



MIDWEST FURBEARER GROUP ANNUAL REPORT MAY 2010



MEETING TIME AND PLACE

The South Dakota Department of Game, Fish, and Parks, Division of Wildlife, hosted the Midwest Furbearer Resources Workshop on April 26- 29, 2010. Presentations and discussions took place at the Hampton Inn in Deadwood, South Dakota. A field trip was held in Custer State Park.

ATTENDANCE

Forty-eight participants attended the workshop in 2010, including state furbearer biologists from 10 Midwest member states (Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin) and attendees from many other organizations/agencies including the Oklahoma Dept. of Wildlife Conservation, New York State Division of Fish, Wildlife & Marine Resources, Three Affiliated Tribes Game and Fish, Badlands National Park, US Forest Service, USDA APHIS Wildlife Services, Fur Takers of America, South Dakota Trappers Association, South Dakota State University, University of Nebraska-Lincoln, South Dakota Dept. of Health, US Fish and Wildlife Service, and the Association of Fish and Wildlife Agencies. A complete list of attendees and contact information for state furbearer biologists is available in Appendices 1 and 2.

EXECUTIVE SUMMARY

Attendees at the 2010 Midwest Furbearer Resources Workshop were welcomed by Tony Leif, Director of the Wildlife Division, South Dakota Department of Game, Fish and Parks (SDGFP). Numerous speakers presented timely information on issues related to furbearer research and management (Appendices 3 and 4). Profession presentations were given on the following topics:

- swift fox restoration at Badlands National Park
- habitat selection by female swift fox

- home range and movement of exploited versus unexploited coyotes in the Badlands ecosystem
- black-footed ferret recovery progress and challenges
- summary of plague control in Conata Basin/Badlands black-footed ferret reintroduction area
- zoonotic diseases
- management of beaver on Tierra del Fuego
- microhabitat selection and home range size of bobcats in the southern Black Hills
- bobcat population monitoring and harvest management in Wisconsin
- evaluation of two cable neck-restraints with stops to capture coyotes
- improvements and modifications to beaver trapping equipment
- new species-specific designs of lethal traps for raccoon harvest
- future trappers of Wisconsin
- a short history of the European-based effort to disrupt the North American fur trade and what the US did about it and how BMPs for animal traps got its start
- an overview and update for Best Management Practices for trapping the US
- assessing American marten reintroduction in the Black Hills
- abundance of American martens and fishers in Michigan using statistical population reconstruction
- the role of human dimensions in mountain lion management in South Dakota
- history of mountain lion research in the Black Hills
- overview of lion management in South Dakota
- combining high-tech and low-tech in furbearer research
- planning for river otter in South Dakota

The group participated in numerous discussions throughout the course of the meeting. There were also 2 open discussion periods on the agenda, facilitated by SDGFP staff. One session included a discussion on trap tagging requirements and issues, and another session included discussion on river otter management and issues in member states. Everyone agreed that these discussions were extremely informative and beneficial. In addition, nearly all conference participants attended the Black Hills field trip which was held in Custer State Park. Jack Alexander, SDGFP, demonstrated techniques used to capture mountain lions for research and management.

Forums such as the Midwest Furbearer Resources Workshop provide valuable opportunities for state furbearer biologists to become acquainted with emerging issues and exchange information and ideas related to furbearer research and management. The need for state fish and wildlife agencies to establish and maintain furbearer biologist positions and support travel of furbearer biologists to the annual Midwest Furbearer Resources Workshop is imperative for exchanging information to promote quality furbearer management and research in each state. It is more important than ever that state agencies are in the forefront of issues related to furbearer management and trapping in order to protect the heritage and recreational opportunities of hunting and trapping for future sportsmen and sportswomen.

DIRECTOR ACTION ITEMS

1. The Midwest Furbearer Working Group asks that the Association of Fish and Wildlife Agencies (AFWA) adopt the position statement in Appendix 5 pertaining to hound dog training (coursing) pens and associated commercialization, translocation, and use of wildlife within fenced enclosures.
2. At the request of MAFWA, the Midwest Furbearer Working Group has drafted a resolution in Appendix 6 on the Management of gray wolves.
3. The Midwest Furbearer Working Group requests continued strong support and funding for Best Management Practices (BMPs) for trapping. The Furbearer Working Group would like to emphasize the need to maintain commitment to BMPs by AFWA and Directors. BMPs have been used by several states to defend trapping through science and even allow new types of traps which were previously prohibited.

DIRECTOR INFORMATION ITEMS

1. The Association of Fish and Wildlife Agencies represented the interests of state fish and wildlife agencies by participating in the recent CITES "Conference of the Parties" held in Doha, Qatar earlier this spring, as an official member of the U.S. delegation. One of the key U.S. positions was that bobcat should be de-listed from CITES Appendix II and placed on Appendix III. This would have greatly relieved the regulatory burden imposed on the states. While the U.S. garnered strong support for this change, it was not enough to prevail since a 2/3rds majority is required for a change in species listing. Therefore, for the time-being, bobcat will continue to be listed on Appendix II and regulated accordingly by the U.S. Fish and Wildlife Service.

However, since the CITES Treaty does not require the use of pelt seals for river otter or bobcat, the long-standing position of AFWA is that the use of pelt seals should be phased out. Immediately following the vote in Qatar, AFWA sent a strongly written letter to the Department of the Interior requesting that they implement the joint recommendation stemming from the work of an AFWA/USFWS work group to eliminate the tagging requirement for these two species. While AFWA has not yet received a response to that letter, plans are now underway to meet face-to-face with officials from the Department of the Interior to resolve this issue in the most expeditious manner feasible. That meeting is likely to occur in early summer 2010. A change in the use of pelt seals would not occur until 2012 at the earliest.

2. The Midwest Furbearer Working Group requests commitment by state Directors to support and encourage travel of state furbearer biologists to the annual Midwest Furbearer Resources Workshop.

TIME AND PLACE OF NEXT MEETING

The Wisconsin Department of Natural Resources will host the 2011 Midwest Furbearer Resources Workshop. A complete list of past host states is available in Appendix 7.

Respectfully submitted by Andy Lindbloom, Regional Wildlife Manager, SDGFP, on behalf of the MAFWA Furbearer Working Group.

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Appendix 1. 2010 Midwest Furbearer Resources Workshop Attendees.

First Name	Last Name	Agency/Affiliation
Jack	Alexander	SD Game Fish & Parks
Erik	Bartholomew	OK Dept. of Wildlife Conservation
Gordon	Batcheller	NYS Div. Fish, Wildlife & Marine Resources
Randy	Becker	SD Game Fish & Parks
Jeff	Beringer	MO Dept. of Conservation
Jessica	Blunck	Three Affiliated Tribes Game & Fish
Adam	Bump	MI Dept. of Natural Resources & Env.
Joshua	Delger	Badlands National Park
Eileen	Dowd Stukel	SD Game Fish & Parks
John	Erb	MN DNR
Dwayne	Etter	MI Dept. of Natural Resources & Env.
Antoine	Fettig	Three Affiliated Tribes Game & Fish
Keith	Fisk	SD Game Fish & Parks
Larry	Gigliotti	SD Game Fish & Parks
Randall	Griebel	USFS, Wall Ranger Dist.
Tyler	Haase	USDA-APHIS-Wildlife Svs.
John	Hart	USDA, Wildlife Services
David	Hastings	Fur Takers of America
Anna	Hermanson	SD Trappers Association
Tim	Hiller	Univ. of Nebraska-Lincoln
Scott	Huber	SD Game Fish & Parks
Jon	Jenks	South Dakota State University
Gary	Jepson	Fur Takers of America
John	Kanta	SD Game Fish & Parks
Silka	Kempema	SD Game Fish & Parks
Lon	Kightlinger	SD Department of Health
Joe	Kramer	KS Dept. of Wildlife & Parks
Scott	Larson	United States Fish and Wildlife Service
Tony	Leif	SD Game Fish & Parks
Andy	Lindbloom	SD Game Fish & Parks
Scott	Lindgren	SD Game Fish & Parks
David	MacFarland	WI Dept. of Natural Resources
Cory	Mosby	South Dakota State University
Gary	Nohrenberg	USDA, Wildlife Services
John	Olson	WI Dept. of Natural Resources
Laura	Patton	KY Dept. Fish & Wildlife Resources
John	Paulson	USDA-APHIS-Wildlife Svs.
Matt	Peek	KS Dept. of Wildlife & Parks
Suzie	Prange	Ohio Div. of Wildlife
Indrani	Sasmal	South Dakota State University
Ron	Schauer	SD Game Fish & Parks
Greg	Schroeder	Badlands National Park
Josh	Smith	South Dakota State University

Appendix 1 continued.

First Name	Last Name	Agency/Affiliation
Chad	Switzer	SD Game Fish & Parks
Rick	Tischaefer	USDA-Wildlife Services
Stephanie	Tucker	ND Game and Fish
Bryant	White	Assoc. Fish & Wildlife
Sam	Wilson	NE Game & Parks Commission

Appendix 2. Midwest Furbearer Biologists - Contact Information.

Colorado

Contact Info Needed

Illinois

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Appendix 3. 2010 Midwest Furbearer Resources Workshop – Agenda.



MONDAY – 26 APRIL

6:00 – 9 p.m. Registration and evening social

TUESDAY – 27 APRIL

7:00 – 8:00 Registration

Session 1 – Contributed Papers (Andy Lindbloom – moderator)

8:00 – 8:05 Opening remarks/logistics

8:05 – 8:20 **Tony Leif**, Wildlife Division Director - Welcome and Introduction

8:20 – 8:45 **Greg Schroeder** – The swiftest fox returns: swift fox restoration at Badlands National Park.

8:45 - 9:10 **Indrani Sasmal** – Habitat selection by female swift fox (*Vulpes velox*) during the pup-rearing season.

9:10 - 9:35 **Greg Schroeder** – Home range and movement of exploited versus unexploited coyotes in the Badlands ecosystem of South Dakota.

9:35 – 10:00 **Keith Fisk/Ron Schauer** – Trap tagging discussion

10:00 – 10:15 *Break*

10:15 – 10:40	Scott Larson – Black-footed ferret recovery progress and continued challenges.
10:40 – 11:05	Randy Griebel – Summary of plague control activities in the Conata Basin/Badlands black-footed ferret reintroduction area.
11:05 – 11:30	Lon Kightlinger – Zoonotic diseases: wildlife infections that make humans sick.
11:30 – 11:55	John Paulson – Management of beaver (<i>Castor canadensis</i>) on Tierra del Fuego: past, present, future??
11:55 – 12:00	Closing comments/logistics – Moderator
12:00 – 1:00	<i>Lunch – on your own</i>

Session 2 – Contributed Papers (Ron Schauer - moderator)

1:00 – 1:25	Cory Mosby – Microhabitat selection and home range size of bobcats in the southern Black Hills of South Dakota.
1:25 – 1:50	Dave MacFarland – Bobcat population monitoring and harvest management in Wisconsin.
1:50 – 2:15	Dwayne Etter – Evaluation of two cable neck-restraints with stops to capture coyotes.
2:15 – 2:40	Tyler Haase – Gear, gadgets, and garb: improvements and modifications to beaver trapping equipment.
2:40 – 3:05	Tim Hiller – New species-specific designs of lethal traps for raccoon harvest: a pilot study.
3:05 – 3:25	<i>Break and Silent Auction</i>
3:25 – 3:50	John Olson – Future trappers of Wisconsin.
3:50 – 4:30	Gordon Batcheller – A short history of the European-based effort to disrupt the North American fur trade, what the United States did about it, and how BMPs for animal traps got its start.

4:30 – 5:00 **Bryant White** – Best Management Practices for trapping in the United States: an overview and update.

Dinner – on your own

WEDNESDAY – 28 APRIL

Session – Contributed papers (Scott Lindgren - moderator)

8:00 – 8:25 **Josh Smith** – Assessing an American marten reintroduction in the Black Hills, South Dakota.

8:25 – 8:50 **Dwayne Etter** – Abundance of American martens and fishers in Michigan using statistical population reconstruction.

8:50 - 9:10 **Larry Gigliotti** – The role of human dimensions in mountain lion management in South Dakota.

9:10 - 9:35 **Jon Jenks** – History of mountain lion research in the Black Hills of South Dakota.

9:35 – 10:00 **John Kanta** – Overview of lion management in South Dakota.

10:00 – 10:15 *Break and Silent Auction*

10:15 – 10:40 **John Erb** – Combining high-tech and low-tech in furbearer research - examples from a Minnesota fisher/marten project.

10:40 – 11:05 **Silka Kempema** – Planning for the river otter in South Dakota.

11:05 – 11:20 **Eileen Dowd Stukel** - Open discussion on otter management planning.

11:20 – 11:25 Closing comments/logistics

11:25 – 12:30 *Lunch – on your own*

12:30 **Leave for field trip**

12:30 – 8:30 **Black Hills Field Trip and Barbeque (John Kanta and Jack Alexander)**

THURSDAY – 29 APRIL

8:00 – 10:00 **State Reports** – all state furbearer biologists

10:00 – 10:15 *Break*

10:15 – 12:00 **Business Meeting**
AFWA Federal Appropriations Recommendations
BMP resolution
Wolf take resolution
Bobcats and CITES
Hound hunting/training pens
MWFB budget, next year meeting location
Other topics...

12:00 Adjourn



Appendix 4. 2010 Midwest Furbearer Resources Workshop - Abstracts

The Swiftest Fox Returns: Swift Fox Restoration at Badlands National Park

Greg M. Schroeder, Badlands National Park, 25216 Ben Reifel Road, PO Box 6, Interior, SD, 57750, Email: greg_schroeder@nps.gov, Phone: 605.433.5269.

Swift foxes (*Vulpes velox*) are an integral part of the heritage of the Badlands National Park region and likely were very common in this area prior to the early 1900s, but were extirpated from Badlands NP by the mid-1900s. From 2003-2006, 114 foxes were released originating from Colorado and Wyoming. Swift foxes were released using hard, semi-hard, and soft release methods. Survival differed ($P = 0.08$) for foxes by release method. Straight-line distance moved from release site at 50 days differed ($P = 0.01$) for swift foxes that died (22.6 ± 4.2 km) versus swift foxes that survived (10.5 ± 1.2 km). Juveniles are the preferred age class of swift fox translocation candidates, but survivorship of all released foxes can be improved with short-term soft release techniques. Due to the success of the initial reintroductions, no swift foxes were released after 2006. A minimum of 152 litters and 561 pups have been produced in the Badlands population since swift fox reintroduction.

Habitat Selection by Female Swift Fox (*Vulpes velox*) During the Pup-rearing Season

Indrani Sasmal (presenter), Jonathan A. Jenks, Troy W. Grovenburg, Shubham Datta, Department of Wildlife and Fisheries Sciences, South Dakota State University, Brookings, SD, 57007, Email: indrani.sasmal@sdstate.edu, Phone: 605.651.0381.

Greg M. Schroeder, Badlands National Park, 25216 Ben Reifel Road, PO Box 6, Interior, SD, 57750.

Robert W. Klaver. USGS Earth Resources Observation and Science Center, Sioux Falls, SD, 57198.

The swift fox (*Vulpes velox*) was historically distributed in southwestern South Dakota including the region surrounding Badlands National Park (BNP). The species declined during the mid-1900s due to habitat fragmentation, non-target poisoning, and harvest. Following the successful reintroduction of the species in Canada (1983), a reintroduction program was initiated in BNP in the year 2003. Free-ranging swift fox from Colorado and Wyoming were translocated to BNP from 2003 to 2006. Despite these releases and observations of free-ranging swift fox occurring throughout western South Dakota, it was unknown if a viable population occurred in western South Dakota. Evaluation of habitat selection of female swift fox during pup-rearing season (May-August) can provide information related to the potential viability of a reintroduced population. Habitat selection analysis was conducted during summer 2009 at the landscape-level and within the home range of established foxes. Home range level analysis indicated that swift fox disproportionately decreased use of woodland ($\hat{w} = 0.0$), shrubland ($\hat{w} = 0.14$), pasture/agricultural-land ($\hat{w} = 0.25$) and development ($\hat{w} = 0.16$), whereas foxes used grassland ($\hat{w} = 1.01$), sparse vegetation ($\hat{w} = 1.4$) and prairie dog towns ($\hat{w} = 1.18$) in proportion to availability. Our analyses indicated that swift fox selected habitats that provide greater visibility, such as grassland, sparse vegetation, and prairie dog towns mainly due to increased prey availability and avoidance of coyotes (*Canis latrans*).

Home-Range And Movement Of Exploited Versus Unexploited Coyotes In The Badlands Ecosystem Of South Dakota

Greg M. Schroeder, Badlands National Park, 25216 Ben Reifel Road, PO Box 6, Interior, SD, 57750, Email: greg_schroeder@nps.gov, Phone: 605.433.5269.

From 2003-2006, 17 adult coyotes were fitted with Global Positioning System (GPS) radio collars and monitored during the pup rearing season (May-August). Coyote core-use areas were calculated and avoided when selecting sites where swift foxes would be reintroduced. Mean home range size during the pup rearing season did not differ between male ($14.2 \pm 1.0 \text{ km}^2$) and female ($14.9 \pm 2.0 \text{ km}^2$) ($P > 0.75$) coyotes. Mean home range size for coyotes located within ($15.2 \pm 2.9 \text{ km}^2$) and outside ($14.3 \pm 1.0 \text{ km}^2$) of BNP was similar ($P > 0.78$). Size of core-use areas for male ($1.4 \pm 0.2 \text{ km}^2$) and female ($1.3 \pm 0.2 \text{ km}^2$) coyotes did not differ ($P > 0.65$) from one another. Core-use areas for coyotes located within BNP ($1.0 \pm 0.6 \text{ km}^2$) or adjacent to BNP ($1.5 \pm 0.6 \text{ km}^2$) did not differ ($P > 0.11$) from one another. Mean nighttime movement rates (km/hr) differed among female coyotes occupying areas within BNP ($0.65 \pm 0.02 \text{ km/hr}$), female coyotes outside of BNP ($0.88 \pm 0.02 \text{ km/hr}$), and male coyotes outside of BNP ($0.78 \pm 0.02 \text{ km/hr}$; $P < 0.001$). Sample size for male coyotes outside of BNP was insufficient for comparisons. The existence of refuge area such as BNP increases the opportunity for daytime movements of coyotes, while coyotes outside of BNP offset this discrepancy by increasing nighttime movements.

Black-footed Ferret Recovery Progress and Continued Challenges

Pete Gober, Scott Larson (presenter), and Paul Marinari, United States Fish and Wildlife Service, Suite 400, Pierre, South Dakota, 57501, Email: scott_larson@fws.gov, Phone: 605.224.8693 x 232.

The endangered black-footed ferret (*Mustela nigripes*) is a member of the weasel family. It weighs approximately two pounds and has a long, slender body marked by black feet and a black mask. It is one of the rarest animals in North America and for a time was thought to be extinct. Its recovery program is one of the oldest in the U.S.

The ferret is an extreme specialist that depends on prairie dogs (*Cynomys spp.*) for food and shelter (Biggins 2006). Historically, it was found throughout the Great Plains, mountain basins, and semi-arid grasslands of North America wherever prairie dogs occurred. The ferret's close association with prairie dogs was an important factor in its decline. Historically, prairie dogs occupied approximately 100 million acres. Over the past century occupied habitat has declined by 98% (Mac et al. 1998). This decline was largely due to the conversion of native grassland to cropland, widespread poisoning, and the inadvertent introduction of a non-native disease (sylvatic plague).

In 1979, the ferret was presumed to be extinct after the last few individuals from a population in South Dakota died in captivity. Fortunately, in 1981, a small population was discovered near Meeteetse, Wyoming. Unfortunately, disease outbreaks occurred at Meeteetse in the early 1980s. Eighteen surviving ferrets were removed into captivity. Seven of these animals produced a captive population lineage that is the foundation of present recovery efforts (Hutchins et al. 1996). Extant populations, both captive and reintroduced, descend from these seven founder animals.

The National Black-footed Ferret Conservation Center, managed by the U.S. Fish & Wildlife Service, and five zoos affiliated with the American Zoological Association, now maintain separate captive breeding facilities for approximately 290 ferrets. An estimated 7,000 ferret kits have been produced in captivity since 1987, and over 2,500 ferrets have been released into the wild. There have been 19 ferret reintroduction projects initiated since 1991 in eight states, Mexico, and Canada. A minimum of 400 breeding adults occur at these reintroduction sites (approximately 25% of the downlisting goal). Populations are currently self-sustaining at four sites.

Many diverse partners have contributed to the recovery of the ferret including foreign governments, state and federal agencies, tribes, the American Zoological Association, conservation groups, and private landowners. Most of these partners are members of the Black-footed Ferret Recovery Implementation Team. Team members meet regularly to coordinate recovery efforts and address challenges to the recovery of the species.

Some obstacles to ferret recovery have been successfully addressed, including the development of captive breeding and field reintroduction techniques. However, many

challenges remain including providing enough secure prairie dog habitat to support ferrets in the wild and developing tools to manage sylvatic plague, which is usually lethal to both ferrets and prairie dogs.

Many stakeholders consider prairie dogs a pest species. Large prairie dog complexes of a size necessary to support self-sustaining populations of ferrets are particularly at risk from poisoning. Incentive programs to conserve prairie dogs where appropriate and control them in other areas will be needed to achieve ferret recovery in the western U.S.

The quality of ferret habitat is also limited by sylvatic plague. This disease was accidentally introduced into San Francisco in 1900 (Gage and Kosoy 2006). It was first detected in prairie dogs in 1932 and now occurs in all 12 states within the range of the ferret. Several potential management tools are being evaluated including direct vaccination of ferrets, dusting prairie dog burrows with an insecticide that kills the plague-bearing fleas, and vaccination of prairie dogs via oral bait.

Despite the radically altered environment that reintroduced ferrets face today, recovery of this species is within reach. The challenge will be to continue ferret and prairie dog management efforts in order to complete the job.

Summary of Plague Control Activities in the Conata Basin/Badlands Black-footed Ferret Reintroduction Area

Randall L. Griebel, U.S. Forest Service, Buffalo Gap National Grassland, 708 Main St., Wall, South Dakota, 57790, Email: rgriebel@fs.fed.us, Phone: 605.279.2125.

Plague is an exotic disease caused by the bacterium *Yersinia pestis* that is lethal to prairie dogs (*Cynomys* spp.) and black-footed ferrets (*Mustela nigripes*). The Conata Basin/Badlands black-footed ferret reintroduction area is one of only 3 sites with a self-sustaining ferret population and is important to the overall success of the program. Epizootic plague was discovered in the Conata Basin in May 2008. As of November 2009, plague has impacted a little over 15,000 acres of prairie dogs in the Conata Basin and 726 acres in Badlands National Park; killing an estimated 190,000 prairie dogs. A large-scale effort was initiated in June 2008 by the Forest Service, National Park Service, Fish and Wildlife Service and the Animal and Plant Health Inspection Service to apply deltamethrin dust to burrows in active prairie dog colonies considered the highest quality black-footed ferret habitat. This included 7 colonies in the Conata Basin (10,000 acres) and 1 colony in Badlands National Park (1,000 acres) for a total of 11,000 acres. Since some prairie dog colonies support higher ferret densities than others, it was determined that dusting the 7 Conata Basin colonies could preserve approximately 2/3 of the ferret population even if everything else was taken-out by plague (21,000 acres). In addition to dusting, ferrets were given plague vaccinations during spotlighting and trapping operations. For 2008 and 2009 combined, a total of 907,245 burrows were dusted in 22,433 acres of active prairie dogs. Additionally, 284 ferrets received at least one plague vaccination. Since 2008, half the prairie dog colony acreage in the Conata Basin has been lost to plague (i.e., went from 31,372 acres in 2007 to 15,926 acres in 2009). The majority of what remains has been dusted each of the last two years (10,000 acres). The 2009 Conata Basin fall ferret population is estimated at 185 animals; which is down from 321 in 2007 (pre-plague). However, out of the 19 black-footed ferret reintroduction sites, Conata Basin is still one of top sites in regards total population. Our efforts in dusting prairie dog colonies and vaccinating ferrets demonstrate that a plague epizootic can be mitigated with some success.

Zoonotic diseases: wildlife infections that make humans sick

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In a rural state, like South Dakota, human-wildlife encounters are common. Occasionally, viral and bacterial infections are transmitted to humans. These wildlife-associated zoonotic diseases include rabies, plague, hantavirus pulmonary syndrome, tularemia and giardia. This presentation discusses the risk to humans of these zoonotic diseases and their incidence in South Dakota.

Management of Beaver (*Castor Canadensis*) on Tierra del Fuego: Past, Present, Future??

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North American beavers (*Castor canadensis*) were introduced to southern South America in 1946 and have spread over most of the islands in southern Tierra del Fuego, owned by Argentina and Chile. Beavers in South America are pests on biodiversity values and damage economic infrastructure. They have recently crossed the Straits of Magellan onto the Brunswick Peninsula in Chile on the South American mainland and, unless removed from this foothold, they will expand their range into all suitable habitats in Patagonia and beyond.

The Government of Chile has decided to attempt to eradicate beavers from Brunswick Peninsula, and the Governments of Argentina and Chile have signed a Treaty to take a binational approach to the management of beavers in the whole of Tierra del Fuego.

As part of this approach, the Governments commissioned an international team with expertise in eradication planning and operations, and in beaver control to assess the feasibility of the preferred option – the eradication of beaver from Tierra del Fuego, and to explore fall-back options if this preferred solution is not feasible.

Microhabitat Selection And Home Range Size Of Bobcats In The Southern Black Hills Of South Dakota

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Bobcats (*Lynx rufus*) inhabit a variety of landscapes across North America. Within the distribution of bobcats, habitat use at the home-range level has been well studied, particularly in forested landscapes. In contrast, few studies have evaluated microhabitat use of bobcats and no microhabitat work has been conducted in the Black Hills. Our objective was to characterize microhabitat selection and home range size of male and female bobcats in this region. A total of 9 bobcats (3 male, 6 female) were fitted with store-on-board GPS collars. Twenty variables were measured at 173 locations used by bobcats to assess (1) bobcat habitat selection (2) variation in habitat selection with male and female bobcats, and (3) home range size. Data were analyzed using a-priori modeling and logistic regression to determine the best model. Microhabitat characteristics of used sites varied from random sites ($F_{17, 276} = 5.31$ $P < 0.0001$). Modeling results of the pooled male and female data showed that bobcats selected for steeper slopes, distance to drainages, grass and shrub cover, bare ground, and medium vertical cover ($w_i = 0.631$). Habitat selection also varied by sex ($F_{17, 128} = 5.41$, $P < 0.0001$). Males selected for higher elevations, where as females selected for taller grass and shrubs, and greater amounts of low and total visual cover. Home range sizes were derived using Brownian Bridge estimation methods. Male bobcats had an average home range of 47.8 km² where as female home range size averaged 22.6 km². While our findings are similar to work in other regions of the United States, the scale of habitat selection researched has furthered our knowledge of the species and provided insight as to how bobcats use the Black Hills landscape.

Bobcat Population Monitoring and Harvest Management in Wisconsin

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Bobcat harvest in northern Wisconsin has been regulated with a limited permit system since the early 1990s. Population trends have been monitored primarily through winter-track surveys with supplemental information from hunter/trapper questionnaires and observations by agency personnel. Harvest levels have been documented through mandatory registration. Combined harvest age and sex structure and reproductive data from annual mandatory carcass collections with harvest information in an accounting-style population model to estimate population size and harvest rates. Harvest methods have changed over past 30 years likely affecting harvest composition, hunting with dogs has increased, proportion of males in harvest increased, proportion of adults in harvest increased. Estimates of bobcat population size in northern Wisconsin increased consistently during the 1990s and early 2000s but have since stabilized and declined slightly. Modeling suggests that harvest rates <12% permitted population growth. Pelt price may not completely reflect harvest demand due to increase interest in trophy mounts. Harvest demand and success rates have increased during the past 20 years as bobcats have gained trophy status resulting in pressures to expand harvest opportunities.

Evaluation Of Two Cable Neck-Restraints With Stops To Capture Coyotes

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Wildlife managers must consider and recommend appropriate capture devices for public use. Trappers desire devices that maximize efficiency yet are humane to captured animals; however, concerns for continued improvements in humane capture devices by various segments of the public has intensified. We compared efficiency and selectivity of two cable neck restraints (CNs) with stops allowing a minimum 10.8- or 8.9-cm diameter loop closure to capture coyotes (*Canis latrans*) in Michigan. Cable neck restraints were set for 1,175 (8.9-cm stops) and 3,166 (10.8-cm stops) trap days, respectively, during March 2008 and January-March 2009. Capture efficiency was 64% ($n = 14$ coyotes) and 100% ($n = 11$ coyotes) for CNs with 10.8 and 8.9 cm stops, respectively. Coyotes captured in CNs with 10.8-cm stops were larger, presumably because smaller individuals escaped. Selectivity was high (>90%) for both CNs; nontarget species included white-tailed deer (*Odocoileus virginianus*) and raccoon (*Procyon lotor*). No dogs were captured and held; however, 3 dogs were captured and released by humans. Mail surveys of Michigan trappers suggested annual capture efficiency (47-62%) using CNs with 10.8-cm stops was less than capture efficiency in this study. The CN with 8.9-cm stop outperformed the CN with 10.8 cm stop which only marginally exceeded Best Management Practices criteria (60% capture efficiency) for coyotes in the United States. Based on comparable selectivity, higher capture efficiency, and below-standard capture efficiency of trappers, we recommend use of CNs with 8.9-cm stop for coyote capture.

Gear, Gadgets, and Garb: Improvements and Modifications to Beaver Trapping Equipment

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In 1958 the Animal Trap Company purchased the manufacturing rights to a trap patented by Frank R. Conibear of Victoria, British Columbia after extensive field testing by Conibear and others. In 1959 the Animal Trap Company first introduced the 330 Conibear killer trap on the market, and the trap soon became a good seller and a favorite choice amongst beaver trappers. Since that time, many improvements have been made to the body gripping (Conibear) trap to improve its effectiveness. Foothold traps and cable devices (snares) have also seen many improvements to make them more efficient for the beaver trapper. In fact, most all of the equipment used in modern day beaver trapping have seen modifications and/or improvements which increase capture efficiency, reduce fur damage, improve animal welfare and overall create a better beaver trapper.

New Species-Specific Designs of Lethal Traps for Raccoon Harvest: A Pilot Study

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Raccoons (*Procyon lotor*) have been increasing not only in abundance, but also in geographic distribution. The raccoon has been the most sought-after furbearing species by trappers in the U.S., is among the most economically important furbearing species in North America, but is also responsible for damage in rural and urban settings. The need for retaining effective traps and trapping methods while reducing non-target captures is probably more important now than ever. To reduce or eliminate non-target captures (e.g., domestic dogs), regardless of how rare these occur, some state wildlife agencies have implemented regulatory changes. For example, maximum size restrictions of lethal body-gripping traps on dry land have been in place for years in several states. More recently, baited cubby sets using body-gripping traps have been modified such that traps are placed farther inside the cubby, thereby theoretically reducing capture of dogs and other non-target animals. However, this cubby design remains untested, and its efficacy for capturing the desired furbearers has come into question by some trappers. A new device, the Coon Bumper, has been designed specifically to be used with body-gripping traps to capture and dispatch raccoons while excluding dogs by capitalizing on raccoon behavior, such as their ability to manipulate food items with their front paws. Raccoon-specific restraining traps are currently available (e.g., EGG™ trap, Lil Griz trap) and some have been tested; however, these restraining traps are used only by an estimated 3% of U.S. trappers in comparison to 26% that use lethal body-gripping traps. Further, these restraining traps are relatively expensive, with some trappers claiming that some styles are not user-friendly. In contrast, Coon Bumpers are projected to be relatively inexpensive and may be used with traps and equipment already owned by many trappers, including traps often used for multiple species. Preliminary testing of Coon Bumpers during the development process has shown this device to hold much promise for the species-specific lethal capture of raccoons. Digital video footage has recorded raccoon visits and behavior at trap sites, which allowed prototype designs to be improved upon. Such preliminary testing, however, remains somewhat anecdotal, as large sample sizes obtained through appropriate study design and data analysis are lacking. Here, I discuss development of a study design to compare capture success and selectivity of Coon Bumpers, standard cubby sets, and dog-resistant cubby sets for raccoons using body-gripping traps.

Future Trappers of Wisconsin

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The Wisconsin Trappers Association (WTA) began a fledgling program called the Future Trappers of Wisconsin (FTW) in 1999. Under the umbrella of the WTA, this organization is open to youth 18 years of age or younger with guiding principals gleaned from various organizations such as 4-H, Girl Scouts, and Boy Scouts. Leadership and skills development are key objectives attained through a series of achievement pins and organizational levels. Trapper education is a significant focus which includes a trap loan program, annual FTW Camp, and Fall Rendezvous events. Future plans include the development of displays for county fairs and other larger events in addition to a separate FTW fur auction. This is the first such dedicated youth trapper organization known in the United States.

A short history of the European-based effort to disrupt the North American fur trade, what the United States did about it, and how BMPs for animal traps got its start.

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During the 1990s, the North American fur trade was threatened by actions of the European Union upon their adoption of a law pertaining to the trade of wild furs. While ostensibly claiming concerns for the welfare of trapped animals, the law was aimed directly at the heart of the fur industry and furbearer management as practiced in North America. Under the auspices of the Association of Fish and Wildlife Agencies, most state wildlife agencies documented the harmful impact this regulation would have on wildlife management programs throughout the United States. Consequently, a strong state and national political consensus emerged enabling state agencies to lead a diplomatic effort to sustain the free trade of wild furs in the U.S. Recognizing that wildlife management is a competency within state governments, federal authorities with the U.S. Trade Representatives' Office named a delegation consisting of *both* federal and state officials to negotiate a non-binding "Agreed Minute" that provides for the continuation of trade in wild furs. The essence of the Agreed Minute is the on-going commitment, previously started independently by state agencies, to develop and implement best management practices for animal traps. While the diplomatic efforts reached a successful conclusion in 1997, the commitments associated with the Agreed Minute continue without an "expiration date." Therefore, the use of BMPs not only continues to ensure the open trade of wild furs and fulfills the commitments made by state wildlife agencies; it also continues a long-standing tradition of continual improvement in trapping and furbearer management that has been the hallmark of these programs in the United States.

Best Management Practices for Trapping in the United States: An Overview and Update

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Best Management Practices for Trapping in the United States (BMP) have been under development since 1998. Research to develop trapping BMPs was undertaken by the Association of Fish and Wildlife Agencies (AFWA) partly as a response to the European Union's ban on the import of furs from countries continuing to use foothold traps. BMPs will identify and recommend the most humane, efficient, selective, safe, and practical trapping devices. BMPs will serve as a standard that can be voluntarily adopted and used by state and federal wildlife agencies, trapper organizations, and individuals to improve trapping, trapper education, and furbearer management programs. The AFWA Furbearer Resources Technical Work Group has identified and prioritized 23 species of furbearers for trap testing. Over 100 trap types have been tested through the assistance and participation of 41 state fish and wildlife agencies.

Best Management Practices for Trapping beaver, bobcat, coyotes in the eastern U.S. (revised), coyotes in the western U.S. (revised), fisher, gray fox, American marten, mink, muskrat, nutria, raccoon, red fox, river otter, opossum, striped skunk, weasels and an Introduction BMP have been published. Completion of BMPs for ringtails, swift/kit fox and Canada lynx are expected in 2010.

Other projects conducted during BMP development include the Trapping Matters Workshop, new Web-based Trapper Education Program, Train the Trainers Workshop, National Trapper Education Program, Ownership and Use of Traps by Trappers in the United States, On-line National Furbearer Harvest Database and numerous other projects that support regulated trapping in the U.S.

Assessing an American Marten Reintroduction in the Black Hills, South Dakota

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Following a 50-year absence, American marten (*Martes americana*) were reintroduced into the Black Hills of South Dakota in 1980. To improve active management of this species, we evaluated factors affecting range expansion, estimated probability of detecting (p) marten at high (>2 marten/ 10.2 km^2) and low (≤ 1 marten/ 10.2 km^2) densities, and assessed survivorship of this reintroduced population. We used presence-absence data obtained from a track-plate survey in conjunction with results from a saturation-trapping study to derive detection probabilities when marten occurred at high and low densities within 8, 10.2 km^2 quadrats. Estimated probability of detecting marten in high density quadrats was $p = 0.952$ (se = 0.046), while the detection probability in low density quadrats was considerably lower ($p = 0.333$, se = 0.136). Results from track-plate box surveys revealed marten occurrence was associated with areas of high precipitation near prior release locations and mature stand-aged forests. To assess survivorship we monitored 50 (22 females, 28 males) marten and determined cause-specific mortality in 2 regions (central and northern) of the Black Hills, South Dakota. We documented 15 mortalities (30% of monitored population) during 1553 marten weeks. Nine (60%) marten died of predation (5 coyote [*Canis latrans*] and 4 unknown predators), 3 died (20%) of unknown causes, 1 (7%) died of injuries suffered after being captured in a bobcat set, 1 (7%) died from collar entrapment, and 1 (7%) was ran over by an Off-Highway Vehicle. Results of AIC_c analysis indicated regional variations had the greatest effect on marten survivorship (58% of summed model weights) with marten in the north (0.949; CI 0.912-0.971) demonstrating lower monthly survivorship than in the central (0.987; CI 0.950-0.997) Black Hills.

Abundance Of American Martens And Fishers In Michigan Using Statistical Population Reconstruction

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Estimating furbearer population dynamics is challenging because their elusive behavior and low densities makes detection difficult. Statistical population reconstruction is a robust approach to demographic assessment for harvested populations, but the technique has not been applied to furbearers. We extended this approach to furbearers and analyzed 8 and 12 years of age-at-harvest data for American marten (*Martes americana*) and fisher (*Martes pennanti*) populations, respectively, in the Upper Peninsula of Michigan. Marten abundance estimates showed a general downward trend from an estimate of $\hat{N} = 1310$ ($SE = 470.8$) animals in 2000 to $\hat{N} = 920$ ($SE = 281.7$) in 2007. The harvest probability of martens increased nearly 5-fold from 0.0709 ($SE = 0.0234$) in 2000 to 0.3330 ($SE = 0.0996$) in 2007, which corresponded to a 5-fold increase in trap-nights. Fisher abundance estimates declined precipitously from $\hat{N} = 2557$ ($SE = 1657.1$) in 1996 to $\hat{N} = 760$ ($SE = 533.4$) in 2007. Annual harvest probabilities for fishers more than doubled from a low of 0.18 in 2000 to a high of 0.37 in 2006. We also observed a substantial decline in fisher recruitment from 1996–2007. Continued monitoring of martens and fishers in the Upper Peninsula, Michigan, in relation to continued harvest, is necessary given the estimated declines. We do not encourage continued use of some harvest indices, which were incapable of detecting the trends we report, as the sole technique to assess status and trends of marten and fisher populations. Statistical population reconstruction models offer a robust alternative to assess demographics of furbearers and refinements to data collection and additional

studies in the Upper Peninsula, Michigan will allow for continued use and improvement in the application of these models.

The Role of Human Dimensions in Mountain Lion Management in South Dakota

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About 8 to 9 years ago mountain lions took on a new level of awareness in South Dakota with a sudden increase in reported incidences and consequently an increase of mountain lion stories in the news. At the time the mountain lion was listed as a South Dakota state threatened species, however, research funded by the Game, Fish and Parks (GFP) Department through South Dakota State University indicated a growing population mountain lions in South Dakota. The research information was going to be used by GFP to develop a mountain lion management plan for South Dakota. Since public opinion and understanding of mountain lions will be a critical component of developing and implementing any mountain lion plan the research also included a public opinion survey. This public opinion survey was the first step in developing the social component (human dimensions) of the South Dakota mountain lion plan. The survey results were used to develop an attitude model to provide a framework for understanding public opinion of mountain lions in South Dakota.

The mountain lion attitude model developed from the survey results is an intuitive model, but was derived empirically from respondents' answers to a set of 12 questions about mountain lions using a cluster analysis procedure. The model developed was a continuum of attitudes ranging from being strongly supportive of mountain lions to strongly disliking mountain lions. This continuum model was divided into five groups and named: strongly pro-lion (22.7%), slightly pro-lion (33.7%), neutral (11.3%), slightly contra-lion (22.5%), and strongly contra-lion (9.8%). Many additional human dimensions surveys of citizens and hunters (elk, deer and mountain lion) were conducted following the first public opinion survey conducted in 2002 as well as an extensive public involvement effort in 2005 and again in 2010. The most recent survey was a large representative sample of Black Hills citizens. A consistent finding of all the surveys was high citizen and hunter support for having a healthy population of mountain lions in South Dakota and also high support for having a managed hunting season for mountain lions.

History of mountain lion research in the Black Hills of South Dakota.

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Since its listing as “state threatened” in 1978, the mountain lion (*Puma concolor*) population in the Black Hills has increased from what was believed to be about 25 transient animals in the mid 1980s to what is recognized as a viable breeding population. We began studying this population in 1998 when it was recolonizing the region and have continuously monitored it through a period of population saturation. During this period, we have radio collared 280 mountain lions of various ages (kittens, subadults, and adults) and sexes. Previous, and on-going, research has estimated population size, dispersal, and survival of lions. Currently, the mountain lion population is estimated at 220 to 280 based on population reconstruction, modeling, and mark recapture. Dispersal is male biased with approximately 90% of subadult males dispersing up to 1067 km. Data collected on this population also indicates that it became saturated in about 2005. Total percent kidney fat of mountain lions declined from average levels documented prior to 2004. In addition, some adults and kittens appeared emaciated and domestic prey has increased in diets since 2004. Information collected on this population was used to justify a harvest of mountain lions in the Black Hills. In 2005, a total of 13 lions (7 females, 6 males) was harvested from the Black Hills. More recently (2009), harvest was increased to a quota of 45 mountain lions or 25 female mountain lions. A history of this research project with associated results will be presented.

Combining ‘High-Tech’ and ‘Low-Tech’ in Furbearer Research – Examples from a Minnesota Fisher/Marten Project

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Traditionally, wildlife researchers relied primarily on field observation and carcass analysis to gather information on a species of interest. Through time, the ‘tools’ available to researchers have expanded, including increasingly sophisticated computer hardware/software, various types of remote wildlife monitoring equipment, and chemical and molecular analyses. As is often the case with technological advancements, some overzealously adopt them to the exclusion of previous tools, while others fail to embrace them at all. I argue that our ability to study, monitor, and manage wildlife is best served by a combination of traditional methods and modern tools, though some approaches may be more or less applicable depending on the research topic and status (alive/dead) of the animals of interest. Hence, it is imperative that researchers continue to maintain skills and knowledge derived from traditional field and lab experience, as well as continuing to stay current with newer technologies and methods. I believe this is especially true for furbearer biologists who typically work with species ranging from weasels to wolves, and for which the range of both traditional and newer research tools varies widely across species (e.g., compare options available on a weasel radio-collar compared to those available on a wolf collar). I illustrate how methods can be combined using examples from an ongoing fisher and marten project in Minnesota. Specifically, I discuss: 1) determination of cause of mortality using a combination of field sign, necropsy, and forensic analysis; 2) quantifying reproductive parameters using a combination of radio-telemetry, carcass (ovary/oviduct) analysis, blood chemistry, and remote camera/video/ultrasound; 3) documenting den/rest site structures and use patterns using field telemetry, remote cameras, and miniature data loggers; and 4) examining food habits using both scat/stomach analysis and stable isotope analysis of muscle, hair, or bone.

Planning for the river otter in South Dakota

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South Dakota Game, Fish and Parks has begun preparing a conservation and management plan for the river otter, a state threatened species. Staff with the Wildlife Diversity Program are working with regional wildlife staff and Wildlife Division trappers to assure that the plan is relevant to on-the-ground personnel. Public involvement strategies will benefit from experiences of other states, particularly related to real and perceived conflicts with fisheries resources. An additional challenge will be to determine appropriate population monitoring techniques to help set and monitor delisting goals. Since river otters have recovered naturally and through reintroduction in many states, South Dakota will seek input from other states and partners in designing and implementing the plan.

Appendix 5. Hound Dog Training (Coursing) Pen Position Statement.

Position Statement

Hound Dog Training (Coursing) Pens

There is increasing interest from private citizens to hold furbearers in captivity for the purpose of training and conducting field trials with hound breeds of hunting dogs. The interest for these facilities likely stems from declining access to private lands, reduced risk of trespass, and desire for guaranteed access to furbearers for dog training. These facilities pose many challenges for agencies charged with their regulation. In most Midwest states, the agencies mandated to protect and manage wildlife are the same agencies responsible for regulating captive wildlife, but additional agencies (i.e., Departments of Agriculture and Public health) may also have jurisdiction. Biological issues related to furbearers used in coursing pens include diseases and parasites associated with their transport, confinement and escape of furbearers; intra-and-interspecific competition; and effects to native wildlife species inside and outside of fences, including habitat loss. Social issues related to confinement of furbearers include sale and interstate trade of wild furbearers; animal welfare; fair chase; public perception of hunting and trapping; commercialization and domestication of wildlife; and funding for regulation and inspection of facilities.

With these issues in mind the Midwest Association of Fish and Wildlife Agencies:

1. Recognizes that dog training and hunting activities have a long history in the United States, and many sportsmen participate in recreational pursuit of furbearers with dogs.
2. Recognizes the increased difficulty for sportsmen to gain access to private lands for hunting, including hunting and training with dogs.
3. Supports state and provincial wildlife agencies as the primary regulatory authority over native North American furbearers held in captivity.
4. Opposes use of funds generated from traditional wildlife management sources for regulation and inspection of dog training pens.
5. Recognizes the serious disease and parasite issues associated with the inter- and intra-state transport and confinement of furbearers, and supports eliminating the movement of furbearers across state and provincial lines to reduce potential translocation of diseases and parasites. Recognizes the need to inform pen proprietors and participants about risks to their dogs and person due to potential exposure to diseases and parasites commonly carried by furbearers.

6. Recognizes the need to inform pen proprietors and participants that escape of furbearers from training pens could pose significant risks to native fauna, and supports regulations and enforcement to prevent escape of furbearers from training pens and provide means to facilitate recovery of furbearers that escape (e.g., visible marking of captive furbearers).
7. Recognizes the need to inform pen proprietors and participants about potential social concerns, that are not limited solely to anti-hunting groups, regarding take of game species in fenced facilities, and that these concerns may place some hunting organizations in conflict.

Appendix 6. Wolf management resolution.

RESOLUTION # 1

DELIST THE GRAY WOLF

AND RESTORE MANAGEMENT TO THE STATES

WHEREAS, the “Recovery Plan for the Eastern Timber Wolf” identified population goals of 1,250 – 1,400 animals for Minnesota and 100 animals for Wisconsin/Michigan.

WHEREAS, population estimates as of 2008 include 2,922 animals in Minnesota; 549 animals in Wisconsin; and 520 animals in Michigan.

WHEREAS, as acknowledged by the U.S. Fish and Wildlife Service, Minnesota’s wolf population has met the federal recovery goal since the late 1970’s and Wisconsin / Michigan have met the federal recovery goal since the winter of 1993 – 1994.

WHEREAS, a primary purpose of the Endangered Species Act (ESA) is to “provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section.”

WHEREAS, the primary purpose of the ESA has clearly been achieved for the gray wolf, and gray wolves have recovered in the Midwest, formally known as the Western Great Lakes Distinct Population Segment;

WHEREAS, a lack of delisting, given the species has met recovery goals, can result in an erosion of public acceptance of wolves and the ESA.

WHEREAS, Minnesota, Wisconsin and Michigan have each developed state management plans for the gray wolf that include population levels that will assure long-term sustainability and avoid the need for future state or federal endangered species listing.

WHEREAS, State wildlife agencies are the competent authorities to manage resident species for their sustained use and enjoyment.

WHEREAS, the overall aim of the ESA is to recover species such that the species can be managed by the appropriate entity. State wildlife agencies are the appropriate entities to assume management of the gray wolf as a resident species.

THEREFORE, BE IT RESOLVED, that the Midwest Furbearer Working Group, at their April 2010 annual meeting, supports and endorses efforts to delist gray wolves in the

Midwest (formally known as the Western Great Lakes Distinct Population Segment) from the Endangered Species Act as a recovered species, and recommends the management of this species by state agencies for the multiple values and benefits associated with their recovery.

Appendix 7. Host States – Midwest Furbearer Resources Workshop.

Year	State
1979	Kansas
1983	Wisconsin
1984	Illinois
1985	Iowa
1987	Minnesota
1988	Indiana
1989	Missouri
1990	Nebraska
1991	South Dakota
1992	Ohio
1993	Oklahoma
1994	North Dakota
1995	West Virginia
1996	Michigan
1997	Illinois
1998	Kansas
1999	Wisconsin
2000	Missouri
2001	Ohio
2002	Iowa
2003	Minnesota
2004	Illinois
2005	North Dakota
2006	Michigan
2007	Nebraska
2008	Kansas
2009	Kentucky
2010	South Dakota