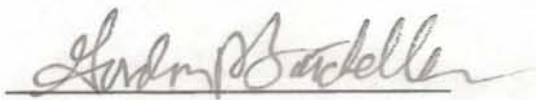


Management Plan For Bobcat in New York State 2012-2017

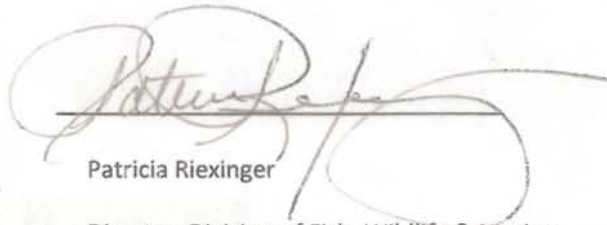


**Management Plan
For Bobcat in New York State
2012-2017**



Gordon R. Batcheller

Chief, Bureau of Wildlife



Patricia Riexinger

Director, Division of Fish, Wildlife & Marine
Resources

12 October 2012

Date

NYS Bobcat Management Plan

Mission of the Bureau of Wildlife

To provide the people of New York the opportunity to enjoy all the benefits of the wildlife of the State, now and in the future. This shall be accomplished through scientifically sound management of wildlife species in a manner that is efficient, clearly described, consistent with law, and in harmony with public need.

Goals of the Bureau of Wildlife

- Goal 1.** Ensure that populations of all wildlife in New York are of the appropriate size to meet all the demands placed on them.
- Goal 2.** Ensure that we meet the public desire for: information about wildlife and its conservation, use, and enjoyment; understanding the relationships among wildlife, humans, and the environment; and clearly listening to what the public tell us.
- Goal 3.** Ensure that we provide sustainable uses of New York's wildlife for an informed public.
- Goal 4.** Minimize the damage and nuisance caused by wildlife and wildlife uses.
- Goal 5.** Foster and maintain an organization that efficiently achieves our goals.

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Executive Summary

Bobcats (*Lynx rufus*) are widely valued as a resident wildlife species in New York, although they are rarely seen in the wild due to their secretive behavior. All indications, including harvest trends, suggest that bobcats have increased in abundance here and in surrounding states, and observations have become more common in recent years. Based on analysis of harvest data, we estimate New York's bobcat population to be approximately 5,000 animals in areas where regulated hunting and trapping seasons have been in place since the 1970s. Estimates are not available for populations expanding into western and central New York.

New York's Environmental Conservation Law (ECL) specifically authorizes trapping and hunting as a legitimate use of our wildlife resources. This management plan provides for this continued use of bobcats, while ensuring that harvest occurs on a sustainable basis. We will accomplish that through setting of appropriate seasons across the state, specifying allowable trapping and hunting techniques, and monitoring bobcat populations and harvests. We propose no changes to bobcat harvest opportunities for most of southeastern New York, where bobcat hunting and trapping seasons have extended from late October to mid February since the late 1970s. In northern New York, we propose some changes to create a uniform hunting and trapping season throughout most of eastern New York. We expect minimal additional harvest (less than 50 animals) to result from these changes because trapping conditions and access in this region limit trapper effort and success during the winter months. We also propose opening a limited (3-4 weeks) trapping and hunting season in central and western New York, where bobcat populations have recently become established. We expect this limited season to result in a harvest of less than 100 bobcats, which will allow for continued population growth. We will also cooperate with efforts to assess the feasibility of restoring bobcats to Long Island, where the species has been absent since the early 1800s.

This management plan is the first in New York to provide direction and oversight for sustaining or enhancing the abundance, enjoyment and utilization of bobcats throughout New York State. The goal of this plan is not to reduce bobcat populations anywhere in the state, since bobcats cause few conflicts with human interests or activities. We expect our actions to maintain populations at or above their current levels in eastern New York, while allowing for continued population growth in central and western New York. Current annual harvests average about 470 bobcats per year, and we expect annual harvests to increase by less than 150 animals per year. We will monitor those trends closely and we will enhance our monitoring capabilities by instituting more robust surveys of trapper and hunter effort. We will adjust seasons in the future as needed if we see evidence of significant population declines in any area. Over time, we expect the statewide population to stabilize at 6,000-8,000 animals, limited more by inherent territorial limits of the species than by hunter/trapper harvest.

Although this plan focuses on harvest opportunities and associated monitoring programs (because of the need to manage those activities carefully), we acknowledge the value that people place on

observing bobcats or their sign, and simply knowing that bobcats exist as a component of natural ecosystems in New York. As noted above, we expect our proposed actions to maintain bobcat populations at or above their current levels throughout New York State. Beyond that, there is little that DEC or anyone can do to increase the likelihood of a chance encounter with a bobcat in the wild.

Neither DEC nor the trappers or hunters of New York wish to exploit bobcats to the detriment of the population. Historically, trappers and hunters are among the first to recognize a downturn in populations of harvested game species. We will regularly engage hunters and trappers in central and western New York concerning their observations of bobcats. These and other informal observations, coupled with rigorous legal requirements for harvest reporting, will strengthen DEC's understanding of the population status of bobcat. Season changes enacted pursuant to the plan will be evaluated in five years, when the plan should be reviewed and updated as needed.

Background

The bobcat (*Lynx rufus*) is a North American member of the cat family Felidae, ranging from southern Canada to northern Mexico, including most of the continental United States. The species is found throughout most of New York State, except for Long Island. They are defined as a protected, small game species per Environmental Conservation Law (ECL) 11-0103(2)(c).

With a gray to brown coat, whiskered face, and black-tufted ears, the bobcat resembles other species of the Lynx genus. It is smaller than the Canada lynx (*Lynx canadensis*), but is about twice as large as the domestic cat. It has distinctive black bars on its forelegs and a black-tipped, stubby tail, from which it derives its name. Males are one-third larger than females and both sexes can be greater than 30 pounds; however, averages for males and females are 21 and 14 pounds, respectively. Body length for males is 34 inches and 30 inches for females. Tail length is usually between 5 and 6 inches for both sexes.

Bobcats are solitary, territorial animals and may be active at any time, day or night. Breeding occurs between January and March with females reaching maturity in their first year, while males do not mature until their second year. Most litters are born in April or May and range from one to five kittens. Kittens disperse prior to the birth of the following year's litter.

Bobcats are habitat generalists, not usually found in areas of high development or intensive agriculture. Bobcats are opportunistic feeders and their food habits change seasonally in response to prey availability. Bobcats usually consume mammalian prey, especially rabbits, hares, and other mammals ranging in size from mice and voles to deer (primarily fawns or deer weakened by winter-induced stresses) (Pollack 1951). In one New York study, deer and rabbits were the main diet components, occurring in 32% and 30% of 169 bobcat stomachs that had food items; mice and voles were in 24% but accounted for only 3% of the stomach contents by weight (Fox 1990). However, bobcats will

occasionally feed on ground nesting birds, reptiles, amphibians, invertebrates, carrion, and domestic animals, including house cats, poultry, small pigs, and lambs. Livestock or poultry depredations, while rare, do occur in some areas of the state. Environmental Conservation Law (ECL) section 11-0521 provides the Department with the authority to issue nuisance permits to address these situations.

Bobcats typically occur as solitary predators, with adult females remaining separated from each other within relatively exclusive home ranges and male home ranges overlapping numerous female home ranges (Fox 1990). Seasonal home ranges vary widely depending on food availability and energetic demands, but annual home range size appears related to bobcat density rather than food availability, i.e., females expand their movements until they establish contact with an adjacent female (Fox 1990). Home range size for bobcats in New York during 1978-1980 varied from less than 40 km² for two males and a female in the Catskills to 86 km² for four females and 326 km² for four males in the Adirondacks (Fox 1990). Based on 29 studies across North America, female home range sizes average about 16 km² (6 mi²), and male home ranges average about 40 km² (15 mi²) (Ferguson et al. 2009). Using those figures, upstate New York has the capacity for a maximum population of about 7,000 to 10,000 bobcats, assuming all suitable habitats were fully occupied. Because bobcats occur in such low densities, they generally do not control or limit prey populations, such as small rodents or deer. Small mammal populations fluctuated dramatically during one New York study with no noticeable response in the bobcat population (Fox 1990).

Observations by hunters, trappers, hikers, farmers, trail camera users, and others who spend time outdoors clearly indicate that bobcat populations are increasing and expanding throughout New York State, beyond their historic core range in the Taconic, Catskill, and Adirondack mountains, now extending into central and western New York. In addition, emigration of bobcats from Pennsylvania has likely fostered growth of the bobcat population in the southern tier of the state (Matt Lovallo, Pennsylvania Game Commission, personal communication). Bobcat population trends in New York reflect general trends across the United States, as many other states have reported increasing bobcat populations (Roberts and Crimmins 2010).

Unfortunately, there is no practical way to estimate bobcat populations based on direct observations of the animals or their sign (tracks, droppings, etc.). The elusive nature of bobcats prohibits the effective use of traditional visual surveys such as those used for assessing waterfowl or other wildlife populations. In the absence of complex field studies, the most common and generally accepted method for estimating abundance involves analysis of data collected from hunters and trappers.

In the absence of a reliable population survey method, we can estimate current bobcat population size by extrapolation from harvest data. Harvest totals in recent years via hunting and trapping have ranged from 400-500+ animals per year, with a clearly increasing trend from the late 1980s to the 2000s (Fig. 1). Long-term trends in harvest generally reflect abundance of the species, with annual variation related to variables such as fuel costs, pelt prices and weather conditions. Assuming a conservative harvest rate of 10% (the % of the fall population taken by hunters and trappers), and approximately 500 bobcats

harvested annually, we estimated a population of approximately 5,000 bobcats for those areas of New York where harvest is currently allowed. A 10% harvest rate is consistent with the apparent population growth observed, as harvest rates of 14-20% may be sustainable (Knick 1990, Roberts 2010). The estimate of 5,000 bobcats does not include areas where we have not allowed harvest to date, which is more than half of upstate New York. A slightly lower estimate of 3,400 bobcats would be calculated for the current harvest area if we had used the actual mean harvest of 470 bobcats per year observed during 2005-2009, and a sustainable harvest rate of 14% that was calculated for bobcats from a study in east-central New York (Roberts 2010). Either estimate suggests a substantial population increase since 1980, when there were an estimated 800-1,100 adult bobcats in the state (Fox 1990) and harvests of 100-200 animals per year were reported (Fig. 1).

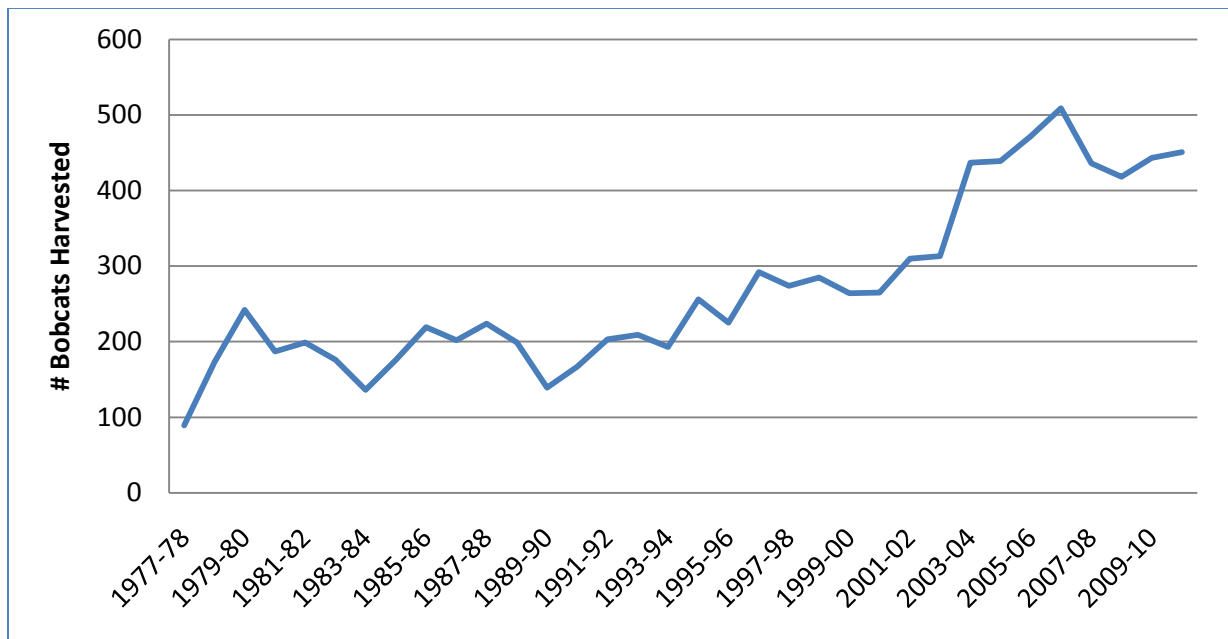


Figure 1. Total New York bobcat harvest (hunting and trapping), 1977-2011.

Diseases and parasites known to occur in bobcat include feline panleukopenia (feline distemper), rabies, toxoplasmosis (an intracellular parasite), cytauxzoonosis (a blood parasite), and infections of the tapeworm *Spirometra* (Davidson, 2006). Of these, feline panleukopenia may be an important cause of natural mortality and may influence bobcat abundance in New York State (Fox 1983). Rabies is often of concern to the public because of its potential transmission to humans and domestic animals and always-fatal consequences. However, the occurrence of rabies in bobcats in New York is rare with only three animals testing positive from 2001 to 2010 (NYSDOH 2012).

The Department is responsible for managing bobcat populations and accomplishes this task through harvest season timing, season length, and defining legal methods of take. Bobcats were unprotected in New York until the Legislature granted the Department authority to establish open hunting and trapping seasons in 1976. In 1977, the Department closed a large portion of the state to bobcat harvest while

allowing harvest in the remaining areas. At that time, a pelt tagging system was instituted to monitor bobcat harvest. Since the first seasons were established, there has been a steady increase in bobcat harvest from approximately 200/yr in the 1980s to more than 400/yr since the mid 2000s (Fig. 1). Many bobcats are used for taxidermy and are often considered a “trophy” species. However, most bobcats are pelted and enter the fur trade via both domestic and international outlets. Bobcat pelts provide income to several hundred trappers and hunters in New York. In recent years, eastern or northern U.S. bobcat pelts prices have ranged from around \$50 to over \$200, although prices fluctuate from year to year, depending on market conditions (FHA 2011).

While hunters and trappers are the most obvious users of the bobcat resource, wildlife enthusiasts, nature photographers, and others also appreciate the existence of a healthy bobcat population in New York. As is the case with hunters and trappers, many wildlife photographers also view the elusive bobcat as a “trophy” species and a rewarding challenge to capture on film. Others simply value knowing that bobcats exist in the wild in New York, and that they are an indicator of healthy ecosystems. As evidenced by the number of observation reports fielded by Department staff, the public is very interested in bobcats and can play a role in their management by facilitating the collection of data on this species.

Currently, bobcats are listed in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The U.S. Fish and Wildlife Service (USFWS) is responsible for implementing certain treaty obligations, and they do so via their Office of Scientific Authority, and their Office of Management Authority.

Historically, furbearer species in New York have been managed at the Wildlife Management Unit (WMU) Aggregate level (Fig. 2). These aggregates are composed of one or more WMUs grouped based on ecological similarity. Occasionally, managing by individual WMUs within a WMU Aggregate may be appropriate, such as when new harvest opportunities are established.



Figure 2. New York's Wildlife Management Unit Aggregates and Wildlife Management Units, 2011.

GOAL

The goal of this bobcat management plan is to:

Maintain or enhance secure, viable populations of bobcats, where suitable habitat exists, and provide sustainable benefits for the people of the state.

OBJECTIVES

To achieve this goal, two primary objectives are recognized:

1. Maintain or enhance bobcat populations in all areas of the state, where suitable habitat exists; and
2. Provide for sustainable use and enjoyment of bobcats by the public.

MANAGEMENT STRATEGIES

For purposes of this plan, we divided the state into four management zones (Fig. 3), defined using Wildlife Management Unit (WMU) Aggregates or individual WMUs, as follows:

The **Current Harvest Area** includes all areas where bobcat hunting and trapping seasons have been in place for many years. This includes most of northern New York (*WMU Aggregates: Champlain Valley and Transition, Central Adirondacks, Northern Adirondacks, St. Lawrence Valley, East Ontario Plain, and Tug Hill*) and much of southeastern New York (*Neversink-Mongaup Hills, Catskills, Hudson Valley, South Taconic Highlands, and North Taconic Highlands*).

The **Harvest Expansion Area** includes all areas where we plan to initiate limited hunting and trapping opportunities for bobcat. This area generally extends across the Southern Tier and includes a portion of the lower Hudson Valley (*WMU Aggregates and WMUs: West Appalachian Plateau, Central Appalachian Plateau, Otsego Delaware Hills, Mohawk Valley, New York City Transition, and WMU 7S*).

The **Population Growth Area** includes areas where we will allow maximum growth of bobcat populations, with no immediate plans to establish harvest seasons. This encompasses the areas around Lake Ontario and the Finger Lakes, and other parts of western and central New York (*WMU Aggregates and WMUs: Tug Hill Transition, Oswego Lowlands, Oneida Lake Plain, North Appalachian Hills, Great Lakes Plain, and WMUs 7M, 7R, and 7P*).

The **No Bobcat Area** is the area of New York where bobcat do not occur currently and where we have no plans to establish a population. This includes all of New York City and Long Island (*WMU Aggregate: Coastal Lowland*).

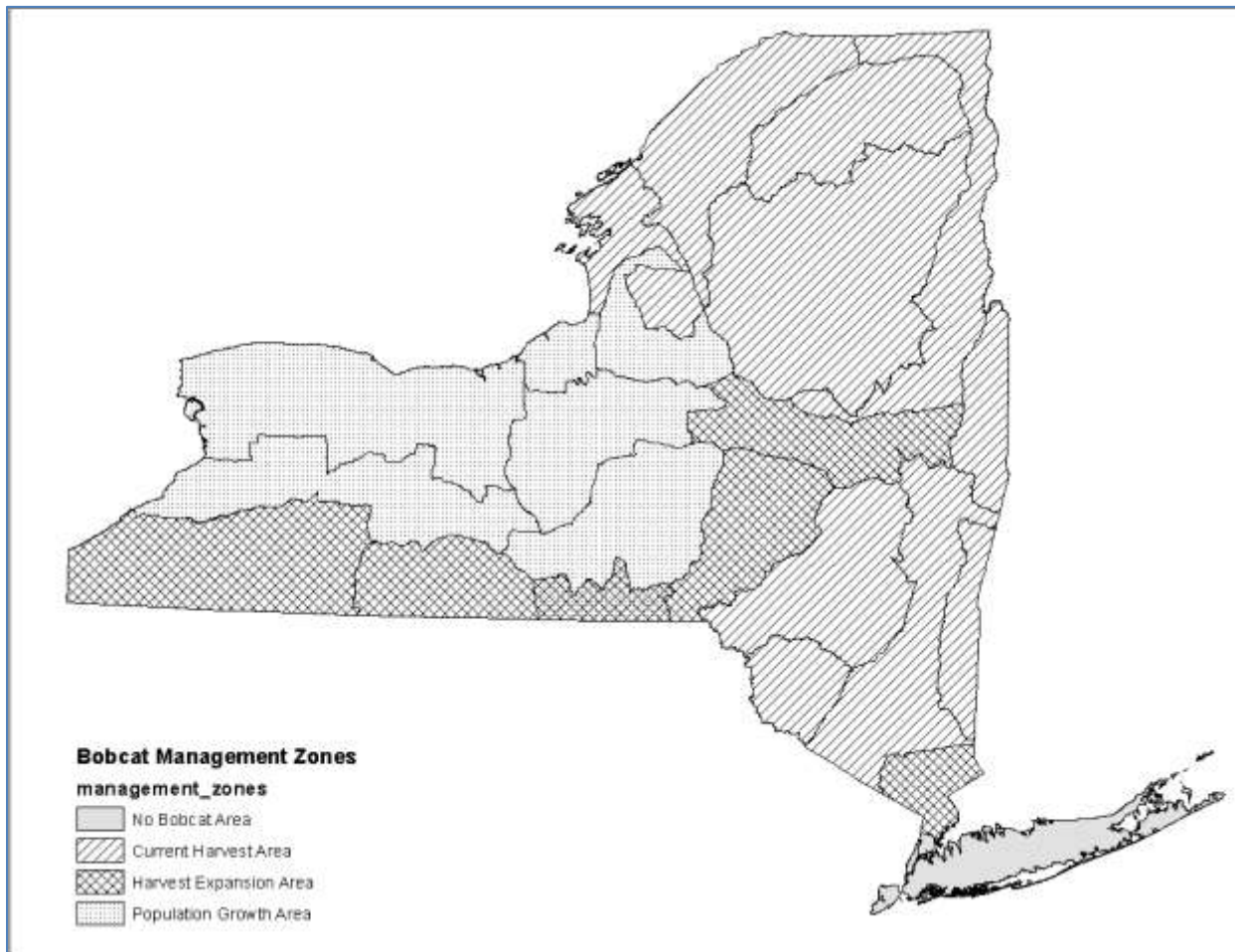


Figure 3. Bobcat Management Zones

For each objective noted above, we defined management strategies specific to each of these management zones in New York.

Objective 1: Maintain or enhance bobcat population levels in all areas of the state, where suitable habitat exists.

Strategy 1.1: Maintain bobcat population levels in the Current Harvest Area, and monitor their status through the collection and review of harvest and take-per-unit-effort (TPUE) data.

We propose no changes to bobcat harvest opportunities for most of southeastern New York, where bobcat hunting and trapping seasons have extended from late October to mid February since the late 1970s. Annual harvests in that region have been relatively stable since 2005-06, with about 290 animals

taken per year, or about 0.034/mi². Analysis of bobcat age structure in the harvest suggests that the current harvest rate in this region is about 10% of the fall population, well below the 14-20% harvest rates that bobcat populations can sustain (Knick 1990, Roberts 2010). There is little demand for additional harvest opportunity in the southeastern portion of the Current Harvest Area (i.e., Catskill and Hudson Valley regions), and there is widespread public support for maintaining bobcats at current levels for the chance to observe one in the wild.

We will continue to estimate and monitor harvest trends in the Current Harvest Area through mandatory pelt sealing. However, annual variation in harvest data can often be misleading due to numerous factors that can influence total harvest, including pelt prices and trapper effort. One method to improve these data is to express harvest as a function of trapper effort (i.e., take-per-unit-effort or TPUE), with effort expressed in trap-nights (calculated as the product of the number of traps set and the number of days the traps are set). TPUE has been used as an index of relative abundance for a variety of furbearers, and can improve our ability to interpret harvest fluctuations. Roberts (2010) specifically noted the utility and relative cost-effectiveness of effort data for monitoring bobcat populations.

DEC will measure the effort of both bobcat hunters and trappers using diary logbooks to collect TPUE data. This method is best suited to use with trappers who can more easily calculate and record their effort. We may use similar methods for bobcat hunters, except that effort will be based on a unit of time (e.g., number of hours or days hunted). While not immediately planned, post-season surveys to quantify effort of bobcat hunters and trappers merit further investigation. By collecting TPUE data, we will be better able to use bobcat harvest information to monitor relative abundance in all areas where trapping or hunting occurs.

Strategy 1.2: Allow a limited harvest and continued growth of bobcat populations in the Harvest Expansion Area, and monitor their status through a combination of harvest and observation data.

We plan to open some new areas of western, central, and southeastern New York with a limited opportunity for trappers and hunters to take bobcat. In this Harvest Expansion Area, we will monitor trends in harvest and relative abundance using pelt seal and TPUE data in the same manner as described in strategy 1.1. In addition, we will continue to collect a variety of observation data as described in strategy 1.3 for the Population Growth Area. Based on current observation data, bobcats are well distributed across this management zone, and we will limit harvest opportunity in the near term to allow continued population growth.

Strategy 1.3: Allow maximum growth of bobcat populations in the Population Growth Area, and monitor their status through collection of observation and encounter data.

We have no immediate plans to open bobcat hunting or trapping seasons in this management zone so the population can grow at the fastest possible rate. We will document population expansion by

soliciting and compiling bobcat observation reports from specific user groups (e.g., bowhunters, trappers) as well as the general public. We will request observation reports from all sources via the annual hunting and trapping regulations guide, Department website, outreach to user groups, and Field Notes, the Division's list-serve. We will continue to solicit and collect this information with particular emphasis on observations confirmed with photographic evidence or a carcass. Information, including sex and age when possible, will be collected from road kills, unintentional captures, and reliable photographic evidence. Observation data will be stored in a centralized database or spreadsheet that is compatible with a Geographic Information System (GIS).

Soliciting observations from the public is a relatively low cost method of obtaining data on bobcats. Observation data obtained from hunters and trappers have proven useful in documenting changes in bobcat distribution at little cost to DEC. The annual trapper mail survey provides an excellent source of observation data. Questions on the survey regarding bobcat observations should continue. In addition, the Bowhunter Sighting Log was established primarily for the management of white-tailed deer but has also been useful as an index to monitor relative abundance of a variety of wildlife species, and should continue as a tool to also document selected furbearers, such as bobcat.

Lastly, most Regional offices record nuisance complaint data as standard practices and we propose that this should continue, especially in areas where bobcat range is expanding and populations are increasing. We will document the location and nature of any nuisance bobcat complaints, which may be more likely to occur in the Population Growth Area because of its predominantly agricultural and urban/suburban character.

Strategy 1.4: Assess feasibility of bobcat restoration to Long Island.

Bobcats do not currently exist on Long Island, and it is unlikely that they will colonize this region naturally due to the geographic isolation of any potential habitat from nearby populations. Bobcats did occur on Long Island in pre-settlement times, but they have been extirpated from the island since the early 1800s (DeKay 1842, Connor 1971). DEC has no plans to establish a bobcat population in this area, so we refer to this as the No Bobcat Area, where a closed season will be maintained and no monitoring is planned.

Some people have advocated for restoration of bobcats to Long Island. However, there are questions as to whether Long Island can support a bobcat population within its highly developed landscape and heavy vehicular traffic. It is also uncertain whether the public would support reintroduction of this species to the region. Given the territorial nature of bobcats, establishment of a population on the east end, if possible, could result in frequent dispersal of individuals westward into highly developed areas, where road kills and other conflicts could arise. Feasibility studies are necessary to answer these questions. However, we consider those a low priority at this time, with low likelihood that a restoration effort would be warranted. Nonetheless, we will cooperate with or assist other stakeholders who wish to pursue such an effort.

Objective 2: Provide for the sustainable use and enjoyment of bobcat by the public.

Strategy 2.1: Establish a uniform, equitable and sustainable harvest opportunity (October 25 – February 15) for hunters and trappers throughout the Current Harvest Area, beginning in 2012.

This strategy involves two specific regulatory changes: 1) extend the close of bobcat trapping season to February 15 in the Northern Adirondacks, Central Adirondacks, Champlain Valley and Transition, St. Lawrence Valley, and East Ontario Plain; and 2) extend the bobcat trapping and hunting seasons until February 15 in the Central Tug Hill WMU Aggregate. These changes will result in a uniform bobcat hunting and trapping season throughout the Current Harvest Area.

Historically, Northern Zone WMU Aggregates have had much shorter (7-week) bobcat trapping seasons nested within a more liberal (16-week) hunting season. These shorter trapping seasons were designed to protect a growing fisher (*Martes pennanti*) population. Fisher populations have since expanded throughout the Northern Zone, and they have been harvested in a sustainable manner for several decades, so the shorter bobcat trapping season is no longer necessary.

Total bobcat harvest in northern New York during 2005-06 through 2009-10 averaged 165 animals, with 88 taken by hunters and 71 by trappers (the rest were other or unknown). Extending the season to February 15 would provide eight additional weeks of trapping opportunity, but we expect minimal additional harvest to occur because snow, ice and poor road access limit trapper effort and success in this region during the winter months. In addition, the rugged landscape and limited road network in the Adirondacks creates many refuge areas where bobcats are subject to little trapping pressure. Few trappers can afford the time to maintain trap sets in remote areas of the Adirondacks. We recently extended land trapping seasons for other furbearing species (i.e., fox, coyote, opossum, skunk, raccoon, and weasel) in eight Northern Zone WMUs, from December 10 until February 15, and the 2010-2011 Trapper Mail Survey revealed that only 3% of trappers took advantage of this new opportunity. We expect a similar level of participation by bobcat trappers with the same season extension, and predict that fewer than 40 additional bobcats will be taken per year with this extension.

In the Central Tug Hill aggregate (WMU 6N), both the bobcat hunting and trapping seasons currently end on December 10. We propose to extend both the hunting and trapping seasons in this aggregate to close on February 15. The season change will result in a uniform bobcat hunting and trapping season throughout the Current Harvest Area. Over the past seven seasons, this aggregate has produced a low, but steady bobcat harvest of up to eight animals per year. The Tug Hill area is well known for its deep snows that limit hunter and trapper access, and which make trapping on land exceedingly difficult. Hunting is limited to those areas located near roads or along snowmobile corridors. Similar to the other Northern Zone changes, participation in this new opportunity is expected to be limited and, as a result, harvest increases should be small (we predict fewer than 10 additional bobcats).

The changes proposed above would greatly simplify season structure (concurrent season dates for both bobcat hunting and trapping for all WMUs) in the Current Harvest Area. This will make it easier for hunters and trappers to interpret the seasons and ease enforcement for Division of Law Enforcement personnel.

Strategy 2.2: Adopt regulations allowing for a limited harvest of bobcats in the Harvest Expansion Area, as described below, beginning in 2012.

The presence of bobcat in New York's Southern Tier has increased dramatically over the past decade. What began as occasional sightings along the New York/Pennsylvania border has progressed to frequent observations, trail camera photos, and incidental captures and releases by trappers. Over the past five years there have been more than 330 bobcat observations documented in the harvest expansion area (Fig. 4).

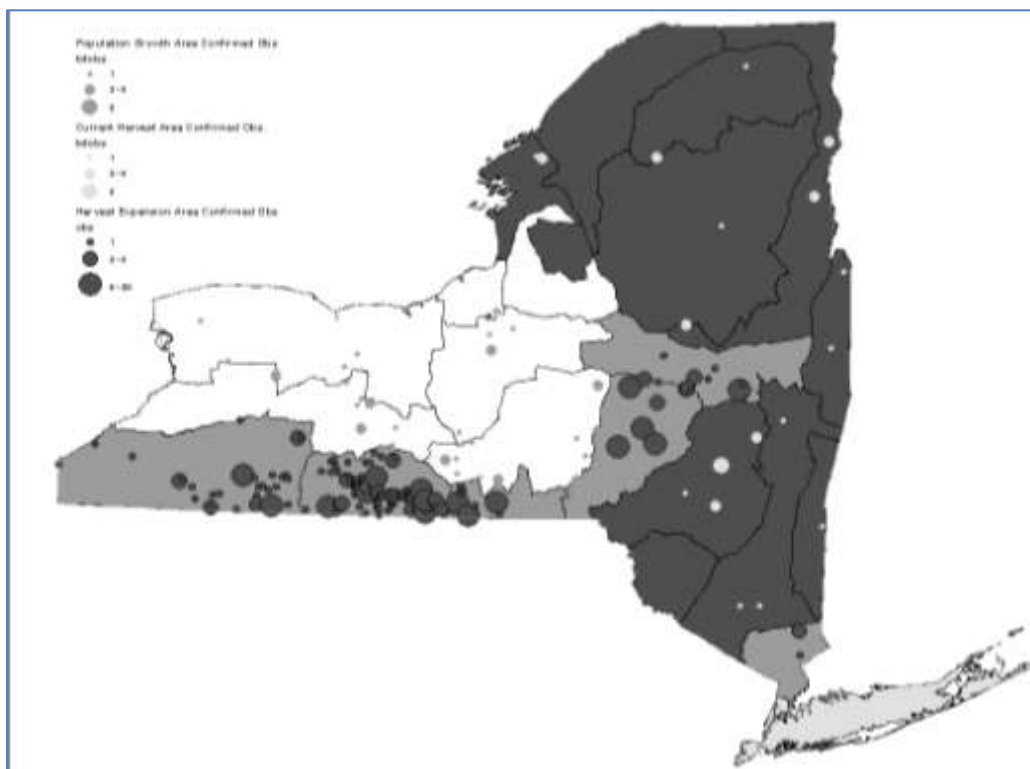


Figure 4. Total confirmed bobcat observations, 2006-2011.

Observations of bobcats, when normalized by land area (miles²), indicate that bobcats have become well established in the Harvest Expansion Area and observation rates in this area are similar to, or exceed, those in the Current Harvest Area in eastern and northern New York (Figures 5 and 6). Figure 5 depicts the total number of bobcats observed per square mile for each WMU aggregate, using data from the Bowhunter Sighting Log and trapper mail survey from 2006-2011. Figure 6 depicts this same information at the individual WMU level.

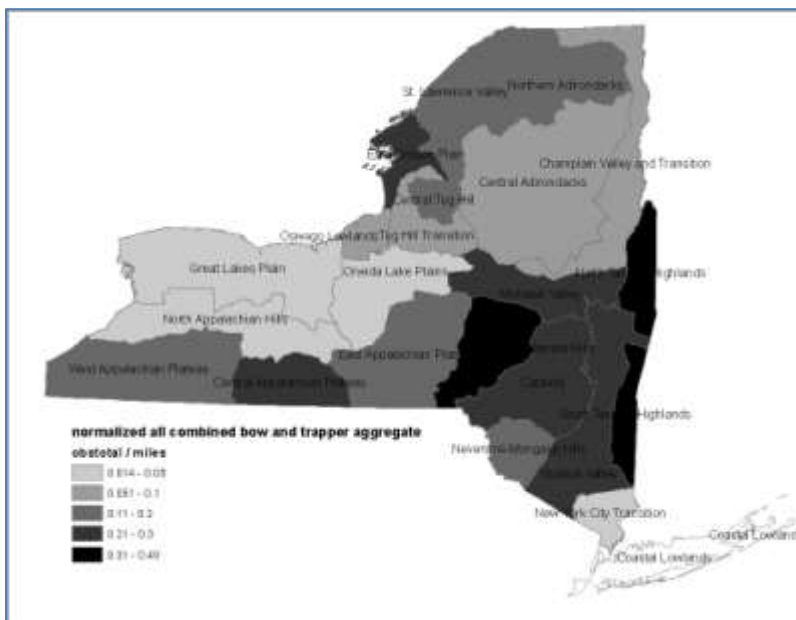


Figure 5. Combined bowhunter log and trapper observation data by WMU aggregate.

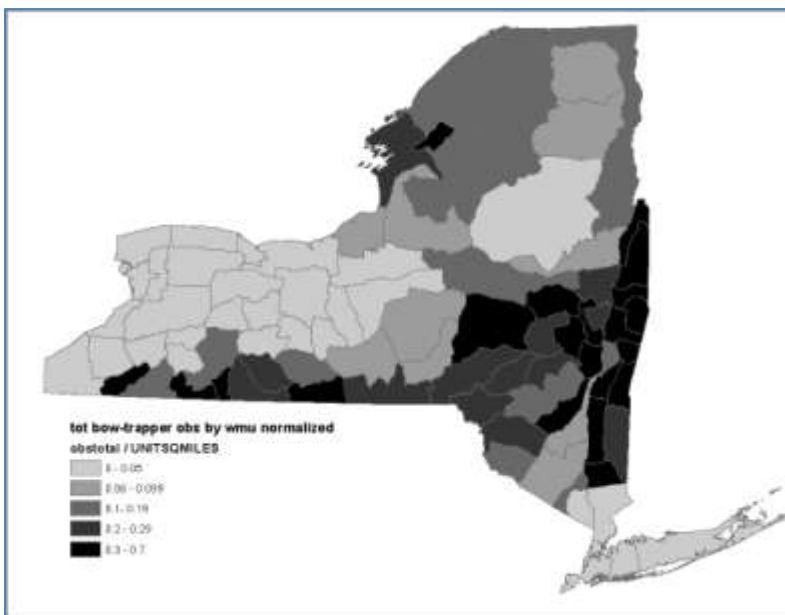


Figure 6. Combined bowhunter log and trapper observation data by WMU.

Based upon these observation data, and experience gained from a special study conducted in the northern Catskills during 2006-2008 (Roberts 2010), we propose opening a very conservative bobcat trapping and hunting season in the Harvest Expansion Area. The season would be open from October 25 through the Friday before the start of the Southern Zone regular big game season (which opens on the 3rd Saturday in November).

We propose a very conservative approach to initiating bobcat harvest opportunity in this area, including restrictions on season length and timing. First, a short season would limit the number of bobcats harvested, while still providing some opportunity for small game hunters and trappers. Season length in the Harvest Expansion Area will be much shorter (3-4 weeks) than in the Current Harvest Area (~16 weeks), where bobcats have been harvested in a sustainable manner for many years. Secondly, the timing of the bobcat trapping and hunting season (prior to the firearms deer hunting season) will limit the number of bobcats harvested because it avoids the time period when many bobcat would be harvested incidental to deer hunting. We believe that these harvest control measures will allow for both a limited and sustainable harvest of bobcats, and continued growth of bobcat populations in central and western New York.

To predict the expected harvest of bobcats in the Harvest Expansion Area, we examined data from the Current Harvest Area, where bobcat harvest rates (animals harvested/mi²) vary temporally (e.g., relative to the deer hunting season) and spatially (northern versus southeastern New York) (Table 1). Mean harvest/mi² for the entire bobcat trapping and hunting season (2005-06 through 2009-10) in northern and southeastern NY were 0.012 bobcats/mi² and 0.034 bobcats/mi², respectively. Using these mean harvest levels as lower and upper limits, we estimated that a full-length (October 25 to February 15) bobcat trapping and hunting season in the Harvest Expansion Area (~10,000 mi²) would result in a harvest of approximately 120-350 animals (Table 1). However, by limiting the season to just 3-4 weeks before deer season, estimated harvest in this area should be only about 30% of a full season, i.e., 35-100 bobcats.

Table 1. Estimated number of bobcats that may be harvested during potential open periods in the Harvest Expansion Area, based on harvest densities observed in northern and southeastern New York relative to deer hunting seasons (2005-2010).

Season	Region used as basis for estimate	
	Northern	Southeastern
Oct. 25 to Southern Zone Deer Season Opener	34	98
First Week of Deer Season	13	39
Remainder of Deer Season	18	51
Remainder of Bobcat Season	55	162
Totals	120	350

As noted earlier, statewide harvest totals in recent years have fluctuated between about 400-500+ bobcats, averaging about 470/year. Adding the maximum predicted harvest for the Harvest Expansion Area (100 animals) plus the maximum predicted harvest increases expected from proposed changes in the Current Harvest Area (up to 50 bobcats) results in a total predicted bobcat harvest of up to 650 animals statewide. We are confident that this is a sustainable harvest from the estimated population of 5,000+ bobcats statewide.

With the opening of limited hunting and trapping seasons in the Harvest Expansion Area, we will carefully monitor the harvest that occurs through pelt seal data and analysis of TPUE and biological data from bobcats taken in that area. Effort data, and biological information from bobcat carcasses, will be obtained from participating trappers and small game hunters interested in pursuing bobcats. This will be accomplished via a mandatory harvest permit, which will require that trappers and hunters submit a logbook and the lower jaw or canine tooth from all harvested bobcat prior to the pelt being sealed. The logbook will collect information on hours hunted and/or trap-nights. A canine tooth will be examined for age determination. Sex of harvested bobcats will be determined via the current pelt sealing process. A report on the age and sex of harvested bobcat(s) will be returned to the hunter or trapper once available.

The collection of age data will allow us to model survivorship for bobcat. Roberts (2010) found utility in tracking survivorship to monitor a previously un-harvested population of bobcats in the Otsego Delaware Hills WMU aggregate. Assuming sufficient sample sizes, concurrently collecting sex of harvested bobcat would allow for survivorship modeling by sex to determine if there are gender specific differences in survivorship. Additionally, analysis of sex and TPUE data may allow us to determine if there are differences in capture vulnerability between the sexes. These data could inform future management decisions such as season timing shifts to afford protection to young or female bobcat if necessary or season length adjustments to decrease or increase overall harvest rates.

The resultant season map depicting the proposed changes appears in Figure 7.

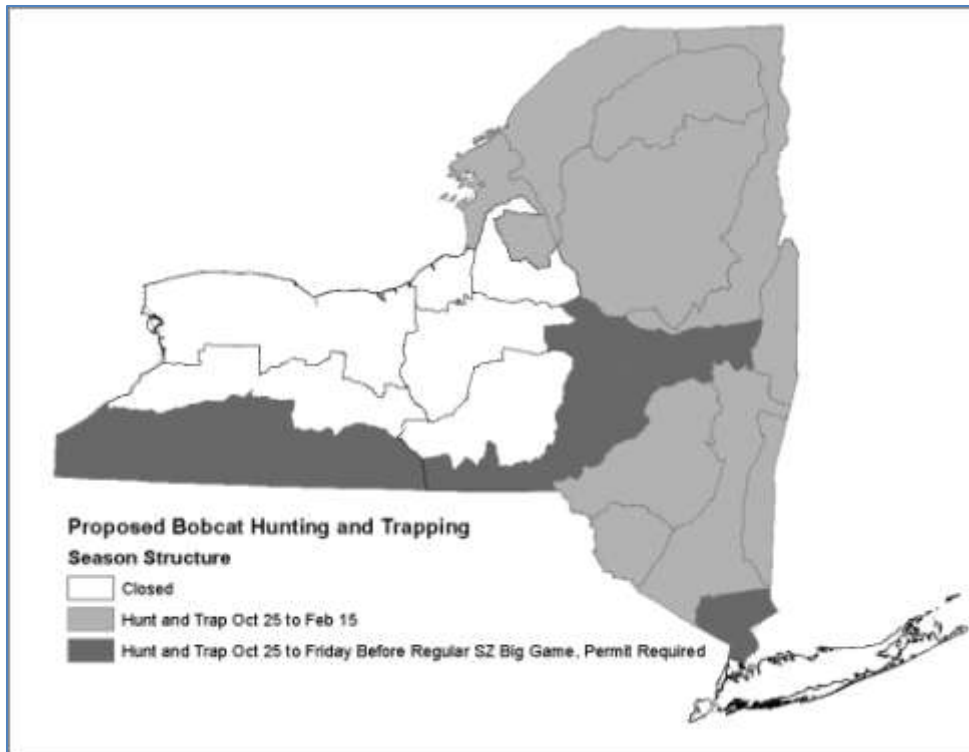


Figure 7. Proposed bobcat hunting and trapping season map for the 2012-13 season.

Strategy 2.3: Develop and implement monitoring criteria to evaluate and adjust harvest regulations.

Moving forward under this plan, we need to better define or standardize criteria to assess bobcat population status and harvest impacts in harvest and non-harvest areas. We anticipate several scenarios where this would be used: 1) to identify or assess potential new areas for harvest; 2) to evaluate any new harvest seasons that we implement, and determine if or when harvest opportunity can be expanded further; and 3) to evaluate well established seasons and evaluate or prescribe modifications to reduce or expand harvest. Thus, if conditions suggest that harvest opportunity should be restricted to meet the management objectives, harvest quotas, permits, season structure, season closure, bag limits, or other management techniques will be considered.

In order to implement new harvest opportunities for bobcat in other WMU Aggregates or individual WMUs, trapper mail survey and bowhunter log indices must fall within the range of indices from existing harvest areas. Going forward, we propose using observation rate criteria for opening new areas to bobcat harvest based on the previous five-year sum of bobcat observations from the combined trapper mail survey and Bowhunter Sighting Log. This criterion would require that WMU Aggregates have a minimum of 0.1 bobcat observations/mi² and 50% of the individual WMUs that comprise the aggregate have a minimum observation rate of 0.1 bobcat observations/mi². If the WMU Aggregate does not meet this criterion, then individual WMUs may be opened if the observation rate in that WMU is ≥ 0.2 bobcat observations/mi². Supplemental data, including methods described by Roberts (2010), or confirmed observations from the area of interest with densities similar to existing harvest zones, may also be used. These criteria were met by most of the Harvest Expansion Area in this plan, except for the New York City Transition aggregate, where low numbers of trappers and bowhunters limited opportunities for bobcat observations (e.g., only 14-22 cooperating bowhunters in WMU 3R during 2007-2011).

For areas open for harvest, we will evaluate multi-year trends in harvest and effort data. Bobcat harvests will be monitored through the mandatory tagging of pelts or unskinned carcasses with pelt seals, and through estimates of hunter and trapper effort from user surveys. Methods for tagging bobcat pelts/carcasses will be consistent with existing procedures within our pelt sealing program, including the collection of Furbearer Possession Tags from trappers and hunters. Data collected from these tags include method of take, date of harvest, sex, and harvest location (town, county, and WMU) and enable us to determine harvest chronology, sex ratios, and harvest density, respectively. A current database of licensed hunters and trappers is maintained through the Department of Environmental Conservation Automated Licensing System (DECALS). This database will facilitate the collection of information from licensed hunters and trappers through the annual small game hunter and trapper mail surveys.

We will evaluate existing practices of our pelt sealing program and implement reforms to increase efficiency for DEC and reduce burdens to the public without compromising the integrity of bobcat

management. These reforms could include, but are not limited to, mailing pelt seals to hunters or trappers who harvest a bobcat, appointing agents to seal bobcat on behalf of DEC, or removing the need for hunters and trappers to record the sex of harvested bobcats (external determination of sex for bobcat is difficult even for trained observers). Reforms of this nature, if adopted, may also have applicability to the other furbearer species in New York that require a pelt seal.

For areas open for harvest, we will also calculate TPUE and use these estimates to monitor trends in relative abundance of bobcats. Effort is influenced by factors such as weather, pelt prices, and gas prices, and can have large impacts on annual variation in harvests. Therefore, calculation of TPUE reduces the effect of these sources of variation on harvest trends. Assuming equal harvest vulnerability among years, these estimates would better reflect changes in relative bobcat abundance than harvest totals.

In the Current Harvest Area, we will collect bobcat TPUE data using a voluntary questionnaire completed by cooperating bobcat hunters and trappers. We will also collect lower jaws for cementum age analysis by voluntary submission from hunters and trappers.

In the Harvest Expansion Area, we will collect bobcat TPUE data using a mandatory questionnaire that all bobcat hunters and trappers will receive as part of their permit package. All trappers will be required to report the number of traps set and the number of bobcats caught on a seasonal basis within each WMU. Small game hunters will be required to estimate and report the numbers of hours they spent pursuing bobcats. In addition to the trapping questionnaire, we will require that permit holders submit the lower jaw from harvested bobcats for a minimum of a 3-year period. Using estimates of age-at-harvest from cementum analysis, we will evaluate the age structure of the bobcat harvest and compare age distributions with other areas of New York and with adjacent cooperating states (e.g., Pennsylvania, Vermont). These data may be used to model survivorship as described by Roberts (2010). After the 3-year period, we will determine if, and at what sampling intensity, we should continue collecting teeth from harvested animals.

Despite our best efforts, incidental harvests by hunters or trappers pursuing other species may occur. Because the information that could be collected from these instances is valuable, we will issue permits retroactively to address these situations. The trapper or hunter will need to meet all of the requirements noted above including TPUE data and lower jaw submission.

Strategy 2.4: Conduct outreach to increase public understanding and support of bobcat as a sustainable wildlife resource in New York State.

The public comment period for this plan revealed a high level of public interest in bobcat management in New York. Not all accept the fact that trapping or hunting of bobcats is a legitimate use of this resource as established in New York's Environmental Conservation Law. Therefore, and in light of

regulatory changes proposed in this plan, we need to continue to provide information to ensure that the public understands, and user groups comply with, the management strategies described in this plan.

Regulations must be communicated to the regulated public in an effective and efficient manner. Proposed regulatory changes will be disseminated to the public through news releases, targeted mailings and publications, trapper meetings, and use of the Department's web site. Whenever the Department is considering significant regulatory changes, staff will undertake outreach efforts to gauge public acceptance and desires prior to these changes becoming an official proposal. Regulations will be made as simple as possible and they will be clearly described in the regulations guide and on the Department's web site. In addition, the Sportsmen Education program, specifically the Trapper Education program, will address many of the regulations relevant to bobcat management. Effective law enforcement is critical to the success of this plan, so we will maintain a liaison with Division of Law Enforcement (DLE) to ensure that Environmental Conservation Officers (ECOs) are knowledgeable of relevant regulations.

We will provide trappers/hunters with information regarding bobcat management and harvest via the Department website, regulations guide, and Sportsmen Education program. Voluntary use of recommendations presented in "Best Management Practices for Trapping Bobcat in the United States" (AFWA 2011) will be encouraged and this document will be provided to trappers via a link on the Department website (www.dec.ny.gov/outdoor/81564.html).

Beyond regulations, we will strive to enhance the public's knowledge and awareness of bobcat resources and management in New York. A bobcat profile will be maintained on the public web site that provides information on the status, natural history, and management of bobcat in New York. Department personnel will engage the public, when appropriate and feasible, and provide information concerning bobcat populations and management. These events may include fairs, schools, trapper meetings, and other public events as requested as well as informal contacts via phone, e-mail, and in-person office visits.

Finally, we recognize that some negative bobcat-human interactions may occur and need to be addressed. Although negative bobcat-human interactions are uncommon, Department personnel may issue nuisance permits authorizing the removal of problem bobcat(s), if warranted. Between 2007 and 2010, the Department issued only 13 such nuisance permits, mostly in response to bobcats taking poultry. While only a few complaints warrant action by the Department, all of them will be included in the observation database that we maintain for population monitoring purposes. We will develop standard staff responses and guidelines for responding to and resolving negative bobcat-human interactions. These will include a standard form to document reports or incidents of bobcat-human conflicts. Guidelines developed by other states or wildlife damage experts will be used to the extent possible.

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Appendix 1. Legal Matters

Furbearer management occurs within the authority provided by the ECL. The ECL further authorizes DEC to establish rules and regulations for some, but not all, aspects of furbearer management. Despite our outreach efforts, hunters and trappers remain confused by the distinction and mistakenly believe DEC has full control of all aspects of furbearer management. This section outlines several items where amendment of the ECL is desirable to improve DEC's ability to manage bobcat.

1. Pursue revisions to the statutory authority in ECL 11-0905(3) governing the harvest of bobcats that requires concurrent hunting seasons during open trapping seasons. Alternatively, pursue regulation changes restricting method of take for hunting seasons.

ECL 11-0905(3) requires the Department to provide a concurrent hunting season anywhere there is an open trapping season for bobcat. At times, the separation of these two activities is desirable, such as allowing trapping while restricting hunting during an open firearms deer season. Bobcat shot incidental to deer hunting often are harvested with firearms that may not allow for full utilization of bobcat pelts.

The Department does not have the authority to amend laws and must rely on the legislature to do so. However, regulations governing methods of take (caliber or shot size restrictions) may be considered to help promote responsible use of bobcats taken by hunters.

2. Develop methods to increase reporting of road-killed bobcat in areas closed to harvest to enable more timely updates of bobcat status assessments.

We will pursue the development of legal avenues or criteria to allow for the lawful salvage of bobcat in areas closed to bobcat harvest (e.g., road-killed animals) and during periods when seasons are closed. Currently, salvage of bobcat in closed areas and outside of an open season is not legal and the finder often does not report these observations to the Department. We believe that by facilitating a means of legal salvage, the Department can obtain valuable information on bobcats at little cost. Efforts on this front would also have tremendous value in the management of fisher, marten, and otter as the same situations occur for these species.

3. Legalize the use of modern cable restraints.

Finally, in recognition of the many positive attributes of modern cable restraint devices for the live capture of wildlife, the Department will continue to seek legislative authority to allow and regulate their use. Cable restraints are another selective, Best Management Practices (BMP) approved device that would allow trappers to target bobcat and canines while avoiding other species that may have more restrictive trapping seasons like fisher and marten.

Appendix 2. Climate Change

The impacts to bobcat populations in New York due to climate change forces, especially over the five-year span of this management plan, are not conclusive. Current information available suggests that average temperatures will increase, long-term snowfall will decrease, and overall length of winter conditions will decrease (Karl et al 2009). In the short term, storm intensity is predicted to increase which may result in more significant snowfall events in areas to the east of Lake Ontario and Lake Erie where lake-effect precipitation occurs. There are several potential impacts to bobcat populations and management, which are discussed further below.

Parker et al (1983) suggested that bobcat range might be limited by deep snow. It is plausible that deep snow may also limit population densities. With decreases in long-term snowfall, bobcat numbers may increase in some areas of the state and there may be some minor shifts in occupied range. Our mechanisms for collecting bobcat observations noted elsewhere in the plan should be sufficient to monitor changes in range and potentially density.

Rosenzweig et al (2011) noted that predatory species such as bobcat might experience some level of vulnerability due to possible population declines of snow-dependent prey species such as snowshoe hare, voles, and other rodents. This would suggest the potential for bobcat population declines in some areas such as the Adirondacks, Tug Hill, and the Catskills. However, bobcats are a generalist species and we believe a shift in prey is more likely.

Finally, trappers may find it difficult to capture bobcat using foothold traps if the short-term increasing storm intensity prediction is realized and deeper snows result. Trapping in deep snow and winter conditions with foothold traps is challenging and has a low rate of success. To continue to provide reasonable opportunity for trappers to target bobcat, new tools that are easier to use in deep snows such as modern cable restraints, may become necessary.

Appendix 3. Wildlife Health Program

The Department's Wildlife Health Unit has written a comprehensive Wildlife Health Program Strategic Plan (NYSDEC 2011). This will allow the Department to respond effectively to health issues involving free-ranging wildlife, as well as minimizing the negative impacts of wildlife health issues affecting domestic animals and humans. The Department collaborates with the Departments of Health and Agriculture and Markets under the umbrella of the "One Health" concept to address issues affecting people and animals in their environment. The Wildlife Health Program integrates statewide wildlife health activities into a single unified program to address all wildlife health issues including providing diagnostic services, disease response and prevention, and a suite of wildlife veterinary services.

The Wildlife Health Program will assist bobcat management efforts by performing necropsies, identifying the cause of death, disease diagnosis, conducting wildlife health-related investigations, assisting in research design and supporting regional and national bobcat research and/or classroom/laboratory exercises. As needed, sick or abnormal acting bobcats reported to the Department should be submitted for necropsy.