

Utah Bobcat Management Plan V.2



Prepared by:

The Bobcat Working Group

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INTRODUCTION

Kevin Bunnell

The purpose of the Utah Bobcat Management Plan is to direct the management of bobcats (*Lynx rufus*) to assure the future of the species through protection, propagation and management. While considering the species distribution, intrinsic, scientific, educational and recreational value to the citizens of Utah. The UDWR will conduct an internal review of this plan every 10 years.

The Utah Bobcat Management Plan was developed by UDWR with the assistance of a group of Utah citizens representing major stakeholders concerned with bobcat management and conservation. This “Bobcat Working Group” consisted of a representative from the Utah Trappers Association (UTA) (Stan Bassett), a houndsman representative (Ernie Millgate), a representative of non-consumptive views (John Weis), an academic (Dr. Jerran Flinders) and two representatives from UDWR (Kevin Bunnell and Heather Hill). This group operated on the basis of consensus and all members of the group endorsed the Utah Bobcat Management Plan. UDWR wishes to thank the members of the Bobcat Working Group Team for the time and efforts they devoted to the development of this plan.

NATURAL HISTORY

Kevin Bunnell

Distribution

The bobcat is the most widely distributed felid native to North America. It ranges from as far north as central British Columbia and south to Oaxaca, Mexico (Rolley 1987). With the exception of Delaware, the bobcat occurs in all of the lower 48 states, although its distribution is restricted in Illinois, Indiana, Iowa, Michigan, Missouri, and Ohio (Woolf and Hubert 1998). In Utah, bobcats occur in all 29 counties and in most habitat types.

Description

Bobcats can be various shades of buff and brown with dark brown or black stripes and spots. In Utah, bobcats from lower elevations tend to be more spotted than those at higher elevations, leading trappers to refer to higher elevation bobcats as “lynx cats”. Bobcats are distinguished from other felids, except Canada Lynx, by a short tail, tufted ears, relatively small head, and a flared facial ruff or mane. Lynx can be distinguished from bobcats by their large furred feet, long legs, slightly shorter tail, longer ear tufts (>2 in), and relatively spotless and grayer pelage. One of the best ways to distinguish between bobcats and lynx is by their tails. Bobcat tails are banded only on the upper surface with a black spot on the upper surface of the tip. Lynx tails are not banded on either the upper or lower surfaces and have a black tip that completely encircles the tail, as if the tail was dipped in black ink.

Bobcats are sexually dimorphic with males being larger than females. Adult bobcat weights vary throughout their range with adult males and females averaging 21.2 (14.1 – 40.3) lbs and 15.0 (9.0 – 33.7) lbs., respectively (Banfield 1897). In Utah, bobcats trapped on the Sheeprock and Tintic Mountains averaged 26.9 lbs and 14.3 lbs for adult males and females, respectively (Blackwell 1991). Total length of male bobcats averages 86.9 (47.5 – 125.2) cm and adult female length averages 78.6 (61.0 – 109.2) cm (McCord and Cardoza 1982). Bobcat body size appears to follow Bergmann's rule, with size increasing with latitude and elevation (Sikes and Kennedy 1992).

Reproductive Biology

Bobcats are seasonally polyestrous and probably spontaneous ovulators, experiencing up to three estrous cycles between March and June if not impregnated during one of the ovulations (Crowe 1975). However, early researchers assumed bobcats were induced ovulators and there is some evidence to support this contention. Male bobcats possess a barbed penis and engage in repeated coitus, both characteristics of induced ovulators (Merher 1975). Female bobcats can ovulate without stimulation from a male, but coitus may induce or hasten ovulation (Anderson and Lovallo 2003). The majority of bobcat breeding occurs between February and March, however, breeding can occur at any time with litters being reported in every month (Duke 1954; Young 1958; Gashwiler et al. 1961; Fritts 1973; Crowe 1975). The breeding season for bobcats varies with latitude, longitude, altitude, climate, photoperiod, and prey availability (McCord and Cardoza 1982).

Habitat Selection

In general, any habitat that supports abundant prey in terms of leporids and other small mammals, and is suitable for hunting by either ambush or stalking, is suitable for bobcats. This generalization is supported by the broad distribution of the species in the United States, which includes forested bottomlands of the southeast, arid deserts regions of the southwest, boreal forests of Minnesota, tropical regions of Florida and montane habitats in the Rocky Mountains (Anderson and Lovallo 2003). In Utah, bobcat habitat selection has been characterized by 2 separate research efforts (Karpowitz 1981; Blackwell 1991; Appendix I). Karpowitz (1981) characterized bobcat habitat selection in the Wasatch Mountains and found that pinyon-juniper and mountain brush vegetative types were preferred, and also reported that cliffs and rocks were important components of bobcat habitat. The preference for rocky habitats was believed to be important for providing escape terrain for evading coyotes. Blackwell (1991) studied bobcat habitat selection in the Sheeprock and Tintic mountains and determined that pinyon-juniper mixed with sagebrush, closed pinyon-juniper communities and riparian zones were preferred habitats.

Prey Selection

Bobcats are almost exclusively carnivores and most frequently kill prey that weighs between 1.5 and 12 lbs. (Anderson and Lovallo 2003). Throughout most of their range,

rabbits and hares are the most important prey items, sometimes exceeding 90% of their diet (Bailey 1979; Parker and Smith 1983). However, there are regional variations. In the northern portion of the range, snowshoe hare and white-tailed deer predominate bobcat diets (Nussbaum and Maser 1975; Berg 1979; Parker and Smith 1983) while in the southeast, cotton rats constitute the majority of their diet (Knight 1962; Beasom and Moore 1977; Miller and Speake 1979). In western Washington, the mountain beaver makes up the majority of bobcat diets (Knick et al. 1984). In Utah, Blackwell (1991) found that 78.6% of bobcat scats collected in the Sheeprock and Tintic mountains contained the remains of desert cottontails. Other prey items found in the scats included deer mice, great basin pocket mice, wood rats, chipmunks and mule deer.

Behavior and Home Range

Bobcats are essentially solitary with brief, infrequent social interactions. The exceptions to this generalization are females with kittens and adult males and females during breeding season. Three social classes seem to exist in all populations, including residents, transients and kittens. Most adults are considered residents and generally remain in a home range or territory. Transients are generally yearlings dispersing from their natal home ranges (Bailey 1974; Rolley 1983).

Estimates of bobcat home range sizes vary widely among studies and range from 0.4 mi² to 26.9 mi² for females and 1.0 mi² to 53.5 mi² for males. However, there are several consistent generalizations that have been discovered. Home ranges in northern latitudes are considerably larger than those in the south. Male home ranges are generally 2-3 times larger than those of females. Home range size seems to be most strongly correlated to prey abundance (Anderson and Lovallo 2003). In Utah, Karpowitz (1981) reported home range sizes of 6.3 mi² for female and 8.7 mi² for male bobcats in the Wasatch Mountains. Daily movement distances also vary widely by region, sex, weather conditions and individuals (Anderson and Lovallo 2003).

Competitive Interactions

The most significant and influential competitors of bobcats are coyotes. Coyotes often use the same habitats and utilize the same prey as bobcats. Buskirk et al. (2000) hypothesized that coyotes have a significant ecological advantage over bobcats due to their larger size, broader diet, wider habitat niche, higher reproductive rates, wider behavioral plasticity and higher human tolerance. Litvaitis and Harrison (1989) reported that a sharp decline in bobcat harvest in Maine was highly correlated with a dramatic increase in coyote populations. Likewise, a 3-year experiment in western Texas in which coyote populations were artificially reduced led to increases in bobcat and rodent populations, whereas no similar population changes were observed in a control area (Henke and Bryant 1999). In addition to coyotes, cougars have been documented killing bobcats. For example, Blackwell (1991) found an instance where a cougar killed and mostly consumed a radio-collared bobcat, and a female with kittens reduced her activity to portions of her home range with rocks and crevices in seeming response to the presence of a resident cougar, which also had kittens.

History

Prior to the 1970s, bobcats were classified as predators (non-protected wildlife) and therefore not under the jurisdiction of the Utah Division of Wildlife Resources (UDWR). Bounties were offered on bobcats in Utah from the late 1800s to 1975, with the greatest number of bounties, 4,396, occurring in 1969 and again in 1970 (Stiver 1982). Historically, bobcats had little economic importance, with an average pelt price of only \$5.00 between 1950 and 1970 (Anderson 1987). During the 1970s, bobcat harvest and average pelt price increased dramatically in the United States. With this increased demand, the bobcat trade came under heavy fire during the 1970s and early 1980s. In 1973, UDWR began attempts to gain management authority over bobcats, and met strong opposition by agricultural and livestock interests hoping to reduce loss caused by predators. UDWR and sportsmen successfully achieved a moratorium on bobcat trapping in Utah in 1976.

CITES

The 1977 listing of bobcats as an Appendix II species under the Convention on International Trade in Endangered Species (CITES) required that the exportation of bobcat pelts not cause detriment to the survival of the species. Bobcats became a protected wildlife species in Utah in 1979, and active management of harvest was implemented at this time. As a result of a suit brought by Defenders of Wildlife, a court order was issued in 1981 that required the collection of reliable population estimates and accurate harvest data prior to the lifting of a temporary export ban. The case was dismissed in 1982 and in 1983, CITES permitted the U.S. to redefine bobcats in Appendix II, under "similarity of appearance" to enable effective regulation of other listed cats. Due to the political uproar during this time, management and research efforts were greatly increased in an attempt to collect more information on the biology and ecology of bobcats in the United States.

License Requirements

New regulations were also implemented in 1979 when bobcats received protection in Utah. Any person intending to harvest bobcat were required to obtain possession tags from UDWR and check-in each pelt to have a permanent CITES tags affixed, as well as surrender the lower jaw. A bobcat season was also implemented, restricting the take of bobcats to a fixed-length season. In 1982, UDWR added bobcat to its annual fur harvest questionnaire. This questionnaire included questions about bobcat harvest and trapping effort by county, as well as questions to collect fur harvester suggestions on management decisions.

Harvest History

During the last several decades, bobcat harvest has been primarily open statewide. The bobcat season length fluctuated between 6 and 12 weeks, and permit limits were between 3 and 10 permits per person. Harvest also fluctuated during this time, from a mere 527 bobcats during the 1990-91 season, to a high of 3,377 bobcats during the 2006-07 season (Table 1). Years of low harvest were partly attributed to a decrease in the rabbit population and decreased pelt prices (Bates 1987; McDonald 1990).

Population Monitoring

Each year, biologists and managers use population trend indicators to determine the status of the bobcat population in Utah. Most of these indicators, such as set-days per bobcat, bobcats per trapper, ratio of juveniles to adult females, abundance, and suggested permits, are obtained from the annual fur harvest questionnaire and a mandatory reporting of harvest to have permanent CITES tags affixed to pelts. In 1985, UDWR began to age teeth from the lower jaws of harvested bobcat. This information provided additional population trend indicators, such as adult survival and age structure of the harvest (Table 2).

UDWR initiated two studies during the mid-1980s in an effort to gain a better understanding of bobcat populations in Utah. One was a 1986-93 study to determine the relationship between prey base levels and bobcat juvenile recruitment (Bates 1987), and another was a 1988-89 study examining habitat selection, prey base, home range and reproduction of bobcats in western central Utah (Blackwell 1991; Appendix I). Other important research on bobcats in Utah included a 1978-1981 study examining home ranges and movements of bobcats with radio telemetry and habitat selection and the relationship of bobcats to their prey base (Karpowitz 1981; Appendix I).

Table 1. Bobcat harvest in Utah, 1979–80 to 2015–16.

Trap year	Hunters afield	Total harvest	Bobcat / person	Incidental harvest*	Set-days / bobcat	Bobcats / trapper	Pelt price
1979–80	1360	1593	1.2	—	—	—	—
1980–81	1017	1646	1.6	—	—	—	—
1981–82	1051	2535	2.4	—	—	—	\$155.14
1982–83	1145	2540	2.2	—	185	2.2	\$171.00
1983–84	1050	2640	2.5	—	152	2.5	\$189.00
1984–85	1253	2532	2.0	—	221	2.0	\$202.00
1985–86	1083	1530	1.4	—	269	1.4	\$197.00
1986–87	1036	1024	1.0	—	220	1.0	\$309.00
1987–88	1108	1023	0.9	—	247	0.9	\$245.00
1988–89	941	1042	1.1	—	169	1.1	\$221.00
1989–90	1167	843	0.7	—	169	0.7	\$102.00
1990–91	542	527	1.0	—	145	1.0	\$87.00
1991–92	726	968	1.3	—	122	1.3	\$104.00
1992–93	827	1171	1.4	—	120	1.4	\$90.00
1993–94	900	1256	1.4	—	152	1.4	\$118.60
1994–95	914	1293	1.4	—	163	1.4	\$70.02
1995–96	749	896	1.2	—	121	1.2	\$79.51
1996–97	615	866	1.4	—	160	1.4	\$147.80
1997–98	619	1234	2.0	—	207	2.0	\$60.89
1998–99	1031	2092	2.0	—	303	2.0	\$55.86
1999–00	828	1430	1.7	—	167	1.7	\$82.64
2000–01	852	2008	2.4	—	199	2.4	\$93.56
2001–02	666	1866	2.8	—	184	2.8	\$147.66
2002–03	984	2176	2.2	—	273	2.2	\$270.33
2003–04	1133	2027	1.8	—	346	1.8	\$203.17
2004–05	1300	1954	1.5	—	236	1.5	\$221.65
2005–06	1523	2926	1.9	0	289	2.7	\$358.56
2006–07	1379	3377	2.4	—	289	3.0	\$197.53
2007–08	1479	2437	1.6	376	400	2.1	\$388.43
2008–09	1928	2062	1.1	295	701	1.1	\$238.69
2009–10	1088	1167	1.1	24	481	1.4	\$223.71
2010–11	1056	1002	0.9	121	492	1.1	\$368.95
2011–12	1011	1245	1.2	43	400	1.4	\$456.16
2012–13	979	1365	1.4	50	392	1.5	\$560.96
2013–14	1091	1870	1.7	117	333	1.8	\$407.44
2014–15	1320	2919	2.2	78	373	2.5	\$223.11
2015–16	1215	1683	1.4	141	479	1.6	\$151.63
Average	1045	1676	1.6	123	269	1.7	\$207.17

*Projected afield from 1979–80 to 1981–82 is actually total number of permits sold, and bobcat/person is actually bobcat/permit.

Table 2. Bobcat population trend indicators in Utah, 1985–86 to 2015–16.

Trap year	Juveniles / adult	Juv. males / juv. females	Proportion juveniles in harvest	Proportion females in harvest	Males / females	Adult survival		Juvenile* survival	
						S	95% C.I.	S	95% C.I.
1985–86	—	—	—	—	1.2	63	60–65	42	40–45
1986–87	—	—	—	—	1.1	63	60–65	35	32–39
1987–88	—	—	—	—	1.1	65	61–68	35	32–38
1988–89	—	—	—	—	1.3	64	60–68	38	35–40
1989–90	—	—	—	—	1.4	67	63–71	41	38–44
1990–91	—	—	—	—	1.2	58	53–62	36	31–41
1991–92	—	—	—	—	1.5	58	55–60	32	29–36
1992–93	—	—	—	—	1.4	59	56–63	29	25–33
1993–94	—	—	—	—	1.3	54	52–57	40	36–43
1994–95	0.6	1.1	0.36	0.44	1.3	57	54–59	34	30–37
1995–96	0.5	1.0	0.35	0.44	1.3	64	61–66	30	25–34
1996–97	0.7	1.1	0.41	0.41	1.4	68	65–70	34	30–38
1997–98	0.4	0.9	0.30	0.42	1.4	71	69–74	34	28–40
1998–99	—	—	—	—	1.3	71	70–73	29	26–33
1999–00	1.0	1.4	0.50	0.39	1.6	66	64–68	35	33–38
2000–01	0.9	1.3	0.47	0.39	1.6	64	62–66	36	33–39
2001–02	0.6	1.2	0.38	0.39	1.4	65	63–67	39	36–42
2002–03	0.4	1.0	0.28	0.41	1.2	67	65–68	39	35–42
2003–04	0.5	1.0	0.31	0.47	1.1	71	70–72	22	19–25
2004–05	1.2	1.1	0.55	0.44	1.3	74	73–76	36	33–38
2005–06	2.5	1.4	0.72	0.43	1.4	68	65–70	16	14–18
2006–07	1.5	1.4	0.60	0.43	1.3	53	48–58	35	30–39
2007–08	1.4	1.1	0.56	0.43	1.3	58	54–62	39	35–43
2008–09	0.7	1.0	0.42	0.45	1.2	57	54–61	43	39–48
2009–10	0.6	1.2	0.38	0.47	1.1	59	56–62	34	29–39
2010–11	0.5	1.2	0.31	0.43	1.4	69	66–71	31	26–37
2011–12	0.5	1.2	0.35	0.45	1.2	70	66–73	29	22–36
2012–13	0.5	0.9	0.35	0.48	1.1	75	72–78	34	26–41
2013–14	0.8	0.9	0.46	0.45	1.2	70	66–74	33	27–39
2014–15	1.5	1.2	0.60	0.45	1.2	74	71–77	33	29–37
2015–16	1.6	1.4	0.62	0.44	1.3	73	70–76	39	35–42
Average	0.9	1.1	0.44	0.44	1.3	65	—	34	—

*Prior to 2005–06, the "juvenile" age category referred only to kittens (age 0.5) while "adults" included all bobcats age 1.5 and older. Beginning with 2005–06 the term "juvenile" now refers to kittens and yearlings (ages 0.5-1.5), while "adults" include all bobcats age 2.5 and older.

BOBCAT TRAPPING

Stan Bassett

Most bobcats harvested in Utah are harvested by trapping. There are a multitude of reasons why an individual traps bobcats. There are also a multitude of techniques used to trap bobcats. Harvesting a bobcat by trapping offers an individual a unique and rewarding experience by allowing the trapper to match wits with the bobcat while experiencing the bobcat's demanding environment.

Reasons for Trapping

The vast majority of bobcats that are harvested are harvested for the sale of their pelts. Many trappers harvest bobcats to help supplement their income. Bobcat pelts are sold to fur buyers and the fur buyers sell the bobcat pelts to manufacturers, who process the pelts into coats and fur garments. The price of bobcat pelts is determined by fashion trends. When fashion trends encourage the use of bobcat pelts then the price of bobcat pelts increase. When bobcat pelts are not the focus of the fashion designers then the price of bobcat pelts decreases. Trappers who harvest bobcats for income usually experience a roller-coaster ride for their pelts. They may receive low prices for their pelts and then as soon as the fashion market warrants the need for bobcat pelts then the price will begin to increase.

Many trappers trap bobcats just for the enjoyment of getting to experience the beauty of nature. Trophies or supplemental income are secondary to the general overall experience of being able to be in the bobcats' habitat with a chance to match wits with this elusive feline. Finding a travel route that the bobcat routinely uses, or finding bobcat tracks in the snow is reason enough for many trappers to pursue bobcats.

Trapping bobcats can be hard work. It usually requires hiking through snow or up steep mountains. The recreational possibilities for trapping bobcats are vast. Trappers can snowshoe, use ATV's, snowmobiles, boats and skis to get into bobcat habitat. Bobcat trappers can and do use many different recreational avenues while trapping bobcats.

Methods of Trapping

Trappers use several different types of traps to trap bobcats. The most common type of trap that is used for bobcats is the foothold trap. When the bobcat steps in the trap, jaws close on the bobcat's foot and hold the bobcat until the trapper arrives. This restraining type trap allows for the release of the bobcat if the trapper does not want to harvest a particular bobcat. Trappers must use traps with an offset jaw (a gap between the jaws), and they must check their traps every 48 hours. This will help to ensure that the bobcat will not have to endure any unneeded discomfort.

Lethal traps are traps that will dispatch the bobcat as soon as it is captured. Snares that are set to catch the bobcat around the neck typically dispatch the bobcat with little discomfort to the bobcat. Conibears are another type of lethal trap that is used for

bobcats. When the bobcat puts its head in the jaws of a conibear, the jaws close on the bobcat's neck, and death occurs in seconds. The major disadvantage of using lethal traps is that the trapper cannot be selective in harvesting and releasing unwanted bobcats.

Some bobcat trapping is done with box or live traps. These are wire cages with a door that closes when the bobcat steps inside. They are designed to catch bobcats so they will be alive and unharmed. Box traps are used in urban areas where catching pets may be a problem. They are also used when bobcats need to be trapped for research or for relocation to another area.

Trapping bobcats is a sport that offers many unique opportunities for those that participate. Bobcat trapping is typically taught and passed down from generation to generation. Fathers and sons or daughters tend to be trapping partners as soon as many children are old enough to walk. It is not uncommon to see grandparents, parents and grandchildren all on the same trap line together. Children are taught at an early age to understand the balance of nature and they soon learn to respect the environment as well as the animals that they pursue. Young trappers are taught the trapping techniques that have taken their parents a lifetime to learn. As a result, these young trappers learn the most efficient, as well as humane, techniques for harvesting bobcats.

There is far more to bobcat trapping than merely harvesting a bobcat. Bobcat trappers learn to use the best possible equipment for bobcat trapping to minimize any discomfort that the bobcat will have to endure. But most importantly, they learn to truly respect the bobcat and the bobcat's environment. With parents teaching young trappers the proper trapping ethics, and with mandatory fur harvester education classes being taught in the state, bobcat trapping should continue to be a rewarding experience for those individuals that choose to trap bobcats.

BOBCAT HARVEST WITH HOUNDS

Ernie Millgate

The history of hunting with hounds can be traced back to our forefathers. As we know, George Washington had a pack of hounds imported from the old country in order to carry on the sport here in this country. But soon the poorer class families found that hounds could contribute in securing food for their families.

As people came west to settle and raise livestock, the need for hounds was realized again as a tool for taking predatory animals such as bear, lion, bobcat, and coyotes. It seemed that, in the early days, almost every ranch house had its own pack of hound dogs. Neighboring ranches would help each other with not only working cattle, but would also get together with their hounds for big hunts.

Today, a lot of houndsmen just want to carry on the tradition of the early settlers of the west. Though many of us are not full-time cowboys or full-time hunters, it is a romantic part of the western life we don't want to see end.

In the eyes of many houndsmen, bobcats are trophy class animals because it takes a well-trained pack of dogs to catch them consistently. More times than not, after turning dogs loose on a bobcat track, a houndsman is just happy at the end of the day to get ALL the dogs back and loaded in the truck without even putting a cat up the tree. Bobcats use every trick in the book when pursued by dogs: climbing ledges, jumping from tree to tree, and lots of circles back over their own tracks to elude their pursuers. In different parts of the country, hunters use this trick to their advantage. They lay in wait to shoot the bobcat ahead of the dogs as they come around on one of their famous circles.

The majority of houndsmen in Utah do this for the thrill of the chase, to see and know that their dogs can actually put a bobcat up a tree. That is why we as hunters can be selective in our own harvest by taking home only mature cats or leave them in the tree to run another day.

In order to get dogs to the point where they are considered "good bobcat dogs", you must spend more time working with them than most dog owners can relate to. It is an ongoing, year-round program, training dogs on scent and raccoons. You can't let a week slip by without working your dogs, which in turn makes serious houndsmen very passionate about their sport. As for the physical demands that are put on a person, you not only have to hike into prime bobcat areas, but also must keep within hearing distance of the dogs so you don't lose any. The elements can have you past your limits in waist deep snow on a sixty degree plus slope in temperatures that, some days, can be well below zero degrees. But there is nothing better to a houndsman on a below zero morning than listening to hound music echo across the canyon, and to hear the long drawn out bawl of a hound change to an excited, choppy bark and know you have just treed your first bobcat.

VALUE OF BOBCATS TO NON-CONSUMPTIVE USERS

John Weis

Bobcats are an indigenous predator that few Utah residents have observed in the wild. Bobcats are solitary hunters, leery of human contact and well camouflaged within their habitat. These cats, like the lynx, occupy a physical and emotional niche that many non-consumptive users find intriguing. Bobcats, unlike the mountain lion, are not a feline predator to be feared, and contact with them in the wild would be an unexpected pleasure. Developing management plans to increase the numbers of bobcats that would, in turn, increase the probability of chance meetings should be encouraged as long as the additional bobcats would not negatively impact other native species. Bobcats should not be targeted for harvest under any predator control initiatives.

Bobcat Viewing Opportunities

Most Utah residents would prefer see a bobcat in the wild, rather than in their backyard stalking quail or domestic pets. Non-harvest areas represent the best viewing

opportunities, including National Parks and State parks such as Antelope Island. The Utah Division of Wildlife Resources should survey state and federal lands, and identify regions in which bobcat viewing could be productive. The identity of such areas should be publicized as long as the area is protected from bobcat harvest. While habitat restoration and protection is critical for the maintenance and expansion of many species, the same is not likely to be as true for bobcats due to their prey base and opportunistic feeding habits.

Attitudes of Non-consumptive Users Toward Harvest

The attitudes of non-hunters towards the killing of bobcats ranges from acceptance of harvest objectives to rejection that any harvest should be permitted. A common ethic of many non-hunters, especially concerning a species such as a bobcat, is that they should be left alone, not hunted, and appreciated for their wildness. Bobcats rightfully occupy many of their traditional habitats in the state of Utah (unlike some other predator species) and their presence there must be protected. Encroachment of urban areas in foothill and mountainous areas guarantees that conflicts between the bobcat and households will increase, especially if accessibility of food is linked to the human dwellings. Such problems should be anticipated and homeowners educated to prevent unwanted interactions.

The two major methods of hunting bobcats in the state of Utah, hounds and trapping, are objectionable to many non-consumptives. Using hounds to track and tree a bobcat is seen by some as providing an unfair advantage to the hunter, eliminating a reasonable chance of escape for the bobcat. Trapping and snaring of bobcats is perhaps more objectionable than the use of hounds because the opportunity of release of the bobcat is limited - leg trapped animals can be held for a time before the trap is checked, and snaring is designed to suffocate the animal. Although trained trappers can design the positioning of their traps/snares to catch adult animals, those trappers with less experience can catch immature bobcats or other animals, including endangered lynx, should they return to Utah.

It is difficult to reconcile the wants and desires of the bobcat hunters and trappers with those of non-consumptive appreciators of wildlife who do not agree with any level of harvest. Finding common ground for compromise could include requiring greater hunter/trapper education to prevent inadvertent killing of immature animals and animals of different species. Regulations on trap maintenance and supervision must be enforced. Setting aside regions, other than national or state parks, for bobcat protection and viewing opportunities should be explored, as should re-introduction of the animal into areas in which the feline has been eliminated by hunting and trapping.

GOAL, OBJECTIVES AND STRATEGIES

Goal

Maintain a healthy bobcat population within existing suitable habitat and provide quality recreational opportunities for bobcat harvest while considering the social aspects of bobcat harvest.

Population Objective

- 1) Maintain current statewide distribution of bobcats with a reasonable proportion of older age animals.

- a. Performance Targets

Variable	Mean	95% Confidence Interval
Proportion of kittens and yearlings in the harvest	0.49	0.42 - 0.56
Adult survival	0.68	0.65 - 0.72
% females in the harvest	0.43	0.41 - 0.45

- b. Strategies

- i. Maintain baseline management strategy if ≥ 2 variables are within or outside the historical range (95% CI) in a positive direction for population growth.

1. Baseline strategy :

- a. 6 permits per individual
 - b. Season from third Wednesday in November to March 1.
 - c. No cap on the number of permits sold

- ii. Decrease the number of bobcat permits available to individuals (1-2 permits) if ≥ 2 of the performance targets are outside the historical range (95% CI) in a negative direction for population growth.*

*Keep the # of permits available to individuals consistent with the previous year if performance targets are moving back toward the historical range in a positive direction for population growth from the previous year.

- iii. Decrease the length of the bobcat harvest season on the front end of the season (1–2 weeks) if ≥ 2 of the performance targets are outside the historical range (95% CI) in a negative direction for population growth.*

*Keep the season length consistent with the previous year if performance targets are moving back toward the historical range in a positive direction for population growth from the previous year.

- iv. If all 3 performance targets are outside the historical range (95% CI) in a negative direction for population growth the number of permits may be capped at 80% of the number of permits sold the previous year. These permits would be sold on a first-come, first-served basis. Implemented in addition to Strategies ii and iii.
- v. After a cap has been implemented, the season length and number of permits available per individual may be increased by 1-2 (weeks, permits, respectively) per year back toward baseline, if performance targets are moving back toward historical ranges in a positive direction for population growth.

Outreach and Education

Objective 1:

Increase awareness and appreciation of the general public for the role of bobcats in Utah's ecosystems.

Strategies:

1. Determine the public's knowledge and attitudes towards the role of bobcats in Utah's ecosystems.
2. Develop educational programs on the role of predator/prey interactions in our ecosystems.
3. Provide educational opportunities on the role and use of trapping and hounds in bobcat management.

Objective 2:

Maintain quality hunting and trapping opportunities for bobcat.

Strategies:

1. Promote ethical and legal hunting and trapping practices through the Furharvester Education Program.
2. Develop incentives to help attract new Furharvester Education teachers.
3. Promote and develop incentive programs that encourage the reporting of violations.

4. Advertise monetary reward program available through UTA newsletter and the Division Furbearer Guidebook.
5. UTA and the UHA will appoint a contact person for reporting violations.
6. UDWR will develop additional incentive programs with input from UTA and UHA.
7. Advertise and promote trapping “Best Management Practices” for trapping developed by the Association of Fish and Wildlife Agencies
8. Hold an annual coordination meeting that will include UDWR wildlife and law enforcement sections with the Utah Trappers and Utah Houndsmen Associations to discuss issues and solutions.
9. Trappers should use the smallest trap sizes they can in order to minimize damage to hounds when trapping for bobcats in areas that might also be used by houndsmen.
10. Trappers should avoid using lethal sets when trapping in areas frequented by houndsmen.
11. Houndsmen should avoid conflicts with trappers by avoiding running their dogs in areas that are known to be frequented by trappers.
12. When hounds are caught in traps, they should be released in a way that leaves traps undamaged and trap sites undisturbed.

Objective 3:

Reduce conflicts between those involved in bobcat harvest (trappers and houndsmen) and other recreationists.

Strategies:

1. Promote the setting of traps and snares away from popular hiking and recreation sites and that they should not parallel established hiking trails.
2. Encourage houndsmen and trappers to avoid trapping or pursuing bobcats in highly urbanized or populated areas and popular recreation areas to avoid conflicts or capture of domestic pets.
3. Trappers should avoid using lethal sets when trapping in areas where it is likely they may catch a domestic pet.
4. Recreationists have an obligation to respect the private property of trappers and houndsmen. The traps, snares, and dogs used in lawful pursuit of game are the property of trappers and houndsmen and should not be abused. If traps or captured animals are encountered they should be left undisturbed.
5. Trappers and houndsmen should avoid displaying dead animals in ways that others may find offensive.

Research:

Objective: Increase base understanding and knowledge regarding bobcat populations in the state of Utah. Potential research topics include:

- a. Population estimation
- b. Survival
- c. Population connectivity
- d. Identification of sources and sinks

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APPENDIX I – ABSTRACTS FROM THESE

(Blackwell 1991) **Abstract:** Prey base, habitat selection, and home range use by bobcats were studied for two and one-half years on the Sheeprock and Tintic mountains of Utah. Most of the study area was closed to commercial trapping for bobcats during the period of research. Fourteen bobcats were radio instrumented, including 3 kittens. An assessment of fecal pellet numbers determined that each bobcat location was associated with 20.8 leporids per ha for females and 9.6 for males in 1988, and 28.3 per ha for females in 1989. Diets were dominated by desert cottontails with an average of 78.6% occurrence in scats (n=40) that were analyzed. Other diet items were field mice, Great Basin pocket mice, wood rats, chipmunks, and mule deer. Single needle pinion and/or Utah juniper mixed with sagebrush and closed pinion-juniper communities were preferred habitats. Riparian zones were also important habitat. Mean home range size of adult males was found to be significantly larger than that of adult females.

(Karpowitz 1981) **Abstract:** Home ranges and movements of bobcats (*Lynx rufus*) were studied for 3 years in the Wasatch Mountains of Utah. Thirteen bobcats were radio instrumented including 5 kittens. Home ranges of resident males ($x = 22.5 \text{ km}^2$) were larger than those of resident females ($x = 16.4 \text{ km}^2$). A minimum density of 1 resident per 16.1 km^2 was estimated. Boundaries of home ranges were prescribed by social interactions and by physical features of the study area. Seasonal uses of home ranges were defined by elevation and directional aspect of slope. Pinyon-juniper and mountain brush vegetative types were determined to be preferred habitats. Rocky habitats were also selected as high use areas. Dispersal was observed for 1 kitten but not for 2 other kittens that remained in the study area for more than 1 year. Relative densities of bobcats increased in the study area despite decreases in 2 main prey categories.