NJDEP Division of Fish and Wildlife

Status Report On the Implementation of the 2015 Comprehensive Black Bear Management Policy January 4, 2018

INTRODUCTION

The New Jersey Division of Fish and Wildlife (DFW) manages black bears according to its Comprehensive Black Bear Management Policy (CBBMP) to ensure the continued survival of black bears in New Jersey. This approach allows the DFW to address the bear-related property damage and safety concerns of residents and farmers while maintaining a healthy population of black bears in the state. Human safety concerns are primary consideration of the state's black bear management program because NJ experienced its first documented human fatality from a black bear attack in 2014, which reinforces the importance of proper management for this species. With appropriate management, the black bear will continue to provide an overall benefit to the citizens of NJ in the form of wildlife appreciation, observation, hunting, and ecosystem balance.

The CBBMP is an integrated management approach with its statutory framework provided by N.J.S.A. 13:1B-28. DFW provides scientific evidence to the Fish and Game Council (the Council), which opens and closes seasons, and sets season lengths, bag limits and manner of take to ensure long-term stable populations and to responsibly and equitably distribute recreational opportunity to user groups.

On February 28, 2005, the NJ Supreme Court held that a black bear hunt must conform to a comprehensive black bear management policy developed by the Council and approved by the DEP Commissioner (U.S. Sportsmen's Alliance Found. v. N.J.D.E.P., 182 N.J. 461, 867 A.2d 1147 (2005)). The opinion indicated that comprehensive policies should include: 1) black bear management objectives, 2) a detailed outline for meeting those objectives, 3) the tools at the Council's disposal, and 4) the criteria used to determine which tools are selected.

Since 1980, the DFW has been conducting research on NJ black bears and has utilized an array of tools for managing black bears. The CBBMP was formally adopted in 2005 according to the instructions/guidelines of the NJ Supreme Court, then reviewed and revised both in 2010 and 2015 through the regulatory process (NJ Administrative Procedures Act - APA). The CBBMP is incorporated into the NJ Game Code following the full APA process. The current policy sunsets in June 2021.

Key elements of the CBBMP and the DFW's integrated approach to black bear management in New Jersey include: 1) education, 2) control of human-derived food, 3) research, 4) bear habitat analysis and preservation, 5) black bear response (lethal and nonlethal control), 6) population control. Details and significant accomplishments for these elements of the CBBMP are provided below.

Education

Public education is an important component of any species management program and especially important for black bear management since bear-human interactions can pose a serious threat to human life and property. The DFW continues to conduct an extensive educational campaign to provide NJ residents and visitors with techniques and methods for minimizing negative interactions in areas where black bears exist. DFW's educational outreach on bears has been ongoing since the 1980s with the primary message being "Do Not Feed Bears." More than 1,700,000 pieces of information and materials published since 2007 by DFW. Annually, DFW airs radio and television public service announcements concerning bear behavior on a seasonal basis. The DFW's main bear webpage (www.njfishandwildlife.com/bearfacts.htm) continues to provide up-to-date information on bears and avoidance of negative human-bear interaction. Additionally, since 2015, DFW increased its presence on social media, specifically Facebook, to increase public awareness about bears. Guidance on how to prevent dangerous encounters with black bears have been posted on Facebook, increasing public awareness about how to react correctly if a conflict occurs.

Significant accomplishments since 2015 CBBMP was approved include:

- DFW presented educational programs to nearly 15,000 people in 19 counties.
- DFW partnered with "Untamed Science" to produce more than 200 copies of the *Understanding Black Bears* educational kits to schools.
- DFW partnered with Untamed Science to convert the *Understanding Black Bears* curriculum to a web-based portal, which K-8 teachers and students can use free of charge.
- DFW updated content on the NJDFW website.
- DFW has updated, produced, and distributed 1,000 "Living in Bear Country" DVDs, 150,000 Know the Bear Facts brochures (40,000 in Spanish), 1,000 educational magnets, and 6,500 Bear Safety Signs for State Park trailheads.
- DFW increased its presence on social media, specifically Facebook, to increase public awareness about bears.

Control of Human-Derived Food

Controlling bears access to human-derived food is critical to reducing bear-human interactions. DEP and DFW law enforcement officers have inspected thousands of residential properties in high bear incident areas and found near complete compliance with black bear garbage management guidelines, suggesting the black bear education effort has been effective in obtaining such compliance. NJ legislation enacted in 2002 that banned the intentional feeding of bears (N.J.S.A. 23:2A-14) was helpful in reducing bear-human conflicts because bears habituated to human food sources through intentional feeding can cause problems for entire communities. However, experience has shown that the ambiguous definition of unintentional feeding as contained in the statute has made effective enforcement difficult. Still, over 90% of homeowners are complying with the law's requirements.

DFW has been successful at aiding municipalities and other entities in implementing important controls into their waste management programs. These programs were implemented in an effort to reduce human-derived food sources for black bear in NJ.

Significant accomplishments since 2015 CBBMP was approved include:

- DFW investigated 53 locations for bear feeding; 32 verbal or written warnings were given and officers issued 2 summonses.
- DFW continues to work with waste haulers in several municipalities and is helping coordinate ongoing community-wide bear-resistant garbage container programs in Denville and Mountain Lakes.
- DFW has drafted amendments to the bear feeding law to provide more effective enforcement however no legislation containing theses fixes has been introduced.

Research

DFW continues to use the most advanced scientific knowledge and modeling available, in concert with its science and education partners, to provide the most accurate population estimates possible.

Since 1981 DFW personnel have handled over 9,400 individual black bears; DFW staff have tagged and released alive over 3,700 bears, including 1,069 young-of-the-year at dens. During this same period, DFW personnel have collected data from 6,701 bears that died for various reasons, including vehicle strikes (1,568) control action, illegally killed or unknown cause of death (821) and hunting seasons in NJ, PA and NY (4,312).

Research over the past five years that included surveys, captures of previously tagged bears, den studies, reproduction analyses and density analyses confirm that northwestern NJ continues to have one of the densest black bear populations in the country and one of its most productive, with large litter sizes and high cub survival rates. DFW has determined that the average litter size is 2.7 cubs per litter in NJ whereas other less productive areas of the country average 1.9 cubs per litter (Western North America) and 2.3 cubs per litter (Eastern North America except PA). The most common litter size in NJ is 3 cubs, which has not changed over the 35 years that DFW has conducted research. This consistent cub birth rate supports our understanding that the superior bear habitat in the northern NJ-northeastern PA-southeastern NY area is what drives population expansion of black bears in this region, not access to human foods.

DFW continues to radio-collar and monitor bears using radio telemetry to acquire information on reproduction, survival, mortality, home range size and habitat use. Since 2015, study results from three cooperative research projects have been published in peer-reviewed journals (Raithel et al. 2016, Raithel et al. 2017, Tri et al. 2017). Noteworthy findings from this research include the following:

1) during years immediately following bear harvest and education outreach, human-bear conflicts declined significantly, whereas human-bear conflicts increased significantly during years immediately following bear harvest moratoria,

2) harvest disproportionately removed bears categorized as "conflict" bears,

3) bear harvest affected bear behavior by inducing a "landscape of fear" in areas where most human-bear conflicts occur,

4) female bears living in close proximity to human development had more cubs compared to females living in wild areas. However, cubs in wild areas had higher survival, indicating that areas near human development serve as a bear population "sink", whereas wild areas serve as a bear population "source".

Although DFW has continued research trapping activities in southern NJ, lower bear densities and sporadic sightings have resulted in relatively fewer captures than in previous years.

The intensive population monitoring that DFW has conducted over the past 35 years has shown that the NJ bear population is robust and viable and maintains a high reproductive and survival rate. This finding is in concert with population parameters reported for other viable populations in the mid-Atlantic region. In fact, NJ's bear population, like all other mid-Atlantic populations, are larger, denser and exhibit a higher rate of fecundity compared to other, less productive habitat areas of the country. In addition, research data collected since 2015 continues to show that at least 70% of the bears handled each year are not previously tagged, further indicating a robust and fecund population.

Significant accomplishments since 2015 CBBMP was approved include:

- DFW biologists captured 436 bears for research tagging and biological sampling, 77% of which were not previously tagged.
- DFW worked on 96 bears in winter dens for ongoing fecundity measurements.
- DFW biologists handled 2 adult female bears with a 6-cub litters.
- DFW continues to provide samples to East Stroudsburg University for DNA analysis and research on black bear diseases and parasites.
- DFW cooperated with University of WV and University of Utah on two research studies involving bear-human interaction.
- DFW is collaborating with Stockton University on a research review of bear birth control efficacy.
- DFW and Colorado State University are initiating research on bear-human conflicts.
- DFW cooperated with PA and WV and West Virginia University on a habitat use study in the urban-wildland interface.

Bear Habitat Analysis and Preservation for NJ's Bear Management Zones

Identifying, preserving, and managing important wildlife habitat in NJ is a primary function of DFW and DEP and NJ contains suitable habitat to support a viable, robust black bear population. DFW delineates Bear Management Zones (BMZ) for all areas of the State and are designated as

zones where bears should be managed at various densities consistent with land use, and biological and cultural carrying capacities

DFW determined that optimal bear habitat consists of $\geq$ 51% forest land and $\leq$ 33% urban land and $\leq$ 26% agricultural land. BMZs 1 and 3 have an average forest cover of 76% and are designated as excellent bear habitat. For this reason, DFW provided $1.4 million in funding for Green Acres to acquire habitat in the Highlands Region, specifically in BMZ 1 and 3.

DFW participated in a mid-Atlantic cooperative study of black bear habitat use utilizing GPS-radio collars. The study found that black bears used forested slopes and riparian corridors in the urban–wildland interface. Black bears on the urban–wildland interface selected habitats similarly to wildland bears. Habitat selection was similar for males and females, regardless of study area, time of day, season, or year. The results indicate that managers can employ the same suite of management tools to reduce bear-human conflicts at the urban–wildland interface that they use to deal with black bear conflicts in wildland areas (Tri et al. 2016).

DFW continues to work on the Connecting Habitat Across NJ (CHANJ) initiative, which uses GIS technology to identify and rank wildlife, including black bear, habitat and travel corridors.

Significant accomplishments since 2015 CBBMP was approved include:

- DFW provided $1.4 million in funding for Green Acres to acquire habitat in the Highlands Region, specifically in BMZ 1 and 3.
- DFW studied habitat use by bears in the urban-wildland interface and found that bears in the urban-wildland interface selected habitats similarly to wildland bears.
- DFW developed the NJ CHANJ initiative.

Black Bear Response: Lethal and Non-Lethal Control

When bear-human interactions occur in the NJ resident expect a rapid response from the state wildlife agency. DFW's Black Bear Rating and Response Criteria (BBRRC) is the most effective operating policy for response to bears that are a threat to human safety, agricultural crops, and property, or are a nuisance. The BBRRC identifies bear behavior which would result in DFW killing dangerous bears, aversively conditioning nuisance bears and monitoring naturally-acting bears; the BBRRC errs on the side of human safety.

DFW has determined that Category I black bears are those bears exhibiting behavior that is an immediate threat to human safety, agricultural crops, or property. These dangerous bears are euthanized by DFW staff to remove the threat. DFW has determined that Category II black bears are nuisance bears that are not a threat to life and property. Category II black bears are aversively conditioned with rubber buckshot and shellcrackers after capture so they receive a negative experience associated with the nuisance location and people. DFW has determined that Category

III bears are bears that are exhibiting normal behavior and are not creating a threat to the safety of the public or a nuisance. In general, these are animals observed and reported to DFW's WCU by the public or local authorities. Bears entering urban settings are considered Category III bears provided they don't exhibit Category I or II behaviors.

DFW's Wildlife Control Unit (WCU) and DEP's WARNDEP Hotline receive complaint calls and the DFW WCU provides response and control using the BBRRC.

The cooperation of law enforcement personnel from all levels of governmental agencies within black bear range is essential to the implementation of the bear response policy. Since January 2001, DFW has trained over 1,380 municipal, county and State law enforcement officers from 130 municipalities, 14 counties and 33 State, county and federal parks to assist DFW in black bear control. Between 2015-2017, the DFW trained 148 law enforcement officers in black bear control.

Depredation permits are issued to farmers that are experiencing bear-related crop damage and are invaluable for alleviating agricultural damage, especially when issued as soon as damage occurs.

Nuisance (Category II) bears are also eliminated through New Jersey's regulated black bear hunting seasons, which occurs in 2 segments each year (each segment is one week in length). Segment A occurs in October and Segment B occurs in December. In each NJ hunting season since 2003, approximately 20% of the tagged bears harvested were known Category II nuisance bears or bears captured at nuisance locations, thereby reducing bear-related problems without cost to the taxpayer. Without some method of population control to reduce and then maintain a viable bear population in NJ at densities compatible with the human population, human-bear conflicts would increase.

Although the number of overall complaints has varied since 2010, the number of Category I complaints has been reduced to a more manageable level since the hunt was enacted in 2010. In 2010, 236 Category I incidents were reported to DFW. In comparison, only 43 Category I incidents were reported in 2017.

DFW personnel, law enforcement personnel, State park police, landowners and farmers have killed 424 dangerous Category I bears since 1993.

Significant accomplishments since 2015 CBBMP was approved include:

- DFW trapped and euthanized 21 Category I bears. DFW captured 43 Category II nuisance bears at complaint sites, which were aversively conditioned with rubber buckshot as they were released.
- Municipal and State Parks Police euthanized 7 Category I bears.
- DFW removed 9 Category III bears from urban areas.
- DFW issued 84 permits to farmers to control bear crop damage.

Bear Population Management

DFW has made significant progress in stabilizing the NJ bear population. The management goal is to decrease and stabilize the black bear population at a level consistent with the available habitat and cultural carrying capacity.

A positive correlation between bear population size and bear complaints exists; as the bear population grows the number of bear complaints increases (Figure 1). This suggests that reductions in population size should contribute to reductions in bear complaints.

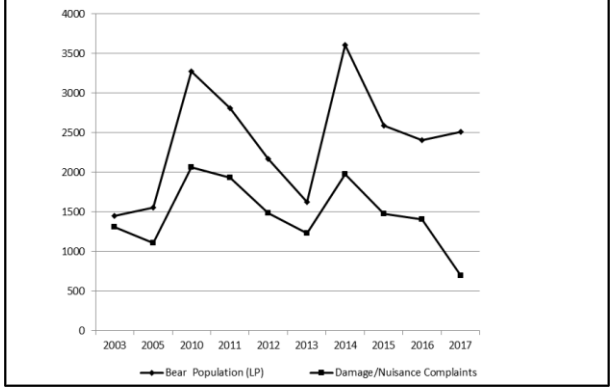

Figure 1. Correlation between black bear population size and nuisance and damage complaints in NJ. Black bear population estimates were calculated using a Lincoln-Petersen Index and represent the bear population on the day before the hunting season of the year estimated. Data are from 2003, 2005, and 2010 through 2017.

The DFW has researched the following population control measures:

1. Relocation:

No state or province has successfully used relocation as a means of population control. Based upon the cost and opposition to relocating bears, particularly nuisance bears, relocation is not a suitable tool for bear population control.

2. Alternative Methods of Population Control:

During the Corzine administration, then-DEP Commissioner Jackson requested a feasibility study on fertility control. The study, published in 2006, entitled *An Analysis of the Feasibility of Using Fertility Control to Manage New Jersey Black Bear Populations* concluded that fertility control, either chemical or physical, was not currently a viable tool for bear population control. The Northeast Black Bear Technical Committee (NEBBTC) has also reviewed this topic and determined that it is not a viable option for management of free ranging populations (NEBBTC, 2012). At this point in time, contraception is yet to be proven effective, even with isolated suburban deer. Thus, in keeping with court mandate, DFW cannot use it on bears.

3. Regulated Hunting:

A regulated hunting season is a safe, legal, and responsible use of the wildlife resource. It has also been proven to be the most effective means to control over-abundant game species in a cost-effective manner.

The 2003, 2005, and 2010 through 2017 hunting seasons established that hunters could safely harvest black bears in a controlled manner. During these seasons, DFW collected biological data

on the bears and demographic data on hunter success and participation, which DFW uses to design future management actions.

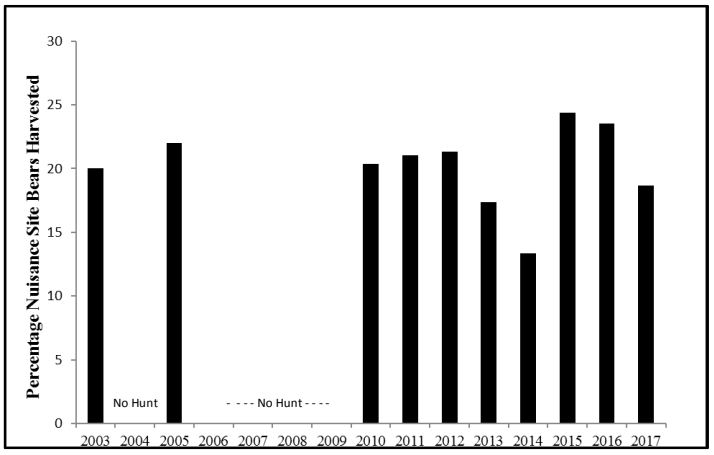

Figure 2. The percentage of bears harvested during each hunting season from 2003 through 2017 that were known to be involved in nuisance behavior or captured at nuisance locations. No hunt occurred 2004 and through 2006-2009 so no nuisance bears were removed from the population by means of legal hunting during these years.

Bear hunting seasons alleviate damage and nuisance incidents caused by problem bears. Approximately 20% of the tagged bears that were harvested during the past seven seasons were bears tagged at nuisance sites or in urban situations (Figure 2). The data suggests that as a result of the 2010 through 2012 hunting seasons, nuisance calls between 2011 and 2013 dropped 40%. In 2014, DFW measured an increase in the number of nuisance incidents which, the data suggests, was the result of an increase in the bear population due to a low harvest numbers during the 2013 season. DFW identified four factors that contributed to diminishing bear season harvest numbers in 2013: 1) season timing, 2) bear behavior, 3) hunter behavior, and 4) hunter participation. All of these factors were addressed in the 2015 CBBMP revision.

The hunting season structure of 2003, 2005, and 2010 through 2014 was timed to be conservative, restricting harvest to bears that had not yet entered winter dens. This conservative structure allowed important data to be collected on NJ bear harvest rates without negatively impacting the population. However, employing this conservative, late season structure during the past several years contributed to a reduction in harvest rates, which in turn, led to an increase in estimated bear population numbers from 1,911 in 2012 to 3,500 in 2014. Following revisions to the CBBMP in 2015, the 2016 and 2017 bear hunting seasons consisted of an October archery and muzzleloader season segment, the concurrent December Six-Day Firearm Buck Season segment. The Council also allowed hunters the ability to take two bears (one in October and one in

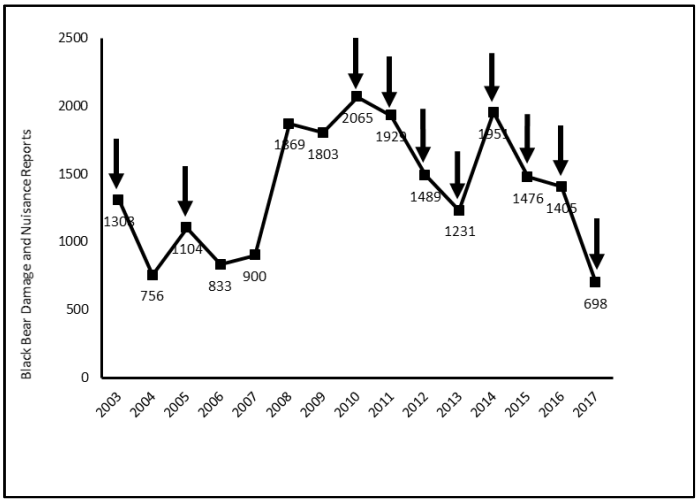

Figure 3. Total statewide nuisance and damage reports for black bears in NJ from 2003 through 2017. These reports are held within the New Jersey Department of Environmental Protection's NJEMS (NJ Environmental Management System) database and are obtained from residents reporting bear activity. Downward arrows indicate years with a regulated black bear hunting season.

December). The 2016 and 2017 season harvests were 636 and 409 bears, respectively.

The expansion of the hunting season in length, legal weaponry, and huntable area in the 2015 CBBMP has proven to be effective at reducing bear complaints and decreasing the risk to public safety and property. Bear sightings have also decreased. Reports of bear sightings is also influenced by education. When bears expand their range into new areas of the State, sighting reports are more frequent. As residents become accustomed to having bears in their area, reports tend to decrease, which may indicate a stabilized population (not expanding as fast), rather than a reduction in actual bears. Between 2016 and 2017, the number of counties reporting bear activity dropped 11%, reports of Category I complaints dropped 64%, and reports of Category II nuisance dropped 61%. Category III reports are down 53% (Figure 3). The decrease in bear incidents shows that dangerous and nuisance bears are being removed from the population, thus reducing the risk to public safety and property.

The number of bears euthanized for agricultural damage has also decreased substantially, from 44 in 2014 to only 3 in 2017. The regulated harvest, in conjunction with other bear management tools, has led to a reduction in the amount of damage being reported by farmers.

Harvest data from the 2017 bear hunting season indicated the most balanced harvest sex ratio since 2003. In past hunting seasons, the percentage of females taken generally was 60%, indicating a large, female-dominant population. The sex ratio in the 2017 bear season was 51% female and 49% male, indicating a more appropriate density in bear range. Given the high reproductive potential of NJ black bears (average litter sizes of 2.7; age of first litter at 2-3 years; first year cub survivorship of 70%), it is important to continue using hunting as a component of the CBBMP to ensure long term population stability and reduced the number of bear-human interactions.

The DFW considers the regulated hunting season to be a critical component in managing NJ's bear population. The importance of the hunting season can be best demonstrated by looking at the 5-yr period between 2006 and 2010 when the hunting season was closed. During this period when hunting was removed as a CBBMP tool, both the black bear population and complaints increased (Figure 1). This is despite the fact that the nonlethal components of the CBBMP were employed intensively during the period of no hunt.

During this period without hunting seasons, DFW captured 166 bears at Category I complaint sites (98 Category I target bears were euthanized by DFW and municipal and State Park Police). Additionally, 156 Category II bears were caught and aversively conditioned by DFW during this timeframe in an attempt to dissuade these bears from utilizing human foods.

Table 1. Number of bears captured and/or euthanized for Category I and II behavior, comparing the 2006-2010 no-hunting period to the 2013-2017 hunting period, plus associated control costs.

Five-year period	# Category I bears (target + non- target) trapped by DFW only	Total cost for Cat I bears trapped and euthanized or aversively conditioned by DFW ($853.98 per bear euthanized and $731.48 per bear conditioned)	# Category I bears euthanized by DFW and municipal and Park Police	# Category II bears caught and aversively conditioned by DFW only	Total cost for Cat. II bears trapped and conditioned by DFW ($731.48 per bear)	Total cost of Cat I and Cat II bears trapped by DFW only
2006-2010 No Hunting Season	166	$129,388.18	98	156	$114,110.88	$243,499.06
2013-2017 Hunting Season	95	$74,023.10	53	86	$62,907.28	$136,930.38
% Change	-42.8%	-42.8%	-45.9%	-44.9%	-44.9%	-43.8%

In contrast, during the past five years where hunting seasons have been employed (2013–2017), the numbers of Category I and Category II bears captured, euthanized, and aversively conditioned was substantially lower (45.9%) than during the 2006 to 2010 period (Table 1). During 2013 to 2017, DFW captured 95 bears at Category I complaint sites (53 Category I target bears were euthanized by DFW and municipal and State Park Police). In addition, 86 Category II bears were caught and aversively conditioned.

The drop in Category I and II complaints measured since 2010 can be attributed to DFW's consistent bear hunting season, which was prescribed simultaneously with all other components of the CBBMP. This fully applied and integrated effort not only reduced the bear population, but also made bears more wary of humans. This reduction in population and change in bear behavior is evidenced not only by the reduction in incidents, but also by the decreased number of nuisance bears trapped and euthanized by DFW and police.

Based on data from the 2006 to 2010 period with no hunting seasons, it is predicted that the current bear population of 2,500 will potentially double by 2022 if the regulated hunt was removed as a management tool from the CBBMP. The highest bear populations estimated thus far were greater than 3,000 bears in both 2010 and 2014. The removal of hunting as a management tool will quickly allow the population to rebound to unacceptable levels.

Significant accomplishments since 2015 CBBMP was approved include:

- The October portion of the hunting season was implemented, resulting in a record harvest of 636 bears in 2016.
- Bear Management Zone 5 was opened to hunting, resulting in 4 bears harvested.
- DFW continues to monitor the feasibility of non-lethal methods of population control and has requested that Stockton University review the status of animal contraception.

CONCLUSION

DFW's active, integrated bear management strategy is effective and essential for maintaining bears at a density that provides for a sustainable population within suitable bear habitat,

minimizes human-bear conflicts and reduces emigration of bears to unsuitable habitat in suburban and urban areas. The black bear population in New Jersey is beginning to stabilize at a level that DFW believes is consistent with the cultural carrying capacity for this species in the state. No one management tool is responsible for the successes demonstrated by implementing the CBBMP. Continued management using *all* the tools provided in the CBBMP is critical to maximize public safety, minimize bear-related damages, and maintain a healthy black bear population. Without continuation of population management by regulated sport hunting, NJ's black bear population will double in five years.

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