific studies last estimated the population to be less than 50 (Edwards 2002 at 49, Prince 2007 at 27).

A. West Panhandle BMU

The West Panhandle BMU includes the Eglin subpopulation estimated at 63-101 bears and encompasses Escambia, Holmes, Okaloosa, Santa Rosa and Walton counties and Eglin Air Force Base. This 2002 estimate does not include the 131 bears killed by vehicle collisions since 2002; the 22 bears killed by wildlife managers due to nuisance complaints or human safety concerns from 2010-2015; the 9 bears illegally killed from 2010-2015; or natural mortality since 2002 (FWC 2016d).

West Panhandle BMU estimate from 2002		**63-101**
Known fatal roadkill	2002-2015	131
Authorized kill due to nuisance complaints or threats to human safety	2010-2015	22
Known illegal kill	2010-2015	9
Authorized 2015 hunt	2015	N/A
Natural mortality	2002-2015	?
TOTAL known mortality since 2002		**162**

B. East Panhandle BMU

The East Panhandle BMU includes the Apalachicola subpopulation estimated at 600 bears and encompasses Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Madison, Taylor, Wakulla, and Washington counties and Apalachicola National Forest. This 2002 estimate does not include the 636 bears killed by vehicle collisions since 2002; the 51 bears killed by wildlife managers due to nuisance complaints or human safety concerns from 2010-2015; the 33 bears illegally killed from 2010-2015; natural mortality since 2002; or the 113 bears killed in the 2015 bear hunt (FWC 2016d).

East Panhandle BMU estimate from 2002		**438-695**
Known fatal roadkill	2002-2015	636
Authorized kill due to nuisance complaints or threats to human safety	2010-2015	51
Known illegal kill	2010-2015	33
Authorized 2015 hunt	2015	113
Natural mortality	2002-2015	?
TOTAL known mortality since 2002		**833**

C. Big Bend BMU

The Big Bend BMU includes the Chassahowitzka subpopulation of approximately 20 bears and encompasses Citrus, Dixie, Gilchrist, Hernando, Lafayette, Levy, and Pasco counties. Bears are nearly absent throughout most of the BMU except around the Chassahowitzka Wildlife Management Area. This 2011 estimate does not include the 2

bears killed by vehicle collisions since 2011; the one bear killed by wildlife managers due to nuisance complaints or human safety concerns from 2011-2015; the one bear illegally killed from 2011-2015; or natural mortality since 2011 (FWC 2016d).

Big Bend Panhandle BMU estimate from 2011		**20**
Known fatal roadkill	2011-2015	2
Authorized kill due to nuisance complaints or threats to human safety	2011-2015	1
Known illegal kill	2011-2015	1
Authorized 2015 hunt	2015	N/A
Natural mortality	2011-2015	?
TOTAL known mortality since 2011		**4**

D. North BMU

The North BMU includes the Osceola subpopulation of 550 bears and encompasses Baker, Columbia, Duval, Hamilton, Nassau, Suwanne, and Union counties. This 2015 estimate does not include the 9 bears killed by vehicle collisions in 2015; natural mortality since 2015; or the 26 bears killed in the 2015 bear hunt (FWC 2016d).

North BMU estimate from 2015		**550**
Known fatal roadkill	2015	9
Authorized kill due to nuisance complaints or threats to human safety	2015	0
Known illegal kill	2015	0
Authorized 2015 hunt	2015	26
Natural mortality	2015	?
TOTAL known mortality since 2015		**35**

E. Central BMU

The Central BMU includes the Ocala/St. Johns subpopulation of approximately 1,300 bears and includes Alachua, Bradford, Brevard, Clay, Flagler, Lake, Marion, Orange, Putnam, Seminole, St. Johns, Sumter, and Volusia counties. This 2015 estimate does not include the 78 bears killed by vehicle collisions in 2015; the 36 bears killed by wildlife managers due to nuisance complaints or human safety concerns in 2015; the 6 bears illegally killed in 2015; natural mortality since 2015; or the 139 bears killed in the 2015 bear hunt(FWC 2016d).

Central BMU estimate from 2015		**825-1206**
Known fatal roadkill	2015	78
Authorized kill due to nuisance complaints or threats to human safety	2015	36
Known illegal kill	2015	6
Authorized 2015 hunt	2015	139
Natural mortality	2015	?
TOTAL known mortality in 2015		**259**

F. South Central BMU

The South Central BMU includes the Glades/Highlands subpopulation of 100 bears and encompasses Charlotte, De Soto, Glades, Hardee, Highlands, Hillsborough, Indian River, Manatee, Martin, Okeechobee, Osceola, Pinellas, Polk, Sarasota, and St. Lucie counties. This 2015 estimate does not include the 14 bears killed by vehicle collisions since 2014; the 7 bears killed by wildlife managers due to nuisance complaints or human safety concerns since 2014; the one bear illegally killed since 2014; or natural mortality since 2015 (FWC 2016d).

South Central BMU estimate from 2014		**100**
Known fatal roadkill	2014-2015	14
Authorized kill due to nuisance complaints or threats to human safety	2014-2015	7
Known illegal kill	2014-2015	1
Authorized 2015 hunt	2015	N/A
Natural mortality	2014-2015	?
TOTAL known mortality since 2014		**22**

G. South BMU

The South BMU includes the Big Cypress subpopulation of approximately 516-878 bears and encompasses Broward, Collier, Hendry, Lee, Miami-Dade, Monroe, and Palm Beach counties and contains the Big Cypress subpopulation. This 2002 estimate does not include the 152 bears killed by vehicle collisions from 2002-2015; the 9 bears killed by wildlife managers due to nuisance complaints or human safety concerns from 2010-2015; the 4 bears illegally killed from 2010-2015; natural mortality since 2002; or the 24 bears killed in the 2015 bear hunt (FWC 2016d).

South BMU estimate from 2002		**516-878**
Known fatal roadkill	2002-2015	152
Authorized kill due to nuisance complaints or threats to human safety	2010-2015	9
Known illegal kill	2014	4
Authorized 2015 hunt	2015	24
Natural mortality	2002-2015	?
TOTAL known mortality since 2002		**189**

FWC's overall population estimate for the Florida black bear is 3,000-3,500; however, this does not take into account the known mortality of 1,500 bears, natural mortality, or other unknown mortality that has occurred since the various subpopulation estimates were made.

V. THREATS

The Endangered Species Act requires the Service to base listing determinations on the following five factors: present or threatened habitat destruction, modification, or curtailment; overutilization for commercial, recreational, scientific, or educational purposes; disease or predation; the inadequacy of existing regulatory mechanism; and other natural or manmade factors affecting the species' continued existence (16 U.S.C. 1533(a)(1)). Such determinations must be made "solely on the basis of the best scientific and commercial data available" (16 U.S.C. 1533(b)(1)(A)).

Native habitats in Florida are rapidly disappearing (Kautz 2001 at 56). This has resulted in the extirpation or extinction of 13 vertebrates over the last 150 years (Kautz 2001 at 56). In part due to extreme habitat loss and historic hunting, the Florida Fish and Wildlife Conservation Commission listed the Florida black bear as threatened (F.A.C. 39-27.003-005). Despite state protections, in 1982, the Service identified the Florida black bear as a candidate for listing under the Endangered Species Act (47 Fed. Reg. 58454). On May 20, 1990, the Service received a petition to list the Florida black bear. On October 18, 1990, the Service made a positive 90-day finding on the petition determining that the petition presented substantial scientific information indicating that listing may be warranted (55 Fed. Reg. 42223). On January 7, 1991, the Service determined that listing the Florida black bear was warranted-but-precluded due to other higher priority actions (57 Fed. Reg. 596).

Following litigation and a mandate to resolve the conservation status of the bear, on December 8, 1998, the Service published a new 12-month finding, concluding that listing was not warranted, removing the bear from candidate status, in-part due to the adequacy of existing regulatory mechanisms (63 Fed. Reg. 67613). Conservation organizations challenged this determination and on December 13, 2001, the District Court of the District of Columbia found that the Service had failed to properly determine whether the inadequacy of existing regulatory mechanisms warranted listing the Florida black bear (Defenders 2001). Specifically, the court found that the Service "cannot rely on speculative future actions to justify its decisions because there is no assurance that those actions will in fact be carried out… 'existing regulatory mechanisms' are those that are being currently implemented and enforced, as opposed to regulations that might be enacted in the future, or current regulations authorizing future government action but which do not require that such action take place" (*Id*. at 20).

On January 14, 2004, the Service issued a finding that existing regulatory mechanisms in 1998 were adequate and again concluded that the Florida black bear does not warrant listing (69 Fed. Reg. 2100). The Service examined four major categories of regulation in

addressing the adequacy of existing regulatory mechanisms: state and federal law and regulation governing hunting and other forms of taking the black bear; section 404 of the Clean Water Act; protections provided to the bear as a state-listed species under Florida law; and laws governing public lands management within land units administered by the Department of Interior, Forest Service, Department of Defense, and Florida. In finding that the bear did not warrant listing, the Service specifically cited the fact that the FWC protected the bear as threatened and that both Florida and Georgia only allowed the killing of so-called problem bears in very rare circumstances, and only after other preventative measures had been exhausted.

Florida state law protections were integral to the federal government's decision not to grant additional protections. In 2012, the State removed the Florida black bear from its threatened species list, and in 2015, FWC allowed the hunt of over 300 Florida black bears with plans to have another hunt in 2016. Today the Florida black bear faces multiple, compounding threats of habitat loss brought on by population growth, collisions with cars, conflicts with humans, and state-sanctioned hunts. These threats have likely reduced population numbers and further isolated subpopulations as to threaten the Florida black bear with extinction. Without Endangered Species Act protection, the Florida black bear is at high risk of extinction.

A. Present or Threatened Destruction, Modification or Curtailment of Habitat or Range

Habitat loss and fragmentation, coupled with human encroachment, have resulted in subpopulations that are increasingly isolated from each other (Dobey 2002 at x). Indeed, habitat destruction and fragmentation is the leading cause of species extinction worldwide (Harris 1984, Meffe 1997). Large mammalian carnivores are particularly vulnerable to habitat loss and fragmentation because of their relatively low numbers, large home ranges, and interactions with humans (Noss 1996 entire, Crooks 2002 at 488-502, Woodroffe 1998 entire). Their low fecundity and long generation times result in reduced levels of genetic variation (Roekle 1993 entire, Lu 2001 entire). Habitat loss and fragmentation can lead to increased mortality (Jules 1998 entire); reduced abundance (Flather 2002 at 40-56); disruption of the social structure of populations (Ims 1999 at 839-849, Cale 2003 entire); reduced population viability (Harrison 1999 at 225-230, Srikwan 2000 entire, Cale 2003 entire, Lindenmayer 2006); isolated populations with reduced population sizes and decreased genetic variation (Frankham 1996 entire). Loss of genetic variation may reduce the ability of individuals to adapt to a changing environment; cause inbreeding depression (Ebert 2002 entire); reduce survival and reproduction (Frankham 1995 entire, Reed 2003 entire); and increase the probability of extinction (Saacheri 1998 entire, Westmeier 1998, Kramer-Schadt 2004 entire, Letcher 2007 entire, Ruiz-Gutierrez 2008 entire, Sherwin 2000).

The Florida black bear is highly vulnerable to the above threats as only 18 percent of its original habitat remains (FWC 2012a at 162). Its remaining habitat is degraded and fragmented, resulting in high rates of vehicle collisions and smaller, more isolated populations (Dixon 2007 at 455-464). Florida black bears have been negatively affected

by this habitat loss (Hellgren 1993). A 2009 study concluded the anthropogenic influences – primarily road density and vehicular traffic – can substantially affect the population dynamics of Florida black bears and other large carnivores with large home ranges (Hostetler 2009 entire). Some studies estimated habitat loss at 60,000 ha per year (Harris 1991, Harris 1992). Due to current and projected trends of substantial bear habitat loss and fragmentation, with 2.3 million acres of bear habitat projected to be destroyed by 2060, bear populations will become smaller and more isolated from one another, exacerbating threats from genetic isolation and road mortality (Cerulean 2008 at 8-10).

Habitat fragmentation and anthropogenic barriers to movement have limited the dispersal capability of the Florida black bear, reducing gene flow among populations, and resulting in genetically distinct populations (Dixon 2007 at 455-464). Large carnivores may be much more susceptible to losses in genetic variation due to habitat fragmentation because of their large home ranges, low population densities, and long generation times (Paetkau 1994 entire, Johnson 2001). Isolation is reinforced when travel between subpopulations is limited due to significant barriers, such as high-volume roads (Paetkau 1997 entire, Mader 1984 entire, Brody 1989, Proctor 2002 entire, Voss 2001 entire, Keller 2003 entire, Gerlach 2000 entire, Trombulak 2000 entire, Coffin 2007 at 396-403). Thus roads and other anthropogenic obstacles cans substantially reduce gene flow among bear populations (Dixon 2007 at 455-464, Kyle 2001 at 343-346, Walker 2001 entire, Ernest 2004). An additional impact of habitat fragmentation is that bears may have to travel farther distances to establish their home ranges, exposing them to greater risk of human conflict and collisions with cars. In one instance, Wooding (1992 entire) noted that a long-traveled female, who was eventually killed by a car, likely traveled such far distances from her home range because in the 3.5 years between her initial capture and her recapture, 9.5 km^2 of habitat in what was assumed to be her home range, was clear-cut.

Dixon (2007 at 455-464) found that bears in Chassahowitzka, the smallest subpopulation, have the lowest genetic variation of any of the subpopulations. The study concluded that due to the relatively low genetic variation in both the Chassahowitzka and Highlands/Glades subpopulations, efforts should be made to restore historic levels of variation. This same study suggested there are high degrees of differentiation between Florida black bear subpopulations, with the Chassahowitzka, Highlands/Glades, and Eglin subpopulations being most divergent. It recommended that Florida black bear subpopulations be managed as a metapopulation so that gene flow can occur among populations connected with conservation corridors. Both Cox (1994 at 50, 55) and Dixon (2007 at 455-464) determined that each subpopulation should have at least 200 mature individuals to maintain genetic health and chances for survival long term (Dixon 2007 at 455-464, Cox 1994 at 50, 55).

1. Human population growth and impacts by BMU

A leading cause of habitat loss is population growth and corresponding land uses. A 2000 analysis of potential ecological connectivity in Florida found that only about half the land identified for connectivity was publically owned and managed (Hoctor 2000 at 984-999).

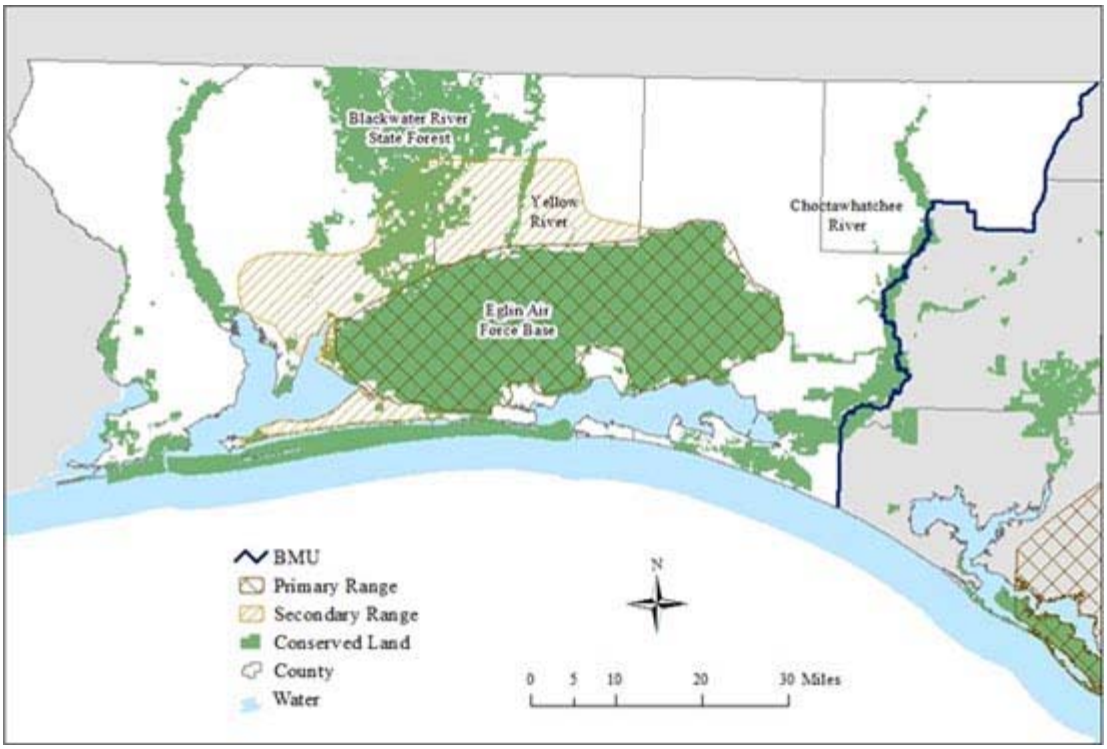
Meanwhile, *Florida 2060: A Population Distribution Scenario for the State of Florida* predicts Florida's population will grow by 49 percent by 2060. The FWC's *Wildlife 2060: What's at stake for Florida?* estimates that such a population increase could result in the conversion of 7 million acres from rural and natural to urban uses (Cerulean 2008 at 2). It predicts that nearly 3 million acres of existing agricultural lands and 2.7 million acres of native habitat will be claimed by roads, shopping malls and subdivisions; 1.6 million acres of woodland habitat may be lost; wetland habitat may become more isolated and degraded; 2 million acres of lands bears depend on may disappear; and gopher tortoises may lose a fifth of their existing range (Cerulean 2008 at 4).

Bunnell (1980 entire) concluded that subpopulations with more than 200 individuals with females reproducing two cubs every two years by three years old can sustain a maximum annual mortality of up to 23 percent without experiencing decline. However, the Big Bend, West Panhandle, and South Central BMUs are estimated to have fewer than 200 bears each. Notably, the East Panhandle, estimated to have 438-695 bears in 2002, lost at least 184 bears in 2015, or 26-42 percent of the total subpopulation.

a. West Panhandle BMU

The West Panhandle BMU has an estimated 63-101 bears, not including known mortality of 162 bears that has occurred since the estimate was calculated in 2002. According to the FWC's Bear Management Plan, 74 percent of the land needed to support the minimum subpopulation objective of 200 bears has been conserved. The Plan recommends creating 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 population through Cunecuh. FWC reports that residential development expansion in recent years has contributed to a rapid increase in bear reports, that the West Panhandle BMU had the highest percentage of reports of bears getting into garbage, and that 27 percent of statewide core complaints in 2010 came from this BMU (Commission, 2012). Stratman (2001b entire) found that riparian zones, compared to swamps, pine plantations, sandhills, and open areas, had the highest use.

The West Panhandle BMU includes Escambia, Holmes, Okaloosa, Santa Rosa and Walton counties and includes Eglin Air Force Base. Escambia County is projected to grow from 294,410 residents in 2000 to 462,458 residents by 2060; Holmes County is projected to grow from 18,564 residents in 2000 to 26,472 in 2060; Okaloosa County is projected to grow from 170,498 residents in 2000 to 324,395 in 2060; Santa Rosa County is projected to grow from 117,743 residents to 316,319 in 2060; Walton County is projected to grow from 40,601 in 2000 to 155,883 by 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 57 percent by 2060. This is 8 percent more than the state average in a BMU that has less than 200 bears, and in fact has lost at least 162 bears from human-caused sources since the survey was done in 2002.



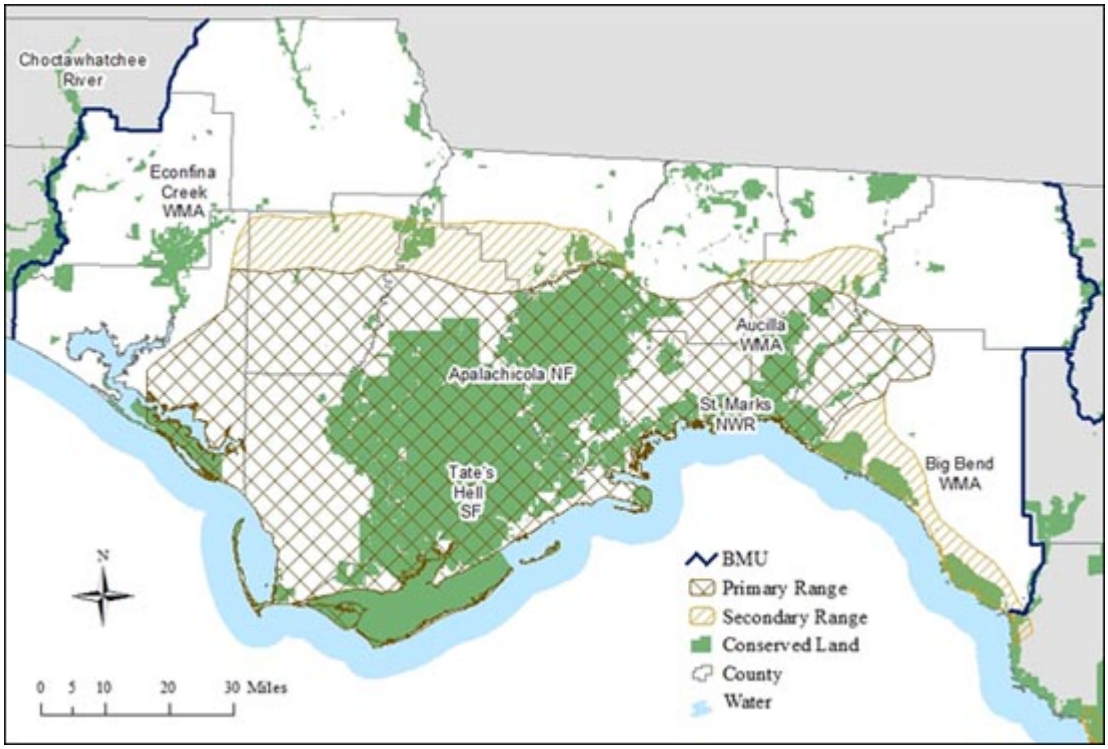
The West Panhandle BMU is relatively small, estimated at 63-101, and has threats mounting against it that stem from increasing pressures from population growth. In the last ten years, at least ten bears a year have been killed by vehicle collisions. The last ten years has also seen an increase in the number of bear-related calls, and the majority of the calls were to report bears in the area or in garbage. Population in this region is projected to outpace growth in other regions of Florida, a state that is the second fastest growing in the nation.

b. East Panhandle BMU

The East Panhandle BMU has an estimated 438-695 bears, not including the known mortality of 833 bears since the estimate was calculated in 2002. FWC reports that potential bear habitat in conserved lands are insufficient to maintain or increase the subpopulation and that conservation efforts should focus on Econfina Creek Water Management Area and Choctawhatchee River conservation areas (FWC 2012 at 94).

The East Panhandle BMU includes Bay, Calhoun, Franklin, Gadsden, Gulf, Jackson, Jefferson, Leon, Liberty, Madison, Taylor, Wakulla, and Washington counties and Apalachicola National Forest. Bay County is projected to grow from 148,217 residents in 2000 to 262,325 residents by 2060; Calhoun County is projected to grow from 13,017 residents in 2000 to 19,170 by 2060; Franklin County is projected to grow from 9,829 residents in 2000 to 18,242 by 2060; Gadsden County is projected to grow from 45,087 residents to 60,102 by 2060; Gulf County is projected to grow from 14,560 to 23,495 by 2060; Jackson County is projected to grow from 46,755 to 64,688 by 2060; Jefferson County is projected to grow from 12,902 to 18,680 by 2060; Leon County is projected to

grow from 239,452 to 438,640 by 2060; Liberty County is projected to grow from 7,021 to 10,286 by 2060; Madison County is projected to grow from 18,733 to 26,096 by 2060; Taylor County is projected to grow from 19,256 to 30,034 by 2060; Wakulla County is projected to grow from 22,863 to 60,410 by 2060; and Washington County is projected to grow from 20,973 to 37,985 by 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 58 percent by 2060. This is 9 percent more than the state average.

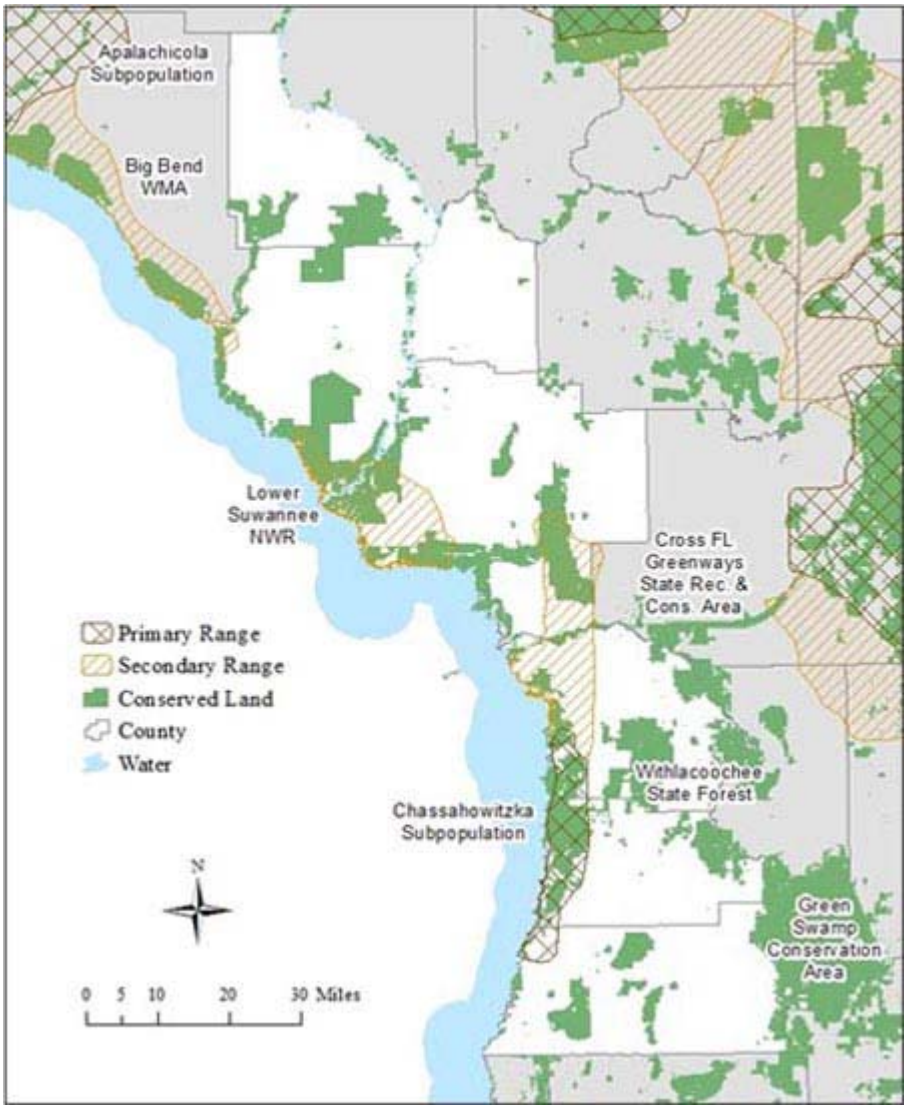


The East Panhandle BMU is estimated to be 438-695, it has lost at least 833 bears since the estimate was calculated. In the last ten years, at least fifty bears a year have been killed by vehicle collisions, with 81 killed in 2012. The last ten years has also seen an increase in the number of bear-related calls, and the majority of the calls were to report bears in the area or in garbage. It is the deadliest unit with an average of 50 bears dying each year due to vehicle collisions. Threats mount against it that stem from increasing pressures from population growth. Population in this region is projected to outpace growth in other regions of Florida, a state that is the second fastest growing in the nation.

c. Big Bend BMU

The Big Bend BMU contains the Chassahowitzka subpopulation, and bears are nearly absent throughout most of the BMU except around the Chassahowitzka Wildlife Management Area. It has an estimated 20 bears, not including the known mortality of 4 bears since the estimate was calculated in 2011. A study of the greater Chassahowitkza ecosystem found that it has experienced almost no recruitment since 1997, food supplies are often separated by busy highways, and the genetics of the population are depauperate (Brown 2004 at 42-48).

The Big Bend BMU includes Citrus, Dixie, Gilchrist, Hernando, Lafayette, Levy, and Pasco counties and contains the Chassahowitzka subpopulation. Citrus County is projected to grow from 118,085 residents in 2000 to 238,637 in 2060; Dixie County is projected to grow from 13,827 residents in 2000 to 30,781 in 2060; Gilchrist County is projected to grow from 14,437 residents in 2000 to 38,937 in 2060; Hernando County is projected to grow from 130,802 residents in 2000 to 312,448 in 2060; Lafayette County is projected to grow from 7,022 residents in 2000 to 11,902 in 2060; Levy County is projected to grow from 34,450 residents in 2000 to 80,074 in 2060; Pasco County is projected to grow from 334,765 residents in 2000 to 872,559 in 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 41 percent by 2060.

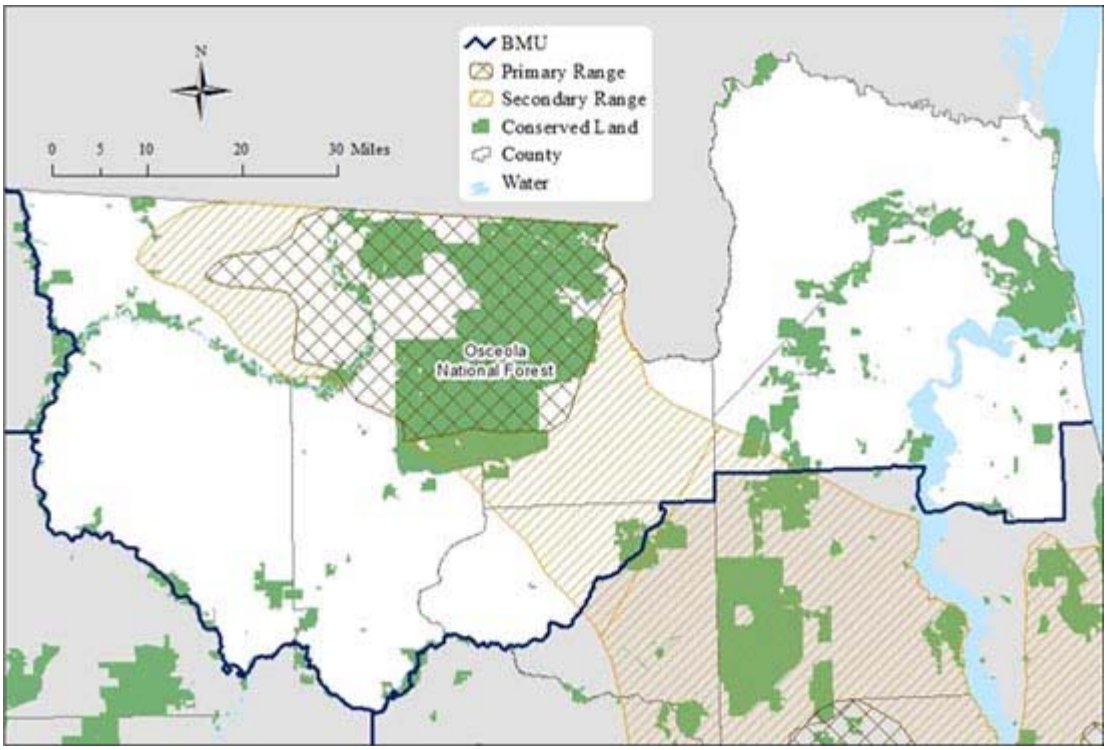


In the last ten years, 0-2 bears have been killed by vehicle collisions each year. The last ten years has seen an increase in the number of bear-related calls. The majority of the calls were to report bears in the area or in garbage. The human population is expected to increase by 40 percent by 2060. This small, isolated population will need diligent management to ensure it survives.

d. North BMU

The North BMU has an estimated 550 bears, not including the known mortality of 35 bears since the estimate was calculated in 2015.

The North BMU includes Baker, Columbia, Duval, Hamilton, Nassau, Suwanne, and Union counties and contains the Osceola subpopulation. Baker County is projected to grow from 22,259 residents in 2000 to 44,421 in 2060; Columbia County is projected to grow from 56,513 residents in 2000 to 120,481 in 2060; Duval County is projected to grow from 778,879 residents in 2000 to 1,515,499 in 2060; Hamilton County is projected to grow from 13,327 residents in 2000 to 20,215 in 2060; Nassau County is projected to grow from 57,663 residents in 2000 to 157,241 in 2060; Suwanne County is projected to grow from 34,844 residents in 2000 to 80,830 in 2060; Union County is projected to grow from 13,442 residents in 2000 to 24,230 in 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 50 percent by 2060.



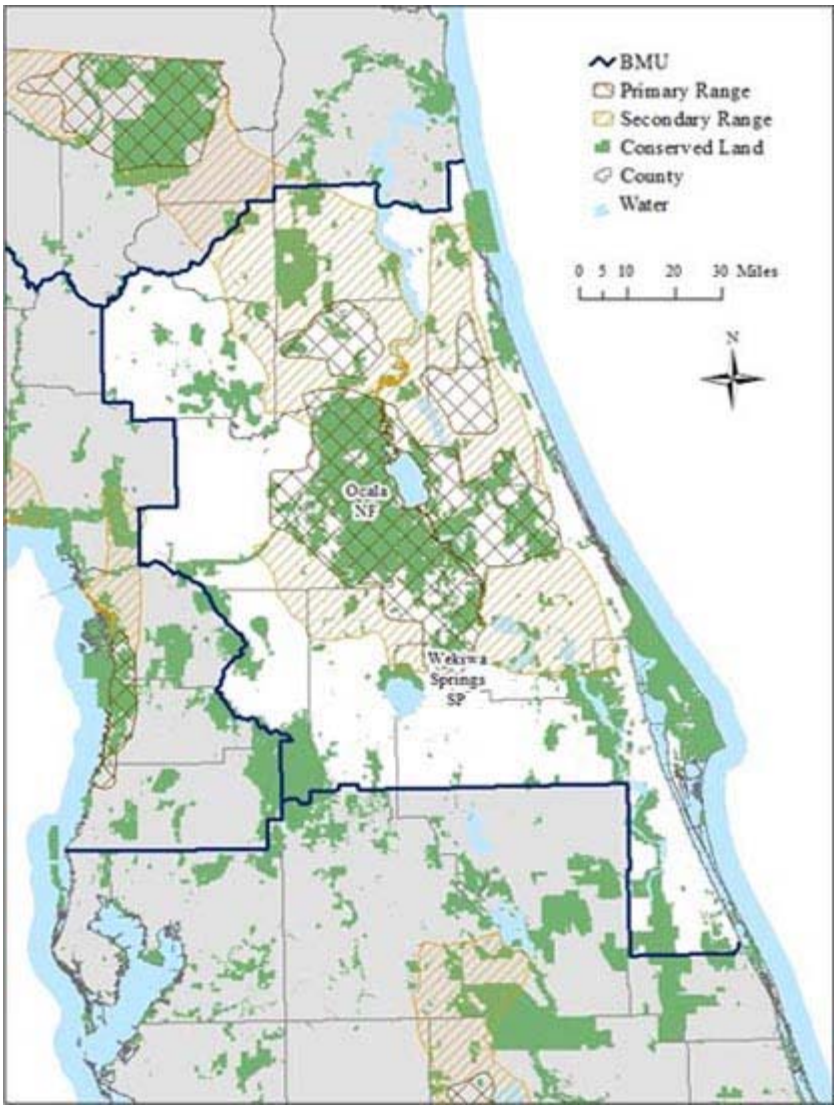
In the last ten years, an average of four bears have been killed by vehicle collisions each year. The last ten years has seen an increase in the number of bear-related calls, and the majority of the calls were to report bears in the area or in garbage. The FWC estimates that the North BMU population grew 100 percent in 13 years; however, the human population is estimated to grow in this region 50 percent by 2060. This will likely further reduce and fragment available habitat, increase collisions with cars, and lead to more human-bear interactions.

e. Central BMU

The Central BMU contains the Ocala/St. Johns subpopulation with an estimated 825-1206 bears, not including the known mortality of 259 bears since the estimate was calculated in 2015. Ocala National Forest hosts one of the largest populations of Florida black bears (Dixon 2007 at 455-464, Simek 2005a at 1). However, it is subjected to many anthropogenic impacts, including vehicular mortality and illegal harvest. McCown (2004 entire) found that female bears living near towns bordering Ocala National Forest experience anthropogenic mortality at rates that would be unsustainable if the subpopulation was isolated.

The Central BMU includes Alachua, Bradford, Brevard, Clay, Flagler, Lake, Marion, Orange, Putnam, Seminole, St. Johns, Sumter, and Volusia counties. Alachua County is projected to grow from 217,955 residents in 2000 to 423,057 in 2060; Bradford County is projected to grow from 26,088 residents in 2000 to 42,798 in 2060; Brevard County is projected to grow from 476,230 residents in 2000 to 1,009,108 in 2060; Clay County is projected to grow from 140,814 residents in 2000 to 418,142 in 2060; Flagler County is projected to grow from 49,832 residents in 2000 to 274,494 in 2060; Lake County is projected to grow from 210,528 residents in 2000 to 706,248 in 2060; Marion County is projected to grow from 258,916 residents in 2000 to 697,710 in 2060; Orange County is projected to grow from 896,344 residents in 2000 to 2,469,540 in 2060; Putnam County is projected to grow from 70,423 residents in 2000 to 104,911 in 2060; Seminole County is projected to grow from 365,196 residents in 2000 to 855,854 in 2060; St. Johns County is projected to grow from 123,135 residents in 2000 to 451,777 in 2060; Sumter County is projected to grow from 53,345 residents in 2000 to 207,227 in 2060; Volusia County is projected to grow from 443,343 residents in 2000 to 943,513 in 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 39 percent by 2060; however, the human population in the immediate surrounding counties – Marion, Lake, Putnam, and Volusia – is expected to grow by 75 percent from 2000 to 2030 (Smith 2007 at 70).[1] As human population increases, so will traffic and vehicle-related bear fatalities (McCown 2009 entire).

[1] A map prepared by the state's Northeast Regional Planning Council, which includes Nassau, Duval, Baker, Clay St. Johns, Putnam, and Flagler counties, illustrates the spread of development throughout Northeast Florida. These counties make up the North and Central Bear Management Units. The map shows a total of 69 Developments of Regional Impact (DRI) as of January 2013. *See* Northeast Regional Planning Council. 2013. Developments of Regional Impact (DRI).



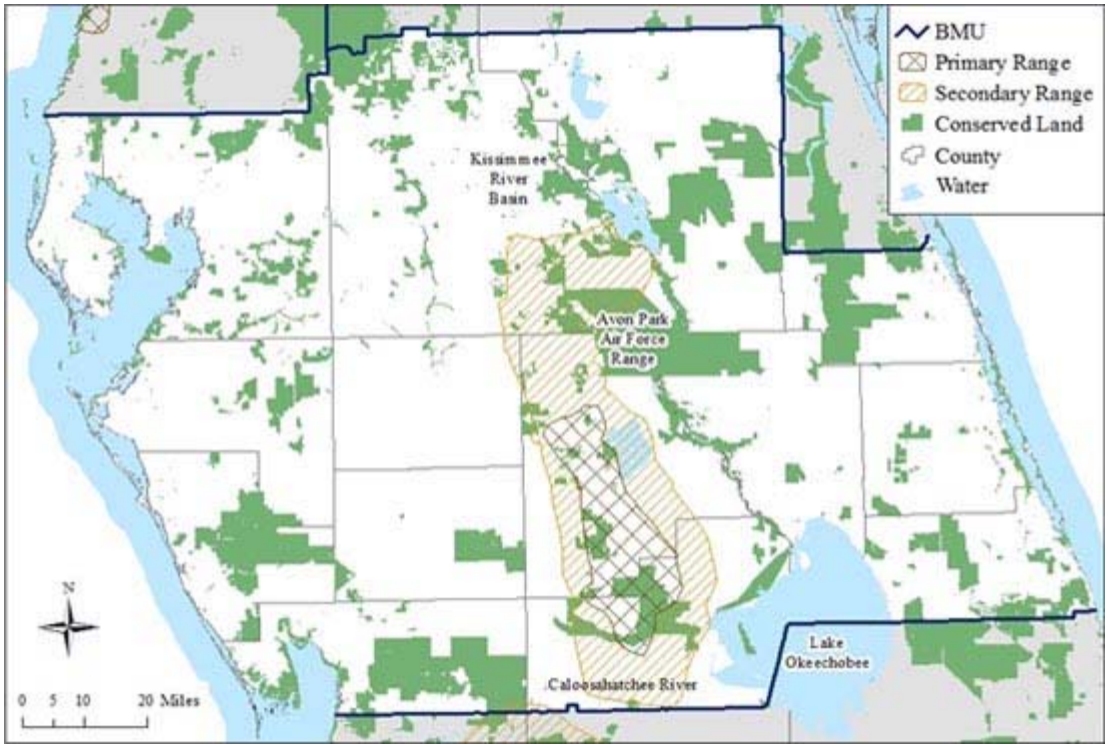
The Central BMU has seen little growth from its estimate of 825-1206 bears in 2002, to its estimate of 1,000 bears in 2015. In the last ten years, an average of 100 bears have been killed by vehicle collisions each year. The last ten years has seen an increase in the number of bear-related calls, and the majority of the calls were to report bears in the area or in garbage. Furthermore, it continually sustains very high rates of mortality from collisions with cars and with the explosive growth predicted for the next 15 years, these threats will increase.

f. South Central BMU

The South Central BMU has an estimated 100 bears, not including the known mortality of 22 bears since the estimate was calculated in 2014. One study found that highway mortality peaks in early summer and fall, that annual increases in annual roadkills since the mid-1980s coincide with human population growth and development in Highlands County, and that concentrations of roadkills may represent important bottlenecks in pathways to and from food supplies on the Lake Wales Ridge and baygall habitats

(Maehr 2004 entire). One study found that the landscape in this BMU is dominated by agriculture on private lands, as opposed to large contiguous forests on public lands elsewhere, and that the mean patch size of forests was smaller, while edge density, diversity, and evenness were higher than elsewhere in the state (Ulrey 2008 entire).

The South Central BMU includes Charlotte, De Soto, Glades, Hardee, Highlands, Hillsborough, Indian River, Manatee, Martin, Okeechobee, Osceola, Pinellas, Polk, Sarasota, and St. Lucie counties. Charlotte County is projected to grow from 141,627 residents in 2000 to 335,713 in 2060; De Soto County is projected to grow from 32,209 residents in 2000 to 69,717 in 2060; Glades County is projected to grow from 10,576 residents in 2000 to 17,768 in 2060; Hardee County is projected to grow from 26,938 residents in 2000 to 43,922 in 2060; Highlands County is projected to grow from 87,366 residents in 2000 to 170,038 in 2060; Hillsborough County is projected to grow from 998,948 residents in 2000 to 2,308,682 in 2060; Indian River County is projected to grow from 112,947 residents in 2000 to 284,447 in 2060; Manatee County is projected to grow from 264,002 residents in 2000 to 643,808 in 2060; Martin County is projected to grow from 126,731 residents in 2000 to 277,297 in 2060; Okeechobee County is projected to grow from 35,910 residents in 2000 to 61,292 in 2060; Osceola County is projected to grow from 172,493 residents in 2000 to 779,319 in 2060; Pinellas County is projected to grow from 921,482 residents in 2000 to 1,257,078 in 2060; Polk County is projected to grow from 483,924 residents in 2000 to 1,029,606 in 2060; Sarasota County is projected to grow from 325,957 residents in 2000 to 704,149 in 2060; St. Lucie County is projected to grow from 192,695 residents in 2000 to 563,093 in 2060 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 46 percent by 2060.

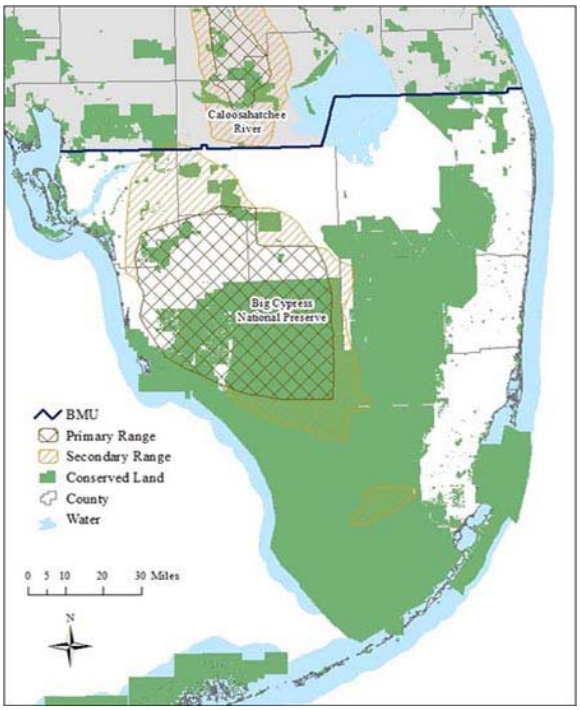


The South Central population is relatively small. Last estimated in 2014 to have 100 bears, it has lost at least 22 bears since then from human causes. In the last ten years, an average of 5 bears have been killed by vehicle collisions each year. The last ten years has seen an increase in the number of bear-related calls. The majority of the calls were to report bears in the area or in garbage. Population growth in the region will continue to degrade and fragment habitat, and associated problems of collisions with cars and conflicts with humans are expected to increase.

g. South BMU

The South BMU contains the Big Cypress subpopulation and has an estimated 516-878 bears, not including the known mortality of 189 bears since the estimate was calculated in 2002. In 1972 it was estimated there were 145 bears in the region (100 in Collier County, 20 in Hendry County, 20 in Monroe County, and 5 in Palm Beach County) and 80-100 bears in the Big Cypress Swamp (Schemnitz 1972 at 1-2).

The South BMU includes Broward, Collier, Hendry, Lee, Miami-Dade, Monroe, and Palm Beach counties. Broward County is projected to grow from 1,623,018 residents in 2000 to 3,353,646 in 2060; Collier County is projected to grow from 251,377 residents in 2000 to 963,051 in 2060; Hendry County is projected to grow from 36,210 residents in 2000 to 79,468 in 2060; Lee County is projected to grow from 440,888 residents in 2000 to 1,369,900 in 2060; Miami-Dade County is projected to grow from 2,253,362 residents in 2000 to 4,046,698 in 2060; Monroe County is projected to grow from 79,589 residents in 2000 to 92,287 in 2060; Palm Beach County is projected to grow from 1,131,184 residents in 2000 to 2,701,242 in 2060 2060 (Zwick 2006 at 20-21). Combined, these counties are estimated to grow 46 percent by 2060.



In the last ten years, an average of 10 bears have been killed by vehicle collisions each year. The last ten years has seen an increase in the number of bear-related calls. The majority of the calls were to report bears in the area or in garbage.

The South BMU is in part protected by the Big Cypress National Preserve, which prevents residential development and currently does not allow bear hunting. However, there are several high intensity plans for oil and gas development proposed for Big Cypress that may affect the bear. Further, the FWC may have already requested that the Preserve Supervisor consider opening the preserve to bear hunting next season (Wiley 2015b entire). Large-scale development in bear habitat is planned for Lee, Hendry, and Collier counties. Lime rock and sand mining have already taken over 13,000 acres of rural lands in Lee County (Dover 2008 at 1.6-1.19, 1.24-1.29); and over 10,000 acres of new mining projects have been permitted by the state in this same region.[2] Over 45,000 acres of additional mining and urban development is proposed in Collier County's Rural Land Stewardship Area (Stantec 2015 at i). Two large sector plans, allowing for urban development, have also been approved just to the north in Hendry County.[3]

Looking at just the South BMU as an example of how the above projections are actually materializing, the following projects located inside the boundaries of the South BMU will lead to the loss, fragmentation, and degradation of many thousands of acres of currently occupied Florida black bear habitat in the unit. Residential development in bear habitat will inevitably lead to an increase in both road mortality and the number of "nuisance bears," and thus more bear killings by the FWC.

- Florida Power and Light Hendry Clean Energy Center (proposed 3,750 MW gas-fired electrical power plant), Hendry County: The company purchased an initial 3,000 acres for this project and has recently acquired an additional 4,000 acres adjacent to the original purchase. The plant would be located in completely rural land known to be excellent Florida black bear and Florida panther habitat in the northeastern section of the South BMU. It is wholly inside the proposed "Panther Glades" Florida Forever Project. When completed, the Hendry power plant will be among the three largest fossil fuel power plants in the United States (Fleshler 2015b at 1-2, Beltz 2015 at 1).
- Town of Big Cypress (recently changed to "Rural Lands West" pending a specific project name) in Collier County: This proposed 4,000 acre development is part of the 200,000 acre Rural Lands Stewardship Area (RLSA) of eastern Collier County. Other residential and commercial developments within the RLSA are likely as that is the purpose of the stewardship area. The Rural Lands West project is adjacent to and just west and north of the Florida Panther National Wildlife Refuge. Its southern boundary is just north of the Picayune Strand State Forest.

[2] FFD 6Ls Mine, Old Corkscrew Plantation Mine ERP No. 0284086-002, Troyer Brothers Mine ERP No. 0292013-001, Lee County and Immokalee Sand Mine ERP No. 0297420-001, Lost Grove Mine ERP No. 2995330991, Hogan Island Quarry ERP No. 0286326-001, Collier County.
[3] West Hendry (King's Ranch) Sector Plan and Rodina Sector Plan, (FLU 2016).

This entire region is extremely important habitat for black bears and is located in the center of the South BMU (Collier 2015 at 1-3).

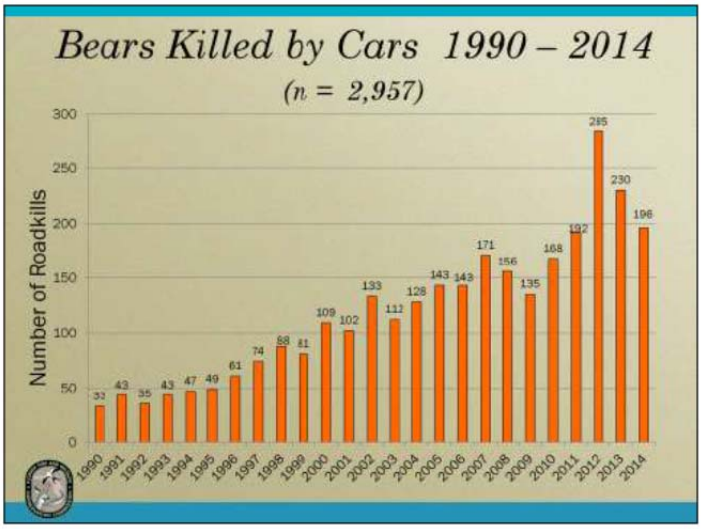
- WildBlue (residential development) Lee County: These 2,960 acres of currently undeveloped land lies east of Florida Gulf Coast University between Corkscrew and Alico Roads (Private 2016 entire, Doane 2015 at 1-3).
- Corkscrew Farms (residential development) Lee County: This 1,300 acre development lies further east on Corkscrew Road from the WildBlue development referenced above. It is surrounded by the Corkscrew Regional Mitigation Bank to the north and the Corkscrew Regional Ecosystem Watershed Flint Pen Strand to the South. In addition to a direct loss of habitat, both this project and WildBlue will greatly increase traffic on Corkscrew Road and presumably Florida black bear road mortality (Cameratta 2010 at 1-11, Smith 2015 at 1, Doane 2015 at 1-3).
- SR 82 widening: 23 miles of road widening in Lee and Collier Counties. The road runs north of and adjacent to important public lands such as the Wild Turkey Preserve, Corkscrew Mitigation Bank, and Pepper Ranch Preserve (FDOT 2016b at 1).
- SR 29 widening: 18 mile expansion from Collier County to Hendry County, the road widening project is adjacent to or near major public lands – e.g. Spirit of the Wild Wildlife Management Area and the Okaloacoochee Slough State Forest – both important Florida black bear habitats in the South BMU. The project report provides the following projection of increased traffic: "Traffic volumes on S.R. 29 are projected to increase from a current volume of 6,200 vehicles per day to 23,800 vehicles per day by the year 2035 as documented in the project traffic report" (FDOT 2016a at 1).
- Snake Road widening, Hendry County: A planned approximately 8-mile expansion inside the Big Cypress Seminole and Big Cypress Miccosukee Indian Reservations. This road is just east of the South BMU but cuts across an important wildlife corridor connecting the Big Cypress National Preserve to public and private lands in Southeast Hendry County and the Southwest corner of Palm Beach County (e.g. the Rotenberger and Holeyland Wildlife Management Areas) (Blackhouse 2011 at 1).
- Town of Babcock Ranch: 18,000 acres just north of the Caloosahatchee River east of SR 31. The project (which recently broke ground) proposes approximately 20,000 new homes. This project, coupled with additional development that is likely to occur in the future, could severely restrict potential expansion of black bears in the southern BMU beyond the Caloosahatchee River. While the project lies north of the South BMU, it lies in the nexus of the Babcock-Webb Wildlife Management Area, the Babcock Ranch Preserve, and the Fisheating Creek Wildlife Management Area. This is a currently existing wildlife corridor that connects (or could connect) the isolated Florida black bear population in the South Central BMU to the South BMU population. Its functionality as a corridor could be greatly diminished by the completion of this project now in progress (Kitson 2016 at 1-2).
- Burnett Oil Seismic Survey (Burnett 2014 at 1-7): This project plans to utilize "vibroseis" (approximately 60,000 pound) trucks across many miles of the Big

Cypress National Preserve. Burnett has leased approximately 235,000 acres wholly inside the Big Cypress National Preserve - ground zero for the Florida black bear population in the South BMU. In its current application to the National Park Service, the company has asked for permission to conduct seismic testing on approximately 70,000 acres of the preserve (a permit from the Florida Department of Environmental Protection for this project has already been obtained). Oil field development involving miles of new oil access roads and the construction of oil pads are expected to follow once oil-bearing rock is located. Noise, traffic, chemical odors and other human disturbances are expected to increase greatly as a result of this seismic project and future oil development.

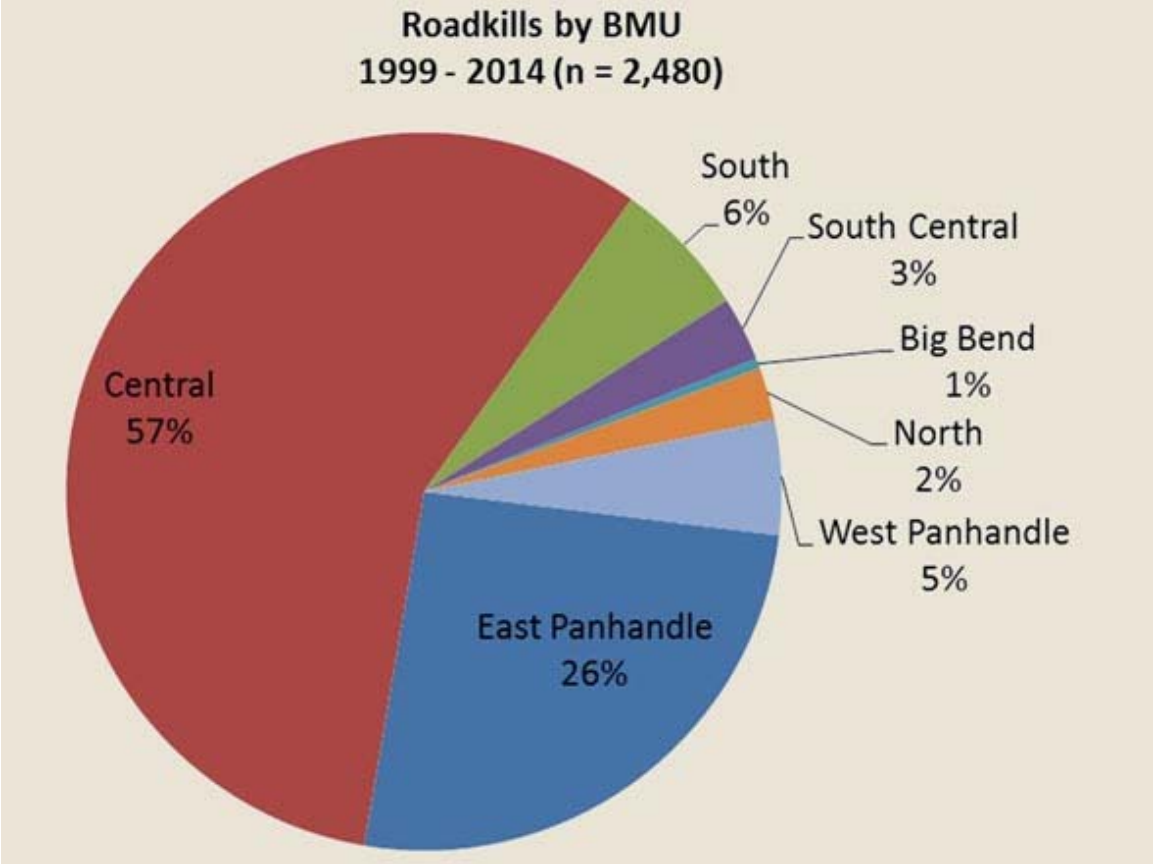
- Tocala LLC Seismic Survey (Passarella 2013 entire): 103,000 acres in Hendry and Collier County utilizing over 8,000 shot holes (containing "pentolite" explosives) as an energy source for the proposed seismic survey. Just north of the Big Cypress National Preserve and the Florida Panther National Wildlife Refuge, the project also includes over 2,000 acres of the Dinner Island Wildlife Management Area. This entire area including the private ranches which will be utilized is extremely important black bear habitat inside the Southern BMU. Again, oil field development and increased habitat loss and human disturbance are expected to follow once likely oil deposits are located by the survey.

2. Mortality due to vehicle collisions

Population-wide, known mortality of adult bears is caused largely by humans. In highly fragmented habitat, bears are exposed to more risk, including vehicle collisions, illegal hunting, lawful killing, and human-bear interactions. Vehicle collisions are the leading known cause of death of Florida black bears. According to FWC, vehicle collision mortality has consistently increased from 33 in 1990 to 170 in 2015, with the peak of 285 bear deaths in 2012 (FWC 2016a at 1-2). Simek (2005b entire) found that principal roadkill areas, areas with three or more roadkill instances within one mile, were located in Apalachicola, Chassahowitzka, Ocala, and St. Johns.

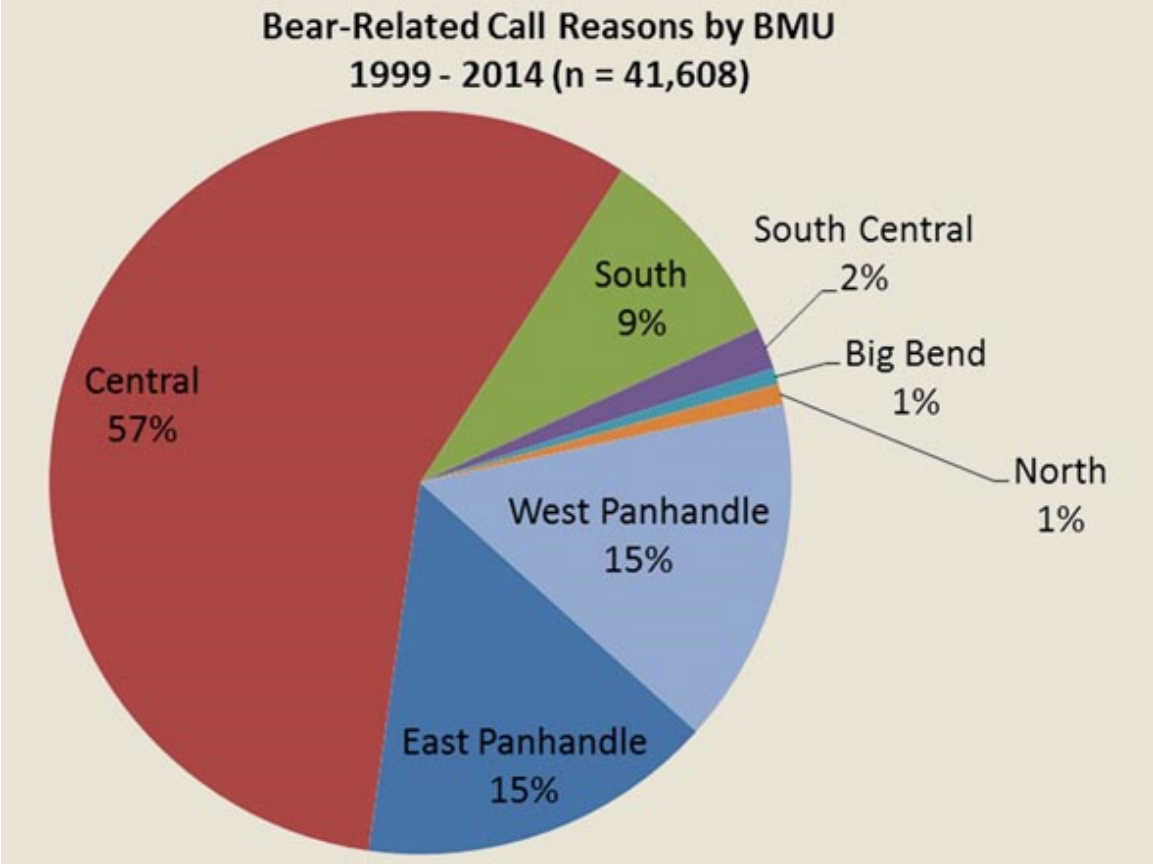


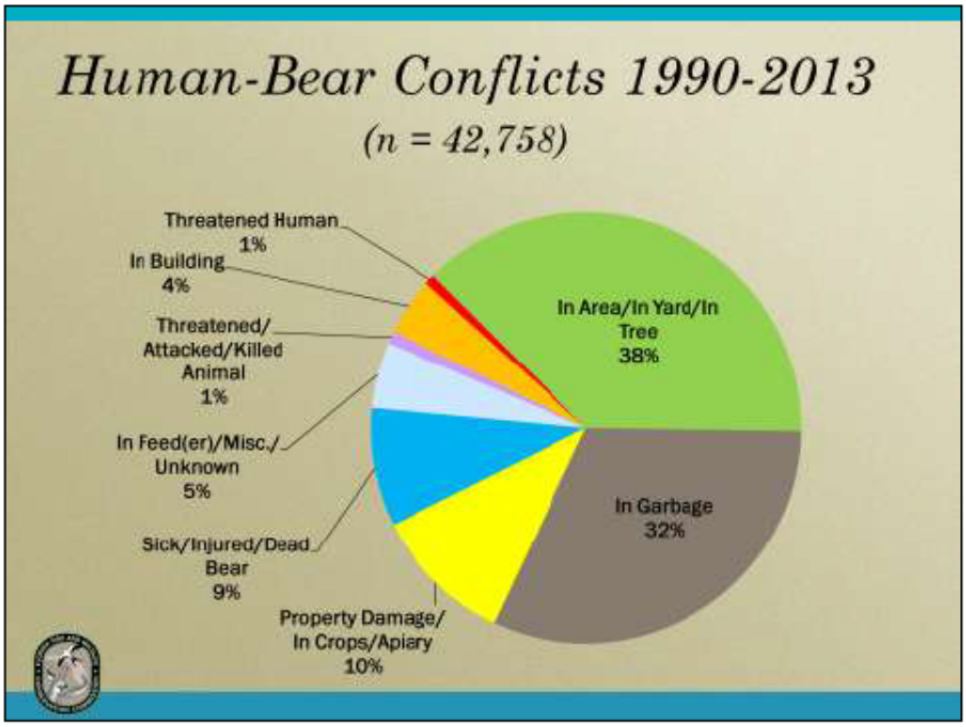
(FWC 2015a at 10)



3. Impacts of human garbage and food sources

In addition to increased risk for collisions with cars, as habitat becomes destroyed and fragmented, and urban development encroaches, Florida black bears have greater opportunities to access human garbage left near human dwellings. In 2000 FWC received approximately 1,000 calls reporting human-bear interactions (FWC 2012). Just ten years later, that number jumped to 4,000, with nearly 70 percent of the calls related to bears accessing garbage and other unnatural food sources in residential areas (FWC 2012 at 164). Bears that forage closer to humans are more likely to be habituated to humans (Mattson 1990 at 33). Recent work in Wisconsin that compared the prevention of nuisance bear complaints following live-trapping and relocating bears to the preventive effect of advising landowners over the telephone on removing attractants such as garbage and bird feeders, found that telephone consultations were as effective in preventing recurrence of nuisance complaints (Voyles 2015 entire). Without a sophisticated scientific test of the effectiveness of FWC bear removal actions compared to removing or securing attractants, the agency is not using the best available science currently.





(FWC 2015a at 12).

(FWC 2015a at 11).

Even if all garbage is secured, bears may still enter residential areas if food like acorns are available (Barrett 2014 at 26-37). Nonlethal deterrents (loud noises, dogs, rubber bullets, bear spray) may be only temporarily effective, with bears returning in 1-2 months when anthropogenic food is still available (Beckmann 2004 at 1141-1145, Mazur 2004 entire).

Translocation of a bear involved in conflict is not always viable: it can create conflicts in the new area, return to the area of capture, or be replaced by other bears that can cause conflict (Annis 2007 at 11-47). Translocated bears may roam for long distances after being translocated (Stratman 2001a entire), resulting in vehicle collisions (Comly-Gericke 1997 at 113-117, Eastridge 2001). These collisions can have high social and economic costs for humans (Conover 1995 at 409-410).

In 2015, the state changed its policy regarding conflict bears and began to limit use of translocation, instead, putting down healthy bears that were habituated to human sources of food or that were too frequently occurring in neighborhoods. The new policy, called the “Accelerated Approaches to Human-Bear Conflict” has resulted in more agency killings of healthy, conflict bears; a total of 108 bears were killed by wildlife managers in 2015, compared to 26 bears in year 2014 (FWC 2015l).

B. Overutilization

For decades, Florida black bear hunting had been prohibited; however, in 2015, hunters killed 304 Florida black bears in 48 hours. The effect of this hunt on the subpopulations remain to be seen. Habitat fragmentation and hunting can collectively work against

species, leading to loss of genetic variation (Kyle 2001 at 343-346, Spong 2002 entire, Ernest 2004 at 353-366, Gottelli 1994 at 309-310, Miller 2003 entire), which can increase susceptibility to disease and decrease population viability (Roelke 1993, O'Brien 1994 entire, Sherwin 2000). One study on cougars found that home range, two-dimensional overlap, and three-dimensional utilization distribution overlap index for males were 2-3 times greater in heavily hunted areas (Maletzke 2014 at 2178). The study predicts that the unintended consequence of harvest intended to reduce density was an increase in interactions with livestock, prey, and people. Indeed, several other studies show that hunting American black bears, and other large carnivores, does not reduce human-bear conflicts or nuisance complaints (Obbard 2014 entire, Treves 2010 entire, Treves 2009 entire).[4]

On October 24, 2015 the FWC opened 4 of its 7 bear management units across 26 counties in Florida to bear hunting. The FWC sold 3,776 permits from Aug. 3 to Oct. 23, 2015, and hunters killed 304 bears in 2 days, 78 percent of which were taken on private land (FWC 2015d at 4). The permits were valid for use in any of the 4 open BMUs, and hunters were not required to disclose which BMU they intended to hunt. FWC established a harvest objective, which served as a quota for the bear hunt. The quota was exceeded in two of the four units within 24 hours. In the East Panhandle subpopulation, where the FWC estimates the population at 600 bears, 114 bears were killed. In the Central subpopulation where the FWC estimates the population at 1,300, 143 bears were killed (FWC 2015d at 6).

Illegal hunting is also a regular mortality factor for the Florida black bear. From 1990 to 2010, FWC documented 147 illegally killed bears (FWC 2012 at 12). Illegal hunting appears to occur more commonly in fragmented habitats bordering human development than in large contiguous land parcels (Wooding 1993 entire, Land 1994,). McCown 2004 entire

1. Florida hunt

Between 1981 and 1994, bear hunting resulted in an average of 46 dead bears (32 males and 14 females) each year (FWC 2012 at 25). In 1994 FWC stopped the hunt for a variety of reasons, including the need to ensure that populations were at a "maximum biological carrying capacity" so that they would be "resilient against decimating factors" (FWC 2012 at 25-26).

After the State removed the Florida black bear from its threatened species list in 2012, the FWC began the process to approve the first hunt of the Florida black bear since 1994. The process began in 2014 when the FWC conducted meetings that obtained public input on the creation of BMUs and various management proposals including hunting (FWC 2015a at 41, FWC 2014b entire, FWC 2014c entire). That process concluded in 2014, and at a February 2015 meeting of the FWC Commission, the Commission requested the staff

[4] This information was presented to the FWC. Several carnivore scientists agree that a hunt on the Florida black bear is unlikely to reduce human-bear conflicts in Florida (Treves 2015b entire, Bohler 2015 entire, Handy 2015 entire, Tavss 2015 entire).

propose hunting regulations (FWC 2015f at 6).

While the logistics of the hunt were not presented in any detail at that meeting, FWC provided a rough framework for the hunt. For example, staff recommended a hunt that would provide an unlimited number of permits (FWC 2015f at 9). Staff also recommended that any resident of Florida should be able to obtain a permit for $100 ($300 for non-residents) (FWC 2015f at 8). According to the staff's proposal, the hunt would open up 4 of the 7 BMUs to hunting (FWC 2015d at 6). Dr. Thomas Eason proposed a harvest objective of 20 percent of the estimated population (minus known human-caused mortality), assuming 20 percent annual replacement rate (FWC 2015j at 5, 9). The recommended harvest objectives for each BMU were as follows:

BMU	2002 Population Estimate	20 % of Population Estimate	Known Mortality (average)	Harvest Objective
East Panhandle	600	120	65	45
North	250	50	8	40
Central	1000	200	118	60
South	700	140	7	130
Total	2550	510	235	275

(FWC 2015a at 33).

At the April 2015 FWC Commission meeting, FWC staff provided additional details of the proposed hunt (FWC 2015?). For example, in addition to reaffirming that there would be no limit on the number of permits that could be sold, FWC stated that the permits would be available through licensed vendors and online up until the night before the hunt would begin (FWC 2015f at 9). Hunters could use archery equipment, firearms and ammunition as allowed for deer hunts (FWC 2015?). FWC recommended that feeding stations be allowed with the caveat that the hunter and the bear cannot be within 100 yards of a station with food in it (FWC 2015f at 12). Bears of either sex would be allowed to be killed (one bag limit) provided that the bear weighed at least 100 pounds and a cub was not present (FWC 2015d at 6). The Commission approved the staff's preferred approach – a 7-day hunt with a cut-off if the harvest objectives have been met (FWC 2015h at 11). The harvest objectives presented at the meeting were as follows:

BMU	2002 Population Estimate	20 % of Population Estimate	Known Mortality (average)	Harvest Objective
East Panhandle	600	120	78	40
North	250	50	10	40
Central	1000	200	163	40
South	700	140	18	80/120
Total	2550	510	269	200/240

(FWC 2015f at 15).

The proposed hunt garnered significant public opposition. During the six-month period the FWC considered the hunt, it received 191,776 comments, with at least 188,489 opposed to the hunt (FWC 2015?). Even the most generous assumptions would put support of the hunt at less than 2 percent. The overwhelming majority of people who wrote, called, and emailed the FWC were opposed to the hunt.

The FWC Commission approved the rule with only one significant change – the harvest objectives were increased in the North and Central areas as summarized below (FWC 2015?).[5] The overall objective was set at 320 bears.

BMU	2002 Population Estimate	20 % of Population Estimate	Known Mortality (average)	Harvest Objective
East Panhandle	600	120	80	40
North	550	110	10	100
Central	1300	260	160	100
South	700	100	20	80[6]
Total	3150	590	270	320

The final harvest objective as proposed at the June 2015 meeting was formally approved at the September 2015 meeting with two Commissioners dissenting (FWC 2015j entire). In setting the harvest objectives, the FWC asserted that stabilizing the bear population "requires at least 20 percent total annual mortality in each population (the scientifically based minimum rate needed to offset annual reproduction), based on the most recent population estimates from studies in 2002 (East Panhandle and South) and 2014 (North and Central)" (FWC 2015d at 2). The method for obtaining that number was taken from the BMU population estimate and subtracting the number of bears killed by vehicles as well as those removed for conflict behaviors (FWC 2015d at 2). The vehicle strikes/conflict removal numbers were averaged over a 3-year period (FWC 2015d at 3).

In setting the harvest objectives, FWC assumed that the success rate for the hunt would be low. Indeed, FWC anticipated that the hunt would likely last for five days. FWC based its low hunter success rates on other states that do not allow the use of dogs or bait with seasonal hunting.[7] For example, FWC looked at success rates for Massachusetts (2 % success), Pennsylvania (2% success) and Maryland (12% success) (FWC 2015j at 7). FWC also relied on its assumption that "Florida's forested habitats with thick understory work against high hunter success, particular with the methods allowed" (FWC 2015?).

[5] The harvest objectives were increased based on results of a study that occurred in 2014 and 2015 (FWC 2015c at 5, 2015f).

[6] The final objective was set for the Southern region based on the fact that hunting would not occur in Big Cypress.

[7] It is not accurate to say that bait stations are not allowed. Rather, the bear and the hunter must be at least 100 yards away from a feeder with feed currently in it. *FWC 2015 Florida Bear Hunting Rules and Regulations Summary*.

FWC concluded "the likelihood of exceeding the harvest objectives during the first two days of the season is very low" (FWC 2015?).

Based on this assumption, the Bear Hunt Rules were written to guarantee 48 hours of hunting regardless of whether the 320 bear quota had been met in that first 48 hours. As stated in the rule, if the "harvest objective . . . is attained prior to the season close and *on or after the second day of the season*, [the] season shall close at 11:59 p.m. on the day its harvest objective is attained" (F.A.C. 68A-13.004(g)(1)). No other rule or statute modifies this rule. As such, based on the plain meaning of the rule, FWC was without the authority to stop the hunt if the 320 bear allotment was reached before the end of the second day, or even within hours of the hunt commencing.

The bear hunt also contained a self-reporting system that added to the uncertainty because it allowed hunters to report their kill up to 12 hours after taking a bear (F.A.C. 68A-13.004(g)(3)). This system also contained another flaw – there was an inevitable lag time between when the quota was reached, when the hunt could be canceled, and when the cancelation could be communicated to the thousands of hunters roving some of Florida's most remote areas, some without cell service (F.A.C. 68A-13.004(g)(3)). FWC's failure to adequately gauge the success of a hunt and incorporate adequate safeguards resulted in significant overharvesting in two of the BMUs.

The FWC was amply warned about the deficiencies in its approach to the hunt. After approving the hunt, the public outcry was intense. Protests were held statewide and news coverage consistently renounced the hunt (Stephzinski 2015 at 1-2, Cordeiro 2015 at 1-4). In addition, a lawsuit was filed challenging the hunt by a local landowner and a non-profit organization, and was supported by amicus briefs filed by nonprofit organizations representing the interests of over 141,000 Floridians.[8]

During those proceedings, FWC was repeatedly warned about the real possibility that the bear hunt quotas would be exceed on the first day.[9] Indeed, the FWC was specifically warned about the East Panhandle:

> Right now, you could conceivably have 2,000 hunters converge on one BMU on the first day of the hunt and vastly exceed the minimum/maximum number of bears that is much smaller for each BMU.
>
> . . .
>
> There's 40 bears [for the quota] in the east Panhandle. Certainly if you have a thousand hunters in the east Panhandle, and there's a lot of hunting

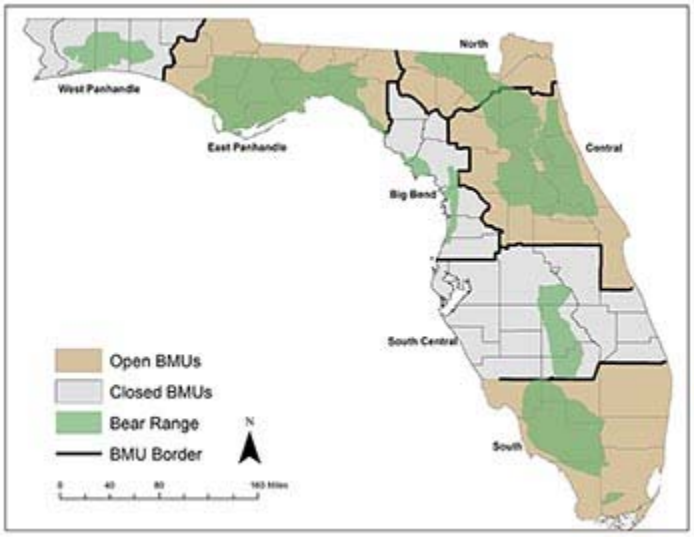
[8] The organizations that joined as Amici included the following local, state and national organizations: Animal Hero Kids, Animal Legal Defense Fund, Animal Rights Foundation of Florida, Animal Welfare Institute, Center for Biological Diversity, CompassionWorks International, Environmental Action, Jungle Friends Primate Sanctuary, Lobby For Animals, Sierra Club, South Florida Wildlands, and Stop the Florida Bear Hunt.

[9] Speak Up Wekiva v. FWC 1D15-4596 (1st DCA 2015) transcript at 17, 78.

> in the Panhandle, you could exceed 40 bears within the first two days. Or you could even exceed that many on another day and the hunt continue until 11:59 of the day that the last bear shot is called in.

However, the FWC maintained that this was unlikely to happen (Speak 2015 at 126). In addition, FWC claimed (based on an erroneous interpretation of the law), that it had the authority to cut off the hunt if the quota were reached. Although the law does not provide them with the authority to do so, when pressed by the Court, FWC counsel made assurances in open court that FWC would call off the hunt if the quota was reached in less than two days (Speak 2015 at 161). While the court did not stop the hunt from moving forward, the court-room promises made by the FWC ended up being critical in preventing the hunt from being all all-out slaughter. The rule has not been updated to correct any of the deficiencies cited above.

Ultimately, FWC authorized a hunt in the East Panhandle, North, Central, and South BMUs. In the East Panhandle BMU, it allowed hunting in the following Wildlife Management Areas: Apalachee, Apalachicola, Apalachicola – Bradwell unit, Apalachicola River, Aucilla, Beaverdam Creel, Big Bend – Hickory Mound Unit, Big Bend – Snipe Island Unit, Big Bend – Spring Creek Unit, Big Bend – Tide Swamp Unit, Box-R, Chipola River, Econfina Creek, Lower Econfina River, Middle Aucilla, Ochlockonee River, Pine Log, Talquin, Tate's Hell, Tate's Hell – Womack Creek Unit, Twin Rivers, Tyndall, Wakulla. In the North BMU, it allowed hunting in the following Wildlife Management Areas: Cary, Cypress Creek, Four Creeks, Little River, Osceola, Ralph E. Simmons. In the Central BMU, it allowed hunting in following Wildlife Management Areas: Bayard, Belmore, Etonlah Creek, Jumper Creek, Lake Monroe, Lochloosa, Marshall Swamp, Ocala, Ralford, Rock Springs Run, Seminole Forest, and Tiger Bay. In the South BMU, it allowed hunting in the following Wildlife Management Areas: Okaloacoochee Slough, Picayune Strand, and Spirit-of-the-Wild (FWC 2015b at 4).



The FWC allowed hunting permits to be sold from August 3rd through October 23rd. As the agency did not give itself the authority to limit the number of hunters, 3,776 permits were sold and the number of permits exceeded the number of bears FWC estimated were in Florida prior to the hunt by more than 600 (FWC 2015d at 2, FWC 2015f at 5). Adding to the problem, while asked their "preference," hunters were not restricted to which BMU they could hunt (FWC 2015d at 3). According to FWC, the preferences were as follows: South: 9% East Panhandle: 28% North: 11% and Central: 52% (FWC 2015d at 2). That means that 80 percent – or over 3,020 hunters – planned to hunt *in just two of the BMUs*. The combined harvest objective in those areas was 140 – or almost 22 hunters per bear. In contrast, in the other two BMUs (North and South), it was expected that there would be only 755 hunters or approximately 4 hunters per bear. While this is precisely the scenario that FWC had been warned about during the legal challenge to the hunt, the FWC took no action to remedy the situation.

The FWC failed to properly manage the hunt with tragic results. On just the first day of the hunt, 207 bears were killed (Larimer 2015 at 1). Under intense public scrutiny and pressure, the FWC closed the hunt in the East Panhandle and Central regions after one day, and closed the remainder after the second (Larimer 2015 at 1). While the overall quota of 320 was not exceeded, in both the East Panhandle and Central BMUs, the harvest objectives were greatly exceeded. In the East Panhandle, the harvest objective was 40 yet the actual harvest was 114, *almost three times the harvest objective* (FWC 2015d at 3). Similarly, in the Central Panhandle, the quota was also exceeded by almost half (FWC 2015d at 3).[10]

BMU	2002 Population Estimate	20 % of Population Estimate	Known Mortality (3-year average)	Harvest Objective	Actual Harvest	Over Quota
East Panhandle	600	120	80	40	114	+74
North	550	50	10	100	25	-75
Central	1300	200	160	100	143	+43
South	700	140	20	80	22	-58

Just as the FWC failed to deliver on its promise of protecting subpopulations from overharvesting, it also failed to deliver on its promise that females with cubs would be protected. Lactating mothers made up 21 percent of the female bears that were killed during the hunt (FWC 2015d at 6). It is unknown what happened to the cubs following the deaths of their mothers.

There is no indication that the FWC will make any changes to future hunts. First, despite the harvest objectives being significantly exceeded in two of the four BMUs, the FWC called the hunt a resounding success (Fleshler 2015 at 1-4, FWC 2015d at 7). Indeed, just

[10] The vast majority of the bears taken were on private lands. The 2015 Florida Black Bear Hunt Summary Report, 3. Bears were killed in 7 wildlife management areas, with the majority (83%) killed in the Ocala National Forest. FWC 2015d at 5.

one day after the hunt, the FWC had already made the hasty decision to repeat the hunt in 2016 (Fleshler 2015 at 1-4). In addition, prior to the hunt, the FWC was repeatedly warned about the problems with the hunt and its own statistics showed that the number of hunters in certain BMUs greatly outnumbered the number of bears. Yet, even after the warnings had come true, the FWC simply wrote the failure off as its assessment (without anything other than conjecture) that the quota being exceeded means that there were simply more bears (and not that the hunter to bear ratio was dramatically high), and that "the hunt structure (one-day cutoff) combined with the high level of attention created a sense of urgency for hunters, compressing the hunting pressure into a single day instead of spreading it out over several days" (FWC 2015d at 3). And in a state that has sunshine more days than not, the FWC blamed the problem on "favorable weather" (FWC 2015d at 3).

2. Georgia hunt

In Georgia, hunting is regulated by the Wildlife Resources Division of the Georgia Department of Natural Resources ("GA DNR"). Unlike Florida, which only last year initiated a hunt of the Florida black bear, GA DNR has long considered the bear a game animal allowing for limited hunting (63 Fed. Reg. 67613). While Florida's North BMU ends at the state line, the Osceola subpopulation of the Florida black bear extends into the areas within and around the Okefenokee National Wildlife Refuge in southern Georgia (the Okefenokee-Osceola population of Florida black bear) (63 Fed. Reg. 67613).

Bear hunting is allowed in Georgia's "Southern Bear Zone," which consists of the Okefenokee Swamp and surrounding areas spanning Brantley, Charlton, Clinch, Echols, Lanier, Lowndes and Ware counties, and including the Dixon Memorial Wildlife Management Area ("Dixon Management Area") (GDNR 2015a at 32). Hunting with bait is prohibited in all bear zones, as is the killing of females with cub(s) or bears under 75 pounds (*Id*). While hunting with dogs is prohibited in the Northern and Central Bear Zones, it is permissible in the Southern Bear Zone (*Id.*).

When the Service analyzed the Okefenokee-Osceola population in its 1998 finding, it concluded that it did not consider Georgia's hunt a threat to the continued existence of the Florida black bear (63 Fed. Reg. 67613). At the time, Georgia allowed a 6-day hunt "around the Okefenokee Swamp for three consecutive weekends in September and October," and had recently added a hunt in the Dixon Memorial Forest on three consecutive days in December (*Id*.). The Service estimated that "[f]rom 1988 to 1997, 392 bears were legally killed, with a mean annual kill of 39 bears" (*Id.*). It estimated annual harvest rates of 10 to 13 percent, which it predicted should not cause a population decrease (*Id.*).

The Service's 1998 findings, however, were made before it was able to consider the results of a comprehensive population ecology study it had commissioned from the University of Tennessee, which was conducted from June 1995 to September 1998 (Dobey 2002 entire). Dobey studied Florida black bears in two areas in the Okefenokee-Osceola ecosystem in southeast Georgia (i.e., Okefenokee) and north Florida (i.e.,

Osceola), the former population hunted and the latter not, "to determine population characteristics (size, density, relative abundance, distribution, sex and age structure, mortality rates, natality, and recruitment) and habitat needs" (*Id.*).

Overall, 67 bears were killed by hunters in the Okefenokee study area from 1995 to 1999 (*Id.*).[11] The study documented seventeen mortalities of radio-collared bears in Okefenokee, with hunting mortality accounting for 70.6% of these deaths (*Id.*). By contrast, there were only 2 deaths of radio-collared females from Osceola, both of whom were illegally killed (*Id.*). The researchers documented an annual survival rate of radio-collared females in Okefenokee of 0.87 for females, which was lower than the survival rate for females in Osceola (0.97) where there was no hunt.

As noted in Dobey (2005 at 3), bears in Osceola experienced higher average annual population growth than those in Okefenokee, "most likely due to protection from hunting and higher recruitment." Dobey (2005 at 3) estimated an average annual sustainable harvest at Okefenokee of approximately 9 bears (12.6%), slightly less than the average 1995-1999 annual harvest of 9.4, a level that the authors said was "sustainable but likely represents the highest exploitation rate in the region." Indeed, according to population modeling, when this level of harvest "was imposed on the population for 10 years beginning in 1999…[e]xtinction occurred in 0.6% of the simulations over the 10-year period and in 58.3% after 25 years. When the average annual harvest level was reduced to 5 bears (7.0%), population growth was stable" (Dobey 2002 at iii).

Finally, the researchers "documented bears in Okefenokee that originated from Osceola but not the reverse," (bears "immigrating" to Okefenokee) which led them to "speculate that bears from the interior of the Okefenokee National Wildlife Refuge, and to some extent northern Florida, served as a source to the population sink caused by hunting mortality in Okefenokee and in the surrounding Georgia counties" (Dobey 2005 at ix). The researchers estimated that "the average sustainable harvest of 5 bears (7%) could be increased to approximately 12" (greater than the average annual 1995–1999 harvest of 9.4) and that such "harvest levels on the Okefenokee study area were sustainable, but not without the immigration that occurred" (Dobey 2002 at 55). To this end, while the authors deemed their results consistent with the Service's 1998 conclusion that listing the Florida black bear was not warranted, they suggested giving greater consideration to metapopulation processes among the various subpopulations, "with the ultimate goal of managing the subspecies as a unit rather than as an assemblage of independent components" (Dobey 2005 at 4).

Several years later, in 2009, GA DNR issued a Black Bear report, publishing the results of bait station surveys it had conducted throughout the state over the previous year, including in the Okefenokee Swamp region (GDNR 2009 at 1-17). As in previous years, in 2008 "bear hunting was limited to 3 3-day hunts (Thursday-Friday-Saturday) beginning before the last weekend in September and the first 2 weekends in October,"

[11] The study area represents only a portion of the South Georgia areas open to bear hunting, not the entire region in which the Service estimated a mean annual harvest of 39 bears from 1988 to 1997.

with an additional 3-day hunt on Dixon Management Area in November (*Id.*). GA DNR noted that "[d]ogs are permitted for hunting bears in the 5 open counties but not on Dixon Management Area. Except for Dixon Management Area, there are no specific archery or primitive weapons seasons for bears in south Georgia" (GDNR 2009 at 7).
During the 2008 hunting season, a total of 57 bears, 22 females and 35 males, were harvested in South Georgia, which was below the average for the 10 preceding years (68) (GDNR 2009 at 16). GA DNR cited the Dobey 2002 study, which estimated a population density of 830 bears for the entire Okefenokee-Osceola ecosystem. Using the lower end of the interval (700 bears), the maximum annual harvest, at the 20% rate, would be 140 bears, with no more than 50% of the harvest being females (GDNR 2009 at 16). GA DNR noted that the 2008 harvest of 57 bears fell below that target. Concurrently, however, GA DNR recorded the lowest level of bear visits to bait stations in South Georgia in five years, down to 35.8%, from a high of 47% in 2005 (GDNR 2009 at 1, 9).

It appears 34 bears were killed in 2011; 14 in 2012; 1 in 2013; and 4 in 2014 (Gray 2015 at 1). As in previous years, Georgia's 2015-2016 hunt will occur in the Southern zone on three consecutive weekends in September and October (GDNR 2015a at 32). Georgia allows a bag limit of two bears per season, no more than 1 of which may be taken from the Southern or Central Bear Zones (GDNR 2015b at 391-4-2.22). Recently adopted hunt regulations for 2015-2017 specify that "hunting with dogs is allowed except that still hunting only is allowed in Lanier and Lowndes counties" (*Id*.).

Georgia does not appear to have altered or reassessed its planned black bear hunt in light of Florida's 2015 hunt, meaning that the 2016 hunt does not take into account the 25 Florida black bears killed in Florida's North BMU in 2015 (and the harvest objective of 100 bears), nor the anticipated 2016 Florida hunt. Given the documented fluidity of the bears across state lines in the Okefenokee-Osceola population, the tendency of the north Florida population to act as a population "sink" for bears killed in the Georgia hunt, and the Georgia population's future sustainability depending on continued immigration from the Okefenokee NWR *and Osceola* (Dobey 2002 at 56, 66, Dobey 2005 at 1-4), the Okefenokee-Osceola population's ability to withstand hunting on both sides of the border is dubious at best. Despite this, neither state has commissioned studies on how this significant change will affect the Florida black bear population, nor promised to reassess their harvest objectives and allowances in light of the neighboring state's actions. This poses significant uncertainty for the Okefenokee-Osceola population of the Florida black bear.

3. Alabama hunt

The black bear population in Alabama consists of both the American black bear (*Ursus americanus*), a new population having recently emigrated to the northeastern portion of the state from Georgia, and the Florida black bear (*Ursus americanus floridanus*), a subspecies of the American black bear with a historic range in southwest Alabama (ADC 2016b at 1). The total black bear population in Alabama is unknown, but scientific studies last estimated the population to be <50 (Edwards 2002 at 49, Prince 2007 at 27).

This figure is outdated and does not include the new American black bear population in the northeast.

The addition of the American black bears from Georgia, along with an increase in bear sightings in other regions beyond the historical range of the Florida black bear in southwestern Alabama may contribute to the premature belief that the Florida black bear population in Alabama has rebounded. The American black bear is much more widely distributed and does not suffer from the level of genetic isolation afflicting populations of Florida black bears that threatens the viability of the subspecies (Edwards 2002 at 1-4). A four-year Auburn University population study under a grant from the DWFF began in 2014 and aims to study genetic variation and provide information on bear roaming behavior that can be used to calculate accurate counts for the Florida black bear and American black bear populations in the state (Auburn 2014 at 1). Until the Auburn study's completion, any updated estimates offered by the DWFF appear to be based on anecdotal sightings reported by the public (Edgemon 2014 at 1-3), a highly flawed method that does not differentiate the subspecies and ignores the possibility that the same bears are being sighted multiple times in different locations, having been forced to roam greater distances as a result of habitat loss (Edwards 2002 at 1-60).

Despite the increase in sightings, there have been minimal complaints, with no reported attacks (Spencer 2007 at 221). Conversely, occasional news reports of illegal bear hunting do occur (AP 2009), although historical data on the number of bears illegally hunted is not currently publically available. Most recently, a man was arrested June 16, 2015 for shooting at a black bear in northeast Alabama in violation of § 9-11-481. In response, a DWFF official was quoted as stating, "If you see a black bear, leave it alone. We want and welcome them in Alabama" (AP 2009).

The Alabama legislature and the state's Division of Wildlife and Freshwater Fisheries ("DWFF") do not appear to distinguish the Florida black bear (*Ursus americanus floridanus*) from the American black bear (*Ursus americanus*).[12] Despite listing the American black bear as an imperiled priority 1 species of highest conservation need (ADC 2015 at 9),[13] the DWFF classifies the black bear as a game animal subject to state hunting regulations (ADC 2016a at 2). In 2001, finding the black bear to be "a unique mammal in the State of Alabama requiring special protection" the state legislature passed the Alabama Black Bear Protection Act, § 9-11-481, which prohibits the hunting of black bears during the closed season and establishes penalties for violations.[14] While the DWFF has thus far elected not to establish a hunting season for black bears, § 9-11-481's specific prohibition against black bear hunting during the *closed* season underscores the

[12] *See* Ala. Code § 9-11-480. While the legislature names only the black bear, the act also applies to the Florida black bear subspecies, which accounts for the majority of Alabama's current black bear population, and the only black bear species known to exist as a breeding population in Alabama at the time of the Act's passage in 2001.

[13] The State Wildlife Action Plan and its priority rankings for species of greatest conservation need are otherwise reserved for nongame species.

[14] These include a minimum $2,000.00 fine for first time offenders, up to one year imprisonment, and the revocation of hunting and fishing license privileges for a period of three years. Ala. Code § 9-11-481(d)(1).

black bear's status as a game animal in the state and the DWFF's authority to ultimately establish an open hunting season. Section 9-11-481, coupled with the lack of hunting season, are the only protections afforded to the Florida black bear under Alabama state law. Prior to 2001, the only protection offered to black bears in the state related to the crime of bear wrestling.[15]

C. Disease and Predation

Florida black bears have few natural predators, though adult males will kill and eat denning adult females and cubs (Garrison 2007 at 725). Dunbar (1998 at 612-619) sampled bears in Apalachicola, Osceola, and Wekiva River and found the evidence of infection from *Coxiella burnetti*, *Toxoplasma gondii*, blue-tongue virus/epizootic hemorrhagic disease virus, canine adeno-virus-type I, canine distemper virus, eastern equine encephalitis virus, and St. Louis encephalitis virus. Given the fragmentation and isolation of the subpopulations, infection from such diseases could further stress small populations.

D. Inadequacy of Existing Regulatory Mechanisms

At one time, the Florida black bear enjoyed regulatory projection in Florida that not only prohibited hunting, but also afforded state and federal agencies opportunities to minimize and mitigate harm to the species and its habitat. However, in the last twenty years, state and federal laws have changed in ways that undermine the longtime survival of the Florida black bear. State regulatory failures include the unenforceability of the Florida Black Bear Management Plan, the failure of the state to acquire and protect land, inadequacies in Florida Department of Environmental Protection and Water Management District permitting, ineffective mitigation banks, and weakened state growth management laws and state land management plans. Federal laws have also changed or weakened in the last 20 years with respect to Florida black bear habitat protection, including regulations to protect national forests, national parks, and national preserves.

1. Florida Black Bear State Delisting and State Regulations

In September 2010, FWC passed a rule that required biological status reviews ("BSR") for species listed as threatened or of special concern, a requirement that applied to the Florida black bear, among other species (FWC 2012 at 26, F.A.C. 68A-27.0012). FWC staff undertook a review of all species listed as threatened or endangered under Florida law on September 1, 2010 (FWC 2011b at 81, FWC 2012 at 26).[16] Of all the species that received any form of protection under state law, the Florida black bear was the first to be considered (FWC 2015?). The agency sought public input from September 17, 2010 through November 1, 2010 (FWC 2011b at 81). While comments were still being

[15] Ala. Code 1975 § 13A-12-5 (2000). The act prohibiting bear wrestling was repealed in 2015 as obsolete or unenforceable. Alabama Laws Act 2015-70 (H.B. 40) (April, 21 2015).

[16] According to Florida's regulations, a species must be removed if it does not "meet any of the criteria in Rule 68A-27.001(3)(b), Fla. Admin. Code R., in accordance with the Guidelines for Using the IUCN Red List Categories and Criteria."

accepted through the close of the day, the meeting to consider the de-listing commenced on November 1, 2010 (FWC 2011b at 81). The following day, the official staff recommendation was made that the Florida black bear should be delisted (FWC 2011b at 81).

Following the staff determination to delist the bear, Florida law required FWC to obtain input on its recommendation to de-list from a biological review group of three to seven scientists (F.A.C. 68A-27.0012). It sought input from 5 individuals: Dr. Dave Garshelis of the Minnesota Department of Natural Resources; Dr. Madan Oli, a professor in the Wildlife Ecology and Conservation Department at the University of Florida; Dr. Michael Pelton, a Professor Emeritus at the Department of Forestry, Wildlife and Fisheries at the University of Tennessee; Dr. Frank van Manen at US Geological Survey; and Stephanie Simek from Mississippi State University (FWC 2011a at 8).

FWC staff summarized the comments of the reviewers stating that "[a]ll of the reviewers supported [their] findings" (FWC 2011a at 8). However, while FWC characterized the reviewers' comments as supportive, FWC's summary neglected to mention several key criticisms raised by the reviewers. One reviewer found that the 2002 estimates were "subjective" and "not scientifically valid" (FWC 2011a at 8). However, most notable was that the reviewers agreed that not all subpopulations of the Florida black bear should be considered under the same analysis. As stated by Dr. van Manen of USGS and the University of Tennessee, different areas may be able to "sustain different levels of mortality" (FWC 2011b at 11). This was echoed by Stephanie Simek of the Carnivore Ecology Lab at Mississippi State University who, while agreeing with the delisting on a broader level, acknowledged that:

> a few of the sub-populations may still meet the criteria for listing and it is these sub-populations that will be most vulnerable should de-listing occur as a result of consolidating the sub-populations in Florida into one population such as in this *BSR*.

(FWC 2011b at 16). In fact, she concluded "the BSR does not provide enough information to make the decision that the IUCN criteria are the appropriate measures for determining if the fragmented sub-populations of Florida black bear do not meet the criteria for listing" (FWC 2011b at 17).

Despite the reservations by reviewers about the impact of delisting on fragmented sub-populations, FWC approved staff's recommendation in June 2011 (FWC 2012 at 27). Under applicable laws and regulations, however, the Florida black bear would not to be technically removed from the list until the Commission approved a bear management plan (FWC 2012 at iii). The Florida black bear management plan was revised accordingly, and went out for public comment from November 10, 2011 through January 10, 2012 (FWC 2012 at iii). FWC received 450 comments from 60 individuals and 79 stakeholder group representatives, as well as 2,000 letters from members of the Humane Society of the United States (FWC 2012 at iii).

Even before the decision to de-list went out for final public notice and comment, de-listing was already starting to draw fire from the public. For example, in a June 23, 2011 *St. Petersburg Times* opinion piece titled *Keep Bears on the List*, University of Florida's Center for Landscape Conservation and Planning's Dr. Tom Hoctor called the FWC's decision to remove bears from the list "flawed and shortsighted," stating:

> I strongly disagree with this month's vote by the Florida Fish and Wildlife Conservation Commission to remove [the Florida black bear] from the state list of threatened species. The decision makes two fundamental errors: 1) It treats all Florida black bears as if they were one population - they're not. Some pockets are in better and some are in far worse shape than others. 2**)** It concludes that a rising population of bears means that they are no longer threatened. That assumption, too, is wrong and is based on a flawed interpretation of bear reproductive trends…. [W]hile it is true that most Florida black bear populations … appear to be gradually increasing, the question is, Why? It's not because their habitat increased, but simply because they were no longer being hunted to death--after all, they were protected as a threatened species.
>
> . . .
>
> [T]he appropriately conservative approach is to not de-list the Florida black bear as pressure on its habitat will significantly increase when local governments begin to approve more development with little to no state oversight and the state and water management districts protect less land through conservation land acquisition and easement programs like Florida Forever….Instead, we need to keep the Florida black bear on the list, and for the FWC to work with various partners to foster bear-smart human communities that will significantly reduce the impact of people on bears, while also working with private landowners and local governments on incentives and revitalized conservation land programs to protect strategic and other important habitat for bears.

(Hoctor 2011 at 1-3). The Humane Society of the United States ("HSUS") likewise opposed the removal of the Florida black bear from the state threatened species list. In The HSUS's comments to FWC dated January 12, 2012, it raised a number of issues including the fragmentation of the bear population and the lack of reliable population statistics regarding the overall bear population (HSUS 2012 entire).

Specifically, HSUS noted that a 2007 study "found that genetically the populations appear to be effectively isolated from one another. As such, consolidating them together as a statewide population under the IUCN-based criteria provides an incomplete picture of the black bear's status and potential future recovery" (HSUS 2012 at 2).

FWC presented a draft management plan to the Commission on February 9, 2012 (FWC 2012 at iii). Although some revisions to the Plan were made, the Commission made no

changes to the staff recommendation to de-list the Florida black bear and directed staff to move forward with advertising the rule (FWC 2012 at iv). FWC received 100 comments from 12 individuals and 13 stakeholder group representatives, along with 3,400 letters from members of the Humane Society of the United States (FWC 2012 at iv). Despite public opposition, the de-listing of the Florida black bear was approved on June 27, 2012 (FWC 2012 at iv).

Following the bear's delisting, Rule 68A-27, F.A.C., which prohibits the take, possession, or sale of any species classified as Federally Endangered or Threatened or State Threatened, no longer applies. Instead, FWC promulgated a new rule (68A-4.009, F.A.C.), which calls for a permit to take bears, authorizes the public to haze bears, and states that the FWC will make itself available to comment on projects. On its face, the new rule provides scant protections for the Florida black bear. Nothing in the rule requires FWC or any other agency to avoid, minimize and mitigate impacts to bear habitat from land development. The only mention of minimizing and avoiding impacts is found in subsection (3) of that rule, and it only states that 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. And even then those comments and recommendations will be based on the goals and objectives of the approved Florida Black Bear Management Plan, which on its face is a non-regulatory, non-binding guidance document (FWC 2012 at 126). Moreover, as the Commission emphasizes in its management plan, Florida "statutes make clear that FWC's comments are not binding on the regulatory agencies." (FWC 2012 at 127). As explained in detail below, the Commission's actual track record of commenting on projects is that it at most comments on half of the more than 1,000 annual requests it receives (Wiley 2015a at 1). Accordingly, state bear regulations are grossly inadequate to provide any real habitat protection for the Florida black bear.

Most notably, it is under this rule that the first hunt since 1994 was allowed – a hunt that allowed for the overharvesting of two subpopulations. Since the state delisting of the Florida black bear, the FWC has authorized hunting and hazing by the general public in response to all human-bear conflict situations. Previously, hunting was not permitted and a permit was required for trained law enforcement to administer hazing techniques.[17]

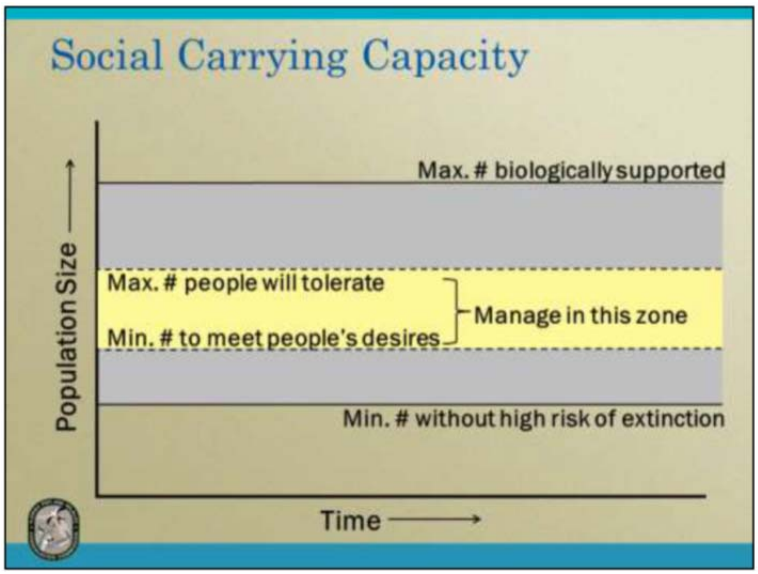
Further, the state has developed a bear depredation permit program. In 2015, the FWC amended the Black Bear Conservation Rule, 68-4.009, F.A.C., to allow issuance of permits to landowners or their lessees to kill a bear that was found to be damaging property. According to FWC policy, landowners who apply for the intentional take of the bear need to show that reasonable efforts were taken to protect property and FWC is not able to capture the bear after four days; however, neither the rule nor agency policies

[17] Hazing is not an appropriate response to all human-bear conflict situations. Hazing may be dangerous to the person administering the aversive conditioning if the bear is a mother with cubs or during extreme environmental conditions such as drought if a bear is hungry or starving (FWC 2014a at 1-4). Hazing at the wrong time may be dangerous to the bear, causing it to cross a road or compounding the effects of existing injuries or illness (FWC 2014a at 1-4).

define “reasonable efforts” (FWC 2015k at 1).[18] Additionally, the agency does not have any language in rule or policy that would restrict issuance of depredation permits in bear subpopulations that are not currently meeting the minimum number for a viable population. This means that depredation permits could be issued in subpopulations where only a few individuals remain.

2. Florida Black Bear Management Plan

Following the bear’s delisting, Rule 68A-27, F.A.C., which prohibits the take, possession, or sale of any species classified as Federally Endangered or Threatened or State Threatened, no longer applies. Instead of developing an enforceable regulatory structure that would ensure that the Florida black bear would be properly managed, the primary tool that FWC uses to manage the Florida black bear population is the Black Bear Management Plan (“Plan”) (FWC 2012 entire). As an initial matter, the Plan’s stated purpose is to maintain “sustainable black bear populations in suitable habitats throughout Florida for the benefit of the species and people” (FWC 2012 at 33). It defines “sustainable statewide bear population” as “healthy and able to persist over the long-term without the need for frequent intensive management actions” and “suitable habitats” as “areas large enough to support bears and area outside of towns and other densely developed areas” (FWC 2012 at 33). The Plan acknowledges that the goal “is intended to be general in nature without providing specific details or timeframes” (FWC 2012 at 33). However, rather than managing the Florida black bear at its biological capacity, FWC seeks to manage the Florida black bear at human social carrying capacity, which FWC does not attempt to quantify.[19]



[18] This ignores at least one study that found that technical assistance over the phone is as effective as removing nuisance bears (Voyles 2015 entire).

[19] Slagle et al. 2013 demonstrate that people’s opinion of black bears fluctuate and change based on the information they are given. More than 75 percent of comments received by FWC on the Florida black bear hunt were opposed to the hunt, indicating tolerance for the species.

Even assuming that the goals of the Plan were consistent with a structure that would ensure the Florida black bear's long term survival, the Plan does not carry the force of law: it is not binding and does not call for any mandatory measures. Instead, it is a "framework" from which FWC can work (FWC 2012 at 34). The Plan is a "guidance document" and must only be "considered" in the development of "technical assistance, best management practices, and formal comments" (FWC 2012 at 127). Its implementation requires the cooperation of members of non-governmental organizations, business interests, and members of the public (FWC 2012 at 49). However, there are no enforcement mechanisms, clear guidelines, or other methods to ensure that the plan is properly implemented (F.A.C. 68A-4.009).

FWC concedes that adequate resource allocation could undermine the ability of the agency to implement the Plan. For example, temporary and part-time staff provides "critical services" to the FWC's bear program (FWC 2012 at 134). However, the funds upon which these positions rely are insecure as they are dependent upon undedicated state funds (FWC 2012 at 134). The result is "high turnover rates" that, according to FWC, undermine its ability to "attract and maintain experienced staff in these important positions" (FWC 2012 at 134). In addition, FWC speculates that implementation of the Plan could require an additional $300,000, although the Plan was approved without developing a detailed budget (FWC 2012 at 135). Not only was there no budget, it is clear that the Plan was approved without any clear structure to obtain any additional required funding. Instead, the Plan outlines several speculative alternatives for securing funding including shifting existing resources, seeking foundation support or submitting funding requests to the legislature (FWC 2012 at 134-142).

The Plan goes as far as to identify areas, which would "benefit" from additional resources as described below, with the implication that resources are presently unavailable for these tasks.

Objective	**Description**	**Ten-Year Cost Estimate**
Population	Subpopulation abundance estimates	$ 600,000.00
Habitat	Identify and prioritize landscape connections among populations	$ 100,000.00
Conflict Management	Bear Response Program annual contractor costs	$ 500,000.00
Education and Outreach	Identify, recruit and assist communities in becoming Bear Smart Communities	$ 70,000.00

(FWCS 2012a (footnotes omitted)).

It is clear that funding is speculative at best, as the FWC states that "the approach most likely to be successful" would be to seek funding from "various foundations" for specific

projects (FWC 2012 at 136). Without that funding, many of the projects described in the Plan would not be possible (FWC 2012 at 136-137).

Even assuming that the Plan could provide an adequate framework and funding for the protection of the Florida black bear, FWC has not shown that it can adequately implement the Plan. The most poignant example of this is their failure to conduct a proper hunt. In both the East Panhandle and Central BMUs, the harvest objectives were greatly exceeded. In the East Panhandle, the harvest objective was 40 yet the actual harvest was 114, *almost three times the harvest objective* (FWC 2015d at 3). Similarly, in the Central Panhandle, the quota was also exceeded by almost half (FWC 2015d at 3). In addition, lactating mothers made up 21 percent of the female bears that were killed during the hunt (FWC 2015d at 6).

3. Florida State Land Acquisition and Habitat Protection

When FWC prepared the Bear Management Plan, and before it permitted statewide hunting of the species, it stated "[t]oday, the greatest threat to the long-term survival of the Florida black bears is habitat loss and fragmentation, exacerbated by incompatible habitat management in areas where subpopulations are very small" (FWC 2012 at 28).

Land acquisition and protection is critical to reducing habitat loss and fragmentation. The Service cited several land acquisition programs, including the Florida Preservation 2000 Trust Fund (now "Florida Forever"), to support its 2004 reexamination of the adequacy of existing regulatory mechanisms. The Service found these programs have benefited bears and "may have been the most valuable means of ensuring the protection and preservation of bear habitat on private lands in Florida" (69 Fed. Reg. 2100). The Service concluded that "Florida continues to emphasize land acquisition to meet a variety of environmental and wildlife related objectives….Considering the effective record of purchases over the last decade, and continued statutory appropriations for funding for these programs, it is reasonable to conclude that future acquisitions will continue to expand public lands and provide additional security to bear populations in Florida" (69 Fed. Reg. 2100).

Unfortunately, the data shows that since 2008, the state has cut funding for land acquisition under Florida Forever by 94% **(**Dixon 2015 at 1-3). From 2002 until 2008, annual Florida Forever expenditures averaged $300 million per year. However, in 2012-2013, for example, the state spent less than $17 million to acquire only 2,637 acres of property statewide (FDEP 2015 at 1-2).

In 2014, 75 percent of Florida voters approved an amendment to the State Constitution that would provide an annual funding mechanism to acquire lands for conservation. Known as "Amendment 1," Article X, section 28 of the Florida Constitution was amended to dedicate 33 percent of real estate transaction taxes (documentary stamp taxes) for 20 years towards the acquisition, restoration, improvement and management of conservation lands, including fish and wildlife habitat. In what was to be its first year of implementation, however, the Florida legislature passed an appropriations bill that

dedicated a mere $17.4 million to Florida Forever, or 3% of the approximate $550 million available (after debit servicing) from Amendment 1.[20]The legislature is once again on track this year to fund Florida Forever at $17 million or less than 6% of the $300 million the state spent on average per year prior to 2008 (Klas 2016 at 1). This demonstrates the lack of any real emphasis the state has placed on land acquisition since the Service's determination not to list the Florida black bear in 2004.

4. Florida FDEP and Water Management District permitting

An additional basis for the Service's 2004 determination was the adequacy of existing state wetlands permitting statutes and regulations. With FWC's removal of the Florida black bear from the state threatened species list in 2012, however, several provisions of the state environmental resource permitting regulations administered by the Florida Department of Environmental Protection ("DEP") and water management districts no longer apply to the Florida black bear.

For example, the Service's 2004 determination referenced several state rules including those that require the water management districts and DEP to specifically evaluate impacts to state-listed species, including impacts to their abundance, diversity, or habitat. These rules included 40B-400.103, 40B-400.104, 40C-4.301, 40C-4.302, 40D-4.301, 40D-4.302, 40E-4.301, 40E-3.02, 62-330.200, Fla. Admin. Code. These rules were repealed in 2013 and a statewide Environmental Resource Permit ("ERP") rule was adopted and became effective on October 1, 2013 (F.A.C. 62-330).

With the removal of the bear from the state list, specific listed species considerations in Rule 62-330, F.A.C. no longer apply. Further, the Environmental Resource Permit Applicant's Handbook, which is incorporated by reference per Rule 62-330.010(4), Florida Administrative Code, only requires permit applicants to conduct wildlife surveys where there is a likelihood that the site is used by listed species or bald eagles (FDEP 2013 at 10-3). Therefore, in the absence of a state listed species occurring in bear habitat, it does not appear a permit applicant even has to conduct a wildlife survey to determine whether bears would be impacted by a particular project.

Additionally, agencies' review of secondary impacts are limited largely to the review of state listed species and demonstrating reasonable assurances that the activity will not adversely impact wetland dependent listed animal species (FDEP 2013 at 10-13-10-16). As the Service's 2004 reexamination discussed, this included a showing that secondary impacts would not affect the ecological value of uplands to bears for enabling existing denning of the species (69 Fed. Reg. 2100, citing F.A.C. 40B-400.103; 40C-4.301; 40D-4.301; 40E-4.301; 62.330.200).With the removal of the Florida black bear from the state threatened and endangered species list, these review procedures (now consolidated into the Statewide ERP rule) no longer apply. Per the applicant's handbook, an "applicant shall provide reasonable assurance that the construction, alteration, and intended or reasonably expected uses of a proposed activity will not adversely impact the ecological

[20] 2015 Fla. Laws ch. 232 (Appropriation No. 1569A).

value of uplands for bald eagles, and aquatic or *wetland dependent listed* animal species for enabling existing nesting or denning by these species, but not including: areas needed for foraging; or wildlife corridors…" (FDEP 2013 at 10-15, emphasis added). The Florida black bear is no longer categorized as a wetland dependent listed animal species (FDEP 2013 at 10-17-10-9).

Furthermore, while FWC recognizes that "landscape connectivity that allows movement among bear subpopulations is crucial for genetic integrity and population viability," and that its objective is to maintain existing connections, solidify and strengthen near connections, and work toward creating more distant connections, with the state's de-listing of the species, these habitat protections are no longer available to the Florida black bear under the ERP rules (FWC 2012 at 51). Further, because the black bear is not listed, there is no longer the requirement that impacts must be offset through management plans, participation in a wildlife mitigation park or other measures (FDEP 2013 at 10-27). Small wetlands (less than a half-acre) may also not be subject to permitting requirements, despite their use by Florida black bears, if listed species do not also use the site (FDEP 2013 at 10-4).

The Service's 2004 determination noted that in addition to the environmental resource permitting regulations (that as explained above no longer apply to the Florida black bear), state law provided commenting opportunities for FWC. FWC is "provided the opportunity to submit comments and recommendations to the District and DEP regarding the impacts of wetland permit proposals on wildlife and state-listed species" (69 Fed. Reg. 2100). FWC also represents in its Florida Black Bear Management Plan that it comments on projects (FWC 2012 at 127). However, more than half of the time FWC fails to comment at all (Wiley 2015a at 1). Taken together, FWC's poor record of commenting, statutory provisions that the FWC recognizes are "not binding," and 2011 legislative changes, which limit the scope of comments that may be submitted on land use changes to only those impacting an undefined important state resource, make clear that commenting procedures are neither adequate nor protective (FWC 2012).

5. Mitigation Banks

An additional basis for the Service's 2004 finding that there were adequate regulatory mechanisms in place for the Florida black bear was the use of compensatory mitigation banks to offset development impacts to wetlands. Since 1998, the date the Service used to conduct its review of regulatory mechanisms, however, several studies have questioned the effectiveness of these mitigation banks and other mitigation practices. These studies include a National Research Council report released in 2001 finding that compensatory mitigation practices did not achieve the "no net loss" wetlands policy put into place by the White House in 1989-1990. That same year, Turner (2001 entire) found mitigation projects often did not comply with their permit conditions (Kihslinger 2008 at 14). In 2005, the Government Accountability Office released a report entitled "Corps of Engineers Does Not Have an Effective Oversight Approach to Ensure that Compensatory Mitigation is Occurring." This report included an analysis of individual permits issued by the Corps' Jacksonville office, which found that of 249 permit files

reviewed less than half had evidence of at least one monitoring report, and one-sixth of those permits had evidence of at least one compliance inspection (GAO 2005 at 8).

Additional studies and reviews have found that mitigation practices may be contributing to a net loss in wetland acres and function (Kihslinger 2008 at 1-3). In 2008 the Corps and Environmental Protection Agency issued a joint Mitigation Rule in an effort to address the NRC's 2001 findings and incorporate its recommendations for improving wetland mitigation projects under the Clean Water Act. While the Corps and EPA have begun to examine the administrative aspects of executing the 2008 Mitigation Rule, the ecological performance of these banks must also be examined (Morgan 2015 entire). It does not appear that since the rule was promulgated in 2008 the agencies have evaluated the ecological performance of compensatory mitigation projects (IWR 2015 at 16). The Corps recognizes that the numbers of mitigation banks and in-lieu fee programs continue to be on the rise but without reliable monitoring and enforcement measures in place, and adequate assurances that mitigation banks and other mitigation practices are providing ecological benefits, these measures will not ensure adequate protection for the Florida black bear and its habitats.

6. State Growth Management Laws

Since the Service reexamined the inadequacy of existing regulatory mechanisms in effect at the time of its previous 1998 12-month finding, significant changes have been made to Florida's growth management laws and Development of Regional Impact ("DRI") review processes that render them less protective of the Florida black bear.

a. Florida's Growth Management Laws

In 1985, the Florida legislature enacted the Local Government Comprehensive Planning and Land Development Regulation Act to "encourage the most appropriate use of land, water, and resources" (F.S. 163.3161(3) (2010)).The Act required all local governments to adopt a comprehensive plan, which set forth the allowable uses, densities, intensities, and development standards for all lands within their boundaries, and to ensure that all development be consistent with the adopted plan (F.S. 163.3167, F.S. 163.3177, F.S. 163.184 (2010)). To be "in compliance" the Act required comprehensive plans to be consistent with the State Comprehensive Plan (F.S. 163.3177 (2010)). The State Comprehensive Plan contains goals and policies to protect water resources. For example, Fla. Stat. 187.201(9)(a)(2015b) calls for the protection and acquisition of natural habitats and ecosystems and 187.201(9)(b)(2015) call for the establishment of "an integrated regulatory program to assure the survival of endangered and threatened species within the state." The Act also directed the Department of Community Affairs to review and approve all local plans and almost all plan amendments to ensure compliance with the law. Comprehensive plans and amendments that were not consistent with the Act and the State Plan could be challenged by the state Department of Community Affairs and/or other affected persons under the Florida Administrative Procedure Act (F.S. 163.3184 (2010)).

Prior to 2011, each local government body was required to transmit a proposed plan amendment to the state land planning agency (at the time the Department of Community Affairs), the appropriate regional planning council and water management district, the DEP, and the Department of Transportation ("DOT") immediately following a public hearing (F.S. 163.3184(3)(a) (2010)). The Department of Community Affairs was then required to transmit a copy of the proposed plan amendment to various governmental agencies, including, but not limited to DEP, DOT, the water management district, and the regional planning council (F.S. 163.3184(4) (2010)). Following adoption, the local government was required to transmit the plan or plan amendment to the state land planning agency within 10 working days after adoption and the relevant regional planning council (F.S. 163.3184(7) (2010)). The land planning agency was required to issue a "notice of intent" to find that the plan or plan amendment was in compliance or not in compliance. If the plan or plan amendment was "not in compliance," the notice was forwarded to the Florida Division of Administrative Hearings to conduct an administrative proceeding under Chapter 120, Florida Statutes (the Florida Administrative Procedure Act) (F.S. 163.3184(10) (2010)).

The state review process for comprehensive plans and plan amendments was significantly changed in 2011. Plan amendments must now follow an expedited state review process, a small-scale review process (if they qualify as small-scale development amendments) or state coordinated review process if they are in an area of critical state concern, propose a rural land stewardship area, propose a sector plan, update a comprehensive plan based on an evaluation and appraisal, propose a development of regional impact, or are new plans for newly incorporated municipalities (F.S. 163.3184(2)(c) (2015)).

For those amendments qualifying for expedited state review, the statute reads: The reviewing agencies…"may provide comments" regarding the amendment or amendments to the local government (F.S. 163.3184(3)(b)(2) (2015)). State agencies "shall only comment on important state resources and facilities that will be adversely impacted by the amendment if adopted" (F.S 163.3184(3)(b)(2) (2015)). The term "important state resources and facilities" is not defined. Further, after the state land planning agency receives an adopted plan amendment, the state land planning agency may only challenge an adopted plan amendment as "not in compliance" upon a determination by the state land planning agency that "an important state resource or facility will be adversely impacted by the adopted plan amendment" (F.S. 163.3184(5)(b)(1) (2015)). The state planning agency must state with specificity how the plan amendment will adversely impact the important state resource or facility (F.S. 163.3184(5)(b)(1) (2015)). Compliance determinations also no longer require plans and plan amendments to be consistent with the State Comprehensive Plan (F.S. 163.3184(1)(b) (2015)).

For those amendments qualifying for state coordinated review, the statute also now reads that the reviewing agencies "may provide comments" to the state planning agency (F.S. 163.3184(4)(c) (2015)). In addition, the state land planning agency is no longer required to make objections, recommendations, and comments in a report following local government transmission of the proposed plan or plan amendment (F.S. 163.3184(4)(d) (2015)). If it does issue a report regarding compliance the agency must state whether the

plan or plan amendment "will adversely impact an important state resource or facility" and any objection based on these grounds must "also state with specificity how the plan or plan amendment will adversely impact the important state resource or facility and shall identify measures the local government may take to eliminate, reduce, or mitigate the adverse impacts" (F.S. 163.3184(4)(d) (2015)).

The 2011 amendments to Florida's growth management laws significantly weaken the regulatory framework that was in place at the time of the Service's 1998 decision. Any comments submitted by reviewing state agencies, as well as any objections, recommendations, and comments from the state land planning agency, must explain how the proposed plan or plan amendment will impact an important state resource or facility. This also applies to plan amendments that propose or amend a sector plan (F.S. 163.3184(2)(c), (4)(d) 92015)). Consequently, while FWC may provide comments relating to fish and wildlife habitat, (F.S. 163.3184(3)(b), (4)(d) (2015)) these comments "shall be limited…as they relate to important state resources and facilities that will be adversely impacted by the amendment if adopted" (F.S. 163.3184(3)(b)(2) (2015)). No definition or guidance is supplied to FWC to determine the extent to which wildlife habitats, much less Florida black bear habitats, relate to or constitute an important state resource.

Further, any state challenges to local plans or plan amendments (including amendments that propose or amend a sector plan), must specifically state how the plan or plan amendment will adversely impact the important state resource or facility. It appears this determination is at the discretion of the DEP. It is conceivable, if not likely, that many important bear habitats, particularly those that do not occur within or near state parks or other public lands (to the extent that state parks or other public lands would be considered important state resources or facilities), could arbitrarily be excluded from the meaning of "important state resource or facility." As a result, it is very possible, if not likely, that a plan amendment that otherwise allows for development in bear habitat but not habitat deemed by DEO as an "important state resource" could go unchallenged by the state.[21] This would likely result in even fewer regulatory protections for the Florida black bear with respect to land use decisions that destroy, degrade, and/or fragment black bear habitat.

b. Developments of Regional Impact

An additional basis for the Fish and Wildlife Service's 2004 determination was the adequacy of regulations pertaining to Developments of Regional Impact. Since that determination, however, the law has also been amended to exempt several types of uses from the DRI process including many industrial, multiuse projects, new solid mineral

[21] An online search of Florida Division of Administrative Hearing records provides some context for the number of administrative petitions filed by the Florida Department of Economic Opportunity in a given year. A search reveals that the Department of Economic Opportunity has filed only three (3) administrative petitions since the legislature amended the statute more than four years ago. By comparison, a similar search of cases where the Department of Community Affairs was the petitioner from 2006-2010 yields more than 1,000 results. *See* https://www.doah.state.fl.us/ALJ/ (last accessed March 1, 2016).

mines, and any proposed addition to, expansion of, or change to an existing mineral mine (F.S. 380.06(2)(d), (1)(c), 380.06(24)(t) (2015)). Moreover, projects that meet DRI thresholds under Fla. Stat. 380.06 are now subject to the same state coordinated review process for comprehensive plan and plan amendments, discussed earlier pursuant to Fla. Stat. 163.3184(2)(c)(2015). Consequently, state agencies providing comments to the state planning agency including FWC, (F.S. 163.3184(4)(c), (4)(b)(2) (2015)) are limited to commenting on "important state resources and facilities that will be adversely impacted by the amendment if adopted." In addition, the state land planning agency is no longer required to make objections, recommendations, and comments in a report following local government transmission of the proposed plan or plan amendment (F.S. 163.3184(4)(d) (2015)). If it does issue a report regarding compliance the agency must state whether the plan or plan amendment will adversely impact an important state resource or facility and any objection based on these grounds must "also state with specificity how the plan or plan amendment will adversely impact the important state resource or facility and shall identify measures the local government may take to eliminate, reduce, or mitigate the adverse impacts" (F.S. 163.3184(4)(d) (2015)). Since "important state resource or facility" is not defined by the Act, nor in section Fla. Stat. 380.06, it is likely that a DRI could still be deemed in compliance with the law despite impacts to important Florida black bear habitats, which are otherwise not determined by DEO to be an "important state resource or facility."

7. State Land Management Plans

In the Service's 1998 reevaluation the agency reviewed several management plans for state lands in Florida that were important to the Florida black bear (69 Fed. Reg. 2101). The Service found that these plans acknowledged the presence of the species and its threatened designation. It concluded that these plans and the past and continued implementation of those plans were and would continue to be compatible with maintaining viable populations of Florida black bears (69 Fed. Reg. 2101).

Since that reevaluation, however, the FWC has removed the bear from Florida's threatened list and permitted a hunt in 2015. It appears almost all of these plans have been updated since 1998 but none of them mention hunting and many still consider the species as listed as "threatened" by the state.[22]

[22] A Conceptual Management Plan for Aucilla Wildlife Management Area, 2004-2009 Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; A Management Plan for Apalachicola River Wildlife and Environmental Area, 2014-2024, Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; A Conceptual Management Plan for Big Bend Wildlife Management Area 2004-2014; Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; A Management Plan for the Caravelle Ranch Wildlife Management Area, 2014-2024, Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; Ten-Year Resource Management Plan for the Picayune Strand State Forest, Collier County, Florida Department of Agriculture and Consumer Services, Division of Forestry, Aug. 15, 2008; Florida Department of Agriculture and Consumer Services, Florida Forest Service. 2015. Ten-Year Resource Management Plan for the Withlacoochee State Forest, Citrus, Hernando, Lake, Pasco, and Sumter Counties, Feb. 13, 2015; Ten-Year Resource Management Plan for the Lake George State Forest, Volusia County, Florida Department of Agriculture and Consumer Services, Florida Forest Service, April 17, 2015; Ten-Year Resource Management Plan for the Blackwater River State Forest, Santa Rosa and Okaloosa

The plans that still consider the bear as "threatened" include the management plans for the Aucilla WMA, Big Bend WMA, Collier-Seminole State Park, Lake George State Forest, Rock Springs Run/Lower Wekiva State Reserves, Picayune State Forest, Seminole State Forest, Tates Hell State Forest, Tiger Bay State Forest, and the Heart Island Conservation Area.[23]

In places such as Lake George State Forest, Tiger Bay State Forest, and Heart Island Conservation Area, the agencies state that the proximity of these lands to other lands allow them to serve as important corridors. In some of the plans that no longer classify the species as threatened but "rare," they nevertheless rely on the Florida Black Bear Management Plan for guidance although that plan does not address the impacts of hunting, much less on state lands (FDA 2013).

The Service's fundamental assumptions that these plans were adequate in 1998 because these plans acknowledge that the bear is protected by the state as a "threatened" species, no longer hold true and the agency's conclusions that the management practices set forth

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Counties, Florida Department of Agriculture and Consumer Services, Florida Forest Service, Dec. 18, 2013; Florida Department of Agriculture and Consumer Services, Florida Forest Service, Ten-Year Resource Management Plan for the Goethe State Forest, Levy and Alachua Counties, June 25, 2013; Ten-Year Resource Management Plan for the Seminole State Forest, Lake County, Florida Department of Agriculture and Consumer Services, Florida Forest Service, Dec. 9, 2011; Florida Department of Agriculture and Consumer Services, Division of Forestry, Ten-Year Resource Management Plan for the Tiger Bay State Forest, Volusia County, Oct. 21, 2010; Florida Department of Agriculture and Consumer Services, Division of Forestry. 2007. Ten-Year Resource Management Plan for the Tate's Hell State Forest, Franklin and Liberty Counties, June 15, 2007; Collier-Seminole State Park, Unit Management Plan, State of Florida, Department of Environmental Protection, Division of Recreation and Parks, Feb. 6, 2004; Fakahatchee Strand Preserve State Park, Unit Management Plan, State of Florida, Department of Environmental Protection, Division of Recreation and Parks, Aug. 19, 2014; Wekiva River Basin State Parks, Multi Unit Management Plan Amendment, State of Florida, Department of Environmental Protection, Division of Recreation and Parks, Aug. 16, 2012; Heart Island Conservation Area, Land Management Plan, Aug. 2009.

[23] A Conceptual Management Plan for Aucilla Wildlife Management Area, 2004-2009 Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; A Management Plan for Apalachicola River Wildlife and Environmental Area, 2014-2024, Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; A Conceptual Management Plan for Big Bend Wildlife Management Area 2004-2014; Florida Fish and Wildlife Conservation Commission, Tallahassee, FL.; Collier-Seminole State Park, Unit Management Plan, State of Florida, Department of Environmental Protection, Division of Recreation and Parks, Feb. 6, 2004; Ten-Year Resource Management Plan for the Lake George State Forest, Volusia County, Florida Department of Agriculture and Consumer Services, Florida Forest Service, April 17, 2015; Wekiva River Basin State Parks, Multi Unit Management Plan Amendment, State of Florida, Department of Environmental Protection, Division of Recreation and Parks, Aug. 16, 2012; Florida Department of Agriculture and Consumer Services, Division of Forestry, Ten-Year Resource Management Plan for the Picayune Strand State Forest, Collier County, Aug. 15, 2008; Ten-Year Resource Management Plan for the Seminole State Forest, Lake County, Florida Department of Agriculture and Consumer Services, Florida Forest Service, Dec. 9, 2011; Florida Department of Agriculture and Consumer Services, Division of Forestry, Ten-Year Resource Management Plan for the Tiger Bay State Forest, Volusia County, Oct. 21, 2010; Florida Department of Agriculture and Consumer Services, Division of Forestry. 2007. Ten-Year Resource Management Plan for the Tate's Hell State Forest, Franklin and Liberty Counties, June 15, 2007; Heart Island Conservation Area, Land Management Plan, Aug. 2009.

in these plans are adequate must be reexamined as hunting is now permitted on state managed lands.

8. Federal Land Management Plans

a. National Forests

In its 2004 review, the Service found that national forest management as identified in the 1998 final Revised Land and Resource Management Plan ("LRMP") for the National Forests in Florida would continue to maintain quality forested habitats that will directly ensure viability for three of the four core Florida black bear populations through the foreseeable future. At the time of its review, however, the Service only examined the LRMP's ability to continue to maintain quality habitat as hunting was prohibited (USFS 1999). The 2015 bear hunt, however, occurred on all three national forests and the LRMP fails to consider this hunt or future hunts on the Forest Service's ability to ensure population viability of three of the four core populations (USFS 1999). The cumulative effects of habitat degradation (e.g. illegal palmetto harvesting) and hunting on national forest lands, remains unexamined in the LRMP or otherwise (USFS 1999).

The Service's 2004 reevaluation also cited several regulations and policies in support of its finding regarding the adequacy of the Final Draft 1998 LRMP. Specifically, these regulations required national forests to be managed to ensure the viability of populations of native species, and required plans to identify, monitor, and evaluate the effects of proposed management on indicator species and their habitats (36 C.F.R. § 219.19). The Service's 2004 reevaluation noted that the Florida black bear was a *management indicator species* "ensuring that evaluations of the impacts of site-specific actions and prescriptions to this species would be conducted" (69 Fed. Reg. 2100). In 2012, however, the Forest Service revised its regulations. The new regulations no longer require the Forest Service to manage fish and wildlife habitat to maintain the viability of populations of native species in the planning area. Instead, the Forest Service is directed "to maintain a viable population of each *species of conservation concern* within the plan area" (36 C.F.R. 219.19(b)(1)). A species of conservation concern "is a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 C.F.R. 219.9(c)). Further, the new regulations no longer require monitoring for "management indicator species" and instead refer to *focal species* (*Id*.). A "focal species" is "a small subset of species whose status permits inference to the integrity of the larger ecological system to which it belongs and provides meaningful information regarding the effectiveness of the plan in maintaining or restoring the ecological conditions to maintain the diversity of plant and animal communities in the plan area. Focal species would be commonly selected on the basis of their functional role in ecosystems" (*Id.*). Under the new regulations, which apply to future plans, each plan's monitoring program must contain one or more monitoring questions and associated indicators addressing the status of focal species to assess ecological conditions (*Id.*).

Considering that the 1999 LRMP is to provide guidance for the next 10-15 years, the next plan would no longer be subject to the 1982 regulations in effect at the time of the Service's 2004 decision. Given that the bear would no longer be considered a "management indicator species" in any new plan, and the classification of a "species of conservation concern" is within the discretion of the local Forest Service official, it is unclear how the Forest Service will classify the Florida black bear and monitor the species on its national forests in Florida. Moreover, unlike the 1982 regulations, the 2012 regulations do not directly apply to site-specific projects. Therefore, even if the bear were to be considered a "species of conservation concern" and/or a "focal species" in the next plan, those considerations could be excluded from the Forest Service's analysis of site-specific projects such as future logging projects and other projects that could substantially impact black bear habitat. The new regulations state that the monitoring requirements do not apply to projects or activities and "are not a prerequisite for making a decision to carry out a project or activity" (36 C.F.R. 219.19(a)(7)). Therefore, the Service can no longer rely on the Forest Service regulations and policies that were in effect at the time to determine that there are adequate regulatory mechanisms to protect the Florida black bear.

b. National Parks and Preserves

The Service determined in its 2004 reevaluation that the General Management Plan for the Big Cypress National Preserve that the habitat goals and results of the implementation of the 1991 plan have been consistent with the overall purposes of a unit of the National Park System and the legislative mandate behind the creation of Big Cypress National Preserve (69 Fed. Reg. 2100). The Service concluded that the plan will help maintain appropriate forested habitats for bears that will help ensure the species' perpetuation in south Florida (*Id.*).

However, the state is seeking to expand the hunt on additional federal lands including Big Cypress Preserve, and the National Park Service is considering a proposal to allow over 100,000 acres (scaled down from 300,000) of seismic testing for oil and gas (Burnett 2014 at 1-7). Much like the 1999 LRMP for the National Forests in Florida, the National Park Service's General Management Plan fails to examine the impact of the 2015 hunt and future hunts on the species. Therefore, it is entirely unclear whether management actions under the 1991 plan would be adequate if the National Park Service were to allow for hunting in the Preserve. Furthermore, the threat of seismic testing and oil and gas development at the 100,000-acre scale was not considered by the Service in 1998, and should be now.

E. Other Natural or Manmade Factors[24]

1. Saw Palmetto Berry Shortages and Mismanagement

As explained above, Florida black bears depend on saw palmetto for food and cover. As such, shortages or improper management of saw palmetto is a threat to Florida black bears.

Until recently, the Florida Forest Service -- an agency that reports to the Florida Department of Agriculture -- sold more than 3,000 licenses to harvest saw palmetto berries from state lands each year. The licenses sold for $10 each and the more than $30,000 generated augmented the budget for managing state forests. But during a vote to allow a bear hunt in Florida in 2015, state wildlife managers asked state forestry officials to stop issuing permits and forestry officials agreed to stop for at least one year. As a result, in June of 2015, Agriculture Commissioner Adam Putnam directed the Department of Agriculture to stop issuing permits to palmetto-berry pickers in Florida's 37 state forests (Hudak 2015 at 2). While this decision will leave additional saw palmetto berries for Florida black bears, there is no guarantee that the Department of Agriculture will continue this practice in the future. In addition, this prohibition only applies to state lands.

As for federal lands, in 1996, USFS issued permits authorizing harvest of 6,400 lbs from Osceola National Forest and 4,000 from Ocala National Forest; in 1997, it allowed 3,200 lbs to be removed from Osceola and 2,000 from Ocala (Robbins 1999 at 15, Duever 2011 at 48). The Forest Service had problems with pickers gathering berries outside the permitted areas. It appears that the Forest Service no longer issues permits for this activity (Duever 2011 at 48), however, harvest is still legal on private lands, where one-acre lots and 100,000 acre ranches continue to provide saw palmetto berries to fuel the medicinal industry (Maehr 1996 at 10).

Because saw palmettos are extremely important to Florida black bears, but these plants are unprotected on private lands and receive no guarantee of future protection on state and federal lands, inadequate protection of saw palmettos is another threat to the Florida black bear.

As explained above, saw palmetto provide important source of berries and forage, as well as cover, for Florida black bears. As such, the loss of these plants or their berries poses a risk to the bears. Harms to Florida black bears from loss of saw palmetto include: forced shifts to other less favorable foods; expansion of home ranges to accommodate alternative food searches; home range abandonments; and local population declines (Maehr 1996 at 10). Because the Florida black bear is highly mobile, bears may travel long distances to reach remaining patches of saw palmetto, which puts them at increased risk of being hit by cars (Maehr 1996 at 10). A dearth of berries could also mean bears

[24] Petitioners do not include a section on apiaries, though note that beekeepers within bear range should use electric fencing to eliminate damage. See Clark 2005 at 234-244.

leave the forests and have more encounters with people while searching for food (Henson 2015 at 1, Hudak 2015 at 2).

This may have been what happened in Ocala National Forest in 2007, when local residents reported that uncontrolled berry pickers harvested far beyond their permit areas and bears took their cubs into nearby communities looking for food. People there had already begun complaining about starving bears invading their yards by mid-September. Lacking the staff to enforce permit compliance, USFS subsequently closed the forest to palmetto berry harvesting. Officials report continuing problems with palmetto berry poaching on the forest however, noting that the number of bear complaints during palmetto berry season has not significantly decreased (Duever 2011).

Decline in availability of the berries is largely caused by illegal poaching of the berries for people who sell the berries for their medicinal qualities. The flavor of the saw palmetto berries has been described as “rotten cheese steeped in tobacco juice” (Green 2014 at 1-2). Yet the taste does not deter people from picking and selling tons of these berries each year. By 2003, the National Institute of Health was ranking saw palmetto as the country’s fifth most popular medicinal herb (Burney 2003 at 1). The berry is used as an herbal supplement and marketed as a treatment for prostate conditions, baldness and a lack of sexual vitality in men (Gillis 2015 at 1, Maehr 1996 at 6). As the popularity of herbal medicine has grown and the efficacy confirmed by scientific research, the industry has continued to develop rapidly (Duever 2011 at 46).

Saw palmettos are now a $70 million or more business in Florida (Green 2014 at 4). The berries are crushed to a fine powder and sold in capsules and teas. The powder itself sells on eBay for $20 to $70 a pound (Gillis 2015 at 1). Capsules of saw-palmetto extract run $30 for an over-the-counter container of 120 softgel tablets at vitamin stores (Hudak 2015 at 3). When berry production was low in 1995, the price shot up to $3.25/lb then settled out around $1.15/lb (Duever 2011 at 48). In the 1990s, it was reported that each fall up to 5,000 tons of saw palmetto berries -- enough to feed 10,000 bears for 90 days -- would be transported to Felda, a southwestern Florida farming community that is home to Plantation Botanicals, which transforms the berries into a medicinal product (Maehr 1996 at 10-11). There are now markets accepting berries in Fort Pierce and other cities as well (Duever 2011 at 47). Since 1996, annual harvests of saw palmetto fruits in Florida have totaled at least 7,700 tons (7,000,000 kg) (Carrington 2003 at 1). The annual harvest may be 2-3 times greater in years with greater fruit production and/or higher prices (Carrington 2000 at 131).

The popularity of the herbal supplement has spawned a black market for the fruit (Hudak 2015 at 3, Duever 2011 at 9, 46). Drivers drop off loads of migrant workers, who sometimes cut fences and enter protected areas. They carry huge sacks of the berries on their backs and fill up entire trucks before leaving (Neill 2010 at 1). FWC has documented 340 violations of berry harvesting since 2003, with 34 violations in 2014. Citations have been at the Alva Scrub Preserve in east Lee County; the Galt Preserve in St. James City on Pine Island; Avalon State Park in Okeechobee County; a Department of Environmental Protection Preserve Area in Collier County; Highlands Hammock State

Park in Highlands County and others (Henson 2015 at 1, FWC 2013). In just one week, FWC Division of Law Enforcement reported four separate incidents of saw palmetto berry poaching (FWC 2013).

For example, conservation officers and local law enforcement arrested six men for illegally harvesting about 5,000 pounds of berries from Chassahowitzka Wildlife Management Area. The men were charged for illegal entry into the management area and possession of palmetto berries. Each charge is a second-degree misdemeanor, punishable by a fine of up to $500 and/or 60 days in jail (Neill 2010 at 1). But authorities can only do so much -- often no more than one or two officers are covering tens of thousands of public acres at a time and determined pickers generally know how to avoid them (Duever 2011 at 48).

In addition to poaching of saw palmetto berries, this plant has suffered tremendous range contractions as pine flatwoods and dry prairies have been converted to cattle pasture, and saw palmetto specifically targeted for eradication (Hilmon 1969 at 1, Maehr 2001 at 9). To be sure, saw palmetto has also been a perennial target of range improvement programs that seek to eradicate it from native prairies and pine flatwoods (Tanner 1988 entire).

Florida black bears are also harmed when this important plant is removed for timber management purposes. The U.S. Forest Service has considered saw palmetto a pest and fire hazard in Southern timber stands (Van Deelen 1991 at 3). It contributes large amounts of combustible fuel to forest understories and competes with pines (*Pinus* spp.) for moisture, nutrients, and space (Van Deelen 1991 at 3). Forest managers control the shrub with mist-blower applications of herbicides often in conjunction with prescribed burning or other defoliation treatments (Van Deelen 1991 at 4, Hilmon 1968 at 1). Growing season roller chopping is another method used to reduce densities of saw palmettos (Willcox 2010 entire).

Although saw palmettos are adapted to fire, land managers often do prescribed burns during the winter even though the plants evolved under a regime of summer fires (Maehr 1996 at 15-16). It has been suggested that the common practice of winter burning promotes vegetative growth of saw palmettos at the expense of flowering, which in turn reduces the ability of the plants to produce the berries upon which Florida black bears depend (Maehr 1996 at 15-16). Carrington (2006 at 69-77) found that infrequent growing season burns (every 5-8 years) were associated with higher fruit yields in saw palmettos but more frequent burns led to decreased yield (Duever 2011 at 51). Because Florida land management programs in upland sites often call for frequent burns as a means to reduce fuel loads and promote plant diversity, it is likely that current burning programs in Florida occur at a rate and during a time of year that artificially reduces fruit production in Florida's most important black bear food plant (Maehr 2001 at 10).

Palmettos are also lost when lands are converted into residential and commercial developments or intensive agriculture (Maehr 1996 at 16), as discussed in the section on habitat loss.

2. Small population size and fragmentation

Small, isolated populations of Florida black bears are vulnerable to extirpation due to limited gene flow, reduced genetic diversity, and inbreeding depression (Lynch 1996). Population isolation also increases the risk of extinction from stochastic genetic and environmental events including drought, flooding, and toxic spills. Habitat modification and cumulative habitat degradation are also major threats for species, which exist in isolated populations. Due to blocked avenues of dispersal or limited dispersal ability, isolated populations gradually and quietly perish as habitat conditions deteriorate.

As explained throughout, isolation is a major threat to the Florida black bear. For species with subpopulations on single island distributions, the risk of extinction as a result of stochastic events is a major concern, especially given that global climate change will likely result in more frequent extreme weather events, such as severe storms and droughts (Goldenberg 2001 entire, Emanuel 2005 at 686-688, Perry 2006 at 242, 244, 251). For example, a direct hit by a hurricane to the remaining habitat could lead to species extinction (Wiley 1993 entire). In addition, isolated populations are unlikely to be recolonized following a local extinction (Semlitsch 1998 at 1220-1221). As such, small and isolated populations are more susceptible to extirpations due to stochastic events, human impacts, and environmental factors (Soulé 1987, Hanski 1999 entire). Further, lack of gene flow may cause loss of genetic variability due to random genetic drift (Wright 1931 at 127-128), and inbreeding depression may occur (Franklin 1980). And the loss of genetic diversity can affect a population's ability to respond to environmental changes, confounding the effects of climate change, contaminants, and introduced species.

The impacts of inbreeding caused by small subpopulation size have been documented in black bears in Alabama and Florida, including kinked tail vertebrae, lack of external tails, cryptorchidism, and prolapsed rectum (Kasbohm 1998). 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 2007 at 455-464). Genetic differentiation was most evident in the Chassahowitzka, Glades/Highlands, and Eglin subpopulations. 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 2007 at 455-464).

3. Climate Change

Climate models project both continued warming in all seasons across the southeast United States, and an increase in the rate of warming (Karl 2009 at 111-113). The warming in air and water temperatures projected for the southeast will create heat-related stress for fish and wildlife, including the Florida black bear. Climate change will alter the distribution of native plants and animals and will lead to the local loss of imperiled

species and the displacement of native species by invasive species (Karl 2009 at 113). Concerning the effects climate change is expected to have on southeastern environments, Karl (2009 at 115) state, "[e]cological thresholds are expected to be crossed throughout the region, causing major disruptions to ecosystems and to the benefits they provide to people."

Climate change will increase the incidence and severity of both drought and major storm events in the southeast (Karl 2009 at 111-116). The percentage of the southeast region experiencing moderate to severe drought has already increased over the past three decades. Since the mid- 1970s, the area of moderate to severe spring and summer drought has increased by 12 percent and 14 percent, respectively. Fall precipitation tended to increase in most of the southeast, but the extent of region-wide drought still increased by nine percent (Karl 2009 at 111). Both drought and severe storms could threaten the Florida black bear with habitat alteration, altered vegetation, and altered prey base and food availability (Seager 2009 entire).

The warming climate will likely cause ecological zones to shift upward in latitude and altitude and species' persistence will depend upon, among other factors, their ability to disperse to suitable habitat (Peters 1985 entire). Because of the Florida black bear's already limited range and the high degree of development in the surrounding area, there is likely no suitable habitat where the bear could disperse, making climate change a dire threat to its survival.

Global average sea level rose by roughly eight inches over the past century, and sea level rise is accelerating in pace (Melillo 2014 at 373). As summarized by the Third National Climate Assessment, "Since the late 1800s, tide gauges throughout the world have shown that global sea level has risen by about 8 inches. A new data set shows that this recent rise is much greater than at any time in at least the past 2000 years. Since 1992, the rate of global sea level rise measured by satellites has been roughly twice the rate observed over the last century, providing evidence of additional acceleration" (Melillo 2014 at 44). Many areas of the Southeast Atlantic and Gulf of Mexico coasts have experienced significantly higher rates of relative sea-level rise than the global average during the past 50 years (Karl 2009 at 37). Large regions of Florida have elevations at or below 3 to 6 feet, making these areas particularly vulnerable to sea-level rise and flooding (Weiss 2011 entire, Strauss 2012 at 3-4).

According to the Third National Climate Assessment, global sea level is projected to rise another 1 to 4 feet by 2100, with sea-level rise of 6.6 feet possible (Melillo 2014 at 589). Sea level rise could increase by another 6 inches in just the next decade (Melillo 2014 at 400). In its 2012 sea-level rise assessment, the National Research Council similarly estimated global sea-level rise at 8 to 23 cm by 2030, 18 to 48 cm by 2050, and 0.5 m to 1.4 m by 2100 (NRCNA 2012 at 4). The effects of sea-level rise will be long-lived. Scientists estimate that we lock in 8 feet of sea-level rise over the long term for every degree Celsius (1.8 degrees Fahrenheit) of warming (Levermann 2013 at 13746).

Regional projections for Florida also indicate that sea level rise of three to four feet or more is highly likely within this century. The Southeast Florida Regional Climate Change Compact Counties—Monroe, Miami-Dade, Broward, and Palm Beach counties—released the Southeast Florida Regional Climate Change Action Plan in October 2012, which included a detailed "Unified Sea Level Rise Projection" for south Florida. The sea level rise projections for south Florida are similar what has been estimated globally by the National Research Council: 8 to 18 cm (3 to 7 inches) by 2030, 23 to 61 cm (9 to 24 inches) by 2060, and 48 cm to 1.45 m (19 to 57 inches) by 2100 (SFRCCC 2011 at 9-10).

Increasingly intense storms and storm surge pose additional climate threats to coastal wildlife species in Florida. Studies have found that the frequency of high-severity hurricanes is increasing in the Atlantic (Elsner 2008 at 92-94, Bender 2010 at 454-458, Kishtawal 2012 at 1-6), along with an increased frequency of hurricane-generated large surge events and wave heights (Grinsted 2012 at 19601-19604, Komar 2008 entire). The risk of extreme storm surges has already doubled as the planet warms, and these events could become 10 times more frequent in the coming decades (Grinsted 2012 entire). High winds, waves, and surge from storms can cause significant damage to coastal habitat. When storm surges coincide with high tides, the chances for damage are greatly heightened (Cayan 2008 at 557). As sea levels rise, storm surge will be riding on a higher sea surface which will push water further inland and create more flooding of coastal habitats (Tebaldi 2012 entire). For example, one study estimated that hurricane flood elevations along the Texas coast will rise by an average of 0.3 meters by the 2030s and 0.8 meters by the 2080s, with severe flood events reaching 0.5 meters and 1.8 meters by the 2030s and 2080s, respectively (Mousavi 2011 entire).

Coastal species face significant risks from coastal squeeze that occurs when habitat is pressed between rising sea levels and coastal development that prevents landward movement (Scavia 2002 at 17-18, Fitzgerald 2008 at 601-634, Defeo 2009 at 6-7, LeDee 2010 entire, Menon 2010 entire, Noss 2011 entire). Human responses to sea level rise including coastal armoring and landward migration pose significant risks to the ability of species threatened by sea-level rise to move landward, if other suitable habitats were even available (Defeo 2009 at 1-9). Projected human population growth and development in Florida may thus threaten the Florida black bear with coastal squeeze (Zwick 2006 entire).

4. Fire management

The Florida black bear, and many other species, benefits from habitat that is managed with prolonged fire intervals (FWC 2012 at 53). Saw palmetto and oak mast are important food for Florida black bears and bears use dense understory including palmetto as concealing cover for natal dens (FWC 2012 at 53-54). When habitat is burned more frequently than every five years, however, it can be fatal to oaks and reduce fruiting of palmettos (FWC 2012 at 54). As a result, bears use areas that have at least five years between burns more frequently than they do areas with shorter burn cycles (FWC 2012 at 54).

In addition, prescribed fire performed during winter seasons may decrease food production and cover for bears at the local level (FWC 2012 at 54, Ulev 2007 at 14-34). Winter or dormant season burning may be altering patterns of flowering and fruiting of saw palmetto (Maehr 2001 at 10-11). Bears are also vulnerable to winter burns because they den in palmetto thickets and cubs present at that time of year are unlikely to be able to escape a fire (Duever 2011 at 51). January through April may be the most important time to protect bear denning areas from fire (Duever 2011 at 51).

Yet, Florida land managers often call for frequent burns (~3 year interval) and it is likely that current burning programs occur at a rate and time of year that artificially reduces fruit production (Maehr 2001 at 11-12). The current trend in Florida appears to be toward burning between late summer and early spring when few fires occur naturally (Noss 2013 at 207-212). This is significant as the Service's reevaluation found at the time that agencies such as the Forest Service had a preference for growing-season fires that improved conditions for the species by ensuring a diversity of habitats that provide sufficient cover and a diverse seasonal food supply (69 Fed. Reg. 2101).

5. Synergies and Multiple impacts

The risk of extinction for the Florida black bear is heightened by synergies between threats, as most species face multiple threats and these threats interact and magnify each other. For example, as habitat availability shrinks, species become more vulnerable to threats from invasive species, pollution, climate change, disease, predation, and other factors.

Because of the multifaceted ecological relationships among species, the extirpation of a species can have effects that cascade throughout the community. The loss of a single species can imperil associated species, highlighting the need to protect entire communities of species simultaneously.

VI. DISTINCT POPULATION SEGMENT

The Endangered Species Act provides for the listing of distinct population segments ("DPSs") of vertebrate species. The Service will consider a population a DPS if it is "discrete" in relation to the remainder of the species to which it belongs and "significant" to the species to which it belongs (61 Fed. Reg. 4725). According to the DPS Policy, a population is "discrete" if it is "markedly separated from other populations" because of "physical, physiological, ecological, or behavioral factors" or it is "delimited by international governmental boundaries within which differences in control of exploitation, management of habitat, conservation status, or regulatory mechanisms exist that are significant in light of section 4 (a)(1)(D)" (*Id*.). A population need not have "absolute reproductive isolation" to be recognized as discrete (61 Fed. Reg. 4725). A population is considered "significant" based on, but not limited to, the following factors: 1) "persistence of the discrete population in an unusual or unique ecological setting;" 2) "loss of the discrete population would result in a significant gap in range;" 3) the population "represents the only surviving natural occurrence of an otherwise widespread

population that was introduced;" or 4) the population "differs markedly in its genetic characteristics" (61 Fed. Reg. 4725).

A. Discreteness

As discussed throughout this petition, subpopulations of Florida black bears are highly fragmented and isolated from one another. Each subpopulation is markedly separated from the other subpopulations because of physical factors (61 Fed. Reg. 4725). The DPS Policy provides that "quantitative measures or genetic . . . discontinuity may provide evidence of this separation" (61 Fed. Reg. 4725). Dixon (2007 at 455-464) found that habitat loss and fragmentation has influenced the genetic structure, resulting in genetically distinct subpopulations. Dixon found genetic differentiation even among populations that were close to each other and concluded that it is likely that habitat fragmentation and other anthropogenic disturbances create barriers to gene flow. Even if there is a low level of gene flow with populations outside the population, this does not mean that the population lacks discreteness. Under the DPS Policy, it is not appropriate "to require absolute reproductive isolation as a prerequisite to recognizing a distinct population segment. This would be an impracticably stringent standard, and one that would not be satisfied even by some recognized species that are known to sustain a low frequency of breeding with related species" (61 Fed. Reg. 4724). As the DPS Policy further explains, discreteness "does not require absolute separation of a DPS from other members of its species, because this can rarely be demonstrated in nature for any population of organisms. This standard adopted [by the DPS Policy] is believed to allow entities recognized under the Act to be identified without requiring an unreasonably rigid test of distinctness" (61 Fed. Reg. 4724). As detailed throughout this petition, each population is highly fragmented and isolated and is therefore discrete from each other because of physical factors that will only worsen with time.

B. Significance

Each subpopulation is also significant because the loss of any of the subpopulations would result in a significant gap in the range and because some subpopulations are markedly different in their genetic characteristics (Dixon 2007 at 455-464).

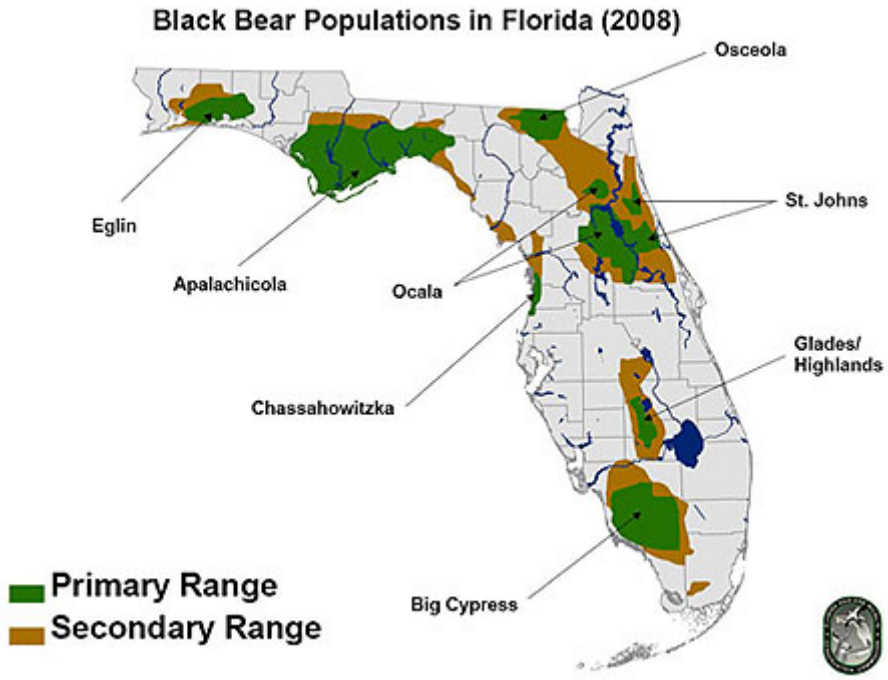
In sum, the best available data demonstrates that all of the subpopulations are likely both discrete and significant. As such, the Service should alternatively recognize the subpopulations of the Florida black bear as distinct population segments and protect them under the Endangered Species Act.

VII. REQUEST FOR CRITICAL HABITAT

Critical habitat designation would provide significant conservation benefits to the Florida black bear, and we urge the Service to propose critical habitat as soon as possible. The critical habitat designation should not only protect existing, known habitat areas, but should also protect currently unoccupied areas that could be important for facilitating habitat movement for the Florida black bear in response to development and climate

change. Deliberate repopulation or reintroduction into areas of species can help restore species' status (Seddon 2014 entire).

FWC has identified primary and secondary ranges, where primary range is "an area that contains a core bear population, habitat that is important to bear movement, and evidence of reproduction;" and secondary range is "an area important to bear movement and habitat use, but less optimal than a primary range" (FWC 2016c at 1).



Within these ranges, the Florida black bear prefers a mixture of flatwoods, swamps, scrub oak ridges, bayhead and hammock habitats. Specifically, Weaver (2000 entire) details the essential elements of forests to bear habitat to include:

- Forested area that provides adequate opportunities for movements, foraging, denning, and cover
- Food supply that is abundant, stable and diverse
- Natural escape cover and cover for bedding and dispersal

Larkin (2004 entire) also identifies pathways to link the highly isolated Chassahowitzka population to the other seven subpopulations. While conceding that various bottlenecks make some of the linkages potentially not viable, Larkin concludes that infrastructure for a conservation network is intact (at 30). Mykytka (1990 at 163) recommends protecting swamps greater than 300 ha and adjacent pine uplands. Mykytka also recommends preserving and restoring the contiguity of large swamp systems and upland buffers surrounding swamps (at 165-166).

A. A finding of "Not Determinable" will not be defensible

The Service must publish a final listing decision within one year of publishing the proposed listing decision(16 U.S.C. § 1533(b)(5)(A), (b)(6)(A)). When the final listing decision is issued, the Service must designate critical habitat for the species *concurrently* "to the maximum extent prudent and determinable" (16 U.S.C. § 1533(a)(3)). A "not determinable" finding allows the Service to extend the time for designating critical habitat under the ESA.[25] This means that when critical habitat is "not determinable," the Service has one year from the date of the final listing decision (i.e., two years from the proposed listing decision) to designate critical habitat. At or before the end of the one-year extension, "the Secretary *must* publish a final regulation, based on *such data as may be available at that time*" (16 U.S.C. § 1533(b)(6)(C)(2)). That final deadline applies even if a longer deliberative process might produce a "better" critical habitat designation.[26] However, the "not determinable" findings should rarely be made. It is expected that the Service will make "the *strongest attempt possible* to determine critical habitat within the time period designated for listing."[27] The Service is to use the best available science in determining critical habitat. That optimal conditions are unknown is not a barrier to designating. Similarly, it is not the Service's task to understand what features of occupied habitat are currently lacking. Instead the Service should synthesize information about what is known about the species and its habitat needs.

B. Unoccupied areas should be identified and designated as critical

The ESA requires the designation of critical habitat for listed species, encompassing all areas essential to the conservation, including survival and recovery, of the species. Importantly in a climate change context, the ESA explicitly allows the Services to designate critical habitat "outside the geographical area occupied by a species at the time it was listed, upon a determination that such areas are essential for the conservation of the species" (16 U.S.C. § 1532(5)). As species and habitats shift in response to climate change, protecting habitat areas outside of the current range, including stepping stone patches and corridors to facilitate species movements to new areas and shifting habitat, will become critical to allowing species to persist in a changing climate. In the case of the Florida black bear, the Service should identify and designate habitat that will protect the species from further development impacts and climate change.

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[25] *Id.* § 1533(b)(6)(C)(ii). *See also* 50 C.F.R. § 424.17(b)(2)(If critical habitat is not determinable, the Service "may extend the 1-year period specified in paragraph (a) of this section by not more than one additional year.").

[26] *See Enos v. Marsh*, 616 F. Supp. 32, 61 (D. Haw. 1984), *aff'd*, 769 F.2d 1363 (9th Cir. 1985); N. Spotted Owl, 758 F. Supp. at 625-26 ("In no event may the secretary delay the designation of critical habitat for more than twelve months . . . "); *Colo. Wildlife Fed'n v. Turner*, Civ. No. 92 F 884, 1992 U.S. Dist. LEXIS 22046, at *13-14 (D. Colo. Oct. 27, 1992). *See also Ctr. for Biological Diversity v. Evans*, No. C 04 04496 WHA, 2005 WL 1514102 (N.D. Cal. June 14, 2005) ("Congress did not contemplate paralysis while critical habitat issues were studied to death.").

[27] H.R. Rep. No. 97 597 (1982), *reprinted in* 1982 U.S.C.C.A.N. 2807, 2819-2820 (emphasis added). *See also N. Spotted Owl*, 758 F. Supp. at 625.

VIII. CONCLUSION

For the reasons discussed above, the Florida black bear is currently in danger of extinction in all or a significant portion of its range or likely to become so in the foreseeable future.

The Florida black bear, Florida's largest land mammal, once roamed freely throughout the southeast. It now occupies only 18 percent of its original range, in seven highly isolated subpopulations. Land use decisions, hunting, and human population growth cut the population from an estimated 11,000 to just 300. For several years, state protections helped bring bears back from the brink of extinction. The population is now estimated at 3,000-3,500, but threats loom large.

Continuous development coupled with the weakening of Florida's growth management laws and the state legislature's failure to adequately fund land protection programs, threaten the last remaining wild places the black bear needs to survive. Bears are losing their genetic diversity, vehicle collisions continue to be on the rise, and human-bear encounters are at an all-time high as bears rummage through unsecured garbage searching for food. This has created so-called "problem bears," resulting in wildlife managers removing or killing them to prevent future conflict. Wildlife managers killed 108 Florida black bears for this reason in 2015 alone. With Florida's population expected to increase by nearly 50 percent by 2060, and at higher rates surrounding some of the subpopulations, these threats will only worsen. Unfortunately, Florida's response has been not only to remove the bear from the state list of threatened species, thereby stripping away several important regulatory protections for the species, but also to hunt the bears, completely misunderstanding the problem and solutions. Despite tremendous public outcry and protest, FWC sanctioned its first hunt in more than two decades, resulting in the death of at least 304 bears in just two days with an undetermined number of cubs left orphaned. These threats coupled with saw palmetto berry shortages and mismanagement, the Florida black bear's small subpopulation sizes, climate change, and fire mismanagement threaten the Florida black bear with extinction in all or a significant portion of its range.

There is no question that under the five listing factors of the Act, listing the Florida black bear may be warranted. The Service must act promptly to protect this umbrella species and a symbol of Florida's last remaining wild places.

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