

NEW JERSEY FISH AND GAME COUNCIL

COMPREHENSIVE

BLACK BEAR

(Ursus americanus)

MANAGEMENT POLICY

Prepared by Black Bear Policy Committee

Leonard J. Wolgast, Ph.D.

W. Scott Ellis

Jeannette Vreeland

Submitted to

Bradley M. Campbell

Commissioner

New Jersey Department of

Environmental Protection

by

Ernest P. Hahn, Chairman

The New Jersey Fish and Game Council

November 14, 2005

TABLE OF CONTENTS

I. INTRODUCTION..... 3
 New Jersey Supreme Court Order and Decision on Bear Management..... 3
 Role of the Fish and Game Council 3

II. HISTORY..... 5

III. INTEGRATED BLACK BEAR MANAGEMENT STRATEGY 7

A. Education..... 8
 Policy: 8
 Discussion: 8
 Recommendations: 10

B. Control of Human – Derived Food..... 10
 Policy: 10
 Discussion: 10
 Recommendations: 10

C. Research..... 11
 Policy- Decision Making: 11
 Discussion: 11
 Recommendations: 13
 Policy – Cooperative Research: 13
 Discussion: 14
 Recommendations: 14

D. Bear Control 14
 Policy: 14
 Discussion: 14
 Recommendations: 17

E. Depredation Permits 17
 Policy: 17
 Discussion: 17
 Recommendation: 18

F. Habitat Protection 18
 Policy: 18
 Discussion: 18
 Recommendations: 18

G. Bear Population Management 18
 Policy: 18
 Discussion: 19
 1. Relocation: 20
 2. Alternative Methods of Population Control:..... 21
 3. Hunting: 23
 Recommendations: 27

IV. CONCLUSION..... 28

V. LITERATURE CITED..... 30

VI. FIGURES 32
 Figure 1. 1988- 1992 Study Area..... 32
 Figure 2. 2003 Study Area 33
 Figure 3. Current Range Map 2005..... 34

Figure 4. Bear Habitat Ranking.....	35
Figure 5. Bear Complaints (negative human-bear interactions over time).	36
Figure 6. Bear Management Zones.....	37
Figure 7. Projected Black Bear Population in Research Study Area with no further hunting seasons other than the 2003 Black Bear Hunting Season.	38
Figure 8. Projected Black Bear Population in Research Study Area with a harvest rate of 0.3 females/square mile during Black Bear Hunting Seasons.....	39
VII. TABLES.....	40
TABLE 1. Number of Black Bear Complaints 1999-2005	40
VIII. APPENDICES	41
Appendix A. Letters in Support of a Bear Hunting Season	41
Appendix B. Letter from Chairman Ellis to Commissioner Campbell regarding Fertility Control.....	46
Appendix C. Results of the 2003 Black Bear Hunting Season Final Data	49
Appendix D. Recommended Bear Management Budget	52
Appendix E. Summary of Comments Related to the Draft Comprehensive Black Bear Management Policy.....	53

I. INTRODUCTION

This document defines the New Jersey Fish and Game Council's (Council) comprehensive black bear (*Ursus americanus*) policies and recommendations regarding the continued management of resident black bears (bears) to ensure their continued existence in suitable habitat. As is the case with any wildlife species under their jurisdiction, the Council will periodically re-evaluate its policies, recommendations and regulations as information on the species' status and the needs of New Jersey's citizens warrant. Policy considerations regarding black bears cannot be based solely upon the biological carrying capacity of the land to support black bears. Black bear policies and management goals must consider the number of black bears that can co-exist compatibly with the local human population in a given area.

New Jersey Supreme Court Order and Decision on Bear Management

On February 28, 2005, the New Jersey 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 Department of Environmental Protection (DEP) Commissioner (*U.S. Sportsmen's Alliance vs. NJ Dept. of Env. Protect. A-69-2004*). 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.

Pursuant to the Supreme Court's mandate, the Council developed a draft policy that was released for public comment on September 6, 2005, and held a public hearing on the draft policy at Cook College, Rutgers University on September 21, 2005. The final policy presented here was revised on the basis of comments from 2035 individuals who either filed comments or presented testimony at the public hearing. A summary of comments and the Council's response is presented in Appendix E.

Role of the Fish and Game Council

The Council has historically worked closely with the Division of Fish and Wildlife (DFW), utilizing their scientific expertise to regulate the taking of wildlife in order to ensure its abundance and minimize wildlife related damage. The Council's ability to manage is primarily through their rule-making authority to regulate hunting, trapping and fishing. 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-government 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.

The Council was established by the legislature in 1945; the Council's current makeup of 11 members was established in 1979. The makeup and authority of the Council was upheld by the New Jersey 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, 793 a.2d 847). Each member is appointed by the Governor, with advice and consent of the Senate. 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 public member knowledgeable in land use management and soil conservation practices is nominated by the Governor. The final member of the Council is the Chairperson of the Endangered and Nongame Advisory Committee (N.J.S.A 13:1B-24).

The Council is mandated with the responsibility of protecting and conserving game birds, mammals and fish and to provide an adequate supply for recreational and commercial harvest. This mandate is carried out through the 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).

Based upon scientific evidence presented to it by the DFW, the 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 bear, white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*) and beaver (*Castor canadensis*), hunting and trapping can be used to control the populations. Historically, the Council has adjusted hunting and trapping seasons to control these species in order to minimize agricultural, residential or environmental damage. Further, the Council recognizes that the most cost effective method of population control for these species is provided through regulated hunting and trapping seasons.

The Council has directed that the DFW manage black bears to assure their continued survival in New Jersey, while addressing the property damage and safety concerns of residents and farmers. In addition, the Council recognizes that although instances of black bears injuring or killing humans are rare and no person in New Jersey 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 bear can be a source of recreational opportunity and esthetic benefit for the citizens of New Jersey in the form of hunting, photography and wildlife observation and appreciation.

II. HISTORY

The black bear occurred statewide in New Jersey 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, the 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 the bear population status was assessed and the Council closed the black bear hunting season in 1971 (Lund 1980).

Historically, management of black bears has always been funded through the Hunters and Anglers Fund. This fund is derived by the sale of hunting and fishing licenses. Additional funding is obtained from Federal Aid to Wildlife Restoration (Pittman – Robertson) Grants, which are derived from a federal excise tax placed on hunting related equipment. This Federal Aid is then passed on to State wildlife agencies for research, education and management activities.

Since the 1980's the black bear population has increased, and its range has expanded 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 New Jersey provided by the maturation of forested areas (McConnell et al. 1997). Based upon population data collected from 1988 to 1992 in the Kittatinny (Western) and Bearfort (Eastern) study areas (Figure 1), the DFW estimated a 1992 population of between 450-550 black bears in the 681 square mile Kittatinny and Bearfort study areas. Based upon agricultural damage attributed to black bears, the DFW and Council recognized that the level of human/bear conflict had become untenable in northern New Jersey and the black bear population was large enough to sustain a limited, regulated hunting season (McConnell et al. 1997).

The 1997 Black Bear Management Plan (BBMP) recommended the following actions:

1. Stabilize New Jersey's black bear population at 1 bear / 2½ square miles through regulated hunting seasons, using bear management zones (BMZ).
 2. Institute a statewide ban on the feeding of black bears.
 3. Install bear-proof (bear-resistant) dumpsters at public campgrounds within black bear range.
 4. Host seminars to educate beekeepers on the use of electric fences to deter black bear depredation.
 5. Institute a black bear depredation permit for landowners suffering damage to property, agricultural crops or livestock.
 6. Continue to analyze New Jersey black bear data as new technology and data becomes available.
 7. Protect critical habitat and reduce illegal killing of bears.
- (McConnell et al. 1997)

The Council notes that since 1997 great strides have been made in implementing the recommendations listed above. However, bear-resistant dumpsters have not been installed in all public campgrounds within the black bear range defined in the BBMP. Equipping parks with bear-resistant dumpsters will become more expensive as bear occupied range expands. More importantly, problems associated with black bears will continue to grow unless the population is stabilized. Although the BBMP recommended a bear season in 1997, action was not taken by the Council until 2000 when the Council supported but then cancelled the first bear season in 30 years

In 2000, DFW biologists estimated a New Jersey black bear population of 1056 in the Kittatinny and Bearfort study areas. The Council amended the 2000 Game Code to reinstate the black bear hunting season. However, as part of a court challenge to the hunt, the Council granted a request for a stay and suspended the hunt in favor of a more aggressive black bear operating policy (Carr 2001). In 2003, the bear population was estimated at between 1600 and 3200 bears in an area north of Route I-80 and west of Route I-287 (NJDEP 2003); in the research study areas (Figure 2), the population was estimated at 1490. The Council reinstated a limited hunting season using a conservative format, resulting in a harvest of 328 bears in December 2003 (Carr and Burgess 2004). The hunting season was closed by order of the New Jersey Supreme Court in 2004.

Since 1980, the DFW has been conducting research on the black bear population, and has utilized an integrated approach to managing black bears. The black bear population is increasing, and there are now confirmed bear sightings in all New Jersey counties (Figure 3). At the same time, increasing numbers of people are moving to the core of bear range in rural northwestern New Jersey. As the human population increases, black bear habitat is affected by residential and commercial development. The human habitat/wildlife habitat interface continues to grow with the resultant potential for conflict.

The DFW utilizes an integrated black bear management strategy which includes monitoring of the black bear population, educating the citizens of New Jersey about black bear ecology and how to adjust human activities while within bear range. Also included in this integrated approach are responses to nuisance bear activity to minimize human-bear conflicts. In 2000, the DFW's integrated black bear management program received the International Association of Wildlife Agencies' Ernest Thomas Seton Award for professional excellence.

In November 2000, the DFW instituted a more aggressive integrated black bear management strategy that includes an enhanced educational effort, increased research and monitoring activities, and more aggressive control measures. The DFW received appropriations from the General Treasury amounting to \$1.7 million dollars in FY01 and FY02 which allowed the DFW to expand the black bear management team to 2 full time biologists, 7 bear technicians, 2 education specialists and one police training officer. Since FY03, the number of personnel devoted to black bear management has been reduced to one full-time biologist, two full-time wildlife technicians, one part-time biologist, one part-time training officer and one part-time education specialist. These

positions are currently funded by the Hunters and Anglers Fund and the Federal Aid Grant.

III. INTEGRATED BLACK BEAR MANAGEMENT STRATEGY

The Council has set the following objectives for management of the New Jersey's black bear population:

- Preserve a robust black bear population as part of New Jersey's natural resource base.
- Reduce and stabilize the population at a level commensurate with available habitat and consistent with reducing risk to public safety and property.
- Educate the public on legal prohibitions and common-sense practices that reduce the risk of black bears to humans, their homes, and their communities.
- Advance our scientific understanding of black bears, including development of alternate and non-lethal control strategies.
- Ensure that sport hunting remains a safe and effective management tool when appropriate to control populations of black bears.

The Council recognizes that management of New Jersey's expanding black bear population to meet these goals, and particularly to reduce overpopulation and public safety risk, requires a range of measures. This policy departs from the 1997 Black Bear Management Plan (BBMP) and later DFW status reports in more clearly recognizing that regulated sport hunting cannot be an exclusive, or even predominant, element of New Jersey's management strategy. Stabilization of the currently expanding population, and ultimate reduction of the population to levels commensurate with available habitat and acceptable levels of public safety risk, will take years. Even a greatly reduced black bear population will require education, enforcement, habituation, aversive conditioning, and other measures to reduce risk to communities living close to black bears.

This policy also departs from prior plans in setting a significantly more modest goal for black bear population reductions. The 1997 BBMP, consistent with the policy of New York and Pennsylvania, set a population goal of 1 bear for each 2.5 square miles of available habitat. But to achieve this goal, New Jersey's current black bear population would have to be reduced by more than seventy-five percent. This level of reduction is far greater than appears necessary to reduce risk, and is unlikely to be achieved even with a gradual expansion of the hunt adopted in the current New Jersey Game Code. Moreover, the significant reduction of nuisance bear incidents following the limited hunt conducted in 2003, suggests that New Jersey can sustain a black bear population at higher levels than previously without unacceptable risk. Accordingly, this policy proposes to reduce New Jersey's black bear population to 2002 levels, and to stabilize the population at that level, over the five-year span of this policy.

In addition, this policy places more emphasis than prior plans on non-lethal control strategies. Given the numerous urban and suburban habitats to which black bears have

emigrated to due to overpopulation, the declining numbers of hunters participating in recreational hunting, non-lethal controls (including immunocontraception) may be needed to supplement whatever role hunting may play as this policy is implemented.

As more fully discussed below, the Council has selected the suite of management tools adopted in this policy according to criteria of consistency with current law, practicability in light of current resource constraints, and demonstrated efficacy.

A. Education

Policy:

The Council believes that there is a continued need to educate New Jersey residents and visitors on how to coexist with black bears. Residents, campers and outdoor enthusiasts within bear country can minimize negative interactions with black bears by following simple adjustments to their activities.

Discussion:

Education alone will not solve all the problems associated with bears. However, it is important to make the educational message available to as many citizens as possible. Although some will ignore the message, those that adjust their activities to take into account bear activity will be less likely to have problems. A recent decline in nuisance complaints involving bear damage to beehives, garbage and bird feeders is evidence that the DFW bear education is having a positive effect. The Council recognizes that the DFW has conducted an extensive educational campaign to provide New Jersey residents and visitors with techniques and methods for living in areas where black bears exist. Especially emphasized is the importance of never feeding bears, either intentionally or unintentionally. Some of the efforts include the following: (1) developing educational materials for campers and homeowners to reduce negative encounters with bears; (2) producing several full-color brochures and other literature for distribution to schools, municipalities, libraries, parks and environmental education centers in northern New Jersey; (3) conducting public presentations on living with black bears for various schools, service organizations, township meetings, parks, camps and clubs; (4) issuing news releases providing bear information and bear-proofing techniques; (5) addressing media inquiries and interviews regarding bears; and (6) providing bear information and bear-proofing techniques to all persons who contact the DFW regarding bears.

The Council recognizes that in 2002 the Commissioner of the DEP hosted four public education forums in northern New Jersey, which emphasized how to live in bear country. The Commissioner also responded to the public's questions and concerns.

The bear education effort conducted by the DFW peaked in FY2001 and FY2002 when general appropriations supplemented education efforts already being funded through the

Hunters and Anglers Fund. The DFW hired two education specialists to work on this project.

The DFW provides New Jersey residents and visitors with techniques and methods for living in areas where black bears exist. The primary message is “Do Not Feed Bears,” either intentionally or unintentionally. The DFW regularly issues news releases alerting the public to safety issues regarding New Jersey's growing black bear population. The 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-proof garbage containers.

Since 1998, the DFW has produced and distributed nearly 2.5 million pieces of educational material. The material produced and distributed includes:

- 300,000 ‘You Are in Bear Country’ brochures (for park, campground and outdoor recreationists)
- 566,000 ‘Living in Bear Country’ brochures (for residential households)
- 53,000 Signs for use in parks and campgrounds
- 200,000 Camper behavior in bear country cards
- 206,000 Garbage can fliers for residential households
- 500,000 Educational brochures for children
- 40,000 Educational coloring books for children
- 350,000 Educational bookmarks
- 110,000 Educational bookcovers
- 45,000 ‘Do Not Feed the Bears’ bumper stickers

During the same period, staff have made over 300 presentations or manned exhibits that have provided black bear information to over 30,000 people, including school groups, camp groups, service organizations, clubs, Boy and Girl Scouts, police and township meetings. Radio public service announcements (PSA’s) are aired for the bear activity seasons in spring, summer and fall.

The overall bear education effort received an education award in 2000 from the Association of Conservation Information. 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.

Since FY02, no general funds have been available to continue the extensive black bear education initiative. Only one staff member has been assigned to bear education on a part-time basis. Only surplus educational materials purchased with FY02 funds are available for distribution to the public. 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.

Recommendations:

1. One full time staff should be devoted to bear education.
2. There is a need to purchase more educational material for distribution to the public and provide public service announcements through the various media outlets.
3. In addition to educational material and PSA's produced in English, educational products should be developed in the Spanish language.
4. The General Treasury should, at a minimum, restore funds to cover the cost of bear education. It is inappropriate to rely on the Hunters and Anglers Fund as the only source of funding for this program that benefits all citizens of New Jersey.

B. Control of Human – Derived Food

Policy:

In addition to the education necessary to ensure that human-related food sources and garbage do not unintentionally become a source of food for bears, the Council believes additional legislation and enforcement initiatives are necessary to minimize human-derived food sources.

Discussion:

The Council recognizes that in 2003 legislation was passed banning the intentional feeding of black bears (NJSA 23:2A-14). An educational and enforcement effort resulting from this legislation will work towards a reduction in human-bear related conflicts. The intentional feeding of bears was made illegal because bears habituated to human sources of food through intentional feeding can cause problems for entire communities. However, wording in the bill is ambiguous regarding when feeding is intentional or unintentional and when a particular enforcement action is warranted.

Although great strides have been made in educating citizens regarding garbage management, the expense of bear-resistant garbage cans and commercial containers has hampered their wide spread use. No municipalities have mandated bear-resistant garbage cans so use is strictly voluntary. In order to deter bears, entire communities will have to adopt such measures. Regulations, funding and coordination with local garbage contractors is necessary in order to implement a successful program.

Recommendations:

1. Enact legislation which would require that public and private campgrounds in habitat occupied by black bears install bear-resistant dumpsters and food boxes.

2. Enact legislation which would require that closed communities make a bear-resistant community dumpster facility available to its residents.
3. Amend the “no bear feeding” legislation to clarify the difference between intentional and unintentional feeding.
4. The General Treasury should provide funds for a grant program to assist public and private entities in the implementation of this conversion to bear-resistant systems.

C. Research

Policy- Decision Making:

Current and future management decisions by the Council regarding black bears will be based upon the best available scientific data, including up-to-date population monitoring.

Discussion:

The number of personnel assigned to bear research, monitoring and control peaked at two wildlife biologists and seven wildlife technicians during FY01 and FY02 when General Treasury funds supplemented the Hunters and Anglers Fund and Federal Aid Grant. The Council recognizes that the DFW has conducted extensive research on the black bear throughout northern New Jersey and more specifically in the Kittatinny and Bearfort regions. A part of the bear population monitoring includes an analysis of the growth and expansion of the range of the population and the effects on the citizens of New Jersey. The black bear population has been spreading south and east, impacting people in areas of New Jersey that have not had bears in this century.

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

Since 1981 DFW personnel have tagged over 1500 black bears including more than 550 newborn cubs and collected data from bears found dead as a result of vehicle strikes or from other types of mortality. Bears continue to be radio-collared and monitored by radio telemetry to acquire information on reproduction, survival, mortality, home range size and habitat use. The Kittatinny (Western) and Bearfort (Eastern) bear populations (Figures 1 and 2) have been studied since 1980 and represent a solid long term and extremely valuable database upon which to make management decisions.

Ranking of Bear Habitat Based on Land Use / Land Cover Data

Figure 4 shows a ranking of bear habitat throughout New Jersey based on bear use of varying landscapes as defined by Land Use / Land Cover data for New Jersey (McLaughlin et al. 1987, Rogers and Allen 1987, MacKenzie 2003, Niles et al. 2004). The Deer Management Unit (DMU), an area of approximately 14 square miles, was overlaid with the 1995/97 Land Use/Land Cover shape file, then analyzed using an Arcview GIS computer system. This method standardized the habitat evaluation. Since some of the areas classified are not currently open for bear hunting during the 2005 bear season, the term Bear Management Zone was used to define areas in place of the term Bear Hunting Areas as used in the 2005-2006 Game Code.

The percentage of land as a Generalized Land Use Category (TYPE95) for forested, wetland, agriculture, urban land, barren land and water was determined in each DMU. For example, excellent bear habitat consists of $\geq 51\%$ forest land and $\leq 33\%$ urban land and $\leq 26\%$ agricultural land.

BMZs 1 & 3 (Black Bear Hunting Areas 1 and 3), which contain the black bear research study areas, have an average forest cover of 68%; BMZs 2 and 4 have an average forest cover of 43%. Mark-recapture studies have shown that the bear density in BMZs 1 and 3 was 2.56 bears per square mile in 2003 (Carr and Burguess 2004). A formula using percent forest cover and the population estimate based on density in BMZs 1 and 3 results in a density of 1.01 bears per square mile in BMZs 2 and 4 in 2003.

BMZ 5 contains a mosaic of forest, farmland and urban land. The BMZ has an average forest cover of approximately 32% with a mixture of forest, farmland, wetlands and urban land, which makes it fair bear habitat. The bear population is undetermined in this BMZ but is likely to exist at a lower density than BMZs 2 and 4.

Based on percent forest cover in BMZs 1, 2, 3, and 4, there are approximately 3 bears per square mile in excellent bear habitat, 1 bear per square mile in good bear habitat and less than 1 bear per square mile in fair bear habitat in northern New Jersey.

Bear habitat in southern New Jersey was also identified. Although there is sufficient habitat for black bears to survive in the Pinelands (BMZ 6), productivity and survival in this area will be different than in northern New Jersey, 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. As the population grows in southern New Jersey, further research will have to be conducted in order to determine reproductive rates, home range size and habitat use before the quality of the habitat can be determined.

A population management goal of 1 bear per 2½ square miles is consistent with neighboring states of New York and Pennsylvania (McConnell et al. 1997). This density is designed to minimize human bear interactions.

The Council notes that the 1997 BBMP discussed the establishment of bear free zones where land use and human population densities make the areas unsuitable for bears. It is

clear, as it was in 1997, that bears can not live in densely populated suburban and urban areas without daily conflicts involving property damage and public safety. This holds true even considering the tremendous effort on the part of the DFW to educate the public on how to coexist with bears.

The percent of urban land within each DMU was used to determine areas unsuitable for bears. Unsuitable habitat was defined as a DMU with greater than 60% Urban Land, less than 30% Forest Land and less than 30% Wetland. Figure 4 depicts the BMZs 1 through 6, classified as bear habitat, as well as the proposed BMZ 7, not classified as bear habitat. 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, the preponderance of suburban and urban land would result in almost certain bear-human conflicts.

Recommendations:

1. DFW should continue to conduct trapping and tagging studies and analyze New Jersey'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.
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 New Jersey'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. The term Bear Hunting Area (BHA) should be replaced with Bear Management Zone (BMZ, Figure 6) to more accurately describe areas which may or may not be open to hunting.
5. The General Treasury should, at a minimum, restore funds for the continued bear research efforts that benefit all residents. The Hunters and Anglers Fund should not be the sole source of funding for this purpose.

Policy – Cooperative Research:

The Council encourages cooperative research. The DFW should continue to partner with research institutions and adjacent state agencies, which have the expertise, staff and economic resources to enhance the knowledge base on the New Jersey black bear population.

Discussion:

The 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 research studies are intended to expand knowledge about New Jersey 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, aversive conditioning, use of contraceptive techniques for population management, genetic relatedness using DNA and developing habitat suitability models.

Recommendations:

1. DFW should continue its cooperative research with university institutions.
2. DFW should convene a bear summit 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. Discussions should include research, population monitoring, aversive conditioning and population control.
3. DFW biologists should 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.

D. Bear Control

Policy:

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

Discussion:

The Council recognizes that increasing human development in the rural northwestern counties of the state, the coincident increase of the bear population within these counties and resulting expansion south and east has resulted in an increase in human-bear conflicts. Incidents involving bear damage to property and livestock remain high in frequency and severity (Figure 5, Table 1). The DFW's Wildlife Control Unit (WCU) receives complaint calls and provides response and control using the BBRRC.

The Council recognizes that the 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. This policy has been approved by the Council, DFW, DEP and the Governor's office. The BBRRC defines three categories of black bear behavior and dictates how the DEP and local governmental agency personnel should respond.

Category I black bears are those 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 (\geq \$ 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.

Category II black bears are nuisance bears which are not a threat to life and property. Examples of Category II behavior are habitual visits to dumpsters or birdfeeders and property damage less than \$500. Category II black bears are aversively conditioned using rubber buckshot, pyrotechnic charges and bear dogs so that 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.

Category III bears are animals 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 the 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 be 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 or destroy 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 current policy requires that all Category III bears, which are extracted from an urban setting, be released at the nearest state land with suitable habitat. Recent captures of such bears in urban areas in central New Jersey have required releasing bears in state owned land in adjacent counties. Although forested state owned land was within the county of capture, the isolated habitat was judged not large enough to support a viable bear population. Additionally, since these state lands were surrounded by suburban and urban areas, it was likely that released bears would re-enter suburban/urban areas again. These

bears were, therefore, released on more distant state land in adjacent counties, resulting in negative feedback from local government officials and citizens who either believed their safety was being compromised or believed they would have to contend with future bear-human conflicts resulting from the release. Additionally, releasing bears in adjacent BMZs where the objective is to reduce the population is counter-productive.

The Council recognizes that integral to the implementation of the bear response policy is the cooperation of law enforcement personnel from other governmental agencies within black bear range. Since January 2001, the DFW has trained over 600 municipal, county and state law enforcement officers from 123 municipalities and 29 state, county and federal parks to assist the DFW in black bear control. The Council recognizes that there will continue to be a need to respond to bear complaints. As bears expand their range in New Jersey, such response will increasingly become the responsibility of local law enforcement agencies.

The Council believes that continued cooperation between local law enforcement agencies and the DFW is necessary to properly manage bears. The Council notes that some local enforcement agencies which have received bear response training from DFW have not filed annual reports on bear incidents as agreed upon when training was received. This lack of information has the potential to negatively impact bear management decisions made by the DFW and Council. These negative impacts may result in a decrease in appropriate allocation of resources and effort and ultimately may threaten public safety.

This bear response policy constitutes the responsible action by the DFW to manage the growing black bear resource while minimizing negative impacts to humans, their pets, agricultural crops, livestock and property. The policy errs on the side of human safety.

The Council recognizes that not all problem bears will be eliminated through regulated hunting seasons. However, past history has shown that some problem bears are eliminated during such seasons, thereby reducing bear related problems without cost to the taxpayer. Additionally, the Council recognizes that without a regulated sport hunting season designed to reduce then maintain a viable bear population in New Jersey at densities compatible with the human population, human-bear conflicts will continue to increase.

Overall, serious bear complaints reported to DFW and law enforcement agencies are high (Figure 5, Table 1). However, the drop in bear complaints reported to the DFW from 1999 to 2004 is attributed to the following: (1) residents calling local police who have been trained by the DFW for bear response; (2) euthanizing Category I bears thereby eliminating further negative behaviors by those animals; (3) the 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 the DFW's policy of destroying Category I bears; and (5) the short term population reduction achieved by the 2003 black bear hunting season.

The Council recognizes that the DFW continues to explore new means of handling nuisance bears. The use of specially trained dogs to assist in the harassment of bears as part of the aversive conditioning process is a method often recommended by citizens and organizations opposed to the lethal control of problem bears. DFW purchased Black Mouth Yellow Cur dogs that are used for aversive conditioning of nuisance black bears.

Recommendations:

1. The DFW should continue to train local police officers and park rangers so that they can respond to problem black bears.
2. Category I bears should be destroyed immediately by DFW personnel, local law enforcement officers and State Park Rangers trained by the DFW.
3. The DFW should continue to develop aversive conditioning techniques for Category II bears. The Council recommends that the DFW continue to refer Category II complaints to local law enforcement agencies, which can more quickly respond.
4. The DFW should not train additional officers in bear response techniques in municipalities which have failed to file the agreed upon annual reports on their bear response activities.
5. The Council recommends adoption of a bear population goal of zero bears for BMZ 7. This objective may be reached by allowing the harvest of any bears within this zone during future bear seasons. DFW personnel will not actively remove or eradicate bears in this BMZ, however, bears that must be removed from urban areas within BMZ 7 should be euthanized upon capture.
6. The General Treasury should, at a minimum, restore funding for DFW bear training and response because these activities benefit all New Jersey residents.

E. Depredation Permits

Policy:

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

Discussion:

The Council recognizes that DFW cannot respond immediately to situations involving depredating black bears and that farmers can alleviate damage caused by black bears if allowed the opportunity.

Recommendation:

1. The Council believes that the circumstances and permit criteria regulating the taking of black bears and other wildlife under the special depredation permit should be clarified. The Council has adopted such amendments in the 2005-2006 Game Code.

F. Habitat Protection

Policy:

The Council supports the DEP's open space acquisition program that has been instrumental in protecting valuable bear habitat.

Discussion:

The Council recognizes that DFW has undertaken an effort to identify and protect critical black bear habitat. The Council also recognizes that DEP and DFW, through its Green Acres Program and Wildlife Management Area system, has acquired a vast amount of habitat which is important to black bears. The Council recognizes that the recent Highlands Protection Act will ensure that bears remain part of New Jersey's landscape.

Recommendations:

1. DEP should continue to protect black bear habitat as it becomes available through the State's open space acquisition programs.
2. All new lands purchased by or deeded to the DEP should have a wildlife management plan which 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. As the Highlands Protection Act is implemented, the Council believes it is important that DEP work with affected landowners to ensure that they receive fair value for their lands.

G. Bear Population Management

Policy:

The Council supports the population goal of maintaining bears at a density that provides for a stable population within suitable bear habitat and which minimizes emigration of bears to unsuitable habitat in suburban and urban areas. This policy sets a management goal of stabilizing the black bear population at the 2002 level over the next five years.

Discussion:

The Council previously endorsed a New Jersey bear density of 1 bear / 2½ square miles as discussed in the 1997 BBMP. The Council notes that both Pennsylvania and New York continue to manage their segments of the tri-state black bear population at this recommended density. The problems associated with New Jersey's high density bear population on adjacent counties in New York and Pennsylvania were reflected in the letters of support received by their environmental commissioners for the Council's proposal for black bear hunting seasons in 2003, 2004 and 2005 (Appendix A). Pennsylvania increased its bear hunting season in counties adjacent to New Jersey in 2002 due to an increase in the bear population and problems in this region. New York is currently considering increasing the season length in the Catskill region. It is clear that to properly manage this tri-state population, density goals must be similar.

This low density was also recommended in the 1997 BBMP because it resulted in a very low number of negative human-bear conflicts. The Council notes that, except for the 2004 reduction resulting from the 2003 bear hunting season, the current level of bear related complaints received by the DFW and cooperating law enforcement agencies, in total, continues to grow, particularly the Category I complaints (Figure 5, Table 1). The results of 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. Maintaining the level of bear response by DFW will be impossible considering current budget constraints.

The tools available for population reduction are few. The Council must set criteria for evaluating which tools should be used. As noted in the recent Supreme Court decision, the Council should consider the size of the population, the harmful human-bear interactions and the fiscal and human resources available. The Council believes it is necessary to also consider the proven efficacy of the tools and the experience of other states.

As previously stated, recent research by DFW indicates that bear densities in New Jersey are as high as 2 to 3 bears / square mile, or 5 to 7 times the density that the Council previously thought desirable. Serious negative interactions, which have increased dramatically in the last five years, include attacks on humans, livestock and pet kills and home entries and attempted home entries (Figure 5, table I). Of these, only isolated livestock kills were an issue in 1997. The current bear population level in the research study area is estimated to be 1606 (Figure 7).

It should be noted, however, that the Council did not authorize a hunt or other black bear population reduction measure in any of the more than six years from 1997 forward that New Jersey's black bear population was reported as exceeding the management goal for the black bear population articulated in the 1997 BBMP. The Council initially approved a hunt in 2000, but then reconsidered and recanted its support for a hunt at the urging of Governor Whitman. The level of reported nuisance incidents and increased emigration of

black bears (due to pressures of overpopulation) to areas lacking sufficient black bear habitat did not reach a level of significant public safety concern until 2002.

Moreover, the Council's conservative, incremental approach to reintroducing a bear hunt in 2003, and the limited hunt forth in the current New Jersey Game Code, make clear that the population goal set in the 1997 BBMP level simply cannot be achieved within the five-year time frame considered for this policy, even if the scope and duration of regulated black bear hunting in the game code are progressively expanded over the course of those years. This is particularly so if the participation levels by hunters remain unchanged from those seen in 2003, when fewer than half of the 10,000 permits authorized by the Game Code actually were sought by and issued to hunters.

In light of these factors, and without disputing the analysis that supported the bear density goals set in the 1997 BBMP and the analogous goals historically set by neighboring states, the Council has concluded to adopt a more modest black bear population management goal of reducing the population to 2002 levels and maintaining the population at that level for five years or until further revision of this policy, whichever is sooner.

In setting this moderate goal, the Council is recognizing practical limitations in reducing the black bear population but also is seeking to reconcile this policy with the views of many commentors who questioned whether a hunt is necessary to manage the black bear population at all. While the Council believes that it be neither lawful nor responsible to accede to those commentors who oppose hunting under any and all circumstances, the Council believes that the conservative approach to population management outlined here, coupled with strict parameters to ensure that the population reduction goal is not exceeded, responds to those commentors who feared that a hunt may extirpate the black bear population in New Jersey.

1. Relocation:

The Council recognizes that southern New Jersey 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. The Council also recognizes that in the early 1980's the 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 New Jersey put a halt to this option. However, as a result of the population pressures created by an expanding northern New Jersey bear population, bears now occupy all New Jersey counties (Figure 3). Even if relocation of excess and/or problem bears to unoccupied range 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 is over \$2,000. Relocating one to two thousand bears from northern New Jersey to southern

New Jersey would be cost prohibitive and likely a multi-year task. Dedication of the necessary staff and funding would likely not make such a program practical. Finally, to the Council's knowledge, no state has successfully used relocation as a means of population control.

2. Alternative Methods of Population Control:

The Council encourages the DFW to investigate alternate means of population control to determine if these techniques are viable for control of wild populations of bears. The Council's position on bear fertility control was presented to DEP Commissioner Campbell by a letter from Council Chair Ellis on September 20, 2004 (Appendix B). The Council will consider for approval, those methods that meet the criteria defined in N.J.A.C. 7:25-5.37.

The policy defined in the Council's September 20, 2004, letter to the Commissioner must be supplemented in two respects. First, the policy failed to recognize that immunocontraception or other non-lethal control strategies may be necessary to supplement the role of regulated hunting in controlling the black bear population, particularly in areas of the state that are unsuited to or unsafe for hunting. Second, the policy failed to set goals and milestones for advancing an immunocontraception alternative. This policy supercedes and revises the policy presented in the earlier letter.

The Council has encouraged the DFW and independent researchers to explore alternative population control techniques, which may have future value. The Council has adopted criteria that will allow the 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. 7:25-7.37). The Council has approved several fertility studies for white-tailed deer, however, the Council recognizes that fertility control research for bears is not nearly as advanced. The Council further recognizes that 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. DEP is also monitoring a study investigating using sterilization as a means of controlling the black bear population. DEP's Office of Science and Research has also contracted for a literature review of fertility control on bears and other wildlife. These research studies will evaluate the safety, effectiveness, feasibility, logistics, assessment of environmental impacts and probability of success of using fertility control to control wild populations of black bears.

Alternative control methods are still in the experimental phase and have yet to be tried on free roaming populations of bears. The FDA has not 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 more costly as previously mentioned for relocation. 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. During the

course of the lifetime of sterilized or infertile bears, they could still continue to be responsible for negative human-bear interactions.

Current contraceptive techniques have been uneconomical or infeasible for practical implementation even in small localized populations of game species and 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)

Although immunocontraception using GnRH has been researched for over 20 years, the vaccine has had mixed success (Miller et. al. 2004). Miller et. al. (2003) reported that GnRH vaccine has significant potential for limiting fertility of both males and females of many domestic and wildlife species, but they also reported that vaccine trapped in fat may not be released to the immune system, and therefore may be unavailable to induce an immune response in seals and black bears. GnRH immunocontraception may represent a broad tool for population control of wildlife; however, in almost every report, a series of treatments was required for adequate immunity and a portion of animals failed to respond to treatment and remained fertile (Levy et. al. 2004). These ambiguous results would indicate that more testing needs to be completed, including the possible harm to the bear population by allowing animals with compromised immune systems to continue breeding (because these animals failed to respond to treatment and remained fertile).

More testing needs to be completed. 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).

The Council notes that alternative methods of control have been tried on small populations of ungulates, primarily white-tailed deer, which are far easier to capture. To date, no published studies have indicated that such programs have been successful. The primary problem is the inability to capture and treat enough individuals to effect a population reduction. This problem is not only a result of the labor cost involved, but also the result of the individual behavior of target animals, some of which are too wary to capture.

While the Council recognizes these limitations, the Council remains committed to advancing the science of non-lethal population control measures for the black bear population, including immunocontraception. As part of that policy, the Council has set a goal of completing the DFW's current immunocontraceptive research with captive populations so that a decision can be made on securing regulatory approval (if needed) for field testing within three years.

3. 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. The Council is legally mandated to provide for a recreational harvest of abundant species. 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. Because monitoring is ongoing, any changes needed can be made by annually reviewing hunting regulations.

Black bear populations can withstand regulated hunting on an annual basis (CA FED 2000, Williamson 2002, Ternent 2005) 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). In other words, sport 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. Additionally, hunters provide an important service to the public while decreasing the general tax burden.

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

No other method of black bear population control has been identified and implemented in states with resident bear populations. Hunting is, therefore, considered one element of an integrated approach to manage bear populations. The purpose of the 2003 hunting season 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.

In 1953, the Council classified black bears as a game animal, thereby protecting bears from indiscriminate killing. This protection stabilized the population. Based upon DFW recommendations, limited hunting was authorized in 10 seasons from 1958-1970 and resulted in a harvest of 46 bears. The Council's decision in 1970 to stop the black bear hunt was critical to the recovery of the black bear population to its current level.

Research on the bear population by the DFW resulted in the development of a bear management plan. The 1997 Black Bear Management Plan 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). Hunting is the primary means of managing and regulating black bear populations in 29 states.

Although the 1997 BBMP recommended that bears be hunted, the Council did not consider this option until 2000, when the Game Code was amended to reinstate the black bear hunting season. However, this season was later suspended by the Council at the request of former Governor Whitman, who recommended that the DEP adopt a more aggressive black bear operating policy as an alternative to the hunt.

In 2003, the Council amended the Game Code to include a conservative bear season concurrent with the Six-Day Firearm Buck Season, December 8 to December 13, 2003. A conservative approach to the first bear hunt in over 30 years allowed for data to be collected without negatively impacting the black bear population. The Council addressed several issues, which were raised regarding the more liberal bear season format proposed in 2000. By placing the season in December, the concern regarding the possibility of over-harvest of the population was addressed because most pregnant females would be denned and not available for harvest. Conflicts with other outdoor recreational activities was minimized by holding a bear hunt during the most popular hunting season when 80,000 hunters are already afield hunting deer. As expected the majority of applicants for the limited number of bear permits were hunters who already had permission to hunt deer within the bear hunting zone.

Bear hunting was limited to an area north of Route I-78 and west of Route I-287, an area of 1558 square miles. A quota of 10,000 permits was established and applicants were required to attend a mandatory bear hunting orientation seminar. Hunters were allowed to use a shotgun not smaller than 20 gauge nor larger than 10 gauge with slugs only or a muzzleloading rifle of .45 caliber or greater. The season bag limit was one bear per hunter and all harvested bears had to be taken to a mandatory bear check station where biological and geographical information was obtained. The Council authorized the Commissioner of DEP, with consultation with the Director of the DFW and the Chairman of the Council, to call off the bear season with 24 hours notice if biologists determined the harvest was excessive based on tagged bear returns in the harvest. Based upon success rates in adjacent states with similar seasons, and the number of permits issued, the DFW estimated a harvest of between 272 and 408 bears. Such a harvest would not surpass yearly recruitment into the population.

The Council believes that the 2003 black bear hunting season was a success because it 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 (Appendix C) followed the predictions of DFW biologists based upon the conservative format. Hunter participation (5,450 hunters) was less than 10% of the 80,000 licensed firearm hunters. The total hunter harvest was 328 bears. Hunter success rate was 6%, within the 5 to 7.5% predicted. Biologists also predicted that the bear population, which is extremely productive with a high survival rate, could withstand a harvest rate up to 25%. Based upon bears tagged within the hunt area (north

or Route I-78 and west of Route I-287) in 2003 which were harvested during the season, a harvest rate of 22% was achieved. Based upon statewide population estimates by the Independent Bear Panel in 2003 (1600 to 3200 bears) (NJDEP 2003), the harvest rate was between 10.2% and 20.5%. As predicted, the sex and age structure of the harvest matched that of bears captured during research and control activities.

A survey of bear permit applicants indicated 47% had previously hunted bears and 86% stated that they intended to hunt bears where they traditionally deer hunt. Participation by non-resident hunters (4.3%) was consistent with other hunting seasons such as deer and turkey. Additional statistics regarding the season are found in Appendix C.

No specific landowner complaints involving bear hunters and no hunter accidents were reported. The hunt successfully established that hunters could safely harvest black bears in a controlled manner. Biological data on the bears and demographic data on hunter success and participation collected during the season is valuable for designing future management actions. Prior to the season, 7 lawsuits regarding the hunt were filed, including a case heard in the Federal District Court, Third Circuit involving bear hunting on federal land within New Jersey. All lawsuits were decided in favor of the bear hunting season.

The data from the 2003 hunting season has proven that hunting can alleviate damage and nuisance incidents caused by problem bears. Ten percent of the tagged bears in the 2003 harvest were known nuisance bears; an additional 10 percent were bears tagged at nuisance sites or in urban situations. Damage and nuisance calls were reduced by 37.5% and Category I reports to DFW were reduced by 37% after the 2003 season. 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).

Hunting is also used as a tool to reinforce the aversive conditioning methods employed by the DFW and trained law enforcement officers. After conducting a review of the scientific literature, Conover (2001) 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 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 resultant human avoidance behavior by bears may reduce the frequency of negative human/bear interactions, thus reducing bear related problems and allow for a bear density higher than 1 bear / 2½ square miles.

In order to gather further information on hunter participation, hunter success and harvest rates, the Council adopted an identical season structure for the 2004 black bear hunting season. However, the hunting season was closed by order of the New Jersey State

Supreme Court in 2004 (U.S. Sportsmen's Alliance vs. NJ Dept. of Env. Protect. A-69-2004).

The Council concludes that the most recent population analysis and the results of the 2003 black bear hunting season indicate that the current bear population can support a recreational hunting season. Such a recreational season is the best and only cost-effective method presently available to control an increasing black bear population. Results of this bear season and similar seasons in adjacent states indicate that a more liberal season format will be required in order to control the black bear population. DFW biologists have developed population projections for the research study areas (Kittatinny and Bearfort) based on the data collected from research activities (litter size, productivity, survival and mortality) and the 2003 bear hunting season (harvest rate, harvest by sex and age class). These data allowed the DFW to project population estimates for the next 5 years in the study area with no further hunting seasons other than the 2003 season (7). Using a deterministic model (Kontio 1998), the bear population within the two study areas was reconstructed back to 2002 and projected with and without hunting seasons over the next five years (Figures 7 & 8 respectively).

The Council notes that the proposed 2005 season is similar in format to the 2003 season and therefore, likely to yield a similar harvest rate. However, several days of heavy rain, as experienced in the 2004 six-day firearm buck season, may affect hunter participation and success. Data on the success rate for the 2003 and 2005 seasons will allow DFW and the Council to design future bear season formats and propose future BMZs. It is likely, however, based upon data from the six-day hunting season format and adjacent states, that the length of the bear hunting season will have to be increased in order to achieve a higher harvest rate. Additionally, in order to achieve population reduction a larger portion of the female cohort must be available for harvest. An earlier hunting season will achieve this goal. Earlier season formats will allow inclusion of bear hunting in other deer hunting seasons.

All states with bear hunting seasons allow archery, shotgun and muzzleloaders to be used. Past bear seasons in New Jersey allowed both archery and shotgun bear hunting. The efficacy of using archery equipment to kill bears was thoroughly discussed and a finding that archery equipment is efficient in killing big game animals including bears has been reported (CA FED 2000). The Wildlife Society determined that it is clearly established that archery is a lethal method of harvest (Kurzejeski et. al. 1999) and bow hunting is a socially responsible tool for both controlling wildlife populations and providing hunting recreation. Pennsylvania has recently amended their regulations to expand the archery hunting opportunity of bears.

The Council will continue to evaluate the results of each bear hunting season. The Council believes that the adaptive management process will guide the future structure of bear hunting seasons. This is a dynamic process that must evaluate the results of the bear hunting season on the bear population and bear related conflicts. The desirable bear population level will be influenced over time by many dynamic factors such as the amount of available bear habitat, availability of natural foods, human population growth

and resulting development; changes in human tolerance for bears brought about by education, and the willingness to change lifestyles to adapt to living in bear county.

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 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.

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.

Recommendations:

1. The Council supports a 2005 black bear hunting season which is similar to the 2003 hunting season and which includes black bear BMZs to direct hunting pressure as appropriate. 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 and cost effective manner and to provide recreational opportunity to New Jersey sportsmen and women.
2. In order to ensure against over-harvest, the Council or the DFW may elect not to authorize a bear hunt, otherwise authorized by the Game Code, in any season in which the prior year's hunt exceeded the following benchmarks: exceeding a hunter success rate of 10%, a bear harvest >1 bear per square mile; an adult female harvest >0.75 bears per square mile or a harvest rate of >25% of the bears tagged this year. An in-season closure by the Director, after consultation with the Council Chairman should remain available pursuant to N.J.A.C. 7:25-5.6, and may consider other factors.
3. The 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, and consistent with public safety, and residential and agricultural concerns. A target bear population to begin this process is the 2002 bear population level. Future season structures should be based on data collected from the 2003 and 2005 bear hunting seasons and subsequent 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.

4. Harvest parameters (female harvest per square mile) will be used as a benchmark to gauge the progress of the population reduction and stabilization, and trigger adjustments to future season structures. Yearly female harvest rates will be analyzed using the deterministic model. The results of the model simulation will be used to determine if the season structure needs to be adjusted. If the model indicates that low female harvest rates will result in a failure to meet the population goal within the stated time frame, lengthening the season and/or increasing permit quotas will be warranted. Conversely, if the model projects that the goal is met in advance of the time frame, a reduction in permit quotas and/or season length will be instituted.
5. Based upon preliminary data from the 2003 bear hunting season as well as success rates from neighboring states, the Council recommends for 2006 and 2007, a nine-day bear hunting format for BMZs 1–4 with permit quotas to direct and limit hunting pressure as necessary. This format includes a one-day archery bear season on the Saturday after Thanksgiving, a two-day muzzleloader bear season on the Monday and Tuesday after Thanksgiving, as well as the current six-day bear season concurrent with the six-day firearm buck season. Based on data collected during this nine-day format, the Council will adjust permit quotas, weapon type and season dates through the Game Code process to effect a reduction, then long-term stabilization of the bear population.
6. Bears in BMZs 5 and 6 will be subject to legal harvest by properly licensed hunters with bear permits during the bear hunting season beginning in 2006 as described in 3 above.
7. Bears within BMZ 7 will be subject to legal harvest by properly licensed hunters with bear permits during the established deer hunting seasons.
8. The Council should charge a bear permit fee. 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.
9. DFW should continue to investigate alternative population control techniques, such as fertility control.

IV. CONCLUSION

The Council recommends that the DFW should continue to focus on an 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 alternate control methods and implementing population reduction through a regulated hunting season. Adequate funding for black bear management is estimated to be \$ 1.25 million (Appendix D). It is unrealistic to believe that New Jersey's sportsmen and women share the sole responsibility for paying for this cost. Since responsible bear management benefits all citizens of New Jersey, it is appropriate that it be funded through the General Treasury.

The 1997 BBMP set a target density of 1 bear / 2½ square miles in order to minimize conflicts and to manage New Jersey black bears consistent with target densities of adjacent states with similar habitat. The Council will continue to evaluate the level of serious Category I incidents as a measure of success in reducing and stabilizing the New Jersey bear population. The goal for the next five years is to reduce the bear population to the 2002 population level. The density will vary within New Jersey's differing landscapes. Currently, the only method available to achieve this population density is by regulated sport hunting. The Council is confident that with careful management for this species, black bears will be able to thrive in suitable habitat in New Jersey where they can safely coexist with New Jersey residents.

V. LITERATURE CITED

Burke, D. and S. Predl. 1990. An assessment of deer hunting in New Jersey. NJ DEP, DFW. 150 pp. Trenton, NJ.

California Final Environmental Document, Section 265, 365, 367, 367.5, Title 14, California Code of Regulations Regarding Bear Hunting. April 27, 2000. CA Department of Fish and Game, 188 pp. + Appendices.

Carr, P.C. 2001. New Jersey status report. Proc. East. Workshop Black Bear Manage. Res. 16:45-50.

Carr, P.C. and K. Burgess. 2004. New Jersey status report. NJ DEP, DFW. 25 pp. Trenton, NJ.

Conover, M.R. 2001. Effect of hunting and trapping on wildlife damage. Wildlife Society Bulletin 29(2):521-532.

Fagerstone, K.A., M.A. Coffey, P.D. Curtis, R.A. Dolbeer, G.J. Killian, L.A. Miller, and L.M. Wilmot. 2002. Wildlife Fertility Control. Wildl. Soc. Tech. Rev. 02-2. 29 pp.

Garshelis, D.L. 2002. Misconceptions, ironies, and uncertainties regarding trends in bear populations. Ursus 13:321-334.

Kontio, B.D., D.L. Garshelis, E.C. Birney, and D.E. Andersen. 1998. Resilience of a Minnesota black bear population to heavy hunting: Self-sustaining population or population sink? Ursus 10:139-146.

Kurzejeski, E.W., J.L. Byford, K. Causey, J.W. Enck, L.P. Hansen, W. Krueger, K. Mayer, and K. McCaffery. 1999. The Role of Bowhunting in Wildlife Management. Wildl. Soc. Tech. Rev. 99-1, 15 pp.

Levy, J.K., L.A. Miller, P.C. Crawford, J.W. Ritchey, M.K. Ross and K.A. Fagerstone. 2004. GnRH immunocontraception of male cats. Theriogenology 62:1116-1130.

Lund, R.C. 1980. New Jersey status report. Proc. East. Black Bear Workshop. 5:6-7.

Lund, R.C., P. McConnell and S. Smyser. 1981. Restoration of the Black Bear to the New Jersey Pine Barrens-A discussion of the Proposal and Assessment of Impacts. NJ DEP, DFGW, BWM. 27 pp. Trenton, NJ.

MacKenzie, K.G. 2003. Nuisance vs. non-nuisance bears: Seasonal movement and home range utilization of female New Jersey black bears (Ursus americanus). M.S. Thesis. East Stroudsburg State University, East Stroudsburg, PA. 108 pp.

- McBride, A.E. 2003. Wild Turkey Research Project Report. NJ DEP, DFW. 64 pp. Trenton, NJ.
- McConnell, P.A., J.R. Garris, E. Pehek and J.L. Powers. 1997. Black Bear Management Plan. NJ Div. of Fish, Game & Wildl. 115 pp. Trenton, NJ.
- McLaughlin, C.R., G.J. Matula, and J.H. Hunt. 1987. A draft habitat suitability index model for black bears in the conifer-deciduous forests of New England: its application in Maine. Maine Dept. Inland Fish. & Wildl. Augusta, ME. 44 pp.
- Miller, L., J. Rhyan, and G. Killian. 2003. Evaluation of GnRH contraceptive vaccine using domestic swine as a model for feral hogs. Wildl. Damage Manage. Conf. 10:120-127.
- Miller, L.A., J. Rhyan, and G. Killian. 2004. GonaCon, a versatile GnRH contraceptive for a large variety of pest animal problems. Vertebr. Pest Conf. 21:269-273.
- Muller, L.I., R.J. Warren, and D.L. Evans. 1997. Theory and practice of immunocontraception in wild mammals. Wildlife Society Bulletin 25(2):504-514.
- Niles, L.J., M. Valent, P. Winkler and P. Woerner. 2004. New Jersey's Landscape Project, Version 2.0. NJ DEP, DFW, ENSP. 56 pp. Trenton, NJ.
- NJDFW 2000. New Jersey Black Bear Status Report 2000. NJ DEP, DFW. 7 pp. Trenton, NJ.
- NJDFW BWM 2000. Black Bear Rating and Response Criteria. NJ DEP, DFW. 4 pp. Trenton, NJ.
- NJDEP. 2003. New Jersey Independent Bear Panel Report. NJ DEP. 17 pp. Trenton, NJ.
- Rogers, L.L. and A.W. Allen. 1987. Habitat suitability index models: Black Bear, Upper Great Lakes Region. U.S. Fish and Wildlife Service Biological Report 82 (10.144). 54 pp.
- Ternent, M. A. 2005. Management Plan for Black Bear in Pennsylvania (2005-2015). PA Game Commission, Harrisburg, PA. 72 pp.
- Walters, C. 1986. Adaptive management. MacMillan Publishing Co. NY. 374 pp.