# WOLF WARS:

## SHOULD WE HUNT GRAY WOLVES IN MICHIGAN?

SEAS SCHOOL FOR ENVIRONMENT AND SUSTAINABILITY
UNIVERSITY OF MICHIGAN

AUGUST 2018

## Dean's Welcome

Welcome, SEAS students!

Before you know it, you will be boarding a bus with your classmates, headed for the University of Michigan Biological Station (the "Biostation") in beautiful Northern Michigan—or "Up North" as Michiganders call it. There, during an immersive orientation experience, you will explore, learn, bond—and become an integral part of our community.

This is just the beginning of your graduate career at SEAS, throughout which we will work together to solve some of the world's most complex environmental problems. This is why you chose SEAS, and why we chose you.

It is all very exciting, and we cannot wait to get started. So, why wait?

The following case study details an active issue in the state of Michigan: whether or not to allow a public wolf hunt. During your time at the Biostation, you will be asked to examine the issue from opposing, nuanced perspectives, challenging your own gut reaction to the problem. Discussions will be guided by the scientific, political, economic, and social analyses included in these pages. You will actively collaborate with your classmates to uncover and synthesize facts, ultimately building a responsible, sustainable policy recommendation on Michigan's wolf population.

To prepare, simply read the case study and let it simmer. There is no need to do additional research.

Enjoy your time at orientation. Get to know your classmates. Explore the gorgeous landscape. And then, come September 4th, join us back at the Dana Building ready to launch your graduate education and set out on a path of meaningful work—work that will have an impact on generations to come.

Sincerely,

Jonathan T. Overpeck
Samuel A. Graham Dean and Collegiate Professor
School for Environment and Sustainability
University of Michigan

# Case study guide[1]

Through a daylong exercise at the Biostation on Wednesday, August 29, 2018, we will take a hands-on approach to building a policy that addresses Michigan's growing gray wolf population.
*To prepare, please read the case, and—if you find yourself on a four-hour bus ride in Michigan—perhaps start thinking through the decision. No other research or preparation is needed.*

**The scenario**
The chairperson of the Michigan Natural Resources Commission faces a difficult decision. Once an endangered species, gray wolves have recovered in northern Michigan enough that some groups are pushing for a public wolf hunt. The Michigan Department of Natural Resources agrees and believes that a limited public hunt is scientifically and economically justified. But others are not convinced and have reacted with skepticism and hostility. What should the chairperson's decision be?

**Step 1: Assessing perspectives**
On Wednesday morning, you will be assigned to a team that will take on the perspective of one stakeholder group. Groups range from livestock farmers to Native American tribes to scientists to environmental organizations.

From the perspective of your assigned stakeholder group, you will assess:

- Your multiple interests in the issue
- How they relate to other stakeholders' interests and positions
- Your strongest and weakest arguments
- How much influence you have on the decision
- If your interests can be achieved in tandem with those of other stakeholders

**Step 2: Policy considerations**
After rafting on a Michigan river, exploring Michigan forests, and getting to know the beach at the Biostation, you will be asked to change perspective and wear the hat of a policy advisor to the chairperson.

Thinking now as a policy advisor, you will work through the following questions:

- What decision would you recommend?
- What is scientifically, economically, morally, and politically justified?
- Why do you believe this is the best course of action for Michigan?

**Step 3: Coming together**
After dinner on Wednesday, we will all come together to hear each other's recommendations and rationale. We will also explore how the characteristics of this case might relate to your own experiences, and we will preview opportunities to sharpen your analytic skillset during your SEAS education.

## Contents

## Introduction

J. R. Richardson took a break from some documents he was reading to think about a difficult decision that he would face in the upcoming days: whether to vote in favor of allowing a wolf hunt to take place in the state of Michigan. As chair of the Natural Resources Commission (NRC), a seven-person policy advisory body to the state's Department of Natural Resources (DNR), Richardson had dealt with his fair share of contentious issues during his tenure at the NRC since 2007. But he could remember none that had aroused such passion from all sides as the wolf hunt issue. As a result, he felt a great deal of pressure to lead the NRC to make the right decision based on sound science, respect for the needs of the people who are affected by the presence of wolves, and sensitivity to public opinion.

The NRC, whose job is to regulate game species, did not appear to be the most likely decision-making body when it came to wolves in Michigan. Indeed, given the systematic extermination of the species throughout the United States during the 19th and early 20th centuries, and its subsequent listing as an endangered species in 1974, the idea of wolf hunts was unimaginable for decades. However, the extraordinary comeback of the wolf led to its de-listing in January 2012, a move that transferred control back to the states – including Michigan, where a growing wolf population now resides. In December 2012, Michigan Governor Rick Snyder and the Michigan legislature officially designated the wolf as a game species, which landed responsibility for regulating any public wolf hunt on the plate of the NRC.

As a lifelong resident of Michigan's Upper Peninsula (U.P.), where the state's wolf population resides, as well as an avid outdoorsman, businessman, and engineer with extensive experience in natural resource issues, Richardson had conflicting personal and professional feelings about the wolf harvest. On the one hand, he saw the wolf's comeback as a sign that the natural environment was healthy and thriving, and he wanted to protect that ecological balance. On the other hand, he personally knew some whose livestock had been preyed on by wolves and had firsthand knowledge of the human–wolf conflicts that made this issue so politically charged. The science, politics, and community concerns surrounding the possibility of a wolf hunt meant that whatever decision the NRC made, not everyone would be happy. And as the point person for the NRC's decision, Richardson would have to take any heat from the governor and legislature, wolf advocates, tribal groups, hunters, ranchers, and the public, who would be scrutinizing this decision heavily.

Now, on the eve of this momentous decision, Richardson reflected on his options. Should he heed the calls of anti-hunt advocates and some scientists that wolves should continue to be fully protected? Should he allow the public hunt to proceed, or encourage the DNR to find other ways to control the population? How might conflicts between wolves and humans be managed most effectively? What are the ramifications of the different decisions for the stakeholders involved? Richardson returned to his reading with these questions weighing heavily on his mind.

## The history of gray wolves in the United States and Michigan

**Figure 1:** The gray wolf, *Canis lupus*
*Source: U.S. Fish and Wildlife Service*

The history of gray wolves in Michigan, which parallels the greater story of the species in the Great Lakes and throughout North America, is woven with trials and triumphs. Native to Michigan, wolves once roamed every county in the state, coexisting with humans (**Figure 1**).

In the 1800s, westward settlement of the United States helped initiate the human–wolf conflicts that were to plague the gray wolf. Animals that had once been prey for wolves—bison, elk, and moose—were killed by new settlers for food or for sport. As their natural food source declined, wolves turned to settlers' sheep and cattle to feed themselves and unintentionally sparked an extermination campaign that was to last over a hundred years.[2] Ranchers and professional "wolfers" indiscriminately killed the animals to protect their herds, using poison, traps, and other methods. The extermination escalated as the federal government promulgated a nationwide eradication program, offering bounties for skins of the dead animals.[3] Even President Theodore Roosevelt, otherwise known as a champion for environmental conservation, reflected the feeling of a nation when he termed wolves "beasts of waste and desolation."[4]

The federal wolf pelt bounty program (**Figure 2**) decimated wolf populations across the country, and Michigan's wolves were not spared. Wolves were eliminated from the southern part of the state by the 1830s, and by the 1900s they had all but disappeared. A tiny population remained in the Isle Royale island north of the U.P., considered possibly one of the last wolf populations in North America during the final stage of wolf extermination in the 1960s.[5] See **Figure 3** for a map of Michigan including the Upper and Lower Peninsulas, Isle Royale, Ann Arbor, and the University of Michigan Biostation. See **Figure 4** for the historical, 1974, and present-day range of the gray wolf in the United States.

**Figure 2:** Wolf pelts offered for bounty
*Source: <Westernwolves.org>*

**Figure 3: The state of Michigan**

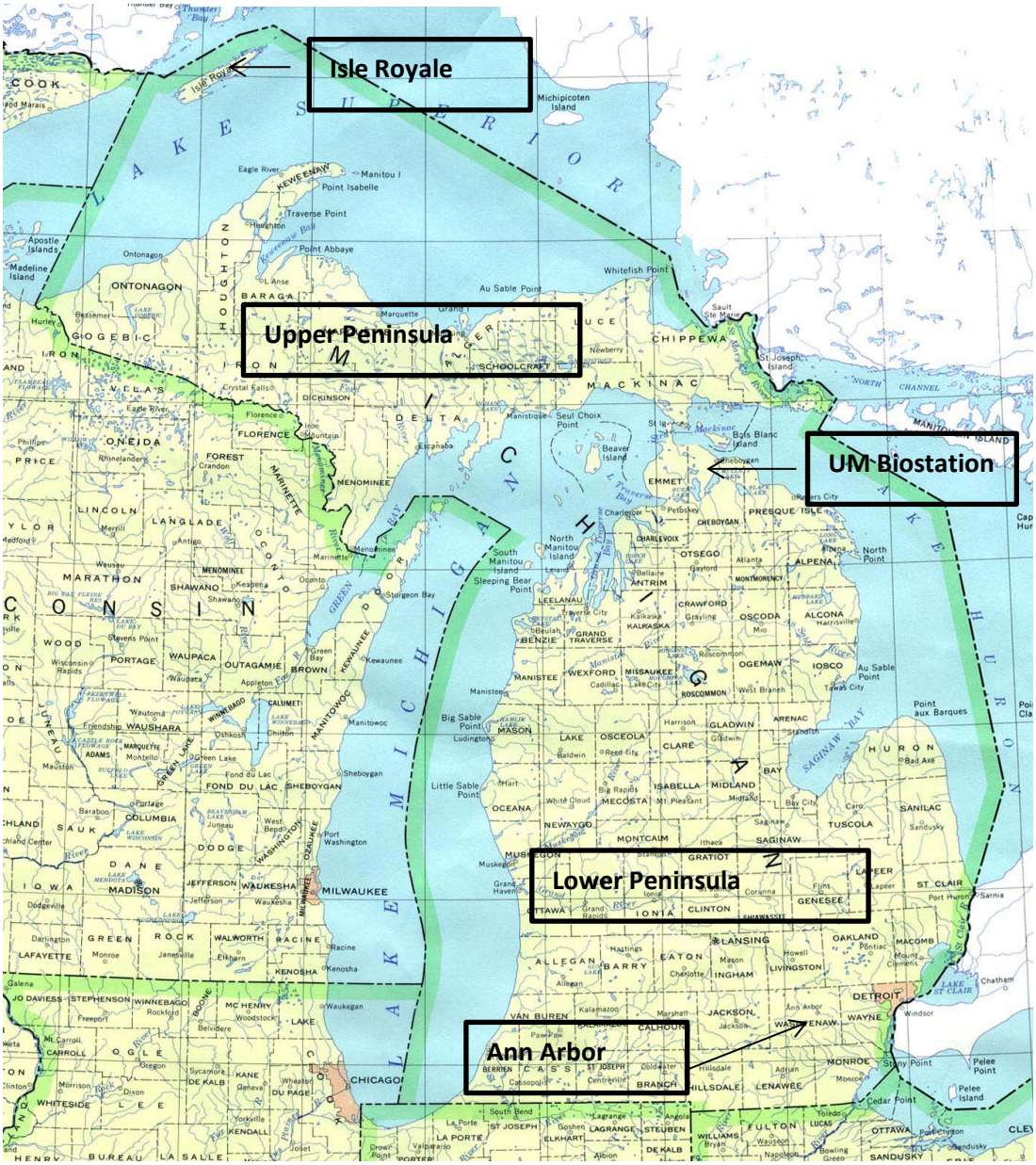
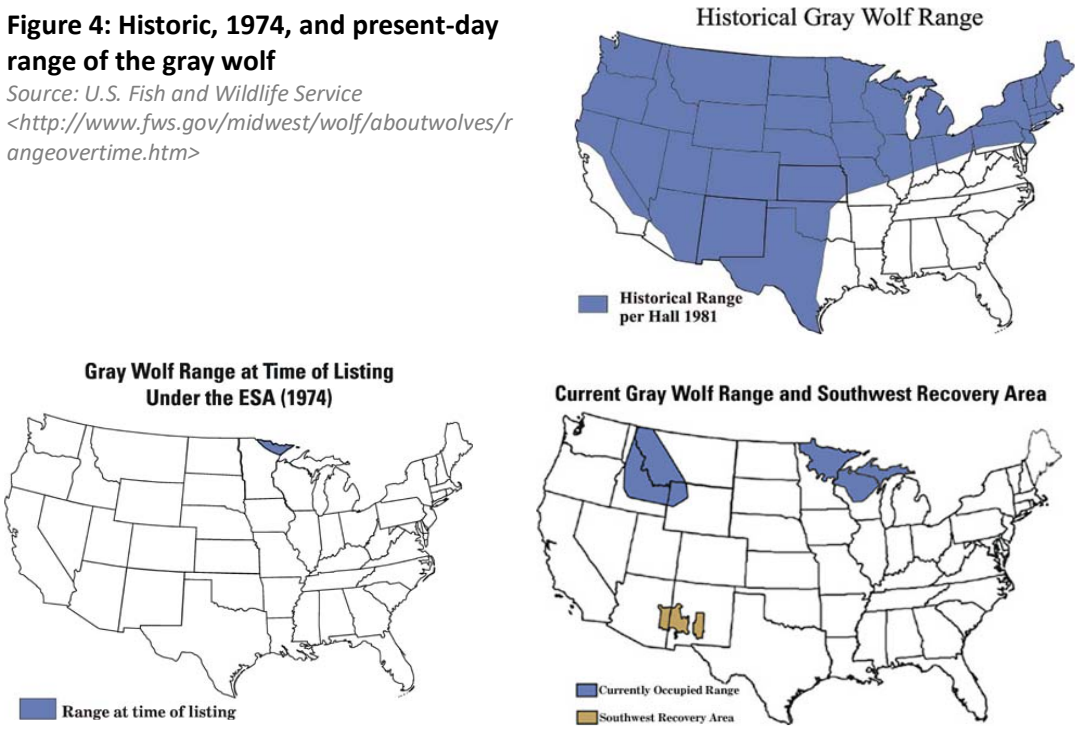


**Figure 4: Historic, 1974, and present-day range of the gray wolf**

*Source: U.S. Fish and Wildlife Service <http://www.fws.gov/midwest/wolf/aboutwolves/rangeovertime.htm>*

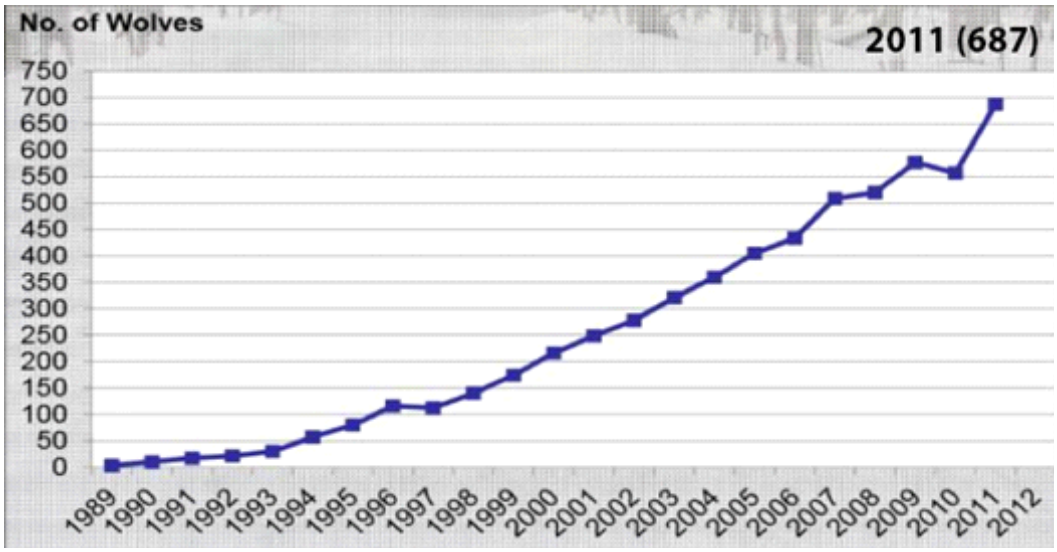



In a major turnaround for the species, Michigan followed other states in legislating protection for wolves in 1965. This gave the few remaining individuals—estimated to be six in the Upper Peninsula and an additional tiny population on Isle Royale—reprieve from systematic hunting, allowing them to begin a slow recovery. Their recovery was bolstered by the 1974 listing of wolves as an endangered species soon after the passage of the 1973 federal Endangered Species Act (ESA).[6] [See Appendix A for a factsheet describing the provisions and function of the ESA. The ESA made hunting and killing of listed species illegal, and it required that a recovery plan be created to guide actions for species conservation.]

There were signs that wolves were staging a comeback, as reports of sightings in Michigan's U.P. began to increase in the 1970s. To try to speed up this recovery, biologists made an attempt in 1974 to introduce a pack of four from Minnesota into the U.P. The plan failed when humans killed all four wolves before they had time to reproduce, causing Michigan's DNR to decide that it would no longer try to intervene in the reestablishment of wolves in the state. This natural recovery gained steam when a pair of wolves was discovered to have immigrated from nearby states into the central U.P. in the 1980s. As the pair began to reproduce in the early 1990s, a steady increase in the population ensued (**Figure 5**). In 2010, 687 wolves were documented to be living in the state. Simultaneously, the public was becoming increasingly supportive of the wolf comeback, with a majority of Michigan residents supporting wolf recovery in the state.[7,8]

**Figure 5: Michigan wolf population, 1989–2011**

*Source: Michigan Department of Natural Resources <http://www.michigan.gov/dnr/>*




Federal and state protection was pivotal in wolves' recovery. The Wolf Recovery Plan, developed to meet ESA requirements, stipulated that the Wisconsin–Michigan population must exceed 100 for a minimum of five consecutive years to ensure the survival of the species, which was achieved by 1994. In 1997, Michigan completed its own recovery plan, the Michigan Wolf Recovery and Management Plan, recommending a population of 200 for five consecutive years. Meeting these goals would pave the way for the removal of the species from state and federal endangered species lists, and indeed the Michigan Legislature and the U.S. Fish and Wildlife Service removed Michigan's wolves from the state and federal endangered species lists in 2009 and 2012, respectively. Removal from the federal list gave full control to the state of Michigan to manage its wolf populations.

## Biology, conservation, and scientific management

### Importance of wolves in the ecosystem

Gray wolves are considered to be a "keystone" species that plays a unique role in maintaining the health of many ecosystems.[9] Biological study of Yellowstone National Park and other areas that have been repopulated by wolves sheds light on the cascade of impacts that their removal and return have had on the ecosystem. To begin, wolves help regulate the size and health of prey populations by selecting young or infirm animals to attack. This simultaneously helps manage the number of prey that reaches reproductive maturity and removes diseased animals from the herd, stemming population growth and reducing disease transmission.

Furthermore, the presence of wolves in the landscape alters the browsing patterns of prey to the benefit of vegetation. Deer, bison, elk, and other browsing species tend to feed in the open on saplings and new growth when predators are absent, which reduces the amount of vegetation that grows in an area. The presence of wolves compels these animals to seek cover and browse in less sensitive areas. This allows for vegetation to grow and for riparian areas to thrive. The cascade effect continues as heavier vegetation attracts beavers, small rodents, birds, and other species whose presence creates habitat for fish and improves the health of waterways. Finally, carcasses left by wolves provide food for scavengers, contributing to the biodiversity of the landscape.[10]

Although wolf re-introduction has led to a dramatic restoration of biodiversity and riparian ecosystems in Yellowstone, researchers are realizing that reintroducing a top predator after a 70-year absence does not solve all problems. In some areas, willows and cottonwoods are still failing to thrive and beaver have not returned. This is because heavy browsing in the absence of wolves actually changed the shape and flow rate of rivers. The habitat became unsuitable for willows and beaver, while other areas became more accessible to bison, an herbivore unaffected by wolves. Even though introduced wolves have now reduced browsing by elk, it will take more to reverse the changed hydrology and landscape of Yellowstone.[11]

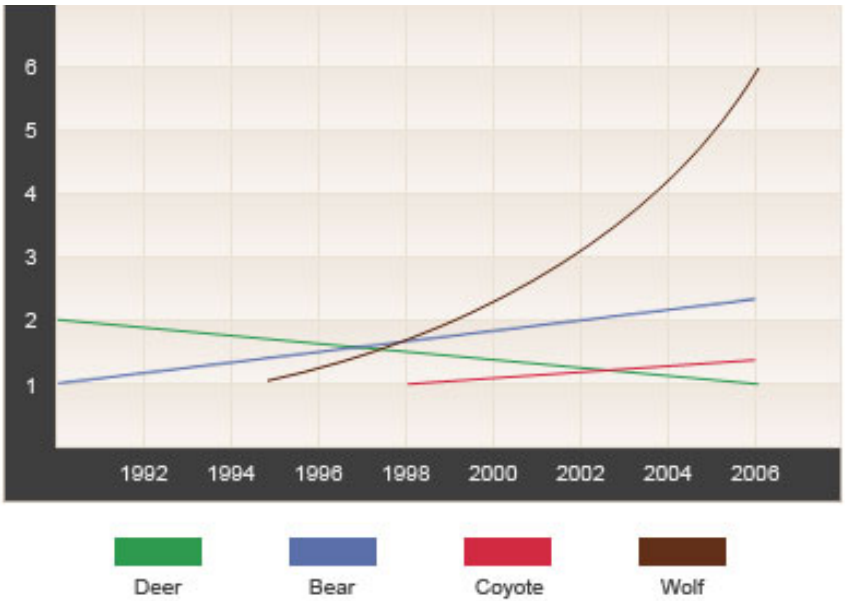
In Michigan, wolves are a key predator of white-tailed deer, a browsing species commonly found throughout the United States. In part because of a dearth of natural predators, deer densities are dramatically higher today than historical estimates, and over-abundant deer can have devastating impacts on native plant diversity and forest ecology.[12] As Forest Service researcher Stephen Horsley notes: “Foraging deer ‘vacuum up’ the seedlings of highly preferred species, reducing plant diversity and, in the extreme, creating near mono-cultures.”[13]

Hunters have noted that the growing wolf population in the Upper Peninsula of Michigan coincides with a declining deer population (**Figure 6**). However, recent studies of causes of deer mortality in this area point instead to hard winters and coyote as the main drivers.[14]

Maintaining the ecological benefit of wolves is an explicit goal of the Michigan DNR Wolf Management Plan, which recognizes that wolves can control and improve the health of prey, and have positive indirect effects on plant communities.[15] Although 200 wolves is the stated minimum viable population of wolves, it is recognized that this size may not be sufficient to provide these ecological benefits. Robert Beschta, who studied the Yellowstone system for over a decade, states that for ecological recovery, “It may be necessary for wolves not only to be present but to have an ecologically effective density.”[16]

**Figure 6: Percent annual population change of black bear, gray wolf, coyote, and white-tailed deer in Michigan's western U.P., 1990–2006**

*Source: Mississippi State University* [http://www.fwrc.msstate.edu/carnivore/predatorprey/background.asp](http://www.fwrc.msstate.edu/carnivore/predatorprey/background.asp)




## Responsibility for wolf management in Michigan: The DNR and other entities

The Michigan Department of Natural Resources is responsible for conserving, protecting, and managing the state's natural and cultural resources. The DNR aims to balance thriving ecosystems, healthy natural resource-based economies, and sustainable recreation and enjoyment of those resources.[17]

Once wolves were delisted from the federal endangered species list in 2012, wolf management was added to the list of DNR's responsibilities. Because it regulates both wildlife and game species, the DNR approaches wolf management both from the perspective of wolves as a wildlife species and as a game animal. As a result, decision-making about how to manage Michigan's wolf population takes into account biological, social, and economic considerations, as discussed further below.

Various committees and groups within the DNR contribute to wildlife management decision-making in the state. The Michigan Wolf Management Advisory Council (WMAC) was formed to review the Wolf Management Plan periodically and to provide guidance to the DNR on what changes should be made. WMAC is represented by people from relevant agencies and stakeholder groups. At a higher level, the NRC, a group of seven governor-appointed members, is responsible for helping to develop policy that influences DNR direction and priorities. The NRC also has authority to regulate game species.[18]

## Wolf management

State and federal regulatory bodies consider how to achieve both social and ecological goals in wolf management decision-making. Whereas the 1997 Michigan Wolf Recovery and Management Plan was created largely in the context of protecting the species and ensuring its successful recovery, the 2008 version of the plan was updated to take a more holistic view of protecting wolves while addressing their coexistence with humans[19] (**Figure 7**).

**Figure 7: Goals of Michigan Wolf Recovery and Management Plan**

*Source: Michigan DNR <Michigan.gov/dnr>*

1) Maintain a viable Michigan wolf population above a level that would warrant its classification as threatened or endangered (200 wolves).

2) Facilitate ecological and social wolf-related benefits.

3) Minimize wolf-related conflicts.

4) Conduct science-based wolf management with socially acceptable methods.

Defining successful wolf management depends on the goals of managing the population and the context for establishing those goals. The DNR notes that the "biological carrying capacity" and "social carrying capacity" of wolves should be considered. *Biological carrying capacity* (BCC) refers to the concept that the population of a species is limited by the ability of the environment to support it with food, water, and habitat. *Social carrying capacity* (SCC) refers to how human tolerance for a species might limit its population. Successful management of wolves, then, means balancing the biological viability of the species and its important role in the ecosystem with the tolerance of the humans who live in its presence. As wildlife biologist David Hammill put it in testifying before the NRC, the viability of the wolf population in the state depends on the ability of humans and wolves to coexist peacefully. As a result, where species are in particular conflict with humans, conflict management is critical to sound scientific decision-making. Management goals are developed to balance ecosystem benefits and human conflicts.

The Michigan Wolf Roundtable, a stakeholder committee reflecting various points of view, was convened by the DNR to provide recommendations on wolf issues. The committee's 2006 report indicated that "goals for wolf management should be based on wolf impacts rather than wolf abundance or numbers" that balance ecological and social concerns.[20] The 20-member committee contained representatives from groups as divergent as the Michigan Farm Bureau, the Upper Peninsula Sportsmen's Alliance, the Michigan Humane Society, and the Timber Wolf Alliance. Members reached consensus on the need to have lethal control of wolves as an "option for response to conflicts involving wolves and livestock. However, the revised wolf plan should place a high priority on developing, evaluating and applying non-lethal management methods." While the group could agree on many things, they could not agree on whether a hunting/trapping season was appropriate. "After substantial deliberation, we concluded consensus on any guiding principles regarding this issue was not possible because the disagreement focused primarily on important differences in fundamental values."[21]

Managing the wolf population can involve various methods of population control, including fertility control, translocation to less populated areas, and selective killing. "Passive management," which essentially allows the population to grow to its biological carrying capacity, is also an option, though it does not address the issue of social carrying capacity. Generally, today these methods are carried out by professionals such as those in the U.S. Fish and Wildlife Service, though in the past the government has allowed and even paid individuals to kill wolves. The designation of wolves as a game species that can be hunted recreationally creates another option for managing the wolf population with potential benefits. The level of take is determined by scientists and managers to ensure viability. Hunters benefit from a new opportunity, and residents perceive that the human–wolf conflict issue is being addressed.[22]

Scientists on both sides of the debate appear to recognize the importance of balancing social and ecological concerns, but disagreement arises over how those concerns should be weighed against one another. Some wolf advocate groups, whose members include both scientists and non-scientists, question this approach to scientific management, asserting that there is no biological need or solid scientific support for a public wolf hunt. Moreover, they argue that public concerns about human–wolf interactions are overblown and that those interactions tend to be so rare that a public wolf hunt is not a sensible approach for dealing with them.[23]

## Humans and wolves: A delicate relationship

Wolves hold a distinct place in Western European culture. Children's stories and fairy tales written centuries ago provide a glimpse of one attitude towards the animal: *The Boy Who Cried Wolf*, *Little Red Riding Hood*, and *The Three Little Pigs* all feature the archetypal big bad wolf. But in the 21st century with an urban population, a more developed landscape, and vastly smaller numbers of predators, is the potential for attack by wolves a real problem? Do they need to be treated as a threat to life and livelihood?

### Attacks on people and dogs

There are few documented wolf-related human deaths in North America. Since 2000, three documented deaths have occurred as a result of wolf attacks (two in Alaska and one in Ontario). A 2002 report produced by the Norwegian Institute for Nature Research cited 18 total wolf attacks in North America in the 20th century.[24] The report identifies four factors associated with attacks on humans: rabies, habituation (when wolves lose the fear of humans), provocation, and highly modified environments. Also in 2002, the Alaska Department of Fish and Game stated that no human deaths have been attributed to healthy wolves since 1900, with the reported deaths being attributed to wolves afflicted with rabies.[25]

While no documented wolf attacks on humans have occurred in Michigan, there have been a handful of attacks on dogs. A 2011 paper found 34 instances of domestic dog depredations between 1996 and 2008.[26] Moreover, a majority of residents in the U.P. believe that wolves are becoming increasingly comfortable with humans, which increases the risks of wolves attacking

people. In an April 2013 memo, the DNR comments on human–wolf interactions in Gogebic County, MI:

> Since 2010, we have recorded 91 complaints of nuisance wolf behavior including wolves traveling within the city limits, wolves chasing dogs in residential areas, and wolves traveling in close proximity to children waiting for school buses or at day care facilities. USDA Wildlife Services, under our direction, has spent a considerable amount of time responding to these complaints. Since 2010, they have employed harassment techniques (cracker shells) and provided technical advice to residents on avoiding negative wolf–human interactions. When the nonlethal techniques failed to resolve the problems, Wildlife Services removed 17 wolves from the area.[27]

Data from the last century indicate that wolf attacks on people and pets in North America are rare, but the past may not be indicative of the future, especially when taking into account the absence of wolves for most of the 20th century.

### Livestock disturbances

The most visible type of livestock disturbance is depredation, when wolves attack and injure or kill livestock. Across North America, sheep and cattle are the most common targets, but any type of livestock can be subject to depredation. Between 1996 and 2008, 87 livestock depredations were recorded in Michigan, with 70% of events involving cattle.[28] There is a positive relationship between wolf abundance and cattle depredation in the U.P., and the 1996–2008 data suggest that for each additional 100 wolves, there will be an additional three cattle depredations.[29] Even when wolf incursions onto farm or ranch land do not directly result in injury, close encounters can frighten cattle and cause them to be less willing to graze. Reduced grazing results in smaller and less valuable cattle. Wolf encounters can also hamper the ability of dogs in herding cattle, negatively affecting the efficiency of livestock operations. Farmers and ranchers note that indirect impacts on productivity do not qualify for compensation under programs designed to mitigate the impact of wolf depredations.[30]

## A political and regulatory saga

The path leading up to the NRC's decision is marked by political drama, in which the Michigan Legislature repeatedly took action to advance the state toward a wolf hunt, hunting groups tried to use ballot measures to promote a hunt, and anti-hunting groups sought to use them to stop the hunt. Public Act 377 granted the NRC exclusive authority to regulate the taking of game in Michigan, removing that power from the Director of the Department of Natural Resources. The proposal was an outgrowth of a ballot initiative funded by outdoor recreation and hunting organizations,[31] and passed by a 69% to 31% margin.[32] Along with granting the NRC new authority, the statute requires that the NRC, "to the greatest extent practicable… use principles of sound scientific management in making decisions regarding the taking of game."

In 2012, State Senator Tom Casperson (R-Escanaba), representing a U.P. congressional district, introduced a bill that would list the wolf as a game species. The bill passed the legislature with overwhelming support,[33] and Governor Snyder signed it before the end of the year, creating Public Act 520. Once designated as a game species by the legislature, the responsibility falls to the NRC to determine whether a hunting season is appropriate.

After the Casperson bill went into effect, an anti-hunting group in Michigan called Keeping Michigan Wolves Protected (KMWP) launched a petition effort to refer PA 520 to a public vote. The initiative submitted more than 255,000 votes, sufficient to force PA 520 onto the ballot. In response, Senator Casperson introduced Senate Bill 288, which effectively bypassed the ballot initiative process, making the anti-hunting groups' efforts moot. The bill passed the legislature with overwhelming support.[34]

In accordance with the requirements of PA 377 to make decisions based on sound science, the NRC asked the Michigan DNR to make a recommendation on whether or not to create a hunting season. The DNR concluded that a public wolf hunt in three specific areas of the U.P. would reduce human–wolf conflicts without hampering the overall abundance of the wolf population. Table 1 shows the DNR recommended areas, the size of the areas, the number of wolves removed by the United States Department of Agriculture Wildlife Services in 2012, and the number of wolves authorized for harvesting in each area. [See Appendix B for a map of the proposed Wolf Management Units.]

**Table 1: DNR Wolf Management Unit proposal**

| Wolf Management Unit | Area (Square Miles) | Purpose | Wolves Removed by USDA in 2012 | Wolves Authorized for Harvest |
|---|---|---|---|---|
| A – Gogebic County | 337 | Nuisance complaints | 18 | 16 |
| B – Baraga, Houghton, Ontonagon, and Gogebic counties | 1,347 | Chronic livestock depredation | 17 | 19 |
| C – Luce and Mackinac counties | 386 | Reduce chronic livestock and dog depredations | 2 | 8 |

### Neighboring states: Examples for Michigan?

Michigan can look to its neighbors to the west for a picture of how a wolf hunt might play out. Following federal delisting early in 2012, Minnesota and Wisconsin, the two other states in the tri-state Western Great Lakes Distinct Population Segment, put into place hunting seasons later that same year. Similar to Michigan, both states experienced significant political turmoil during the decision-making process.

Minnesota's wolf hunt was authorized by its legislature after classifying wolves as small game through state statute. The Minnesota DNR performed a comprehensive wolf population survey in 2008 and counted 2,900 wolves.[35] A target harvest was set at 400. Like Michigan, the Minnesota wolf hunt was split into three territories—east central, northeast, and northwest—with harvest targets of 18, 117, and 265, respectively. The 2012 hunt resulted in 413 wolves taken compared to the target of 400.[36]

Wisconsin's wolf hunt was also authorized through a state statute that requires a wolf hunting and trapping season. Act 169, signed in April 2012, authorized the Wisconsin DNR to design an appropriate hunting and trapping season. Wisconsin's wolf management plan allows for a public hunt if the wolf population outside of Native American reservations exceeds 350. The population goal was met in 2004, and the state status was changed from "threatened" to "protected wild animal." For the 2012 hunt, the DNR set a quota of 201, with an actual harvest of 117.[37]

## Divergent perspectives on the issue

### Upper Peninsula residents and livestock interests

The majority of wolves in Michigan are located in the Upper Peninsula, and U.P. residents have mixed feelings about the animals in their midst. A 2005 survey of Upper and Lower Peninsula residents revealed that tolerance for wolves was highest among Lower Peninsula residents and lowest among residents of the U.P. A second study conducted in 2010 revealed that the majority (82%) of Michigan residents polled strongly agreed that wolves have value, and 78% agreed with the statement: "Wolves should only be hunted if biologists believe the wolf population can sustain a hunt." However, fewer of the U.P. respondents viewed wolves as having value and 55% reported an interest in hunting them.[38] Others see the economic benefits that might be derived from an expansion in wolf-based tourism, including hunting, viewing, and public events.

The Straits of Mackinaw divide more than geography, and cultural differences and varying perspectives often separate the interests of the people who live in the two Michigan peninsulas. The U.P. is generally more rural, more conservative, and less diverse than the downstate population, as well as more dependent on the region's natural resources for its economy. Economic conditions in the U.P. have been hit harder by the various economic downturns the state has experienced over the last several decades. Often anti-government and proudly independent, U.P. residents resent the domination of state policies by the more populous and

urban Lower Peninsula. However, they still maintain a strong presence in the state legislature. While there are anti-hunting advocates in the U.P., there is an "us-versus-them" flavor to the wolf hunting question, which feeds the outrage among U.P. residents because they are the ones living with the impacts of the wolf population.

Farmers who raise livestock have been most vocal on the need to cull wolf numbers. John Koski, a 68-year-old U.P. farmer, has had 119 cattle killed or injured by wolves in the past three years, more than any other farmer in the state. As noted in *USA Today*, "Government-paid sharpshooters and trappers have killed dozens of wolves who've take a liking to Koski's cattle." "I think this is the last year I'm going to keep cattle here," Koski laments, "because I'm losing so many. Sooner or later," he warns, "those wolves are going to kill a person, or a kid waiting for a school bus."[39]

Reflecting concerns over these impacts, the Michigan Farm Bureau (MFB)—one of the most important farm groups in the state, with nearly 48,000 farming families statewide—has been outspoken in support of a wolf hunt. The MFB, as well as many individual livestock-owning members, provided testimony at a meeting of the NRC in support of the hunt as a tool to manage increasing predation of cattle by wolves.[40] Although some ranchers have attempted to use non-lethal methods of reducing livestock predation by wolves, there is a sense of frustration at the lack of success of these measures and near-consensus that public wolf hunts will be far more effective by controlling the number of wolves that can prey on livestock.[41]

Many U.P. residents respect wolves and acknowledge their value but support a public hunt as a technique to better manage a growing population. As one resident puts it, "I love to hear the wolf's howl; I love to see their tracks. But I want there to be a better balance, and I want them to be afraid of people."[42] "There's a wolf problem in the area—I think everyone understands that," says Ironwood City Manager Scott Erickson. "I've never heard anyone say they want to eliminate wolves, but just manage them in an appropriate manner."[43] His perspective was echoed by a DNR manager who commented, "The department's recommendation is not based on providing recreational opportunities; it's to resolve conflicts."[44]

## Hunting and fishing groups

The Michigan United Conservation Clubs (MUCC) is one of the largest and most vocal groups in support of the Michigan wolf hunt. MUCC is largely composed of clubs that focus on outdoor recreation, specifically hunting, fishing, and trapping. The hunting and fishing community in Michigan is large—one in six residents hunt or fish, and license fees provide over 20% of the DNR budget.[45] A thriving wildlife population is key to the continued success of these sporting groups, which often state that sound scientific management of wildlife species is a key priority. From that perspective, the MUCC and its affiliated clubs stand behind the DNR's recommendation to allow a public wolf hunt.

Deer hunting is popular in Michigan, and hunters have blamed rising wolf populations for

causing declining deer sightings, making hunting more difficult.[46] Though MUCC and other hunting organizations have not focused on the impact of wolves on deer harvests, deer harvests have declined from 490,000 in 2007[47] to 418,000 in 2012,[48] a 12% drop. The number of hunters has declined 5% over the same time period, from 694,000 to 654,000, and MUCC is keenly aware of the need to maintain interest in hunting. They see the wolf hunt as a way to stimulate new interest. Hunting activity contributes directly to the state economy through trip-related expenses and equipment purchases. In 2011, those contributions totaled $2.3 billion.[49]

According to Erin McDonough, MUCC executive director, "Wolves are a conservation success story."[50] In MUCC's eyes, actively managing wolves will have a positive effect on their populations. According to McDonough, "Having hunters and trappers assist the department with their management continues the scientific-based framework that has been so successful in sustaining other recovered populations like elk and turkey in Michigan."[51]

Indeed, MUCC perceives efforts by Keeping Michigan Wolves Protected (KMWP) and the Humane Society of the United States (HSUS), which is the primary financial backer of KMWP, as pushing a "radical animal rights agenda"[52] rather than sound management of the gray wolf population. When questioned about the fact that KMWP and HSUS were able to collect over 200,000 signatures to get an anti-hunting initiative on the ballot, MUCC executive director McDonough offered her perspective on the legitimacy of out-of-area organizations:

> The fact that HSUS was able to collect the required number of signatures tells us nothing about the issue other than if you are willing to spend hundreds of thousands of dollars and target areas of the state without a wolf population and refuse to educate the public about the issue, you can collect a lot of signatures. MUCC believes that HSUS has vastly underestimated the intelligence level of Michigan's residents and has grossly overestimated this state's tolerance for out-of-state extremists attempting to buy election results.[53]

## Anti-hunting groups

Keeping Michigan Wolves Protected (KMWP) is the most prominent group opposing the wolf hunt. It is supported by HSUS, the American Humane Association, and other groups at the national and regional levels. KMWP and other organizations oppose hunting the wolf on several grounds. In their view, a public hunt will not resolve human-wolf conflicts because wolves taken in the hunt may not be the problematic animals. Secondly, they argue that the wolf population is fragile, and a wolf hunt would put the species at risk again. Jill Fritz, Michigan director of HSUS, notes that Minnesota, which had its first wolf hunt last year, has cut their wolf quota in half for this year's hunt because of a big drop in the wolf population. "Minnesota's rush to a hunt is now causing them to backpedal. And that's something we can't afford to do here in Michigan because we have so many fewer wolves."[54]

Many of these anti-hunting groups believe that wolf hunting is morally wrong. John Vucetich,

co-director of the Isle Royale Wolf-Moose project, notes, "Wolf hunting is not like deer hunting, where hunters and their families are sustained by consuming its meat. We lose our humanity when we kill living creatures without adequate reason."[55] According to the American Humane Association's position on hunting, the groups are:

> Opposed to the hunting of any living creature for fun, a trophy, or for simple sport … [AHA] believes that sport hunting is a form of exploitation of animals for the entertainment of the hunter … When all other avenues have been exhausted and there remains a demonstrable necessity to kill some wildlife, it should be performed by responsible officials and methods utilized must result in instantaneous and humane death.[56]

Additionally, the groups view a wolf hunt as responding to a problem that has already been solved. Michigan currently has laws in place that allow residents to kill wolves in response to an attack on people, livestock, or pets. Since livestock groups can be compensated for livestock depredation, wolf advocates contend that a public wolf hunt will not provide additional benefits to U.P. residents and farmers. In summary, KMWP argues that:

> After 50 years on the protected list, wolves in Michigan are only now starting to recover. The current population estimate is only 658 wolves.
>
> It's not right to spend decades bringing the wolf back from the brink of extinction only to turn around and allow them to be hunted and trapped for trophies. People don't eat wolves. It's already legal in Michigan to kill wolves in order to protect livestock or dogs. There is no scientific reason to hunt and trap wolves. Wolf hunting may involve especially cruel and unfair practices, such as painful steel-jawed leghold traps and hunting over bait.
>
> It is the goal of Keep Michigan Wolves Protected to preserve the longstanding Michigan prohibition on the trophy hunting of this iconic species.[57]

They also contend that public opinion is allied with their position. They collected more than 250,000 signatures to place the question of a wolf hunt on a public ballot, which in their view suggests the significant level of public opposition to a hunt. They also cite their analysis of public comments collected by the NRC, which KMWP had to obtain via a Freedom of Information Act request. Of 7,000 public comments, Nancy Warren of NWC stated, "Based on a random sample they appear to be overwhelmingly opposed to a wolf hunt."[58]

The groups also contend that the DNR has not been forthcoming about the science on which decisions have been based. Proposed harvest levels appear to be based on literature analyzing population data from other geographic areas, not from a specific model and analysis of Michigan wolf population dynamics (including factors such as sex ratios, age structure, and disease prevalence).

## Environmental groups

National environmental groups—including Defenders of Wildlife, the National Resources Defense Council, the Sierra Club, and the Center for Biological Diversity—have taken positions against wolf hunting in states where a hunt has become a possibility.[59,60] Although these groups have not weighed in substantially during the debate over wolf hunting in Michigan, presumably their position remains the same.

However, national environmental organizations are not unified on the issue. Some argue that hunting is an appropriate wildlife management tool. For example, Ducks Unlimited "supports the concept of regulated sport hunting as an integral part of sound wildlife management, and as a wise and prudent use of renewable natural resources,"[61] while National Wildlife Federation, one of the largest conservation organizations in the country, "supports hunting because, under professional regulation, wildlife populations are renewable natural resources that can safely sustain taking."[62]

For others, the issue is not hunting *per se*, but rather the viability of a species or the health of the larger ecosystem. For example, World Wildlife Fund, "recognizes that responsibly conducted hunting can be an appropriate wildlife management tool, particularly for abundant game that is maintained on a sustainable basis.… WWF opposes hunting that might adversely affect the survival of threatened or endangered species."[63] Similarly, the National Audubon Society notes:

> Our objective is wildlife and environmental conservation, not the promotion of hunting. We think lots of the justifications for hunting are weak ones, and too often exaggerated for commercial reasons, and we do not hesitate to say to when the occasion calls for it. But this does not make us anti-hunting.[64]

For membership-based organizations, the issue of whether to support a hunt or not has a lot to do with the interests of the members and what the organizations can do to sustain their membership base. Defenders of Wildlife, for example, notes that they are "neither an anti-hunting or pro-hunting organization, but most of our 80,000 members are non-hunters."[65] Clearly the image of wolves has changed, so that many people see them as charismatic megafauna, whose dog-like image in movies and literature makes it hard to imagine a hunt.

On the other hand, national environmental groups are aware of their image as "anti-." They want to be seen as embracing sustainable conservation activities. By supporting a wolf management program, they can suggest that endangered species policy can actually work in rebuilding populations enough so that they can be used to support local economies. The relationship between hunting and fishing groups and mainstream environmental organizations has often been strained. Yet, when they have occasionally worked in tandem, they have built a political coalition of significant power. Supporting a hunt may be a strategy for getting greater influence over future conservation decisions.

## Native American tribes

Native American tribal groups across the state, including tribes within the Ottawa and Chippewa nations, are largely opposed to the wolf hunt and have staged protests **(Figure 8)**. For many tribes, wolves represent a critical part of a healthy ecosystem and a public hunt is not a necessary management strategy. They believe that current wolf populations can easily be sustained without problematic human conflict. "What is the biological basis for a hunt?" asks the Chippewa Tribal Chairman.[66]


**Figure 8: Native protesters at the Michigan capitol in 2013**
*Source: <nativenewsnetwork.org>*

Furthermore, many believe that longstanding sovereignty issues are involved, and that tribal groups should have an equal say with the DNR in how wolves are managed in the state. An 1836 treaty granted them unlimited hunting and fishing rights to the 13 million acres of land they ceded to the United States. That treaty was strengthened in 2007, with new provisions committing the DNR to coordinate with the tribes on natural resource management. Yet the relationship between the state and the tribes has been uneven at best and often antagonistic, reflecting more than a hundred years of conflict and mistreatment.

More fundamentally, the wolf is an important aspect of tribal heritage and culture that tribes have, for decades, fought to preserve. Some see a parallel between the fall and rise of wolf populations in the state and the decline and resurgence of native groups; a public wolf hunt that threatens the revival of wolves represents a setback for the tribes as well. [67]

Five Michigan Indian tribes say they will challenge the decision if the state goes ahead with a wolf hunt in the U.P. They do not feel that the state has meaningfully consulted with the tribes as it considers instituting a public wolf hunt, nor that state officials or citizens fully understand or respect the importance of the wolf to Indian culture. "We understand wolves to be educators, teaching us about hunting and working together in extended family units," comments James Zorn, executive director of the Great Lakes Indian Fish and Wildlife Commission. "Wolves exemplify perseverance, guardianship, intelligence, and wisdom."[68]

The chair of the Sault Ste. Marie tribe of Chippewa Indians describes the wolf as "a sacred part of Indian culture and a hunting season disrespects the wolf."[69] The wolf is part of the creation story for Michigan tribes:

> *In the beginning of time, the Creator made Anishinaabe, the original man, and his brother Ma'iingan, the wolf. Together, they walked the Earth naming all of the other creatures on the planet.*
>
> *There came a time when the Creator said the two must live apart but warned that whatever happened to one would happen to the other. To this day, the wolf howls in mourning for the loss of his friend, Anishinaabe.*[70]

The tribes are frustrated by the indifference of white culture to long-standing tribal cultural practices, an indifference that continues to whittle away at tribal efforts to sustain a sense of hope in the survival of the wolf, and hence their people. "Whatever befalls one will befall the other," says Jimmie Mitchell of the Little River Band of Ottawa Indians.[71] "There is a correlation. As the tribes began to heal, the wolf began to heal. Do we risk the possibility of the population being hunted beyond sustainability and lose them again?"[72] Joe Rose Sr., an Indian elder, put it this way: "We see the wolf as a predictor of our future. And what happens to wolf happens to Anishinaabe." And, he comments, "whether other people see it or not, the same will happen to them."[73]

Senator Tom Casperson (R-Escanaba), the primary sponsor of legislation that paved the way for considering a wolf hunt, dismissed tribal concerns, saying:

> That's a personal belief they have. But at the end of the day, I do think many people don't hold that same belief, so what do we do. Do we hold fast to it because the tribes say it's sensitive to them, when many of my citizens don't hold that same value?[74]

## Scientists and managers

As the agency with day-to-day management authority and the bulk of expertise in wildlife biology and management, the state Department of Natural Resources has gone on record in support of a public hunt. In its view, a public hunt can address "conflict issues such as potential wolf-human conflicts and wolf depredation of domestic animals. A public hunt can also help provide a self-sustaining and healthy population of wolves, consistent with accepted population science and biology with respect to the species. A public hunt would also provide an opportunity for sportsmen and trappers to be further involved in Michigan's important hunting and fishing heritage, thereby providing benefits with respect to tourism and recreation."[75]

DNR staff also noted that the hunt would provide them with additional license revenue to support critical and ongoing research to monitor the wolf population. Only 9 percent of the agency's budget comes from taxpayer dollars. Its conservation programs are funded in part through license fees for hunting and fishing. However, the Michigan Legislature has not raised fees since 1996, contributing to a decline in conservation funds that has resulted in $8 million in program cuts since 2009.[76] Issuing 1,200 wolf hunting licenses at $100/resident and $500/nonresident would raise some needed funds.

DNR staff scientists concluded that overall wolf abundance would not be reduced unless human-caused wolf mortality exceeds 30% of the total population. Their conclusion was not based specifically on a viability analysis of the Michigan wolf population, but drew from the sustainable harvest rate of 35% proposed in the literature by researchers of wolf populations in other areas, including Quebec, Alaska, Minnesota, and Poland.[77] In the DNR's view, an appropriately limited harvest of wolves will not change the overall size or trajectory of the Michigan wolf population. Since the prey base (deer) in the state of Michigan is abundant and wolves produce ample young, population growth rates seen in recent years should continue.

At its core, leadership and staff of the Michigan DNR believe that hunting is an appropriate and effective way to manage wildlife populations, a view perhaps best summarized by the following statement: "The North American Model of Wildlife Conservation has served to protect, enhance, reestablish, and assure sustainability for a great many species in this country. Scientific wildlife management is a cornerstone of the model, and managing wolves consistent with these principles will ultimately benefit the species."[78] More specifically, the DNR anticipates two significant benefits of a wolf hunt: "First, through time, hunting could change the behavior of wolves, making them more wary of people, residential areas and farms. A reduction in wolves displaying fearless behavior would reduce the number of nuisance wolf complaints. Second, hunting could also reduce the abundance of wolves, which may result in fewer conflicts."[79]

Other scientists and researchers have a more mixed view of the desirability of a public hunt. Some sound a cautionary note from the Yellowstone experience, where the wolf population plummeted after years of robust growth. Researchers of the wolves on Isle Royale have also witnessed dramatic population fluctuations. Whether the source of the population decline is disease or some other factor, some Michigan biologists have argued that the state needs to be careful in ensuring the resilience of the wolf population in the face of future unknown considerations. Some have argued for an adaptive management approach, where wolves in some areas might culled through controlled means that allow for monitoring experimentation. They cite the experience of the inaugural open season on wolves in Wyoming, where a hunter legally killed a female wolf who was wearing a $4,000 GPS collar that enabled researchers to record her exact location every 30 minutes.[80] A few weeks earlier, her packmate was also shot and killed. The killings blew up into a media controversy reported worldwide—not the kind of publicity a management agency wants or needs.

Some biologists believe that wolf management to prevent livestock depredation can be accomplished through other nonlethal methods, "such as fencing, guard animals such barking dogs, loud noises or flashing lights. When those methods do not work, killing problem wolves may act to deter others from the behavior."[81]

Researchers from Michigan Technological University (MTU) opposed to the hunt commented:

> Advocates of wolf hunting claim that wolf hunting is supported by the best-available

> science. This misrepresents the role of science. The best-available science clearly indicates that we have the technical ability to manage a wolf hunt without endangering the population viability of Michigan wolves. But there is no science that concludes it is necessary to hunt wolves in Michigan.[82]

## The choice at hand

J. R. Richardson stares at the stack of public comments, the DNR recommendation, and a pile of expert interviews, knowing that the fate of public wolf hunting in Michigan rests on his decision. His mandate is to base his decision on sound science, and he is on record stating, "All we can do is based on the science. At the end of the day, there is a lot of passion that is going to bring out a lot of emotion. What we are charged to look through is the emotion and passion."[83]

But science alone does not seem to hold the answer to whether a public hunt should be held. Besides, the gray wolf is such a polarizing animal and the politics of the issue so charged, Richardson has no choice but to consider the complex social and political implications of the decision.

Richardson has also become aware that the NRC's choice is not limited to a simple yes or no on a hunt, but a range of related questions as to who should do the hunting and how it should be done. Should both hunting and trapping be allowed, for example? Some of his agency managers, for example, have argued that the agency should carry out the hunt to keep it as tightly controlled as possible; others thought that it was important to start with nonlethal means of control. Others viewed these options as a waste of a good recreational and economic opportunity.

He remembers his education in environment and sustainability at the University of Michigan many years ago, and how seemingly straightforward questions posed by his professors had layers of complexity under the surface. He wonders whether there is a scientifically correct answer? Or an ethically correct answer? Do the politics of the matter warrant a decision in one direction or another? For example, will his fellow commissioners on the NRC support a decision against the hunt, given their appointments by the governor, the reaction by the legislature, and the traditional constituencies of the commission and DNR?

And what are the broader social implications of the decision? If hunters view wolves as a game animal as opposed to competition for deer or other game, will this alleviate some of their anti-wolf fervor and give the DNR more latitude to make scientifically-based management decisions in the future? What is the duty of the NRC regarding the cultural values and sovereignty concerns of Michigan's Native American tribes? KMWP and the HSUS have sparked public outrage around the hunt, but the NRC must prioritize the best interests of all citizens of Michigan. How important is public opinion, given that the vast majority of Michiganders live outside of the U.P. and will never encounter a wolf? He wished his professors and former classmates were close by to help him think through the answers.

# Appendix A: Endangered Species Act Factsheet

U.S. Fish & Wildlife Service

## ESA Basics

### *40 Years of Conserving Endangered Species*

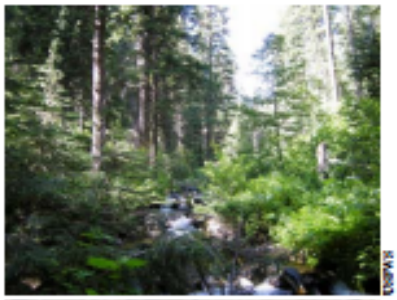
When Congress passed the Endangered Species Act (ESA) in 1973, it recognized that our rich natural heritage is of "esthetic, ecological, educational, recreational, and scientific value to our Nation and its people." It further expressed concern that many of our nation's native plants and animals were in danger of becoming extinct.

The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. The Interior Department's U.S. Fish and Wildlife Service (FWS) and the Commerce Department's National Marine Fisheries Service (NMFS) administer the ESA. The FWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

As of January 2013, the FWS has listed 2,054 species worldwide as endangered or threatened, of which 1,436 occur in the United States.

**How are Species Listed?**
Section 4 of the ESA requires species to be listed as endangered or threatened solely on the basis of their biological status and threats to their existence. When evaluating a species for listing, the FWS considers five factors: 1) damage to, or destruction of, a species' habitat; 2) overutilization of the species for commercial, recreational, scientific, or educational purposes; 3) disease or predation; 4) inadequacy of existing protection; and 5) other natural or manmade factors that affect the continued existence of the species. When one or more of these factors imperils the survival of a species, the FWS takes action to protect it. The Fish and Wildlife Service is required to base its listing decisions on the best scientific information available.



*At home in streams and lakes in Washington, Oregon, Idaho, Montana, and Nevada, the threatened bull trout needs clean, cold water with deep pools, logs for hiding, connected habitat across the landscape and, for spawning and rearing, clean streambed gravel.*

**Candidates for Listing**
The FWS also maintains a list of "candidate" species. These are species for which the FWS has enough information to warrant proposing them for listing but is precluded from doing so by higher listing priorities. While listing actions of higher priority go forward, the FWS works with States, Tribes, private landowners, private partners, and other Federal agencies to carry out conservation actions for these species to prevent further decline and possibly eliminate the need for listing.

**Protection**
The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and the interstate or international trade in listed plants and animals, including their parts and products, except under Federal permit. Such permits generally are available for conservation and scientific purposes.

**What is "Take"?**
The ESA makes it unlawful for a person to take a listed animal without a permit. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct." Through regulations, the term "harm" is defined as "an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." Listed plants are not protected from take, although it is illegal to collect or maliciously harm them on Federal land. Protection from commercial trade and the effects of Federal actions do apply for plants. In addtion, States may have their own laws restricting activity involving listed species.

**Recovery**
The law's ultimate goal is to "recover" species so they no longer need protection under the ESA. Recovery plans describe the steps needed to restore a species to ecological health. FWS biologists write and implement these plans with the assistance of species experts; other Federal, State, and local agencies; Tribes; nongovernmental organizations; academia; and other stakeholders.

**Federal Agency Cooperation**
Section 7 of the ESA requires Federal agencies to use their legal authorities to promote the conservation purposes of the ESA and to consult with the FWS and NMFS, as appropriate, to ensure that effects of actions they authorize, fund, or

carry out are not likely to jeopardize the continued existence of listed species. During consultation the "action" agency receives a "biological opinion" or concurrence letter addressing the proposed action. In the relatively few cases in which the FWS or NMFS makes a jeopardy determination, the agency offers "reasonable and prudent alternatives" about how the proposed action could be modified to avoid jeopardy. It is extremely rare that a project ends up being withdrawn or terminated because of jeopardy to a listed species.

The ESA also requires the designation of "critical habitat" for listed species when "prudent and determinable." Critical habitat includes geographic areas that contain the physical or biological features that are essential to the conservation of the species and that may need special management or protection. Critical habitat designations affect only Federal agency actions or federally funded or permitted activities. Federal agencies are required to avoid "destruction" or "adverse modification" of designated critical habitat.

Critical habitat may include areas that are not occupied by the species at the time of listing but are essential to its conservation. An area can be excluded from critical habitat designation if an economic analysis determines that the benefits of excluding it outweigh the benefits of including it, unless failure to designate the area as critical habitat may lead to extinction of the listed species.

The ESA provides a process for exempting development projects from the restrictions if a Cabinet-level "Endangered Species Committee" decides the benefits of the project clearly outweigh the benefits of conserving a species. Since its creation in 1978, the Committee has only been convened three times to make this decision.

**Working with States**
Partnerships with States are critical to our efforts to conserve listed species. Section 6 of the ESA encourages States to develop and maintain conservation programs for threatened and endangered species. Federal funding is available to promote State participation. Some State laws and regulations are more restrictive than the ESA in granting exceptions or permits.

**Working with Landowners**
Two-thirds of federally listed species have at least some habitat on private land, and some species have most of their remaining habitat on private land. The FWS has developed an array of tools and incentives to protect the interests of private landowners while encouraging management activities that benefit listed and other at-risk species.

**Habitat Conservation Plans**
Section 10 of the ESA may be used by landowners including private citizens, corporations, Tribes, States, and counties who want to develop property inhabited by listed species. Landowners may receive a permit to take such species incidental to otherwise legal activities, provided they have developed an approved habitat conservation plan (HCP). HCPs include an assessment of the likely impacts on the species from the proposed action, the steps that the permit holder will take to avoid, minimize, and mitigate the impacts, and the funding available to carry out the steps.

HCPs may benefit not only landowners but also species by securing and managing important habitat and by addressing economic development with a focus on species conservation.

**Safe Harbor Agreements**
Safe Harbor Agreements (SHAs) provide regulatory assurance for non-Federal landowners who voluntarily aid in the recovery of listed species by improving or maintaining wildlife habitat. Under SHAs, landowners manage the enrolled property and may return it to originally agreed-upon "baseline" conditions for the species and its habitat at the end of the agreement, even if this means incidentally taking the species.

**Candidate Conservation Agreements**
It is easier to conserve species before they need to be listed as endangered or threatened than to try to recover them when they are in danger of extinction or likely to become so. Candidate Conservation agreements (CCAs) are voluntary agreements between landowners—including Federal land management Agencies— and one or more other parties to reduce or remove threats to candidate or other at-risk species. Parties to the CCA work with the FWS to design conservation measures and monitor the effectiveness of plan implementation.

**Candidate Conservation Agreements with Assurances**
Under Candidate Conservation Agreements with Assurances (CCAA), non-Federal landowners volunteer to work with the FWS on plans to conserve candidate and other at-risk species so that protection of the ESA is not needed. In return, landowners receive regulatory assurances that, if a species covered by the CCAA is listed, they will not be required to do anything beyond what is specified in the agreement, and they will receive an enhancement of survival permit, allowing incidental take in reference to the management activities identified in the agreement.

**Conservation Banks**
Conservation banks are lands that are permanently protected and managed as mitigation for the loss elsewhere of listed and other at-risk species and their habitat. Conservation banking is a free-market enterprise based on supply and demand of mitigation credits. Credits are supplied by landowners who enter into a Conservation Bank Agreement with the FWS agreeing to protect and manage their lands for one or more species. Others who need to mitigate for adverse impacts to those same species may purchase conservation bank credits to meet their mitigation requirements. Conservation banking benefits species by reducing the piecemeal approach to mitigation that often results in many small, isolated and unsustainable preserves that lose their habitat functions and values over time.

**International Species**
The ESA also implements U.S. participation in the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), a 175-nation agreement designed to prevent species from becoming endangered or extinct due to international trade. Except as allowed by permit, CITES prohibits importing or exporting species listed on its three appendices. A species may require a permit under the ESA, CITES, or both.

**For More Information**
For more information, contact the U.S. Fish and Wildlife Service at the address below, or visit *http://www.fws.gov/endangered/*.

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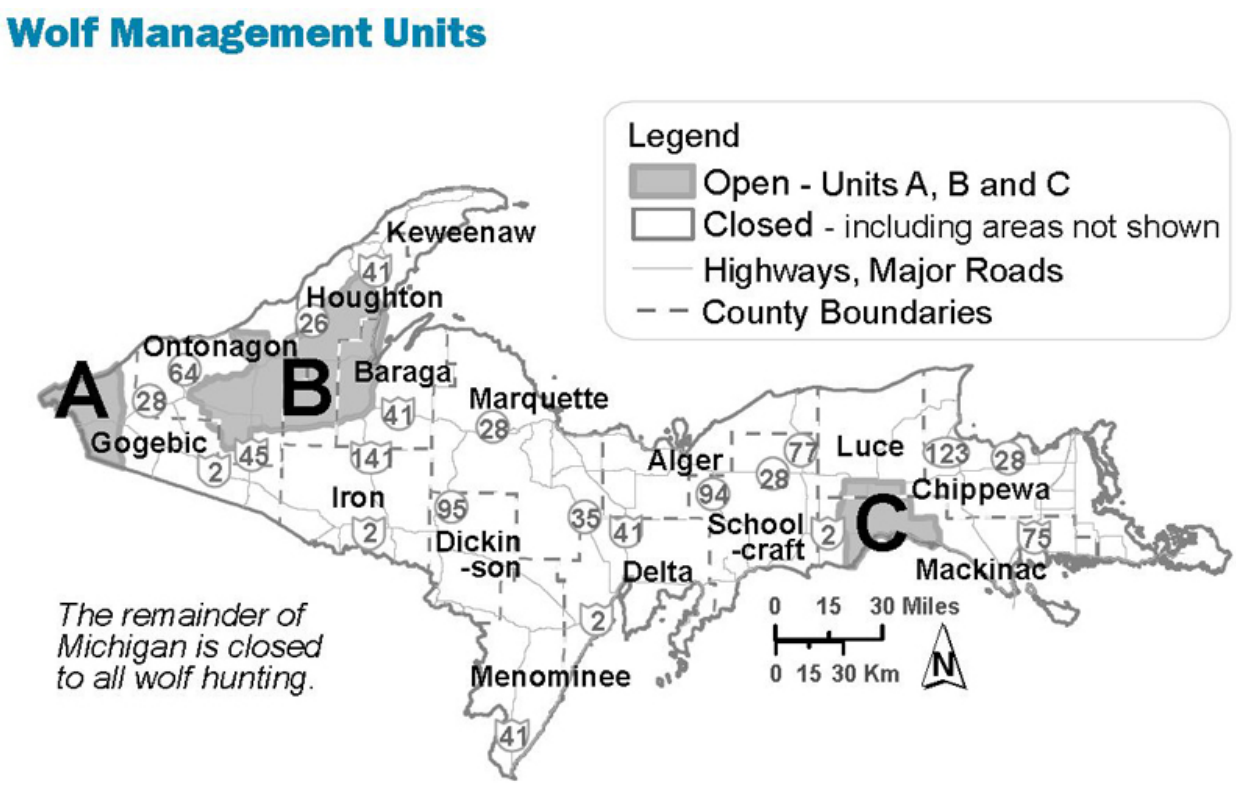
**U. S. Fish and Wildlife Service**
**Endangered Species Program**
**4401 N. Fairfax Drive, Room 420**
**Arlington, VA 22203**
**703-358-2171**
**http://www.fws.gov/endangered/**

**January 2013**

# Appendix B: Proposed Wolf Management Units




**Note:** The official and legal hunt unit boundaries are defined in Chapter XII of the Wildlife Conservation Order, which is available at www.michigan.gov/dnrlaws or by contacting the nearest DNR Customer Service Center.

Source: Michigan Department of Natural Resources
*<http://www.michigan.gov/images/dnr/Wolf_management_units_430181_7.JPG>*

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[1] The faculty and staff offer our special thanks to David Wang and Sheena Vanleuven, former students, who led the effort to develop this case study. Special thanks as well to Professors Steven Yaffee and Julia Wondolleck for their many contributions to the development of this case exercise.

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