



Black Bear Program Update

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Today's presentation is an update on FWC's Bear Management and Research Program.

Bear Program Overview

■ Population Conservation

- ✓ Bear demographic modeling
- ✓ Monitoring mortality
- ✓ Providing area-specific data

■ Habitat Conservation

- ✓ Habitat management practices
- ✓ Connectivity and corridors
- ✓ Increasing lands in conservation



■ Human- Bear Conflict

- ✓ Trends in conflict and agency response
- ✓ Waste Management
- ✓ BearWise funding

■ Education and Outreach

- ✓ Partnering with new stakeholders
- ✓ Input from the public



In 2012, the Florida Fish and Wildlife Conservation Commission (FWC) approved a 10-year management plan that guides bear management and conservation in Florida. The goal of the plan is to maintain sustainable bear populations in suitable habitats throughout Florida for the benefit of the species and people. We are now at the half-way point in our plan. This presentation will provide an update on each of the 4 focus areas of the plan: Population Conservation, Habitat Conservation, Human-Bear Conflict and Education and Outreach.

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- ✓ BearWise funding

- **Education and Outreach**

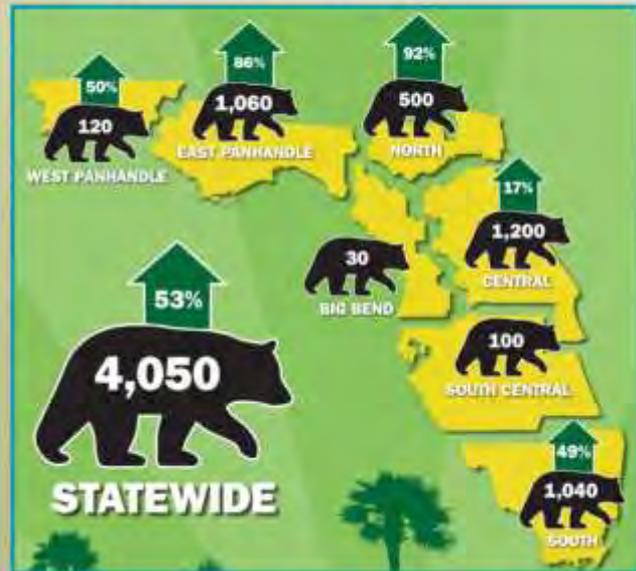
- ✓ Partnering with new stakeholders
- ✓ Input from the public



This portion of the presentation will provide an update on Population Conservation efforts.

Status and Abundance Estimates

- 1970s = 300 bears
- 1974 = State Threatened
- 2002 = 2,700 bears
- 2012 = Recovered
- 2015 = 4,000 bears



Bear populations have made a remarkable recovery in Florida and today are growing and expanding. This slide covers a brief overview of their population status through time. By the 1970's, there was a sharp decline in bear numbers, with as few as 300 bears statewide. In 1974 the Game and Fish Commission listed the Florida Black Bear as threatened under state rule. In 2002, FWC estimated there were around 3,000 bears statewide. In 2012 FWC finished development of the Bear Management Plan, which was approved by the Commission in August and triggered the removal of the bear from the state threatened species list. In 2015, FWC estimated there were over 4,000 adult bears in Florida. This most recent population abundance research has been accepted for publication in the peer-reviewed scientific Journal of Wildlife Management.

Core Bear Demographic Studies

| Subpopulation | Abundance Estimate | Demographic Research |
|----------------|--------------------|----------------------|
| West Panhandle | 2015 | 1998 |
| East Panhandle | 2015 | 1993 |
| North | 2014 | 2005 |
| Big Bend | 2012 | 2004 |
| Central | 2014 | 2009 |
| South Central | 2012 | 2012 |
| South | 2015 | 1994 |



Florida has robust information about bears in each of the Bear Management Units. FWC and partners have conducted population estimates as well as demographic research in all 7 of our Bear Management Units. We continually work to update this demographic information.

Demographic Values

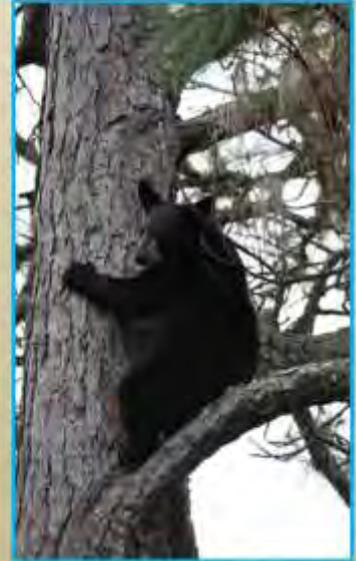
| Bear Management Unit | Demographic Parameters | | | | |
|----------------------|--------------------------|---------------------|----------------|-------------------------|-----------------|
| | Adult Female Survival/Yr | Average Litter Size | Percent Female | Documented Mortality/Yr | Population Size |
| East Panhandle | 91% | 2.17 | 68% | 93 | 1,060 |
| North | 97% | 2.10 | 61% | 11 | 500 |
| Central | 91% | 2.08 | 60% | 161 | 1,200 |
| South | 97% | 1.80 | 43% | 25 | 1,040 |



In order to model population growth, there are certain important demographic parameters that are needed. Annual adult female survival is estimated based on collaring bears and tracking them over time to determine their fates. Average litter size is estimated by capturing and collaring females in a population and then checking how many cubs they have in their winter dens each year. The percent of the bear population that is female was determined by identifying the sex of bears from DNA left in hair snares. Documented annual mortality includes bears the agency recovers that have died, mostly from vehicle collisions, but also from illegal kills, conflict removals, and other causes of death. Population size comes from the abundance research done using hair snares and mark-recapture modeling.

Population Growth Modeling

- Four large bear management units
 - East Panhandle
 - North
 - Central
 - South
- Matrix population model with transient analyses
- Utilized demographic information
- Thousands of model runs



One way to estimate population growth is through the use of transient matrix models. These models take values of the key demographic parameters for bears in each BMU to predict population size and run thousands of simulations to develop a distribution of growth rate outcomes. FWC completed such analyses for the four large BMUs this year. The resulting distributions are shown on this slide. Each gray column is a simulation, and the red line represents the point at which the population is stable, where to the left of the line the population declines and to the right the population is growing.

Population Growth

| Bear Management Unit | Annual Growth Rates based on: | | |
|----------------------|-------------------------------|--------------------|-------------------|
| | Abundance Estimates | Demographic Models | Previous Research |
| East Panhandle | 5.1% | 7.8% | N/A |
| North | 5.5% | 15.4% | 18.4% |
| Central | 1.3% | 2.2% | 0.92 - 10.0% |
| South | 3.1% | 12.2% | N/A |

Average growth rate = 9.4% per year



The FWC has several sources of data with which we can compare estimates of annual population growth rates:

- 1) Abundance Estimates = We can compare the population abundance estimates from 2002 with those conducted most recently in 2015
- 2) Demographic Models = We used demographic information, such as adult female survival and average litter size, to run a series of demographic transient matrix models to predict annual population growth over a 12 year period
- 3) Previous Research = Finally, we have done previous research on 2 of the 4 BMUs listed above that has since been published in peer-reviewed scientific journals:
 - a) North = Dobey, S., D. V. Masters, B. K. Scheick, J. D. Clark, M. R. Pelton, and M. E. Sunquist. 2005. Ecology of Florida Black Bears in the Okefenokee-Osceola Ecosystem. Wildlife Monographs 158.
 - b) Central = Hostetler, J.; Walter McCown, J.; Garrison, E.; Neils, A.; Barrett, M.; Sunquist, M.; Simek, S.; Oli, M. 2009. Demographic consequences of anthropogenic influences: Florida black bears in north-central Florida. Biological Conservation 142: 2456-2463

Apalachicola Bear Research Project

- Determine survival rates for cubs, sub-adults, and adult females
- Document movement patterns and home ranges
- Determine reproductive rates for adult females
- Gather related life history information, such as
 - Weights
 - Sex ratios
 - Health



Starting in the summer of 2016, FWC initiated a research project to update information about the bear population in the East Panhandle BMU, living in and around the Apalachicola National Forest.

Apalachicola Bear Research Project

- 40 Captures (24 males: 16 females)
 - 125 lbs - female average weight
 - 178 lbs - male average weight
- 16 females collared
 - 78,900 locations
- 13 females reproduced
 - 32 cubs (20 female, 12 male)
 - 2.46 mean litter size (1 to 4)



During the first summer, staff caught and put GPS collars on 16 adult female bears. Staff then located dens, collared cubs, and are monitoring their survival. This project is scheduled to be completed in 2019.

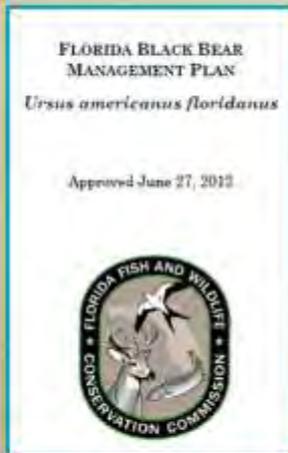
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- Education and Outreach

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- ✓ Input from the public



This portion of the presentation will provide an update on Habitat Conservation efforts.

Bear Food Habits

- Opportunistic feeder
- 80% plant, 15% insect, 5% animal
- Wide variation by season and year
- 66 species of plants
- 45 species of animals



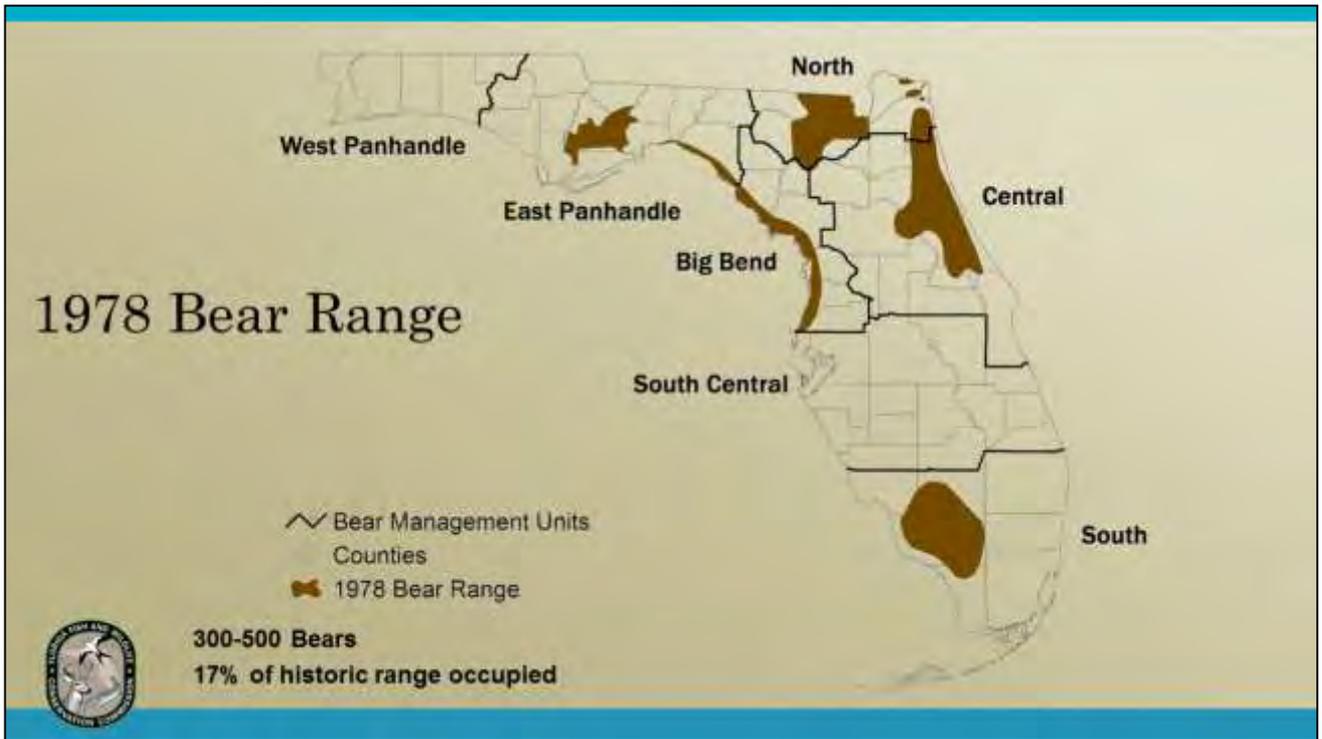
Bears eat almost anything, and their diet varies widely not only by season but also from year to year. In one season of one particular year, they may be eating saw palmettos, while next year during that same season, they are seeking out gallberry instead. Bears are highly adaptable and will take advantage of whatever is available.

Bear Habitat Use

- Bears use a variety of habitats:
 - Large home ranges
 - Matrix of vegetation types
 - Diverse food sources
- Habitat management provides :
 - Variety of forest ages
 - Increased diversity of food sources
 - Mosaic of burn seasons and intervals



Bears use a variety of habitats and benefit from prescribed fire, timber management, and other management practices. These practices maintain the healthy condition of their habitat within their large home ranges, offering a variety of food sources at different stages of forest growth.



In the late 1970's, an estimated 300-500 bears occupied approximately 17% of their historic range.



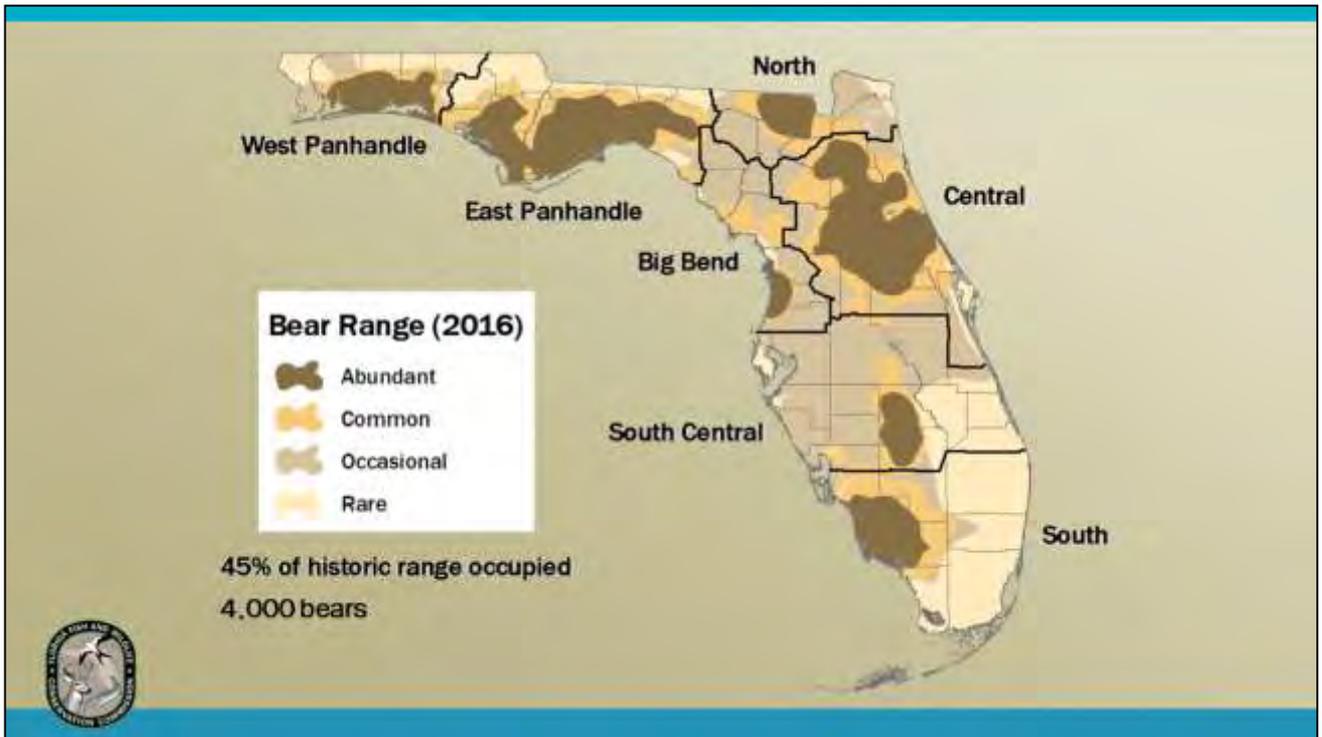
In 2002, an estimated 2,700 bears occupied approximately 31% of their historic range.



In 2016, an estimated 4,000 bears occupied approximately 45% of their historic range.



Bears occupy 58% (or 9.6 million acres) of the over 16 million acres in Florida that have the habitat characteristics important for bears that we refer to as potential bear habitat. The type and size of the habitat and how close or connected it is to other high quality habitat are the main characteristics we are using to quantify potential bear habitat. There are just under 7 million acres (42%) of potential bear habitat still out there for bears to utilize.



Of course, the actual use of areas by bears is more complex than simple range maps, so we divide the state into 4 categories based on how frequently bears occur throughout Florida.

- Abundant areas are those with the highest density of data points on bears (e.g., captures, sightings, locations), indicating bears are spending a considerable amount of time in these areas.
- Common areas are the second highest density areas, and these areas are where bears are spreading from their core areas and spending a fair amount of their time in these areas.
- Occasional areas are parts of the state where bears occur irregularly, but their presence is not unexpected given the proximity to abundant and common areas.
- Because bears have been seen in nearly every part of Florida at some point, we categorized the rest of Florida as rare areas.

More Habitat Protected

| Bear Management Unit | Area of Potential Bear Habitat Protected (acres) as of 2016 | Percent Change 2012 to 2016 |
|----------------------|---|-----------------------------|
| West Panhandle | 745,210 | +3.1% |
| East Panhandle | 1,256,421 | +2.2% |
| Big Bend | 483,898 | +1.2% |
| North | 426,940 | +3.7% |
| Central | 1,394,518 | +6.4% |
| South Central | 934,876 | +5.8% |
| South | 1,197,775 | +2.1% |
| TOTAL | 6,439,639 | +3.7% |

≈230,000 more acres protected



While we recognize there has been some loss of potential and even occupied habitat since the Bear Management Plan was approved in 2012, we are pleased to report the FWC has been able to assist in getting almost 230,000 additional acres of bear habitat protected. The increase in protected habitat on both public and private lands has been accomplished by working with partner agencies, stakeholder groups, and private landowners to protect bear habitat through outright purchase, easements, and other methods, which guarantees these lands will remain in bear habitat into the future.

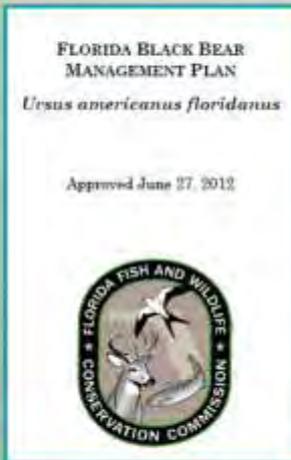
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- Education and Outreach

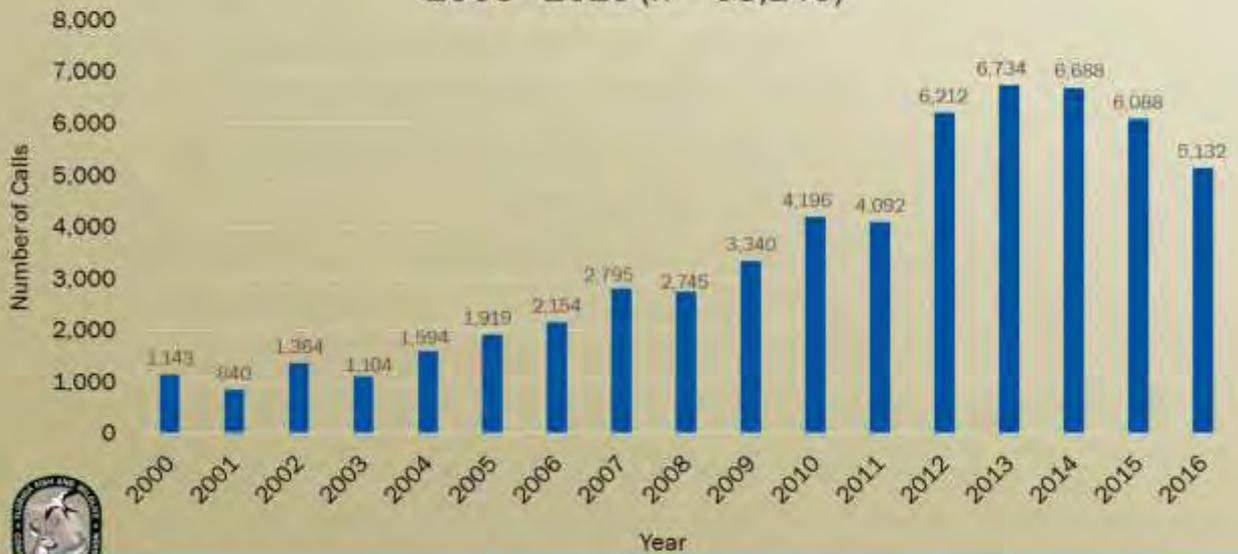
- ✓ Partnering with new stakeholders
- ✓ Input from the public



This portion of the presentation will provide an update on Human-Bear Conflict efforts.

Statewide Bear Related Calls

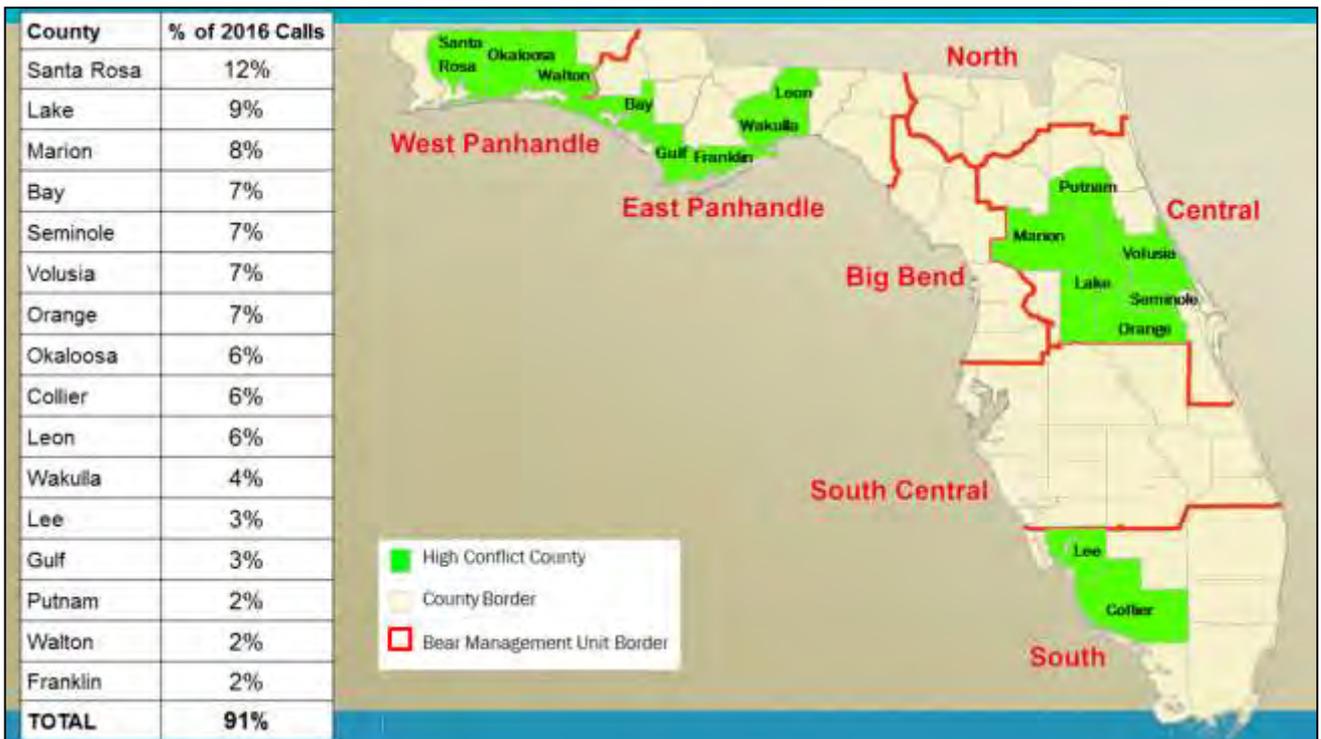
2000 - 2016 (n = 58,140)



While the number of calls have increased between 2000-2013, the reasons for the calls and how much they account for of the overall calls has not changed.

Almost 70% of all the calls received by FWC about bears concern bears being attracted into an area, typically getting into the trash or other human-provided foods, which is usually the reason for the bear being in the area.

Calls have been declining the last three years.



While bears can and have shown up in every county at some point, 91% of our bear calls in 2016 came from 16 counties, shaded in green on the map. We therefore have concentrated our efforts to work with local governments, waste service providers, residents, and businesses in these areas to reduce human-bear conflicts in a variety of ways.

Statewide Response to Conflicts 2015 to 2016



| FWC Action | 2015 | 2016 |
|------------------------------|-------|-------|
| Total Bear Calls | 6,088 | 5,132 |
| Feeding-Related Calls | 3,358 | 2,729 |
| Biologist Site Visit | 539 | 554 |
| Law Enforcement Notification | 89* | 163 |
| Capture Effort | 344 | 234 |

* Notifications not available until July 2015

- The majority of calls we receive about bears are related to bears seeking out food sources from people. Many of the calls we receive result in the FWC providing information on bears and advice on how to keep bears from accessing food sources.
- Roughly 10% of our calls result in biological staff or contractors going out to visit directly with residents and businesses to try to determine what is attracting bears and advise on how to prevent conflicts.
- Law enforcement issues notices of non-compliance with the bear feeding rule to encourage people to secure garbage or other attractants. The notification is a formal reminder the person's actions are attracting bears, and therefore could be in violation of the law. Often, the notification is enough to change people's behavior without the need to issue a warning or citation.
- Note that the bear feeding rule change that allowed for notices of noncompliance did not go into effect until July 2015, so law enforcement only had that tool available to them for half of 2015.
- Around 5% of our calls warrant a trapping effort to remove a bear, either to kill a bear because it is a risk to public safety or in rare cases to move it to a more remote location.

Why are Calls Down?

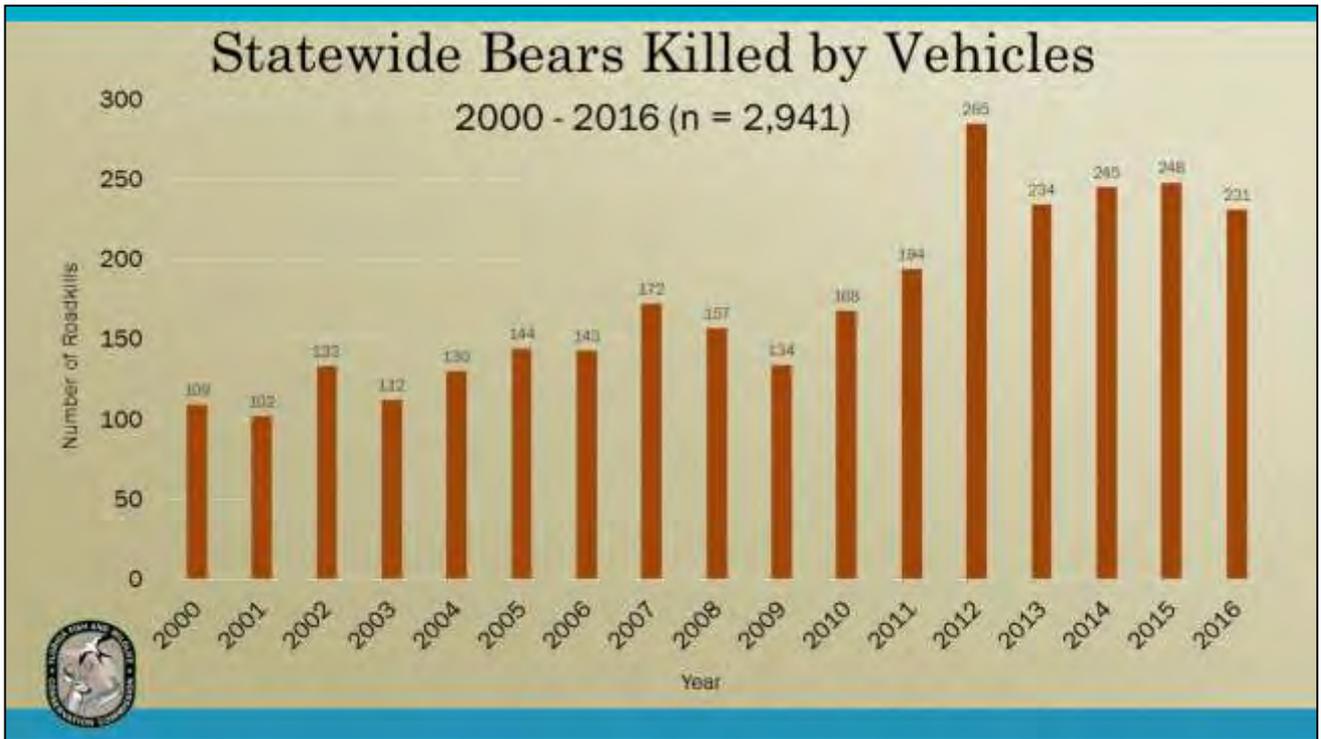
- Natural food variation
- Aggressive removal of bears in 2015
- Public may not be calling FWC
- Hunt helped remove conflict animals



Raithel, J. D., Reynolds-Hogland, M. J., Koons, D. N., Carr, P. C. and Aubry, L. M. (2016). Recreational harvest and incident-response management reduce human-carnivore conflicts in an anthropogenic landscape. *J Appl Ecol.* doi:10.1111/1365-2664.12830



There are a number of factors that influence the number of calls the FWC receives about bears. The primary driver in most states is the boom and bust cycle of natural foods. I am sure many of you noticed how many more acorns were on the ground last fall, that was the case across the state, which can decrease the number of calls about bears as they are spending more time foraging on acorns. Another influence could be the high number of bears we removed for risk to public safety in 2015. Before that time, we removed an average of 36 bears a year for this reason, but in 2015, we removed 112 bears. This resulted in fewer bears that were spending a lot of their time in neighborhoods generating calls. We also speculate that people may not be calling FWC for a number of reasons. Finally, we believe that it is likely the hunt removed some bears that would have been causing conflicts, and the removal of bears in core forested areas decreased the pressure on bears to disperse. An article recently published in peer-reviewed scientific *Journal of Applied Ecology* showed that hunting coupled with conflict removal reduced overall conflicts as compared to conflict removal alone.



Vehicle strikes have trended upwards since the 1990's, with a spike in 2012 followed by consistently high numbers over the past four years. These collisions impact both bears and people, with significant property damage and human safety issues for motorists.

FWC closely monitors where vehicle strikes occur most often and work closely with the Florida Department of Transportation to try and reduce these situations. We provide locations where bear crossing signs are needed to alert motorists of particularly dangerous sections of roads, and in areas where we can provide safe passage for bears and other wildlife from one natural area to another, we incorporate wildlife underpasses, either as part of already existing bridges or when road improvements are made to specifically address wildlife crossings.

BearWise Awards

| Name | Award |
|------------------------|-----------|
| Collier County | \$4,899 |
| F.W. Village (Collier) | \$12,600 |
| Franklin County | \$2,400 |
| Carrabelle (Franklin) | \$1,000 |
| Gulf County | \$25,422 |
| Lake County | \$200,000 |
| Leon County | \$30,000 |
| Marion County | \$22,000 |

| Name | Award |
|--------------------------|-----------|
| Orange County | \$200,000 |
| Putnam County | \$18,000 |
| Seminole County | \$200,000 |
| Springs Lndg. (Seminole) | \$9,000 |
| Volusia County | \$40,000 |
| Daytona (Volusia) | \$20,000 |
| DeBary (Volusia) | \$20,000 |
| Wakulla County | \$19,679 |



The Legislature approved \$500,000, most of which came from permit sales from the 2015 bear hunt, to be cost-shared with local governments to keep trash and other items secure from bears.

60% of these funds were required to go to local governments that require people to keep trash and other attractants secure from bears.

In addition to state funds, FWC was granted \$325,000 in proceeds from the Conserve Wildlife license plate from the Fish and Wildlife Foundation of Florida.

FWC received applications from 12 counties, 3 cities, and 4 homeowner's associations.

FWC is providing funds to 11 counties, 3 cities, and 2 homeowner's associations.

Projects will result in almost 4,000 additional bear-resistant trashcans, 2,500 sets of hardware to modify regular trashcans to make them bear-resistant, and over 40 dumpsters modified to keep bears out.

Working with Waste Service Industries

- Testing new designs for fully automated bear-resistant trashcans
 - Golden Gate Estates
 - Central Florida captive and wild bears
- Memorandum of Understanding with waste services providers
 - Providing bear-resistant equipment in timely and affordable manner
 - Waste Pro (Panhandle)
 - Republic Services of Florida
 - New!



The FWC has been actively working with manufacturers of bear-resistant trashcans to assist in testing new models. In the last year, we have been approached by 3 different companies to test bear-resistant trashcans that can be used with fully automated waste service systems, which have become increasingly prevalent in Florida. The FWC teamed up with the community of Golden Gate Estates, Collier County, and Waste Management to test how cans from 2 of these companies worked for 3 months, from the resident's perspective as well as the waste service provider. Results were encouraging, and companies have been moving forward with additional improvements on their designs.

In addition to our more formal test in Collier County, the FWC has been testing cans with both captive and wild black bears in Central Florida.

All 3 companies are ready to offer their latest designs to Floridians this Spring.

The FWC created a Memorandum of Understanding (MOU) with Waste Pro to define the agency and waste service company roles in reducing human-bear conflicts. Currently, FWC is working with Republic Services of Florida on a similar MOU.

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This portion of the presentation will provide an update on Education and Outreach efforts.

Working with Stakeholders

- Bear Technical Assistance Group (TAG) meets twice a year
- Bear Stakeholder Groups (BSG) meet quarterly
- Met with new stakeholders then integrated them into BSGs and TAG



As part of writing the 2012 Bear Management Plan, the FWC had over 20 groups representing government partner agencies, non-profits, and businesses on a Technical Assistance Group (TAG) to provide their input on the plan. The FWC continues to meet twice a year with the TAG to provide updates and get feedback on bear issues. The Plan set up 7 Bear Management Units (BMU) so we could manage the different bear populations based on the characteristics of the bears, habitats and people who live there. Each BMU has a Bear Stakeholder Group (BSG) to get local input and assistance from stakeholders on area-specific issues. The BSGs meet 4 times a year to discuss bear issues and take on tasks to assist with bear management.

The 2015 bear hunt brought stakeholders to the forefront who had not been involved in bear issues in the past. The FWC reached out to these stakeholders and met with a select group of them. As a result of these meetings, we added 5 new groups to the TAG and new stakeholders to our BSGs to get their input.

Public and Stakeholder Input

- Emails and letters to FWC
 - 3,818 do not support a hunt
 - 476 support a bear hunt
- Petitions active to both support and not support bear hunting
- International Association for Bear Research and Management
 - “...we believe that proposals to integrate well-planned and regulated hunting into black bear management plans and practices are reasonable, responsible, and scientifically defensible.”
 - “...although it is imperative to distinguish between science and values, successful conservation is conducted within a cultural context; societal values help shape effective conservation goals and direction.”



FWC has continued to get input on bear management with a focus on hunting. There are active petitions online to both support and not support bear hunting in Florida. Additionally, the FWC received a position statement from the International Association of Bear Research and Management that addresses the role of hunting in modern bear management.

Scientific Survey on Bear Management

- Conducted by Responsive Management in November 2016
- Representative sample of Floridians
 - Knowledge about bears/ opinions on habitat
 - Opinion on management/ experience with bears/ bear problems
 - Willingness to take action/support rules to reduce conflicts
 - Opinions on hunting



In addition to our direct outreach efforts, we worked with a company to conduct a statewide survey of Floridians to learn about their knowledge of bears, opinions on bears, bear habitat, and management, willingness to take actions to prevent conflicts, and support for management actions. Responsive Management is an internationally recognized public opinion and attitude survey research firm specializing in natural resource and outdoor recreation issues. The company conducted a phone survey of Floridians representing the statewide population. The survey provided us with a wealth of important information. The next few slides provide some of the highlights.

Bears and Bear Habitat

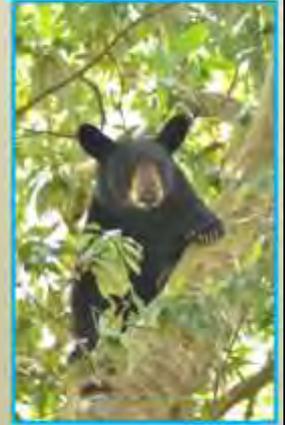
- 80% are aware bears live in the wild in Florida
- 96% say keeping habitat for bears is important
- 53% say there is enough habitat for bears in Florida



Overall, Floridians are aware that bears live in Florida and want to keep habitat for them.

Management/ Experience/ Problems with Bears

- 64% approve of how FWC is managing bears
- 31% say they have seen a bear in the wild in Florida
 - 63% positive
 - 8% negative
- 55% say bears are a problem in Florida
- 3% have had problems with bears in the past 2 years



Most Floridians have favorable opinions of FWC's bear management and are aware that bears can cause problems.

Willingness to Take Action and Support Rules

- 94% willing to keep trash secure until morning of pick up
- 87% willing to remove/secure outdoor pet food
- 86% willing to clean/secure outdoor grill
- 82% willing to modify can to resist bears
- 87% support rules to keep trash secure
- 84% support penalties for feeding bears

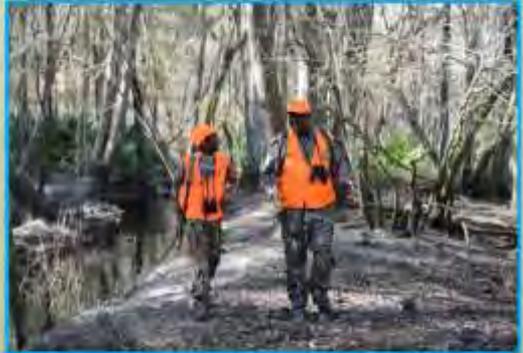


A large majority of Floridians are willing to take actions to secure trash and other attractants for bears.

In addition, a large majority of Floridians are supportive of rules that would require residents and businesses to keep trash and other attractants secure from bears. We now have 4 counties (Seminole, Lake, Santa Rosa, and Orange), 1 city (Fort Walton Beach), 1 military base (Hurlburt Field), and several homeowner's associations in Florida who these rules in place.

Views on Regulated Hunting

- Regulated hunting in general:
 - 70% Support
 - 22% Oppose
- Hunting bears:
 - 48% Support
 - 43% Oppose
- If hunting bears is compatible with healthy bear numbers:
 - 62% Support
 - 28% Oppose



A majority of Floridians are supportive of regulated hunting of wildlife in general. However, Floridians were split when it comes to hunting bears, with slightly more in support than against bear hunting. A majority of Floridians supported bear hunting if they knew hunting was compatible with healthy, sustainable bear populations.

Bear Management Evolution



All bear management elements discussed today fit into the larger context of an evolving bear conservation story. The history of bears in Florida has had highs and lows, but in recent years has become a true conservation success story.

| Conservation Focus Area | Total Plan Action Items (#) | Action Items Scheduled between 2012 and 2016 | | |
|-------------------------|-----------------------------|--|--------------------------------|--------------------------------|
| | | Action Items (#) | Action Items with Progress (#) | Action Items with Progress (%) |
| Population | 15 | 12 | 14 | 117% |
| Habitat | 22 | 19 | 13 | 68% |
| Conflict | 18 | 18 | 18 | 100% |
| Outreach | 35 | 34 | 33 | 97% |
| TOTAL | 90 | 83 | 78 | 94% |



FWC continues to focus on the objectives of the Bear Management Plan as we manage for sustainable coexistence with bears. Staff and partners have been successful in implementing nearly all actions identified for the first five years within the plan.

Bear Management Plan: a work in progress

Population Conservation

- ✓ Update demographic data
- ✓ Monitor mortality
- ✓ Update population estimates

Habitat Conservation

- ✓ Improve habitat management
- ✓ Secure corridors/ connectivity
- ✓ Increase lands in conservation



Human- Bear Conflict

- ✓ Expand bear resistant can availability
- ✓ Secure new waste service MOUs
- ✓ Increase/ distribute BearWise funding

Education and Outreach

- ✓ Improve and expand public awareness
- ✓ Add new partners to stakeholder groups
- ✓ Explore local input for management



We have accomplished much in the first 5 years of our 10 year Bear Management Plan, but there is much yet to be done and many more tasks to complete as we move into the future. We are at half time for our Bear Management Plan and, like in any game, now is a good time to assess where we are and whether we need to make any changes to our game plan. Much has happened and changed over the past five years and staff looks forward to continuing to work with Commissioners, partners, and stakeholders on how best to move forward.