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NEW JERSEY FISH AND GAME COUNCIL

COMPREHENSIVE

BLACK BEAR

(*Ursus americanus*)

MANAGEMENT POLICY

Prepared by Game Committee

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                _____   date

Effective: _____

- 2010 Comprehensive Black Bear Management Policy

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EXECUTIVE SUMMARY

The New Jersey Fish and Game Council has been mandated by the NJ State Legislature to protect and conserve game birds, mammals and fish and to provide an adequate supply for recreational and commercial harvest. Council ensures long-term stable populations and maximizes and equitably distributes recreational opportunity to user groups by opening and closing seasons, setting season lengths, bag limits and manner of take. Council accomplishes this based on scientific evidence presented to it by the NJ Division of Fish and Wildlife through the rule-making Game and Fish Code processes.

Council designated black bears as a game animal in 1953 and provided a limited hunting season from 1958 through 1970. Based on data gathered during the hunting seasons, NJDFW assessed the bear population and Council closed the hunting season in 1971. NJDFW commenced a population research and monitoring project in 1988, providing data showing that the bear population could support a regulated hunting season, so Council reinstated a limited hunting season, resulting in a harvest of 328 bears in 2003 and 298 bears in 2005. The hunting season has been closed since, but NJDFW continues to conduct population monitoring and research.

On February 28, 2005, the NJ Supreme Court issued an opinion that comprehensive policies for black bear management should include the broad preservation goals of the Council, the tools at the Council's disposal to accomplish those goals, and most importantly, the factors that should be considered when determining which tools will be utilized. The Court also said the Council may include consideration, among other things, of the absolute size of the bear population, the number of harmful bear-human interactions and the fiscal and human resources available to carry out the stated goals.

The Council finds that DFW uses an integrated wildlife management approach for bear management, using all available methods within its fiscal and personnel resources, including research, educational programs, promoting the use of bear-resistant garbage containers, lethal control, and non-lethal control, including aversive conditioning. DFW staff has trained nearly 1,000 local police officers, state troopers, and state, county and municipal park rangers to assist in problem bear response. Recent studies in New Jersey as well as other states conclude that aversive conditioning has a limited short-term effect on reducing the negative behavior of nuisance bears.

DFW has determined, through its long-term research and monitoring program, that NJ has a productive black bear population that can support a regulated hunting season. Based upon 2009 research data, the black bear population estimate for the portion of NJ north of I-80 is 3,400 bears. A statewide black bear population estimate cannot be generated without years of extensive population research and monitoring south of I-80.

DFW has conducted an intensive and extensive public education campaign about common-sense practices that may reduce the risk of negative black bear behavior on humans, their homes, their property and their communities. Over 100,000 people have received bear education presentations and over 3 million pieces of education material has been distributed. During the last several years, Law Enforcement staff inspected over 4,600 residential properties in high bear

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incident areas and found 98% were in compliance with black bear garbage management guidelines. This suggests the black bear education effort has been effective.

Despite these efforts more serious complaints have not abated as the bear population continues to expand. DFW uses lethal control on high-risk, dangerous bears and non-lethal aversive conditioning techniques on nuisance bears. DFW and DEP have stepped-up law enforcement activities on bear feeding and garbage containment.

The Council also finds that DFW should reduce and stabilize the bear population at a level commensurate with available habitat and consistent with reducing risk to public safety and property. Although fertility control and sterilization have been studied, these methods of population control are not effective, evaluated either by an efficacy or cost metric. Regulated hunting seasons in 2003 and 2005 demonstrated bears could be harvested safely, and harvests could be accurately predicted. Regulated hunting should remain a safe and effective management tool to provide recreation and control NJ's black bear population.

Council has determined that NJDFW is using all the tools available, as resources allow, to properly manage the black bear resource and further recommends a regulated bear hunting season, both to provide mandated recreational opportunity and to control the population in the most cost effective manner. The proposed Policy continues the commitment to a multi-faceted bear management strategy and is guided by the latest science and data on the New Jersey black bear population.

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I. INTRODUCTION

This document defines the New Jersey Fish and Game Council's (Council) comprehensive black bear (*Ursus americanus*) policy and recommendations regarding the management of resident black bears (bears) to ensure their continued existence in suitable habitat in New Jersey. Council periodically re-evaluates its policies, recommendations and regulations as information on the wildlife species under its jurisdiction and the needs of NJ's citizens warrant. Council has established this black bear policy and management goals should consider the cultural carrying capacity, which is the number of bears that can co-exist compatibly with the local human population in a given area in concert with the biological carrying capacity of the land to support bears, just as it does for all wildlife species under its jurisdiction.

The Council's goals for bear management reflect the legislative mandate of the Department of Environmental Protection (DEP) and the Council (N.J.S.A. 13:1B-28 et seq.) and the mission and goals of DEP and the Division of Fish and Wildlife (DFW). The NJ State Legislature mandated that Council has the responsibility of protecting and conserving game birds, mammals and fish and providing an adequate supply for recreational and commercial harvest. (For more information on Council, see APPENDIX 1, Role of the Fish and Game Council.) The Mission of DFW is to protect and manage the state's fish and wildlife to maximize their long-term biological, recreational and economic values for all New Jerseyans. The Goals of DFW are:

> To maintain NJ's rich variety of fish and wildlife species at stable, healthy levels and to protect and enhance the many habitats on which they depend;

> To educate New Jerseyans on the values and needs of our fish and wildlife and to foster a positive human/wildlife co-existence;

> To maximize the recreational and commercial use of NJ's fish and wildlife for both present and future generations.

Based upon scientific evidence presented to it by DFW, Council opens and closes seasons and sets season lengths, bag limits and manner of take to ensure long-term stable populations and to maximize and equitably distribute recreational opportunity to user groups. Additionally, with some species such as black bear, white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*) and beaver (*Castor canadensis*), hunting and trapping can be used to control populations. Historically, Council has adjusted hunting and trapping seasons to control these species in order to minimize agricultural, residential or environmental damage. The Council recognizes that the most cost effective method of population control for these species is provided through regulated hunting and trapping seasons.

Council has directed that DFW manage black bears to assure their continued survival in NJ, while addressing the property damage and safety concerns of residents and farmers. In addition, Council recognizes that, although instances of black bears injuring or killing humans are rare and no person in NJ has been killed by a black bear since 1852, human safety concerns must be considered as part of black bear management decisions. With careful management, the black

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bear can be a benefit for the citizens of NJ in the form of wildlife appreciation, observation and hunting.

Council notes that it is generally recognized that responsible management, not passive preservation, is necessary when managing agricultural and natural resources, or protecting property and human health and safety (USDA WS WI 2002). Council also notes that DFW uses Integrated Wildlife Damage Management (IWDM), which seeks to prevent, reduce or stop wildlife damage by integrating a combination of methods sequentially or concurrently (USDA WS WI 2002).

II. DECISION MAKING

Council's current and future management decisions regarding black bears have been and will continue to be based upon the best available scientific data. Based upon scientific evidence presented to it by DFW, Council opens and closes seasons, and sets season lengths, bag limits and manner of take to ensure long-term stable populations and to maximize and equitably distribute recreational opportunity to user groups. In addition, the Council, subject to the approval of the commissioner, formulates comprehensive policies for the protection and propagation of fish, birds and game animals (N.J.S.A. 13:1B-28). It is this statutory framework that provides the basis for the CBBMP.

New Jersey Court Order and Decision on Bear Management

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 vs. NJ Dept. of Env. Protect. 182 NJ. 461 (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.

Fish and Game Council Black Bear Management Objectives

Council has set the following objectives for management of the NJ black bear population:

- Sustain a robust black bear population as part of NJ's natural resource base.
- Advance the scientific understanding of black bears.
- Educate the public about common-sense practices that reduce the risk of negative black bear behavior on humans, their homes, their property and their communities.
- Enforce the law on bear feeding and garbage containment.
- Use lethal control on high-risk, dangerous bears.
- Utilize non-lethal aversive conditioning techniques on nuisance bears.
- Reduce and stabilize the population at a level commensurate with available habitat and consistent with reducing risk to public safety and property.
- Ensure that regulated hunting remains a safe and effective management tool to provide recreation and control NJ's black bear population.

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Council recognizes that management of NJ's expanding black bear population to meet these objectives requires a variety of measures. Council reiterates the conclusion of the 1997 Black Bear Management Plan (BBMP) (McConnell et al. 1997) that the New Jersey bear population is large enough to support a regulated recreational hunting season and that the regulated hunting seasons of 2003 and 2005 resulted in a subsequent reduction in nuisance bear incidents, providing relief to people living near black bear habitat. This policy endorses education for people living and recreating in bear country, garbage management to reduce bear access to non-natural food, lethal control for dangerous bears, non-lethal control methods for nuisance bears and a hunting season to provide recreation and control the black bear population.

Council desires to reduce high-risk bear incidences that are a threat to public safety and property damage, and so has selected a range of management tools according to criteria of consistency with current law, practicability in light of current resource constraints and demonstrated efficacy. A well-managed black bear population will require public education, proper waste management, enforcement, bear control, aversive conditioning, population control and other measures to reduce risk to people living close to black bears.

III.   HISTORY

The black bear occurred statewide in NJ through the 1800's, however, by the mid-1900's less than 100 existed and these were restricted to the northern portion of the state (Lund 1980, McConnell et al. 1997). In 1953, Council classified black bears as a game animal, thereby protecting bears from indiscriminate killing. This protection stabilized the population. DFW wildlife control agents (later wildlife technicians) responded to citizen complaints to alleviate black bear damage. Limited hunting was legal in 10 seasons from 1958-1970 and resulted in a harvest of 46 black bears. Based upon data gathered through the regulated hunting seasons, DFW assessed the bear population status and Council closed the black bear hunting season in 1971 (Lund 1980). Council reinstated a limited hunting season, resulting in a harvest of 328 bears in 2003 and 298 bears in 2005.

Historically, management of black bears has been funded through the Hunters and Anglers Fund, which comes from the sale of hunting and fishing licenses. Additional funding is obtained from Federal Aid to Wildlife Restoration (Pittman–Robertson) grants. Funding for these grants is derived from a federal excise tax placed on hunting related equipment and ammunition that is passed on to State wildlife agencies for research, education and management activities. Bear management activities conducted by DFW have been supplemented with General Treasury monies in five of the last ten fiscal years.

Since the 1980's the black bear population has increased, and its range has expanded (Figure 1) due to the protection afforded it by game animal status. Also contributing to this population increase were black bear population increases in Pennsylvania and New York and improved habitat in NJ, provided by the maturation of forested areas (McConnell et al. 1997). Because of agricultural damage attributed to black bears, DFW and Council recognized that the level of human/bear conflict had become untenable in northern NJ and the black bear population was large enough to sustain a limited, regulated hunting season (McConnell et al. 1997).

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The 1997 Black Bear Management Plan (BBMP) recommended that DFW stabilize NJ's black bear population using regulated hunting seasons in bear management zones (BMZs), institute a statewide ban on feeding black bears, install bear-proof (bear-resistant) dumpsters at public campgrounds within black bear range, educate beekeepers on the use of electric fences to deter black bear depredation, institute a black bear depredation permit for landowners suffering damage to property, agricultural crops or livestock, continue to analyze NJ black bear data as new technology and data becomes available, protect critical habitat and reduce illegal killing of bears (McConnell et al. 1997). Since the release of the 1997 BBMP, DFW has instituted these recommendations with some limitations. Council believes that DFW should fully implement those recommendations and advance additional non-lethal control methodologies.

IV. INTEGRATED BLACK BEAR MANAGEMENT STRATEGY

DFW utilizes an integrated approach to managing black bears; this integrated black bear management strategy includes educating people about black bear ecology, recommending human behavioral adjustments while in bear range, enforcing laws that minimize human-bear conflicts, taking action against dangerous and nuisance bears, monitoring the bear population and implementing population control. Since 1980, the DFW has been conducting research on NJ black bears and has utilized an array of tools for managing black bears. This multi-prong approach is necessary because the bear population is increasing and expanding while the human population is also expanding through residential and commercial development. Council believes that it is imperative to have a broad, comprehensive approach in place to address the growing potential for human/bear conflicts. In November 2000, DFW instituted a more aggressive integrated black bear management strategy, implementing an enhanced educational effort, more aggressive control measures and increased research and monitoring activities. From FY01 through FY10, DFW has devoted more than $9 million to black bear management, including $2 million to educational, $2 million to law enforcement, and $5 million to control, research and monitoring activities. These funds have come from the general treasury subsidy ($5.5 million), the Hunters' and Anglers' Fund ($2.5 million) and the Federal Aid to Wildlife Restoration Fund ($1 million).

A. Education

Policy:

Council believes there is a continued need to educate people living and recreating in bear habitat about methods to minimize negative interactions with black bears. Residents, campers and outdoor enthusiasts within bear country can reduce or eliminate negative interactions with black bears by simply adjusting their activities. There is general support from the public, DEP, DFW and Council for increasing education efforts about bears.

Discussion:

Council recognizes that it is important to make the educational message available to as many citizens as possible. While education alone will not solve all the problems associated with bears, those who adjust their activities to take into account bear activity will be less likely to have

problems. Council recognizes that DFW has created and participated in "Bear Aware" programs like nearly all other states and provinces with bear populations. These programs have resulted in declines in certain nuisance complaints over time, especially in such simple actions as reducing bear damage to bird feeders and using electric fencing to protect beehives (Table 1, Figure 2).

DFW has conducted an extensive educational campaign to provide NJ residents and visitors with techniques and methods for minimizing negative interactions in areas where black bears exist (APPENDIX 2). Council notes that this educational campaign is having a positive effect. The DFW campaign emphasizes the importance of never feeding bears, either intentionally or unintentionally. Some of DFW efforts include: (1) developing and distributing educational materials for homeowners and campers to reduce negative encounters with bears; (2) producing brochures, bookmarks, bumper stickers, coloring books and book covers for distribution to schools, municipalities, libraries, parks and environmental education centers; (3) conducting public presentations about living with black bears for schools, service organizations, township meetings, parks, camps and clubs; (4) producing and distributing radio, TV and cinema public service announcements (PSAs) and issuing statewide news releases providing bear information and bear-proofing techniques; (5) addressing media inquiries and providing interviews regarding bears; (6) providing bear information and bear-proofing techniques to all persons who contact DFW regarding bears and (7) producing a Spanish version of the "Know the Bear Facts" brochure.

DFW provides NJ residents and visitors with techniques and methods for reducing negative interactions while spending time in areas where black bears exist. The primary message is "Do Not Feed Bears," either intentionally or unintentionally. DEP developed and continues to issue news releases during the peak spring and fall activity periods, alerting the public to increased bear activity and reminding them with tips to minimize conflicts. Television, radio and cinema PSAs are aired for the bear activity seasons in spring, summer and fall. DFW's Web Page (www.njfishandwildlife.com) provides additional black bear biology, natural history and bear-proofing information, including a black bear slide show and sources for bear-resistant garbage containers. Council recognizes that DFW has also produced two educational videos.

Education programs designed to reduce human-black bear conflict have been instituted by NJDFW and other states, entities and institutions. These programs seek to reduce the magnitude or frequency of human-black bear conflict and/or increase the awareness of human actions that result in conflict. Council concurs with the recommendations of Gore et al. (2006) that emphasis should be placed on evaluating the efficacy of education programs to identify improvements or inform decisions about the allocation of scarce resources.

The need to educate New Jersey's citizenry will increase as bears expand their range throughout the state. Bear education efforts have been concentrated in northern and central New Jersey counties. However, it is now necessary to begin education efforts in the southern counties since there are confirmed bear sightings in all New Jersey counties.

There are data indicating that intense education of campers and visitors to several national parks (for example, Yellowstone, Yosemite and Great Smoky Mountains) has resulted in a reduction in

bear nuisance complaints. Council agrees that educating campers and visitors to parks is a valid and successful way to minimize negative human- bear interactions in the campsite/park situation.

New York tested the outreach intervention program designed to modify bear-related human behavior, NeighBEARhood Watch (NYNW), and found the impact was varied (Gore and Knuth 2006). Council notes that the direct associated costs for the NYNW program for 2 treatment towns were approximately $27,000, not including staff/researcher time and that respondents' knowledge scores did not change after the NYNW program in both treatment and reference towns. In 2004, reference and treatment town respondents did not differ in their knowledge of how to keep black bears away from their home; one year later, neither group demonstrated a change in this knowledge. Neither treatment nor reference towns indicated a change in their willingness to adopt desired behaviors after the NYNW (Gore and Knuth 2006).

Recommendations:

1. DFW should continue educational efforts in northern and central counties.
2. DFW should broaden educational efforts to include the southern counties.
3. DFW should evaluate the effectiveness of its educational campaign for residents and visitors.
4. DFW should evaluate the effectiveness of an educational campaign for residents and visitors to use bear resistant garbage cans.
5. The General Treasury should continue funding bear education at the FY08 level.

B. Control of Human–Derived Food

Policy:

Council believes that legislation and enforcement initiatives are necessary to ensure that human-related food sources and garbage do not unintentionally become a source of food for bears.

Discussion:

Council recognizes that in 2003 NJ enacted legislation that banned the intentional feeding of bears (NJSA 23:2A-14) 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. DEP and DFW law enforcement officers inspected over 4,600 residential properties in high bear incident areas and found 98% were in compliance with black bear garbage management guidelines. This suggests the black bear education effort has been effective. DFW conservation officers have canvassed scores of homes and businesses and have worked with additional state and local law enforcement officials to enforce the law. Inspections of commercial establishments indicates that it is difficult to acquire bear-resistant dumpsters from garbage haulers and bear proofing dumpsters continues to be a problem.

DEP has a trash policy of "Carry In – Carry Out" that reduces the garbage at DEP-managed parks and forests. Council recognizes that DEP has installed bear resistant garbage dumpsters in

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North Jersey and DEP has begun placing bear resistant dumpsters in Central Jersey park and forest locations.

DFW has installed bear resistant garbage dumpsters on North Jersey Wildlife Management Areas (WMAs).

DFW has identified closed or limited access communities in bear habitat where implementation of a bear resistant community dumpster would enhance efforts to limit access of bears to residential garbage. DFW telemetry studies and observations have determined that bears will alter their movements to access household garbage left on the street for hauler pick-up. Installation of a community bear-resistant dumpster would further limit access to garbage by these bears.

Council recognizes that great strides have been made in educating citizens about the value of garbage management, but the expense of bear-resistant garbage cans and commercial containers has hampered their wide spread use. Council notes that no municipalities have mandated bear-resistant garbage cans, so use is strictly voluntary. Additionally, Council notes that it does not have the authority to mandate the use of bear- resistant cans or to regulate municipal garbage containment.

DEP provided a Community Grant to West Milford Township, Passaic County to purchase and deploy 3,000 bear-resistant garbage cans in selected neighborhoods. Council notes that DFW personnel continue to monitor bear activity in those neighborhoods with the bear-resistant garbage cans against those neighborhoods without the bear-resistant cans to evaluate the effectiveness of bear-resistant cans for reducing human/bear interactions and nuisance calls.

Council recognizes that no data exists that demonstrates that reduction of provisioning from garbage sources would result in a decrease in fecundity within the NJ bear population. However, eliminating bear access to human provided food should result in decreased habituation and should decrease nuisance and public safety related complaints.

Recommendations:

1. DEP should work with legislators to amend the feeding ban statute to clarify that intentional and unintentional feeding of bears is prohibited and to tighten the enforcement provision.
2. DEP should seek legislation to require public and private campgrounds in habitat occupied by bears to install bear-resistant dumpsters and food boxes.
3. DEP should seek legislation that would require closed communities to make a bear-resistant community dumpster facility available to residents.
4. Local authorities should mandate the use of bear- resistant garbage containers in entire communities with the coordination and cooperation of local garbage haulers. Regulations, funding and coordination with local garbage contractors is necessary in order to implement a successful program.
5. DEP should identify funding and grant sources and/or incentive programs to assist public and private entities to purchase bear-resistant garbage systems.

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C. Research

Policy:

Council believes that using the best available scientific data is crucial for making management decisions regarding black bears, as it does for all wildlife species under its jurisdiction. Council believes that DFW personnel are qualified and highly trained professionals who provide the data and analysis to ensure that black bears remain a viable component of New Jersey's landscape.

Discussion:

DFW has conducted intensive and extensive research on bears throughout NJ and more specifically in the Kittatinny (Western) and Bearfort (Eastern) regions of northern NJ (Figures 3 and 4) since 1980 and the data represent a solid, long term and extremely valuable database upon which to make management decisions.

Since 1981 DFW personnel have handled over 3,600 individual black bears; DFW staff have tagged and released alive over 2,400 bears, including 750 young-of-the-year at dens.

DFW personnel have collected data from nearly 1,950 bears killed as a result of vehicle strikes (730), control actions (236), hunting seasons in NJ, PA and NY (805) and other types of mortality. Recent tagging and bear information is contained in Table 2.

DFW continues to radio-collar and monitor bears using radio telemetry to acquire information on reproduction, survival, mortality, home range size and habitat use. DFW currently has 40 female bears fitted with radio collars to monitor reproduction and survival. DFW has determined that the average litter size is 2.7 cubs per litter. The most common litter size is 3 (43%), followed by litters of 4 (23%) and 2 (22%), which has not changed over the thirty years that DFW has conducted research.

DFW has been conducting research in the long-term established study areas and has begun research in the area between I-80 and I-78 to gain bear population parameters (density, birth rates and survivability) in an area occupied by bears but which exhibits different habitat characteristics and human development pressures compared to the two study areas already established and studied for the past thirty years. Council recognizes that the information should enable biologists to extrapolate the population level and growth rate in this area of the State and enhance bear management decisions.

DFW has employed population monitoring by determining individual identity using DNA analysis. DFW personnel continue to monitor bears using radio telemetry to acquire information on reproduction, survival, mortality, home range size and habitat use. Council also recognizes that DFW uses cooperating university statisticians to generate population size estimates.

Council recognizes that the current bear population in southern NJ is small. Although there is sufficient habitat for black bears to survive in the Pinelands, productivity and survival in this area will be different than in northern NJ, as is the case for white-tailed deer and wild turkey (Burke

and Predl 1990, McBride 2003). Council recognizes that undertaking a trap and tagging operation for bears at the current low density would not be cost effective at this time, so DFW has limited research opportunities in this region.

Based on the intensive population monitoring that DFW has conducted over the past 30 years, Council concludes that the NJ bear population is a robust and viable population that has maintained 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.

Recommendations:

1. DFW should continue to conduct research and analyze NJ's database on the black bear population within the long-term study areas in the Kittatinny (Western) and Bearfort (Eastern) regions, which can be used as an index to the population within prime black bear range, and the study area in the lower bear density area between I-80 and I-78.
2. DFW should continue using sophisticated statistical analysis as new data and data analysis tools become available to obtain the most accurate density and population estimates.
3. DFW should continue to develop the simulation model of NJ's black bear populations in the Kittatinny and Bearfort regions to evaluate the effect of various recruitment and mortality factors and other factors contributing to bear population dynamics as new data is added to the existing database.
4. DFW should, as limited resources allow, conduct research in southern NJ.
5. The General Treasury should, at a minimum, fund research at the FY08 level.

D. Bear Habitat Analysis for NJ's Bear Management Zones

Policy:

Council believes that NJ contains suitable habitat to support a viable, robust black bear population and that habitat analysis is necessary to properly manage this renewable and valuable resource. Council believes that the designation of Bear Management Zones is the most effective manner in which to make decisions concerning bears.

Discussion:

DFW developed a ranking of bear habitat throughout NJ (Figure 5) based on bear use of varying landscapes as defined by Land Use / Land Cover data for NJ (McLaughlin et al. 1987, Rogers and Allen 1987, MacKenzie 2003, Niles et al. 2004). DFW biologists and technicians overlaid the Deer Management Unit (DMU), an area of approximately 14 square miles, with the 2002 Land Use/Land Cover data, then used an Arcview GIS computer system to standardize the habitat evaluation. DFW determined the percentage of forested, wetland, agriculture, urban land, barren land and water in each DMU.

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DFW designated the term Bear Management Zone (BMZ) to describe areas for bear management. BMZ defines the boundaries for all areas of the state and are designated as zones where bears should be managed at various densities consistent with land use. Individual BMZs may or may not be open to regulated bear hunting.

DFW determined that excellent bear habitat consists of >= 51% forest land and <=33% urban land and <=26% agricultural land. BMZs 1 and 3, which contain the black bear research study areas, have an average forest cover of 68% and are designated as excellent bear habitat. Mark-recapture studies have shown that the bear density in BMZs 1 and 3 was about 2.6 bears per square mile in 2003 (Carr and Burguess 2004).

BMZs 2 and 4 have an average forest cover of 43%, and are designated as good bear habitat. Council recognizes that the bear population is likely to exist at a lower density than BMZs 1 and 3 and, based on percentages of forested habitat, would probably be about 1.6 bears per square mile.

BMZ 5 contains an average forest cover of approximately 32% with a mosaic of forest, farmland, wetlands and urban land, which makes it fair bear habitat. Council recognizes that the bear population is likely to exist at a lower density than BMZs 2 and 4 and, based on percentages of forested habitat, would probably be about 1.2 bears per square mile.

Bear habitat in southern NJ has been designated as BMZ 6. Although there is sufficient habitat for black bears to survive in the Pinelands, Council recognizes that productivity and survival in this area will be different than in northern NJ, as is the case for white-tailed deer and wild turkey (Burke and Predl 1990, McBride 2003). Currently the bear population in southern New Jersey is small and undetermined.

DFW has classified BMZ 7 as unsuitable bear habitat. Council recognizes that the lack of suitable bear habitat in BMZ 7 makes it unlikely that a viable population could be established. Although small areas of forested habitat remain, they are isolated and cannot sustain a viable bear population. Additionally, Council recognizes that the preponderance of suburban and urban land in BMZ 7 would result in almost certain bear-human conflicts.

Recommendations:

1. DFW should continue to update the habitat analysis as new data becomes available.
2. The General Treasury should, at a minimum, maintain the FY08 appropriation level for the continued bear habitat analysis research efforts.

E. Cooperative Research

Policy:

Council believes that cooperative research is the most efficient and cost effective manner for DFW to conduct research on wildlife species, including bears. This model has proven effective, for waterfowl, bobwhite quail, wild turkey and bear. DFW should continue to partner with

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research institutions, federal and state agencies, which have the expertise, staff and economic resources to enhance the knowledge base on the NJ black bear population.

Discussion:

Council recognizes that DFW has participated in a number of cooperative studies with such institutions as Rutgers University, Montclair State University, Tufts University (MA), East Stroudsburg State University (PA) and the adjacent states of Pennsylvania and New York. These studies are intended to expand knowledge about NJ black bears and to collect scientific information on which to base management decisions. These projects have included research on home range and habitat use, food habits, reproduction, diseases (West Nile Virus and Toxoplasmosis) and parasites (*Trichinella)*, aversive conditioning, use of contraceptive techniques for population management, genetic relatedness using DNA and developing habitat suitability models.

DFW is cooperating with East Stroudsburg University's Applied DNA Sciences Center, Northeast Wildlife DNA Laboratory (NEWDL) and Fish & Wildlife Microbiology Laboratory (FWML) to build a black bear DNA database to be used for genetic diversity determination and forensic investigation. DFW continues to provide blood samples for determining the overall population health of NJ black bears and building a serum database that provides information on the extent that wild bears carry disease that may affect human or domestic animal health.

DFW biologists meet with biologists and administrators from NY, PA, the Delaware Water Gap National Recreation Area and the U.S. Forest Service to discuss research, population monitoring, aversive conditioning and population control.

DFW is cooperating with several northeastern states to evaluate non-lethal management techniques to determine their effectiveness. The research results will benefit not only management decisions in New Jersey, but will also provide valuable information to assist other states which are dealing with similar black bear issues.

Recommendations:

1. DFW should continue to cooperate in research projects with other State and Federal agencies, universities and entities.
2. DFW should continue to participate in the bear summits with the bear biologists from the neighboring states of New York and Pennsylvania at regular intervals to continue to coordinate black bear management strategies and to ensure the success of black bear management efforts for this tri-state regional population.
3. DFW biologists should continue to meet regularly with bear biologists from the region, eastern seaboard and North America to stay abreast of up-to-date research and management tools and techniques.
4. The General Treasury should, at a minimum, maintain the FY08 appropriation level for the continued bear research efforts that benefit all residents.

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F. Bear Control: Lethal and Non-Lethal

Policy:

Council believes the DFW Black Bear Rating and Response Criteria (BBRRC) (NJDFW BWM 2000) is the most effective operating policy for response to bears that are a threat to human safety, agricultural crops and/or property, or are a nuisance. Council supports that the policy errs on the side of human safety. Council believes that despite educational efforts, situations will arise that will require private citizens, farmers, local police officers or DEP personnel to take action against problem bears.

Council supports DFW policy, which allows farmers, via special permit, to destroy black bears depredating crops and livestock (N.J.A.C. 7:25-5.32).

Council believes that continued cooperation between state and local law enforcement agencies and DFW is necessary to properly manage bears.

DFW should continue to use non-lethal control techniques such as aversive conditioning, to modify the behavior of nuisance bears. Council also believes that as interactions between humans and bears increase, additional non-lethal control techniques should be investigated, and if effective, be implemented.

Discussion:

Council recognizes that the increase of human development in NJ, the concurrent bear population increase and the expansion of bear range southerly and easterly has resulted in an increase in human-bear conflicts. Council recognizes that incidents involving bear damage to property and livestock remain high in frequency and severity (Table 1). DFW's Wildlife Control Unit (WCU) and DEP WARNDEP Hotline receive complaint calls and the DFW WCU provides response and control using the BBRRC.

DFW has had a policy of responding to problem black bears since the 1980's and a more aggressive black bear operating policy was instituted on November 16, 2000. Council and DEP approved this policy. The BBRRC defines three categories of black bear behavior and dictates how DEP and other governmental agency personnel should respond.

DFW has determined that Category I black bears are those bears exhibiting behavior that is an immediate threat to human safety or which cause agricultural damage to farmland as defined pursuant to the Farmland Assessment Act (N.J.S.A. 54:4-23.1 et seq.) or significant damage (>=$ 500) to property. Examples of Category I behavior are human attacks, home entries, attempted home entries, agricultural crop damage and killing or injuring livestock or pets. Category I black bears are euthanized as soon as is possible in order to protect the public or eliminate further damage to agricultural crops or property.

DFW has determined that Category II black bears are nuisance bears that are not a threat to life and property. Examples of Category II behavior are habitual visitors to dumpsters or birdfeeders

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or cause property damage less than $500. Category II black bears are aversively conditioned using rubber buckshot, pyrotechnic charges and/ or bear dogs (Yellow Blackmouth Cur) so they receive a negative experience associated with the nuisance location and people. If trapped, nuisance bears are released on site and aversively conditioned, or if conditions are unsuitable, taken to the nearest state land where they are released and aversively conditioned.

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. Such animals may be considered by the caller to be a danger or a nuisance because the caller has not had the experience of interacting with bears. Category III black bears include dispersing animals that wander into densely populated areas, black bears passing through rural and suburban neighborhoods and black bears observed by hunters, hikers, campers and others using facilities in black bear habitat. Category III bears may occasionally utilize birdfeeders and trash containers as supplemental food sources in the course of their activities. Until a Category III black bear returns to a particular site and repeats utilization of these food sources, it is not considered to be a nuisance or problem animal (Category II). The WCU offers assistance in the form of technical advice on bear-proofing surroundings to callers reporting Category III encounters. No attempt is made to capture a Category III bear unless it is confined in a fenced area or treed in an urban area during daylight and any further movement will result in a threat to safety of the public or the animal due to potential vehicle collision.

The DFW BBRRC dictates that Category III bears from urban or suburbia settings that must be extracted will be released on the nearest State-owned property with suitable bear habitat. Although municipal officials in the towns where the bear are released have criticized relocation, Council recognizes that it represents the most acceptable public policy at this current time.

Council recognizes that the cooperation of all law enforcement personnel from all levels of governmental agencies within black bear range is essential to the implementation of the bear response policy. Council notes that since January 2001, DFW has trained over 950 municipal, county and state law enforcement officers from 123 municipalities, 14 counties and 33 state, county and federal parks to assist DFW in black bear control. Council notes that DFW has spent nearly $100,000 for this task. Council recognizes that there will continue to be a need to respond to bear complaints. As bears expand their range in NJ, such response will increasingly become the responsibility of local law enforcement agencies. The Council notes that some local enforcement agencies that have received bear response training from DFW have not filed annual reports on bear incidents as agreed upon when training was received and that this lack of information has the potential to negatively impact bear management decisions made by the DFW and Council.

Council recognizes that DFW and local law enforcement officers cannot respond immediately to situations involving depredating black bears and that farmers can alleviate damage caused by black bears if allowed the opportunity. Allowing farmers to act quickly to protect their crops, livestock and/or property constitutes responsible action by DFW to manage the growing black bear resource while minimizing negative impacts to humans, agricultural crops, livestock and property.

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Council recognizes that some problem bears will be eliminated through regulated hunting seasons.   In the 2003 and 2005 NJ hunting seasons, some problem bears were harvested, thereby reducing bear related problems without cost to the taxpayer. Council recognizes that without some method of population control to reduce then maintain a viable bear population in NJ at densities compatible with the human population, human-bear conflicts may continue to increase.

Council considers serious bear complaints (Category I) reported to DFW and law enforcement agencies to be high (Table 1). Many factors contribute to bear related incidences including individual bear and human behavior. Small year-to-year fluctuations may be attributed to environmental factors. For example, natural food scarcity, such as mast failures, may cause bears to seek alternate food supplies resulting in more negative human-bear incidents. It is clear, however, that over time, serious incidences have increased with the increase in the bear population. Of particular concern to the Council are increases in Category I incidents as the bear population has expanded. Although the number of overall complaints has varied since 1999 (Table 1), Category I complaints remain unacceptably high.

DFW personnel, law enforcement personnel, state park police and landowners and farmers have killed nearly 250 dangerous Category I bears since 1993.

Council recognizes that annual reductions in bear complaints reported to DFW from 1999 to 2009 is attributed to the following: (1) residents calling local police who have been trained by DFW for bear response; (2) euthanizing Category I bears thereby eliminating further negative behaviors by those animals; (3) DFW's education program successfully reaching residents who bear-proof their yards including proper garbage management; (4) an increased tolerance of bears by the public due to DFW's policy of destroying Category I bears; and (5) the short term population reduction achieved by the 2003 and 2005 black bear hunting seasons which included the harvest of nuisance bears by hunters.

DFW uses the non-lethal technique of aversive conditioning to deal with nuisance bears. Council recognizes that DFW determined that, as have other state and federal agencies and institutions, aversive conditioning can deter a bear from returning to the treatment location, but treated bears continue nuisance activity at other, different locations.

Council cites particular studies where aversive conditioning reduced but did not eliminate the occurrence of bears entering developed areas to forage on human food and trash in Sequoia National Park (Mazur 2010), Lake Tahoe Basin (Beckmann et al. 2004) and southern Louisiana (Leigh and Chamberlain 2008).

DFW continues to explore non-lethal methods to deal with nuisance bears. Council recognizes that DFW acquired specially trained Yellow Blackmouth Cur dogs to harass bears as part of the aversive conditioning technique.

Most recently, DFW and East Stroudsburg University conducted an evaluation of aversive conditioning techniques and found that rubber buckshot and dogs used to deter bears from returning to the spot of nuisance activity have limited short-term effectiveness. All bears,

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regardless of being unconditioned or conditioned, returned to urban settings within 17 days of capture and /or treatment. Overall, habitat use and availability of natural food in home ranges did not differ significantly among aversively conditioned and control group bears. Both conditioned and control bears were involved in subsequent nuisance behavior. The study concluded that the aversive conditioning protocol did not eliminate nuisance behavior in adult female black bears in NJ (Northeast Wildlife DNA Laboratory 2010).

Council recognizes that when a Category I bear must be destroyed, DFW and local law enforcement follow euthanasia procedures recommended by the American Veterinary Medical Association (Beaver et al. 2001). DFW and local law enforcement personnel follow procedures for animal welfare and care with respect to humaneness, pain and suffering as addressed in USDA WS WI (2002) and CA FED (2000).

Recommendations:

1. DFW should continue to operate under the BBRRC, an operating policy to respond to bear calls.
2. DFW personnel, law enforcement officers, State Park Police officers and park rangers trained by DFW should continue to destroy Category I bears immediately.
3. DFW should continue to refer Category II complaints to local law enforcement agencies, which can more quickly respond.
4. DFW should continue to train State and local police officers and State Park Police officers so that they can respond to problem black bears.
5. DFW should coordinate with universities on research to describe the distribution of black-bear human conflicts in NJ as they relate to spatial and temporal variables including anthropogenic development, habitat features and the demographic makeup of the human and nuisance bear populations.
6. DFW should continue to scientifically evaluate non-lethal control measures to determine their effect on bear behavior and bear related problems;
7. DFW should continue to develop aversive conditioning techniques for Category II bears for reducing conflict by altering bear behavior and movement.
8. DFW should open a dialogue with representatives of those municipalities which have failed to file the agreed upon annual reports on their bear response activities. A letter stressing the importance of reporting should be sent to all participating agencies.
9. DFW personnel should not actively remove bears in BMZ 7, however, Category III bears that must be removed from urban areas within BMZ 7 should be released on the nearest State owned land with suitable habitat.
10. DFW should continue issuing depredation permits to farmers because the circumstances and permit criteria regulating the taking of black bears and other wildlife under the special depredation permit has been addressed.
11. The General Treasury should, at a minimum, maintain FY 08 funding for DFW bear training and response and non-lethal control research because these activities benefit all NJ residents.

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G. Habitat Protection

Policy:

Council believes that DEP's open space acquisition program has been instrumental in protecting valuable bear habitat; Council supports habitat acquisition and improvement programs.

Discussion:

DFW has undertaken an effort to identify and protect critical black bear habitat. Council also recognizes that DEP, through its Green Acres Program and State Park and Wildlife Management Area systems, has acquired a significant amount of habitat which is important to black bears. Council recognizes that the Pinelands and Highlands Protection Acts will ensure that bears remain part of NJ's landscape. Council supports the monumental effort by the DEP to preserve wildlife habitat through its aggressive Green Acres Program and Pinelands and Highlands legislation.

Recommendations:

1. DEP should continue to protect black bear habitat as it becomes available through the State's open space acquisition programs.
2. DFW should create a wildlife management plan for all new lands purchased by or deeded to the DEP that addresses the management and control of bears and other wildlife.
3. DFW should continue to use GIS technology to identify and rank black bear habitat and travel corridors.
4. The State Legislature should continue to allocate funding to purchase wildlife habitat as it becomes available.

H. Bear Population Management

Policy:

Council believes that DFW should stabilize the NJ bear population, then evaluate and eventually maintain the population at a density that minimizes human/bear conflicts, provides for a sustainable population within suitable bear habitat and minimizes emigration of bears to unsuitable habitat in suburban and urban areas.

Discussion:

Council recognizes that DFW has conducted bear population monitoring which has shown bear population growth and range expansion. Council notes that the bear population has been spreading south and east, impacting people in areas of NJ that have not had bears for more than a century.

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Using data collected from 1988 to 1992, DFW estimated a 1992 population of between 450-550 black bears in the 681 square mile Kittatinny (Western) and Bearfort (Eastern) study areas (Figure 3) (McConnell et al. 1997).

In 2000, DFW biologists estimated a bear population of 1,056 in the Kittatinny and Bearfort study areas. The population estimate for the prime bear area of northern New Jersey north of Route I-80 and west of Route I-287 in 2001 was estimated at 1777 adult bears using DNA and mark-recapture data. DFW estimated a 2003 population of between 1,600-3,200 bears in an area north of Route I-80 and west of Route I-287 (NJDEP 2003); in the research study areas (Figure 4), the population was estimated at 1,490. The 2005 population estimate was 1,269 bears (range 700 to 2,306) in the study areas and 2,397 bears (range 1,328 to 4,329) in the areas north of Route I-80 and west of Route I-287 (Diefenbach 2006).

Most recently, genetic data was used to estimate the 2009 population size of black bears in New Jersey and to evaluate population structure, and landscape-genetic relationships. Black bear DNA was provided by the New Jersey Division of Fish and Wildlife (NJDFW) from tissue samples collected from hunter harvested bears and research trapped bears from bear management zones (BMZs) 1-4 in NJ. The 2009 bear population was estimated at 3,438 in the areas north of Route I-80 and west of Route I-287. The genetic structure indicates there is no evidence of increasing genetic isolation with geographic distance in New Jersey. The bears are not restricted in their movements. Highways and other land use features are not a barrier to movement among BMZs. Data indicates the maturing NJ bear population is developing its own genetic character. Results of this study confirm inter-breeding with Pennsylvania bears, however more data is needed to confirm inter-breeding with NY bears, however, this is likely. Additional sampling is recommended to confirm the tri-state nature of our bear population (Huffman et al. 2010).

Council also recognizes that emigration of NJ bears into neighboring Pennsylvania and New York has impacted these states. The concurrent expanding human population and bear population in this region of NJ, PA and NY provides potential for conflict. The 1997 BBMP recommended managing NJ bears at the same density (1 bear / 2½ square miles) as our neighboring states since bears living along our respective borders are essentially one regional population. Council notes that DFW research has found that in some areas in northwestern New Jersey black bear densities are as high as 2 – 3 bears / square mile, which is 5 to 7 times higher than the density recommended by the 1997 BBMP.

Council recognizes that Pennsylvania increased its bear hunting season in counties adjacent to New Jersey in 2002 due to an increase in the bear population and human/ bear conflict problems in this region and that New York increased its bear hunting season length in the Catskill region. Council recognizes that to properly manage this tri-state bear population, density goals must be similar.

The population reduction achieved by the 2003 and 2005 bear hunting seasons resulted in short-term reductions in bear related complaints received by DFW and cooperating law enforcement agencies. Council also notes that bear calls and complaints, in total, remain high, particularly the Category I complaints (Table 1). Council also recognizes that these negative interactions not only result in economic loss to individual citizens, but also have created a severe budgetary

burden on responding agencies, particularly DFW. Council notes that maintaining a high level of bear response by DFW will require continued funding from the General Treasury.

The tools available for population reduction are few. Council notes that the NJ Supreme Court ruled that Council must consider the absolute size of the bear population, the number of harmful bear-human interactions and the fiscal and human resources available to carry out its goals. Council recognizes that DFW must consider the proven efficacy of the tools and the experience of other states and the cost of using the tools.

Council recognizes that wildlife managers, confronted with conflicting public perceptions of bears as both a nuisance and a valued game animal, are faced with a dilemma: how to maintain healthy populations of black bears while minimizing conflicts between bears and humans (USDA WS WI 2002). Council also recognizes that people in NJ express opinions on both sides of the hunting issue.

Council has recognized the concerns of citizens and, therefore, adopted a conservative approach to population reduction by regulated hunting in order to ensure the public that the long-term viability of the bear population is maintained. Council notes that the 2003 and 2005 bear hunting seasons clearly demonstrated that the outcome of the bear hunting season could be predicted based upon previously collected data on the New Jersey bear population and the results of similar hunting seasons in adjacent states.

Various methods to stabilize or reduce the increasing bear population have been suggested to the Council, DEP and DFW by NJ citizens. The following is a discussion of these proposed methods.

1. Relocation:

Although relocation can be used to establish or reestablish bear populations, no state has successfully used relocation as a means of population control. Council recognizes that southern NJ contains quality long-term habitat for black bears. Over 1.1 million acres is contained in the Pinelands National Reserve, of which one third is publicly owned. Council also recognizes that in the early 1980's DFW conducted an Environmental Assessment of a plan to relocate black bears to the Pinelands (Lund et al. 1981). At that time, local opposition to the relocation of bears to southern NJ put a halt to this option. However, as a result of the population pressures created by an expanding northern NJ bear population, bears now occupy all NJ counties (Figure 1).

Council also believes that the bear population that is reestablished in southern NJ will grow. Once all available bear habitat is occupied, there will be no additional space for relocation in NJ. Council has determined that no other state or provincial agency in North America would accept excess bears from NJ.

Additionally, relocation of nuisance and/or problem bears to unoccupied range comes with a level of risk. Dedication of the necessary staff and funding to subsequently handle the resultant nuisance complaints from citizens in southern NJ will place additional burden on already strained budgets.

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Council believes that even if relocation of excess and/or problem bears to unoccupied range in southern NJ was acceptable to local residents, the cost of such a program would be prohibitive. DFW estimates that the cost to capture a bear during their research efforts is over $1,000. Transporting bears out of the woods would significantly increase labor and equipment costs. Due to lower success, costs for trapping nuisance bears approaches $2,000. Relocating 1000-2000 bears from northern NJ to southern NJ would be cost prohibitive and likely a multi-year task. Council believes that DFW does not have the necessary staff and funding to make such a program practical. To the Council's knowledge, no state has successfully used relocation as a means of population control. Based upon the cost and opposition to relocating bears, particularly nuisance bears, Council does not consider this a viable option for population control. Therefore, Council concludes that relocation is not a suitable tool for bear population control.

2. Alternative Methods of Population Control:

DEP's Division of Science and Research commissioned a literature review of fertility control on bears and other wildlife, which concluded that fertility control is very unlikely to be a feasible means of managing the black bear population in New Jersey due to the costs involved with field capture and the inability to capture enough bears to effect population control, even if a licensed fertility agent existed for bears (Frakker et al. 2006).

Council's position on bear fertility control was presented in the 2005 CBBMP (Wolgast et al. 2005), which stated that Council has encouraged DFW and independent researchers to explore alternative population control techniques to determine if these techniques are viable for control of wild populations of bears. Council has adopted criteria that will allow DFW, with Council approval, to issue permits for legitimate research on fertility control when captive studies indicate that there is potential for controlling wild populations (N.J.A.C. 7:25-5.37).

In November 2002, the DEP entered into a Memorandum of Understanding with the Humane Society of the United States (HSUS) to investigate the feasibility of fertility control as a means of controlling the black bear population and DEP authorized a study investigating using sterilization as a means of controlling the black bear population. Both studies utilized captive bears at Six Flags Safari Park in Jackson, Ocean County, NJ. As of the publication date of this CBBMP, no results of these studies have become available.

Alternative non-lethal population control methods are still in the experimental phase and have yet to be tried on free roaming populations of bears. Current contraceptive techniques have been uneconomical or infeasible for practical implementation even in small localized populations of game species. The species for which contraceptives have been primarily tested (long-lived species such as deer and horses) are least suited for population reduction through use of fertility control (Fagerstone et al. 2002). In New Jersey, fertility control on a suburban deer population cost over $ 714 per deer (DeNicola 2004). Although fertility control in field situations has not been attempted on bears, the cost of capturing bears during research or nuisance control activities in New Jersey, reported above, are applicable and might double since it is likely that as in the case of deer, multiple captures and injections would be required.

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In 2006, federal authority to regulate fertility control agents on wildlife was transferred from the US FDA to US EPA. Neither FDA nor EPA has approved any chemical fertility control on an experimental basis for any wild population of bears. Although physical sterilization does not require FDA approval, the costs of trapping bears for such purposes would be prohibitive. Council notes that since New Jersey bears have a very high annual survival rate and are known to live over twenty years, population reduction, if any, through sterilization or fertility control would be slow.

Even though fertility control may not affect survival of individual bears, it can easily be lethal to populations (Hobbs et al. 2000). Animals with good immune systems will be most likely to mount a strong immune response when given an immunocontraceptive agent and so would be least likely to reproduce. Animals with a poor immune system, either due to genetics, injury or disease, would be affected less, therefore be most likely to reproduce. The long-term implications of immunocontraceptives in wildlife populations would be that immunocontraception could artificially select for those individuals that are immunodeficient and produce populations of animals with weak immune systems and high susceptibility to disease and population fluctuations (Muller et al. 1997).

Council reiterates its support for continued testing of fertility control by credible scientists on enclosed populations despite DEP's finding that fertility control is unlikely to be a feasible means of managing the black bear population in New Jersey (Frakker et al. 2006) and the conclusion that fertility control will not limit the growth of long-lived game species like wild black bear populations (Fagerstone et al. 2002).

Based upon the lack of success with current research and logistical problems discussed in the above cited literature review, Council concludes that fertility control, either chemical or physical, is not a viable tool for bear population control.

3. Regulated Hunting:

Hunting is a safe, legal, responsible use of the wildlife resource and a legitimate and effective means to control over-abundant game species in a cost-effective manner. Council notes that, as with other species such as waterfowl and deer, bear hunting relies on the principle of adaptive management as described by Walters (1986). This approach relies on managing wildlife populations through experience and monitoring which allows the management agency to make necessary changes to maintain the natural resource (bear population) in the desired condition. Council further notes that because DFW has ongoing monitoring, any changes needed can be made by annually reviewing hunting regulations (the current Game Code process).

Black bear populations can withstand regulated hunting on an annual basis (CA FED 2000, Williamson 2002, Ternent 2006) and historically, managed hunting has been an effective system for protecting bear populations because it has enlisted a clientele interested in the continued abundance of the resource and it transfers the killing of a species which can become a public nuisance or threat from the general public to a smaller group of people (hunters) (Garshelis 2002). Council notes that regulated hunting engenders a conservation minded constituency group, hunters, who ensure the continued abundance of the species of interest, and who support

and are willing to pay for research, habitat protection and conservation measures necessary to meet that end. Council recognizes that hunters provide an important service to the public while decreasing the general tax burden.

Although the activity of regulated hunting of black bears results in the death of individual bears, specific safeguards, including an in-season closure mechanism and bag limit, will assure that bear harvests are below the population's sustained-yield capabilities. Council agrees with the finding that no significant negative effects, individually or cumulatively, on bears as a species are expected to result from hunting (CA FED 2000).

Council notes that hunting is the primary means of managing and regulating black bear populations in 29 states. Many of these states charge an additional permit fee for bear hunting that is used to support bear research and management. All states with bear hunting seasons allow archery, shotgun and muzzleloaders to be used. Firearms and archery equipment have been shown to be effective (CA FED 2000, Kurzejeski et al. 1999) and that both shotguns and archery equipment were allowed in past bear hunting seasons in New Jersey.

Council recognizes that the 1997 BBMP stated that "continual fragmentation of habitat and the projected growth of the human population has made it untenable to continue maintaining a black bear population at its present level and density" (McConnell et al. 1997, p. 76) and that the black bear population could sustain a limited, regulated hunting season (McConnell et al. 1997, p. 78).

No other method of black bear population control has been identified and implemented in states with resident bear populations. Hunting is considered one element of an integrated approach to manage bear populations. The purpose of the 2003 and 2005 hunting seasons was to provide recreation, gather data on hunter participation and success rates, and begin to reduce the black bear population density in order to reduce the associated human/bear conflicts, including property damage caused by bears.

The 2003 and 2005 black bear hunting seasons were successful because these hunting seasons met the objectives established: 1) the target harvests were obtained; 2) the seasons were conducted safely with no hunter accidents and without incident of trespassing or other complaints; and 3) biological data on bears, hunter success and hunter participation was collected. The results (APPENDIX 3, Wolgast et al. 2005) followed the predictions of DFW biologists based on the conservative format. The 2003 harvest was 328 bears and the 2005 harvest was 298 bears. These hunting seasons established that hunters could safely harvest black bears in a controlled manner.

DFW collected biological data on the bears and demographic data on hunter success and participation, which DFW uses to design future management actions. Using surveys of successful hunters, DFW estimated that hunters spent approximately $1 million in each of the 2003 and 2005 hunting seasons for equipment, supplies, gas, food and lodging in pursuit of black bears. If a bear permit fee had been in effect, similar to deer and turkey hunting permits, DFW would have collected about $283,000 in permit fees from bear hunters. Bear hunting, like other recreational hunting seasons, has a demonstrated positive economic benefit.

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Bear hunting seasons can alleviate damage and nuisance incidents caused by problem bears. Twenty percent of the tagged bears in the 2003 and 2005 harvests were bears tagged at nuisance sites or in urban situations. Damage and nuisance calls to DFW decreased by 40% and Category I reports to DFW decreased by 37% in 2004, after the 2003 season. Damage and nuisance calls to DFW increased by 37% and Category I reports to DFW increased by 35% in 2005; damage and nuisance calls to DFW decreased by 13% and Category I reports to DFW decreased by 7% in 2006, after the 2005 season.

Hunting has been used as a tool to reinforce the aversive conditioning methods employed by DFW and trained law enforcement officers. Council refers to the review of the scientific literature conducted by Conover (2001), who determined that hunting reduces wildlife damage by reinforcing an animal's fear of humans and causing animals to avoid areas where they might come into contact with humans. Conover (2001) also stated that hunting should increase the effectiveness of non-lethal techniques because the animals learn to associate humans with negative consequences. Although some nuisance bears are eliminated during hunting seasons, others are pursued but not harvested, thereby imparting a negative experience on the bear. This negative interaction for the bear contrasts the positive food reward in other human/bear interactions.

The adaptive management process will guide the future structure of bear population management. This dynamic process is already in place as the Game Code, where DFW biologist evaluate the results of the bear hunting season on the bear population and bear related conflicts.

As is the case with other polygamous species such as deer, management of the bear population is affected by management of the female segment of the population. Population benchmarks will provide a quantitative assessment of the effect of hunting on the bear population and guide future hunting season structure. For example, a deterministic model using productivity, survival and mortality of the New Jersey research study population yields population stabilization at a hunting harvest rate of 0.2 females per square mile and 8% reduction at 0.3 females per square mile.

The proposed conservative bear hunting seasons allows data to be collected without negatively impacting the black bear population. The December season reduces the possibility of over-harvest because most pregnant females would be denned and not available for harvest. The current Game Code contains language that has authorized the Director of the DFW, after consultation with the Chairman of the Council, to close the bear season with 24 hours notice, if warranted, after DFW biologists review data from the harvest. Based upon data from the 2003 and 2005 NJ bear hunting seasons and harvest rates in adjacent states with similar seasons, DFW estimates that a harvest rate of more than 25% of the current year's tagged bears would call for consideration of an in-season closure.

Council will continue to rely on the expertise of DFW biologists, who through data collection and analysis provide recommendations regarding the structure and timing of future seasons which will ensure black bear populations are maintained in appropriate habitat at desired densities compatible with existing land use.

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In reviewing the tools available for population control and the costs associated with each, the Council concludes that relocation will never be a viable tool for bear population control. Additionally, non-lethal tools such as sterilization and chemical fertility control are unproven at this time. However, research in this area should continue. In contrast, Council concurs with the experience of all states which manage viable bear populations that regulated sport hunting of bears is the most cost effective and practical tool to control bear populations.

Recommendations:

1. DFW should reestablish a regulated black bear hunting season which is similar to the 2003 hunting season and which includes BMZs to direct hunting pressure as appropriate. Council believes the purpose of this season is to collect additional information on hunter participation and success rates and bear harvest rates and to begin to reduce the bear population in the most efficient, cost-effective manner and to provide recreational opportunity to New Jersey sportsmen and women.
2. DFW should not use relocation as a means of population control.
3. DFW should continue to investigate alternative population control techniques, such as fertility control.
4. DFW should develop a long-term structure for bear hunting seasons to reduce and then stabilize the bear population at a level compatible with the availability and quality of habitat, which is consistent with public safety and residential and agricultural concerns. Future season structures should be based on data collected from the regulated bear hunting seasons and population monitoring. Permit quotas and season length should be adjusted as necessary to regulate hunting pressure in BMZs. Season formats should use all hunting implements legally available including archery and muzzleloaders.
5. DFW should use harvest parameters, including female harvest rates, as a benchmark to gauge the progress of the population reduction and stabilization, and trigger adjustments to future season structures.
6. DFW should include BMZ 7 in future Game Code proposals to legally harvest bears by properly licensed hunters with bear permits during the established deer hunting seasons.
7. Council supports legislation that would establish a fee of $28 for a bear permit. Hunters will pay for the privilege to participate in a regulated hunting season with the fees used to cover the costs of administering the hunt. A bear permit fee comparable to the deer permit ($28) has the potential to generate $ 280,000.

V. CONCLUSION

Council supports active, integrated bear management and DFW's population goal of 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.

Council recognizes that bears are causing considerable damage to personal property and that the amount of damage and threats to public safety have increased commensurate with the bear population. Home entries and attempted home entries increased significantly in the late 1990s and remain unacceptably high despite intensive efforts to eliminate problem bears and despite

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intensive education efforts. Even though DFW has been proactive in response to high risk bear incidents that are a threat to public safety and property damage, Council is not willing to continually subject the citizens of New Jersey to this level of risk to public safety and property damage from black bears and so must take the responsible action of reducing the bear population.

Council recommends that DFW continue its integrated strategy for black bear management that includes continuing the educational campaign, pursuing legislative initiatives, conducting research and population monitoring, continuing appropriate control measures, investigating all population control methods and implementing population reduction through a regulated hunting season. Bear population management through regulated hunting will satisfy the Council's legislative mandate of conserving the bear resource and providing recreational opportunity. Additionally, the use of regulated hunting as a tool for population control satisfies the NJ Supreme Court mandate to consider the most appropriate tool available.

Adequate funding from the General Treasury, combined with Hunters and Anglers and federal funds, must continue to maintain an adequate black bear management program. It is unrealistic to believe that NJ's sportsmen and women share the sole responsibility for paying for this cost. Since responsible bear management benefits all citizens of NJ, it is appropriate that it continue to be funded through an appropriation from the General Treasury. Over time, a reduction in the bear population should reduce the associated management costs as well as reduce the economic losses incurred by citizens of New Jersey resulting from bear related property damage.

Council realizes that the desirable bear population level will be influenced over time by many dynamic factors such as the amount of available bear habitat, human population growth and resulting development, and changes in human tolerance for bears brought about by education and the willingness to change lifestyles to adapt to living in bear county. Council is confident that with careful management of this species, black bears will be able to thrive in suitable habitat in NJ where they can more safely coexist with NJ residents.

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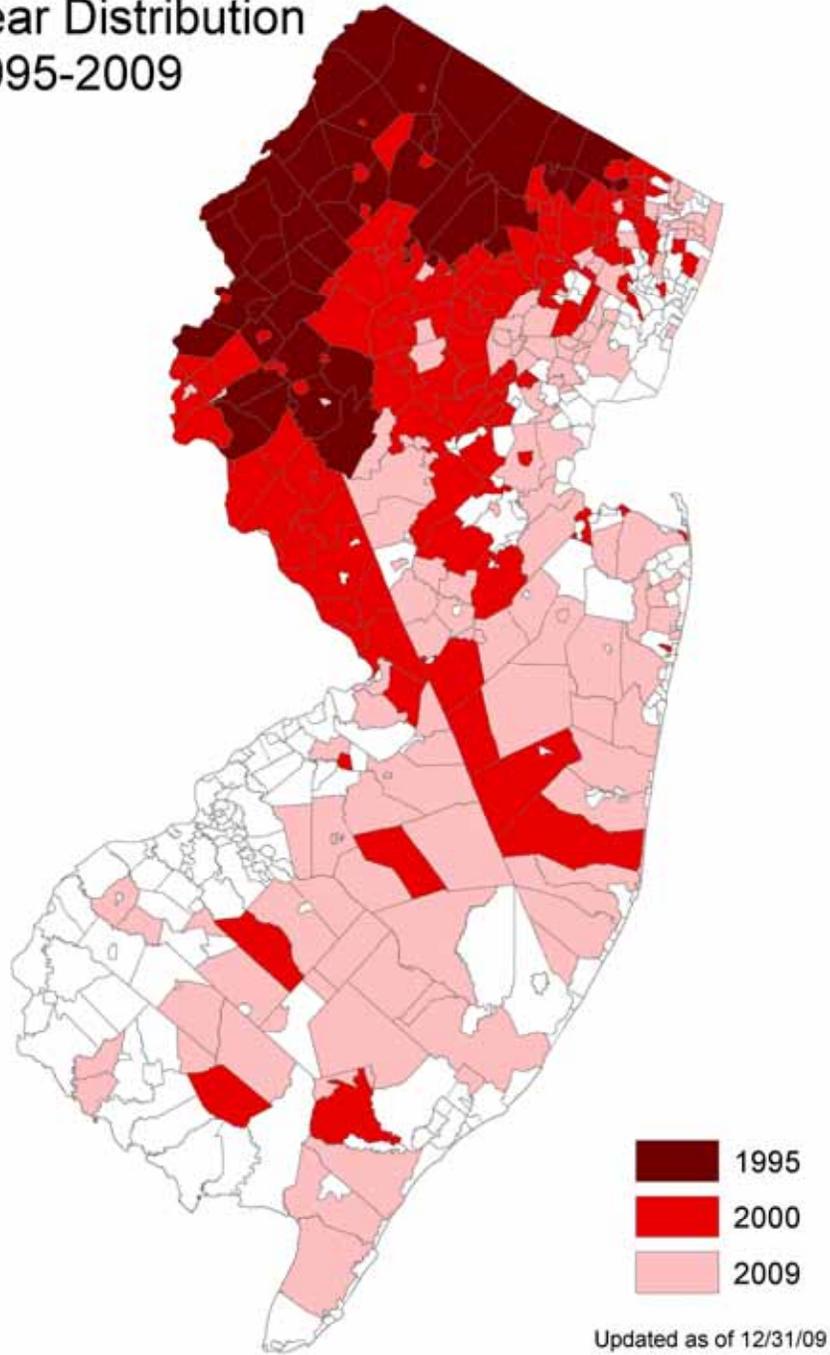
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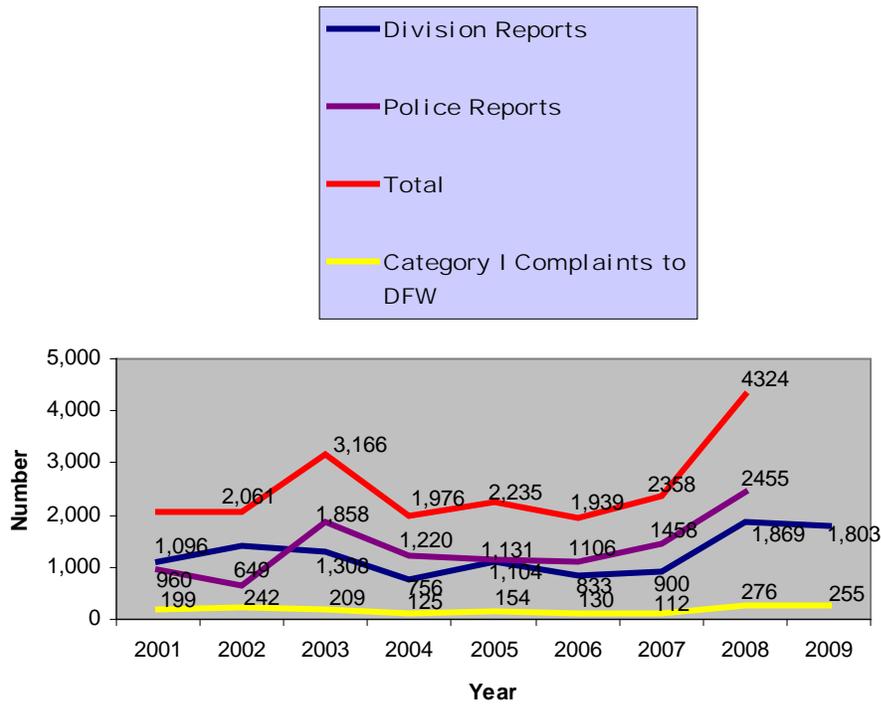
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Figure 1. Black Bear Distribution 1995-2009
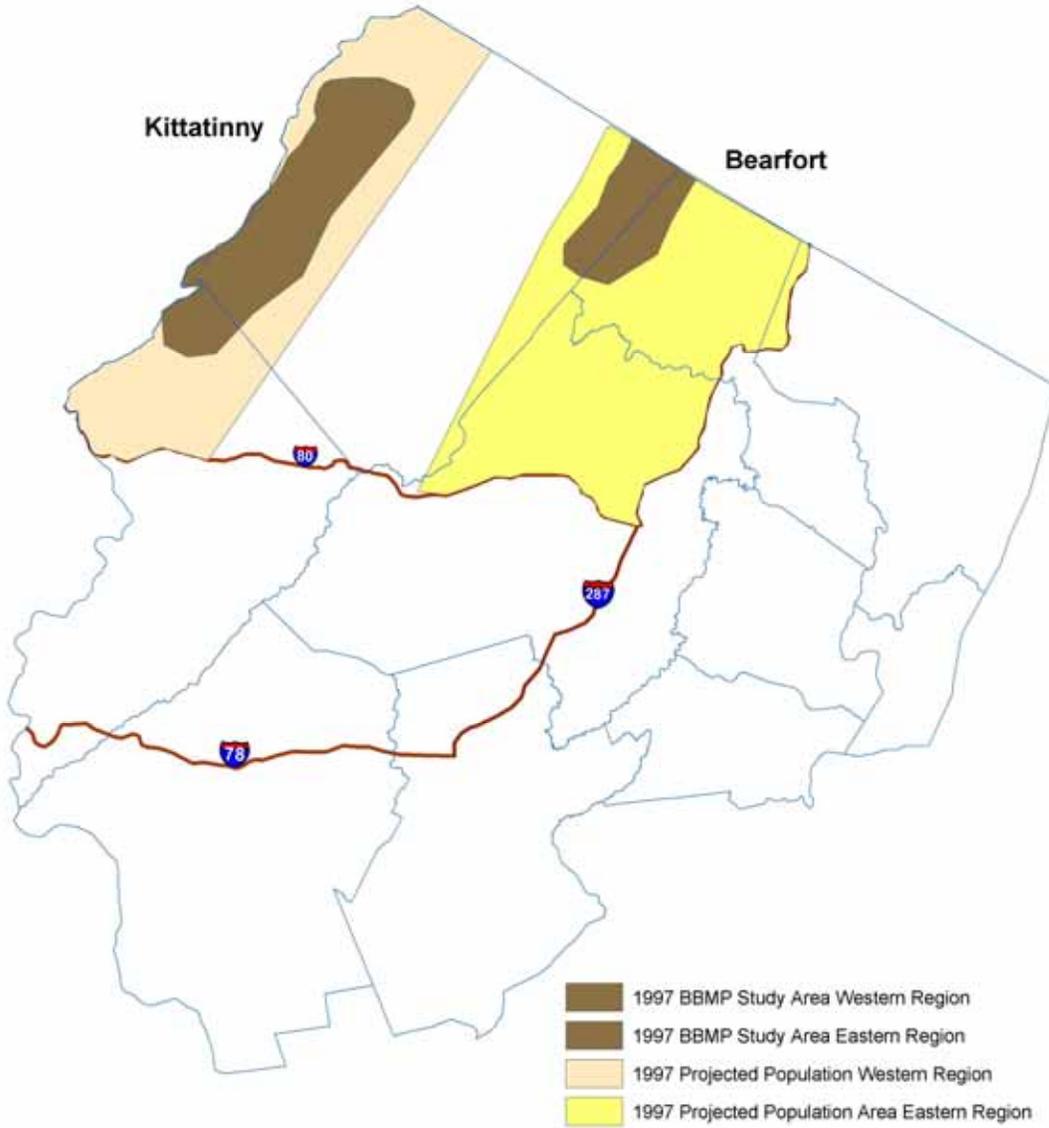

Black Bear Distribution
1995-2009

1995
2000
2009

Updated as of 12/31/09

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Figure 2. Bear Complaint Calls by Year

Legend:
- **Division Reports** (blue)
- **Police Reports** (purple)
- **Total** (red)
- **Category I Complaints to DFW** (yellow)

Y-axis: Number (0 – 5,000)
X-axis: Year (2001 – 2009)

Total (red): 2,061 (2001), 2,061 (2002), 3,166 (2003), 1,976 (2004), 2,235 (2005), 1,939 (2006), 2358 (2007), 4324 (2008)

Police Reports (purple): 960 (2001), 640 (2002), 1,858 (2003), 1,220 (2004), 1,131 (2005), 1106 (2006), 1458 (2007), 2455 (2008)

Division Reports (blue): 1,096 (2001), 1,308 (2003), 756 (2004), 1,104 (2005), 833 (2006), 900 (2007), 1,869 (2008), 1,803 (2009)

Category I Complaints to DFW (yellow): 199 (2001), 242 (2002), 209 (2003), 125 (2004), 154 (2005), 130 (2006), 112 (2007), 276 (2008), 255 (2009)

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Figure 3. **1997 BBMP Study Areas**

Kittatinny

Bearfort

■ (dark brown)	1997 BBMP Study Area Western Region
■ (brown)	1997 BBMP Study Area Eastern Region
■ (tan)	1997 Projected Population Western Region
■ (yellow)	1997 Projected Population Area Eastern Region

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Figure 4. 2003 Study Areas

2003 Study Areas
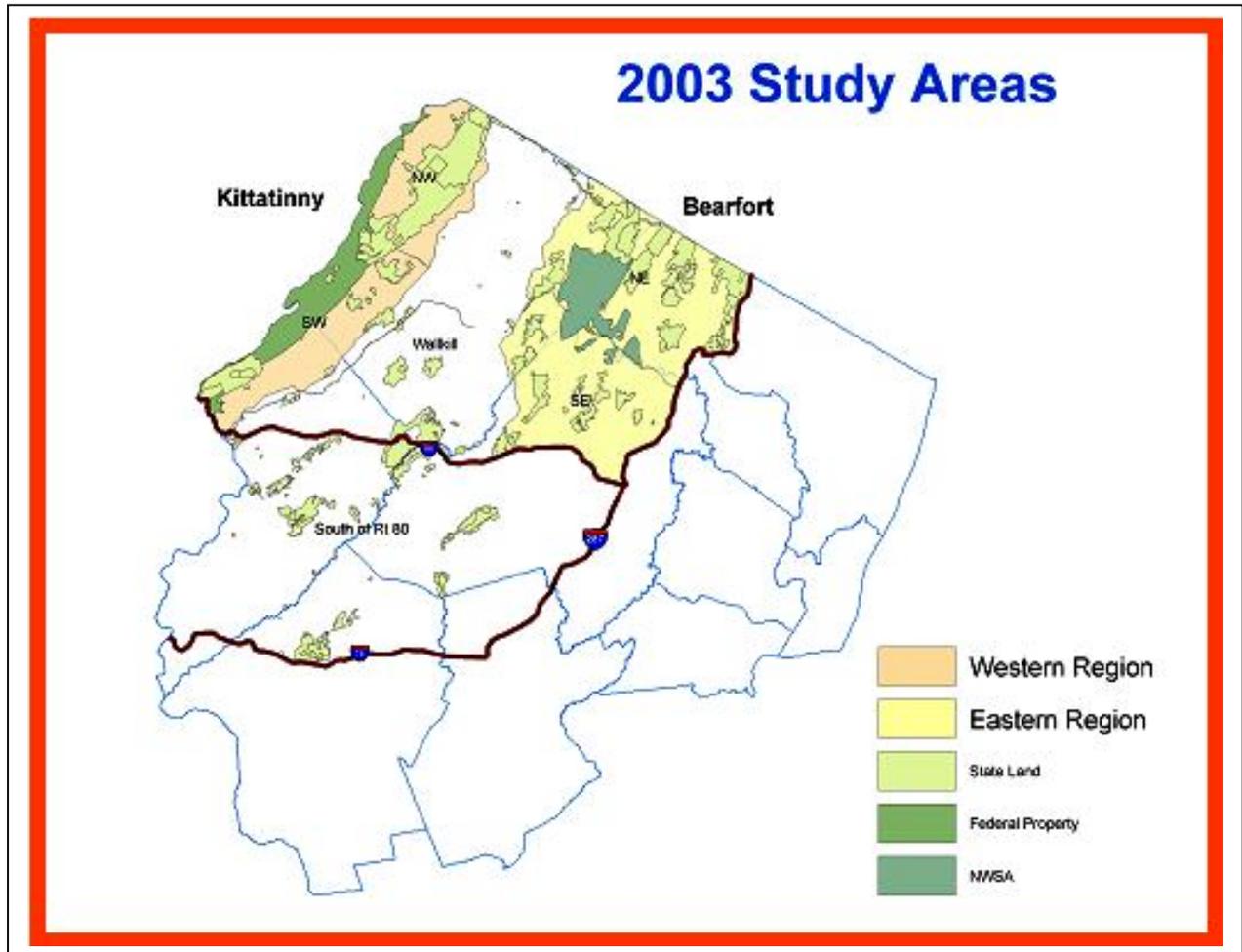
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Figure 5. Black Bear Habitat

Black Bear Habitat

Based on 2002
Land Use /
Land Cover

Bear Habitat Ranking

- Best Habitat
- Good Habitat
- Fair Habitat
- Poor Habitat
- BMZ 7

February 2010
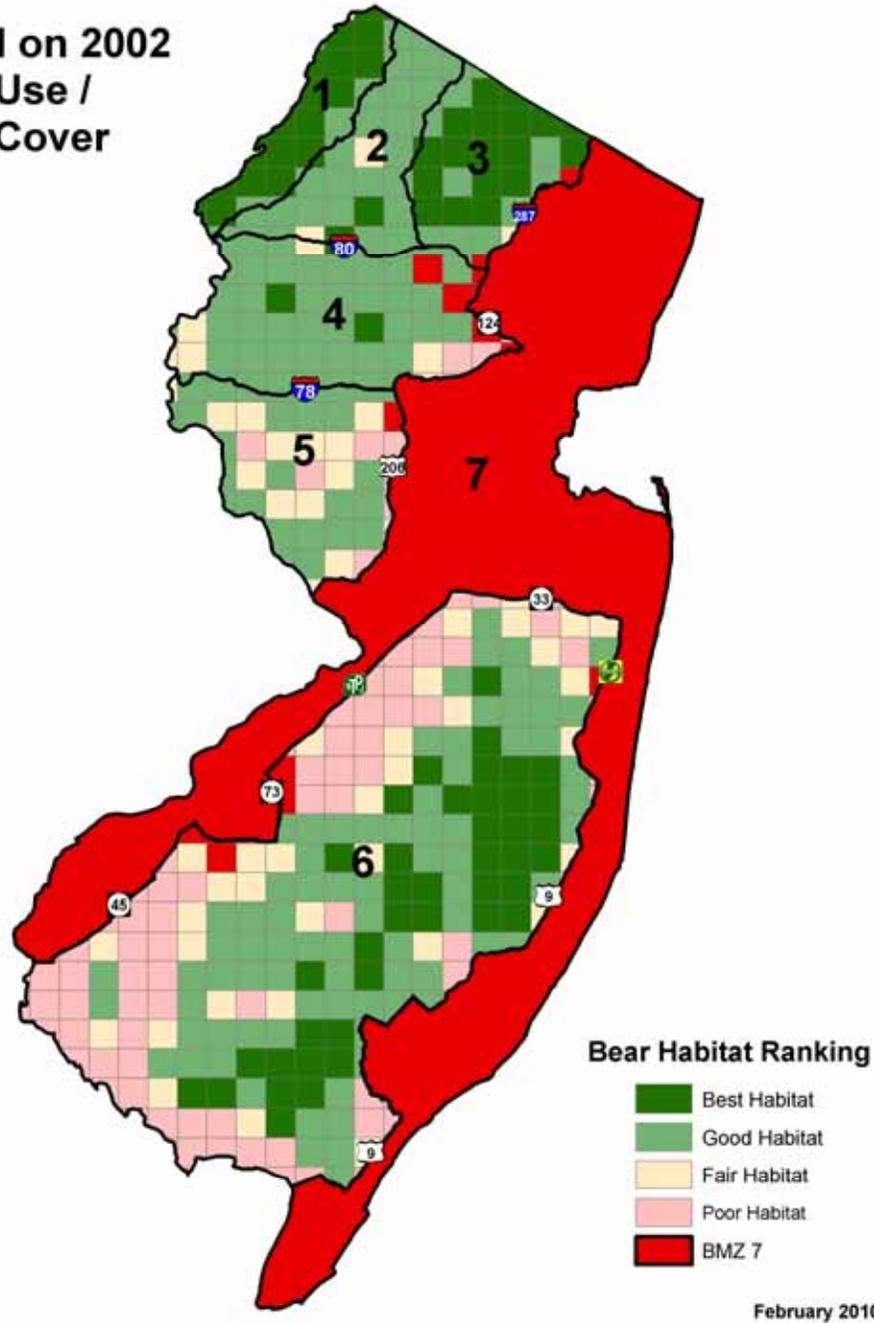
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Table 1. Bear Calls Received by NJDFW by Type

TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009
CAT I	199	242	209	125	154	130	112	276	255
CAT II	754	1025	1015	562	832	625	732	1499	1477
CAT III	783	806	851	489	775	556	573	1045	1274
TOTAL	1736	2073	2075	1196	1761	1311	1417	2820	3006

Category I

TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009
AD	5	9	5	10	8	9	12	29	29
AHE	5	25	23	10	23	17	16	32	36
DA	6	15	11	5	8	2	9	1	2
HA	1	1	2	1	1	1		1	1
HE	29	55	53	24	29	40	32	69	34
LS	36	27	17	24	24	13	13	49	57
PD+	6	11	16	2	7	8	6	10	3
PH		2	3	5	2	6	3	6	9
RA	57	34	38	27	15	7	2	24	29
TA	37	28	19	7	21	13	10	28	35
TE	2	5	4	2	3		1	2	
UH	13	24	9	5	9	10	5	16	13
VE	2	6	9	3	4	4	3	9	7
TOTAL	199	242	209	125	154	130	112	276	255

KEY:		
AD= Agricultural Damage	HE= Home Entry	RA= Rabbit Attack
AHE= Attempted Home Entry	LS= Livestock Attack	TA= Aggressive Bear
DA= Dog Attack (Unprovoked)	PD+= Property Damage > $500	TE= Tent Entry
HA= Human Attack	PH= Protected Beehives	UH= Unprotected Beehives
		VE= Vehicle Entry

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Category II

TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009
CS	5	10	1	3	0	2	4	2	0
GA	269	379	503	282	358	288	319	632	504
NU	357	525	357	229	387	271	331	692	833
PD-	123	111	132	44	83	61	75	160	131
PDA	**	**	22	4	4	3	3	13	9
TOTAL	754	1025	1015	562	832	625	732	1499	1477

KEY:		
CS= Campsite	GA= Garbage	PD-= Property Damage <$500
	NU= Nuisance	PDA= Provoked Dog Attack
		**= new category in 2003

Category III

TYPE	2001	2002	2003	2004	2005	2006	2007	2008	2009
BF	137	137	89	59	87	71	45	77	68
FD	3	3	5	1	1	4	4	14	9
IB	50	65	69	35	58	43	49	58	130
IK	5	6			1	1	4	3	3
OT	13	34	11	7		2		45	80
ST	502	479	610	322	507	345	375	678	833
UB	12	19	11	12	38	15	17	27	6
VS	61	63	56	53	83	75	79	143	145
TOTAL	783	806	851	489	775	556	573	1045	1274

KEY:		
BF= Birdfeeder	IB= Injured Bear	ST= Sighting
FD= Found Dead	IK= Illegal Kill	UB= Urban Bear
	OT= Other	VS= Vehicle Struck Bear

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Table 2. NJDFW Black Bear Tagging Effort

	2001	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL
Tagged & Released, including recaptures	215	312	291	247	286	263	233	364	286	2497
Individual Bears Handled	202	291	270	230	274	246	223	337	262	2335
Cubs of Year (denwork)	14	89	60	50	44	38	42	69	53	459

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APPENDIX 1. Role of the Fish and Game Council

Council has historically worked closely with DFW, utilizing the scientific expertise of its biologists to regulate the taking of wildlife in order to ensure its abundance and minimize wildlife related damage. Council's ability to manage is primarily through its rule-making authority to regulate hunting and trapping (Game Code) and fishing (Fish Code). The ability to implement various Council policies is constrained by the fiscal and human resources of governmental agencies, particularly DEP and DFW, as well as those of interested non-governmental organizations. Therefore, with regard to the Supreme Court opinion concerning the ability to determine the absolute population size of New Jersey black bears, the Council recognizes that the ability to measure wildlife populations is subject to the scientific tools available and that the population status is most often measured through the use of population indices and estimates, as opposed to absolute counts. Except for highly visible small populations such as bald eagles, it is impossible to obtain absolute counts on wildlife species. The CBBMP relies on estimates of abundance within the bear study areas as well as the changes in human-bear related incidences when considering bear management decisions.

Council was established by the legislature in 1945; Council's current makeup of 11 members was established in 1979. The makeup and authority of Council was upheld by the NJ Supreme Court in 1976 (Humane Society of the U.S. vs. NJ State Fish and Game Council, 70 N.J. 565 (1976), appeal dismissed 429 U.S. 1032, 50 L.Ed. 2d 744.) and more recently the Superior Court in 2002 (Mercer Cty. Deer Alliance vs. NJDEP, 349 NJ Super. 440). The Governor, with advice and consent of the Senate, appoints each member. Three members of the Council are farmers, recommended by the Agricultural Convention; six members are sportsmen, recommended by the State Federation of Sportsmen's Clubs; one member is a public member knowledgeable in land use management and soil conservation practices, and the final member is the Chairperson of the Endangered and Nongame Advisory Committee (N.J.S.A 13:1B-24).

Council is mandated with the responsibility of protecting and conserving game birds, mammals and fish and providing an adequate supply for recreational and commercial harvest.   This mandate is carried out through Council's adoption of the Fish and Game Codes, which determine " under what circumstances, when and in what localities, by what means and in what amounts and numbers [fish and game species] may be pursued, taken, killed, or had in possession so as to maintain an adequate and proper supply thereof...." (N.J.S.A. 13:1B-30, 13:1B-32).

"In addition to its powers and duties otherwise hereinafter provided, the Fish and Game Council shall, subject to the approval of the commissioner, formulate comprehensive policies for the protection and propagation of fish, birds and game animals …" (N.J.S.A. 13:1B-28). It is this statutory authority that provides the basis for the CBBMP.

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APPENDIX 2. NJDFW Educational Effort

DFW has been providing information to the New Jersey public about black bears and precautions necessary to avoid attracting bears for the last 30 years. The bear education program was formalized in 1998 and intensified in 2001 through the addition of general treasury funding.

The bear education program received a national education award in 2000 from the Association of Conservation Information and has since won several other awards for bear education publications. The ½ hour television video " Bear Country NJ" produced by DFW and NJN received an Emmy, and more recently, the "Welcome to Bear Country" camping video won a "Telly" award for educational video.

Over the last 10 years, bear education has been provided directly to over 100,000 people through presentations and manned exhibits in every New Jersey county. A variety of audiences were reached including school children of all ages, scout troops, rotary clubs, senior groups, nature clubs, outdoor enthusiasts at public and private campgrounds, civic groups, personnel at various professional organizations and members of the general public. During the same period, over 3 million pieces of bear education material have been produced and distributed to the general public. A long standing education partnership between DFW and the Division of Parks and Forestry has provided bear information to hundreds of thousands of park visitors and minimized park user conflicts with bears.

The educational material produced and distributed includes:

295,000	Park, campground and outdoor recreation brochures
566,000	Residential household brochures
400,000	Residential/Outdoor recreation brochures
26,000	Residential/Outdoor recreation brochures – Spanish version
50,000	Signs for use in parks and campgrounds
350,000	Camper behavior in bear country cards
206,000	Garbage can fliers for residential households
35,000	Waste hauler bill inserts
500,000	Educational brochures for children
40,000	Educational coloring books for children
125,000	Educational activity book for children
350,000	Educational bookmarks
110,000	Educational bookcovers
45,000	'Do Not Feed the Bears' bumper stickers
1,500	Magnets

Annual letters to Municipality leaders on bear response, which have included requests to distribute bear education information to resident households have significantly added to the number of people receiving bear education information. In one year alone, more than 75,000 households received bear education information through the Municipal partnership.

In 2008 and 2009, black bear education public service announcements were aired on 30 New Jersey radio stations during the peak bear activity months of April, May, June, September, October and November. The 30 and 60 second PSAs aired thousands of times each year on these radio stations.

DFW' s Website (www.njfishandwildlife.com) provides electronic versions of bear education literature and bear-proofing information including sources for bear-proof garbage containers. There is also information on black bear biology, natural history and black bear research and management.

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APPENDIX 3. Results of 2003 and 2005 NJ Black Bear Hunting Seasons

The 2003 and 2005 black bear hunting seasons met the objectives established for the hunt: 1) the target harvest was obtained; 2) the hunt was conducted safely with no hunter accidents and without incident of trespassing or other complaints; and 3) biological data on bears, hunter success and hunter participation was collected. The results followed the predictions of DFW biologists based upon the conservative format. As predicted, the sex and age structure of the harvest matched that of bears captured during research and control activities. Seventy percent of the harvested bears were untagged, similar to the numbers that Division personnel handle in research activities.

The data from the 2003 and 2005 hunting seasons has proven that hunting can alleviate damage and nuisance incidents caused by problem bears. Ten percent of the tagged bears in the 2003 and 2005 harvests were known nuisance bears; an additional 10 percent were bears tagged at nuisance sites or in urban situations. GIS analysis of harvest location has shown that in Vernon township, Sussex county, 38 bears were harvested an average of 309 yards from a road; subsequently Category I and II bear complaint calls to DFW from Vernon township were reduced more than 67% (from 174 in 2003 to 58 in 2004).

Township officials have reported that their level of bear complaints dropped significantly in 2004 and 2006, a year after a hunting season, but have since increased. Damage and nuisance calls were reduced by 37.5% and Category I reports to DFW were reduced by 37% after the 2003 season; damage and nuisance calls were reduced by 24.5% and Category I reports to DFW were reduced by 13.6% after the 2005 season.

Harvest		Township	Complaints				
2003	2005		2003	2004	2005	2006	2007
38	33	Vernon	263	72	160	124	167
24	31	West Milford	256	99	207	204	209
14	13	Stillwater	88	42	37	29	29
10	10	Rockaway	87	10	29	13	29
25	14	Montague	31	12	32	6	13
328	298	STATEWIDE	1308	756	1104	833	900

Harvest		Township	Cat I & II Complaints				
2003	2005		2003	2004	2005	2006	2007
38	33	Vernon	174	58	128	102	133
24	31	West Milford	159	51	99	88	127
14	13	Stillwater	57	26	25	25	18
10	10	Rockaway	5	5	17	8	10
25	14	Montague	23	7	11	5	6
328	298	STATEWIDE	1046	629	863	746	838

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Hunting Season Results	2003	2005
Harvest	328	298
Harvest Rate	22.2%	19.8%
Hunter Success Rate	6.0%	7.0%

2003 SEX AND AGE DISTRIBUTION OF HARVEST

Age	Male	Female	Total (%)
Young of year	47	38	85 (26%)
Yearling	36	43	79 (24%)
Adult	36	128	164 (50%)
Total (%)	119 (36%)	209 (64%)	328

2005 SEX AND AGE DISTRIBUTION OF HARVEST

Age	Male	Female	Total (%)
Young of year	23	23	46 (15%)
Yearling	42	66	108 (36%)
Adult	59	85	144 (48%)
Total (%)	124 (42%)	174 (58%)	298

2003 BY COUNTY

County	Total Harvest	Percentage of Harvest	Area mi^2	Percentage of Hunt Area	Harvest/mi^2
Sussex	233	71 %	537	34 %	0.43 / mi^2
Warren	48	15 %	363	23 %	0.13 / mi^2
Passaic	26	8 %	126	8 %	0.21 / mi^2
Morris	20	6 %	429	28 %	0.05 / mi^2
Bergen	1	0.3 %	35	2 %	0.03 / mi^2
Hunterdon	0	0	219	13 %	0 / mi^2
Somerset	0	0	74	4 %	0 / mi^2
Total	328		1558		0.21 / mi^2

2005 BY COUNTY

County	Total Harvest	Percentage of Harvest	Area mi^2	Percentage of Hunt Area	Harvest/mi^2
Sussex	196	66 %	537	34 %	0.36 / mi^2
Warren	43	14 %	363	23 %	0.12 / mi^2
Passaic	32	11 %	126	8 %	0.25 / mi^2
Morris	26	9 %	429	28 %	0.06 / mi^2
Bergen	1	0.3 %	35	2 %	0.03 / mi^2
Hunterdon	0	0	219	13 %	0 / mi^2
Somerset	0	0	74	4 %	0 / mi^2
Total	298		1558		0.19 / mi^2

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NJ bear harvest predictions by Division of Fish and Wildlife biologists:

Prediction: <10% of 79,000 firearms hunters would participate:

> 5,665 permits issued in 2003
> 4,434 permits issued in 2005

Prediction: Bear hunters would hunt bears where they traditionally hunt deer:

> 86% of bear permit holders said they would hunt bear where they hunt deer (based upon application question)

Prediction: This hunting season would not draw excessive numbers of non-resident hunters:

> Only 4.3% of bear permit holders were non-residents. This is similar to other seasons.

Prediction: *About half of the NJ bear hunters would have experience hunting bears:*

> 47% of permit applicants had hunted bears previously, either in NJ before the season was suspended in 1971 or in other states or provinces

Prediction: *Harvest rate would be less than 25% of available bears:*

> 2003: 22.2% harvest rate
> 2005: 19.8% harvest rate

Prediction: *Hunter success rate would be between 5% and 7.5%:*

> 6.0% of 2003 hunters were successful
> 7.0% of 2005 hunters were successful

Prediction: *Harvest would be between 272 and 408 bears*:

> 328 bears were harvested in 2003
> 298 bears were harvested in 2005