Stakeholder Activity

Stakeholder Group: State Wildlife Managers and Science

For the stakeholder meeting, your group will represent State Wildlife Managers and Science. To make things a little easier, you'll represent only one of the state wildlife agencies in the Northern Rocky Mountain region. You will represent Montana Fish Wildlife and Parks.

Your job during the stakeholder meeting is to put yourself in the Wildlife Manager's boots and think about wolf conservation from their point of view. Of all the stakeholders, the Wildlife Manager's position can be considered the most complex because it is your job to consider the values of all the other stakeholders. We've put together some materials for you, which you will find in your Wildlife Manager Stakeholder Folder available for free download on the Bear Trust website (http://beartrust.org/gray-wolves-in-the-northern-rockies).

During the stakeholder meeting, there will be three goals:

1) **Understand the different perspectives of each stakeholder**
2) **Determine "common ground" among stakeholders**
3) **Work together to identify issues and possible solutions, and provide input on how we can collaboratively move forward to ensure all stakeholder perspectives/goals are considered in our wolf conservation efforts**

To help with Goal # 1, each of the 6 stakeholder groups will give a 5-10 minute presentation about its stakeholder group at the beginning of the stakeholder meeting. You can use powerpoint, prezi, or some other presentation format for your presentation. Feel free to use photos provided at the end of these instructions in your presentation.

For your group presentation, we've provided material that you should include in your presentation:

A. Begin your presentation with the following text:

"We represent Montana Fish Wildlife and Parks, the state wildlife agency responsible for wolf management throughout the state of Montana. We manage wild wolves for the benefit of our Montana citizens. Wolf management, just like management of deer, elk, bears, lions and all wildlife species, ***balances*** *recreational opportunity with species viability and public wishes. To achieve balance, we sometimes reduce populations of some wild species. There are also times and places where we try to increase populations of some wild species. There is no single recipe for wolf conservation that can be applied in all ecological and social contexts. We work on diverse solutions at local levels, solutions can differ depending on the humans and wolves that live in a particular area. We work hard to consider the many different stakeholder values".*

B. In your presentation, include Figure 1 and Figure 2 from your Individual Activity. Make sure that your class understands what the term "Minimum Year-End Population" means. Using Figures 1 and 2, remind the class that wolves met delisting criteria in 2004 and that wolves were delisted in Montana in 2011. After delisting, the state of Montana was required by federal law to maintain at least 150 wolves and 15 breeding packs, otherwise wolves could be relisted again. If wolves are relisted, then wolf management would be transferred to the federal US Fish and Wildlife Service.

Make sure your class understands that the state of Montana has maintained well above 150 wolves and 15 breeding packs since 2011 (Figures 1 and 2 show this undeniably). Furthermore, Montana Fish Wildlife and Parks has a self-imposed statewide goal to maintain between 450-600 wolves in Montana. This goal has successfully been met since wolves were delisted in 2011.

C. In your presentation, show the video "Wolves in MT". You can find the video "Wolves in MT" on the Bear Trust website: http://beartrust.org/gray-wolves-in-the-northern-rockies .

D. Read the ARTICLE: "Weighing in on Wolves"

What does this article state about Montana Fish Wildlife and Parks' role in wolf conservation? Include this information in your presentation.

E. In your presentation, define the "Public Trust Doctrine".

What role does science play in wolf conservation? Include this in your presentation.

F. ARTICLE: "North American Wildlife Conservation Model"

Read this article. Briefly describe the North American Wildlife Conservation Model in your presentation.

G. In your presentation, make sure your classmates know that wolf hunting and trapping are part of wolf conservation and management throughout the state of Montana.

Show the video "Wolf Hunting Season" in your presentation, which provides a brief summary of the importance of wolf hunting and trapping. You can find the video "Wolf Hunting Season" on the Bear Trust website: http://beartrust.org/gray-wolves-in-the-northern-rockies .

Show Figure 5 from "Student Pages: Questions about Excel Data" and talk about the importance of maintaining balance in the ecosystem. If we didn't use wolf hunting and trapping in 2013, the minimum estimate would have been above 900 wolves, which is far above the Montana statewide goal of maintaining 450-600 wolves. Hunting and trapping are conservation tools that provide a way for the public to participate in wolf management. Remember, it's a balancing act. If we have too many wolves on the landscape especially in rural areas, then the ability of ranchers to make a living can be threatened and in some places elk and deer populations might be affected. If we have too few wolves on the landscape, then goals of wolf watchers, wilderness advocates, and other stakeholders will not be met, AND if the number of wolves falls below 150, then wolf management returns to the US Fish and Wildlife Service.

H. Below is a list of Montana Fish Wildlife and Parks Wolf Management Objectives. Include this list in your presentation.

1. Maintain a viable and connected wolf population in Montana

2. Gain and maintain authority for State of Montana to manage wolves (this means we want to keep the wolf OFF the Endangered Species list)

3. Maintain positive and effective working relationships with livestock producers, hunters and other stakeholders

4a. Reduce wolf impacts on livestock

4b. Reduce wolf impacts on big game populations

4c. Maintain sustainable hunter opportunity for wolves

4d. Maintain sustainable hunter opportunity for ungulates

5. Increase broad public acceptance of sustainable harvest and hunter opportunity as part of wolf conservation

6. Enhance open and effective communication to better inform decisions

7. Learn and improve as we go

I. The "Hunter Stakeholder" will present their perspective and they will tell the class that they are concerned about wolves killing too many elk. Read the following ARTICLES to learn more about this topic:

ARTICLE: "Bitterroot Elk Study Progress Report_Spring 2013"

The Bitterroot Research Project was started to scientifically evaluate what was causing a decline in the elk population in the Bitterroot area in Montana. Instead of just assuming that wolves were the major cause of elk decline, Montana Fish Wildlife and Parks and the Rocky Mountain Elk Foundation wanted to do scientific research to figure out the answer. What did they find?

Do you see the pie charts on Page 2 of "Bitterroot Elk Study Progress Report_Spring 2013"? We copied these pie charts and provide them to you so you can use them during your presentation. You can find these pie charts in the Photo Section of the document you are reading (look at the end of this document). We renamed these pie charts as "Figure X" and "Figure Y" so we could easily refer a little bit later.

ARTICLE: "Where are all the elk?"

In your presentation, include information about the reasons for changes in elk behavior. What is the primary driver behind elk movement patterns?

ARTICLE: "Finding a Way In"

How did Montana Fish Wildlife and Parks collaborate with Rocky Mountain Elk Foundation and how did this affect elk hunters?

In your presentation, include the following text:

"We know that wolves kill ungulates like elk and deer. It is true that in some places in Montana where wolves live, the elk herd has decreased. It is also true that in some places in Montana where wolves live, the elk herd has not decreased. Figure 6 demonstrates this clearly. (Embed Figure 6 from "Student Pages: Questions about Excel Data" into your presentation).

Another thing to consider: in areas where elk numbers are declining, can we attribute all elk mortality to wolves? No. Following reports on wolf predation on the southern Bitterroot Valley's elk herd, we launched a large-scale investigation in 2011. Researchers found that mountain lions were more responsible for elk population declines in the study site than wolves were".

(NOTE: this information comes from the: "Bitterroot Elk Study Progress Report_Spring 2013" you read).

During your presentation, to support the above statement, show Figures X and Y (which are located in the Photo Section at the end of this document).

Also, present Figure Z (also found in the Photo section at the end of this document). Figure Z shows that the number of elk harvested throughout the state of MT has OVERALL increased since 1971.

J. The "Wolf Watching Ecotourism Stakeholder" will present their perspective and they will tell the class that they want to protect Yellowstone wolves that occasionally leave the Yellowstone Park Boundary. Specifically, they would like to ban wolf hunting along the border of Yellowstone National Park.

Remind the class that most Wolf Watching Ecotourism focuses on INDIVIDUAL wolves. As the state wildlife agency responsible for the management of wolves throughout the entire state of Montana, it is our job to manage wolves at the POPULATION level. From a POPULATION perspective, the loss of a few wolves near the border of Yellowstone National Park does not affect the size of the POPUALTION of wolves in Montana.

It's important to remember that wolves living inside Yellowstone are protected because they live inside a National Park, which is federally managed for the purpose of **preservation = no use**. Wolves that live outside Yellowstone in the state of Montana are not protected from hunting because these wolves are managed by the state of Montana for the purpose of **conservation = wise use**. The Montana legislature passed a law a few years ago that specifically states Montana cannot establish buffers around national parks.

Why? There has to be an administrative boundary somewhere and that administrative boundary is the national park boundary.

The state of Montana manages wolves throughout the state FOR all people in Montana. As a wildlife agency that uses science as the basis for management decisions, Montana Fish Wildlife and Parks doesn't make management decisions based on individual wolves. They make management decisions based on the wolf population.

PHOTO SECTION

Feel free to use these photos in your presentation

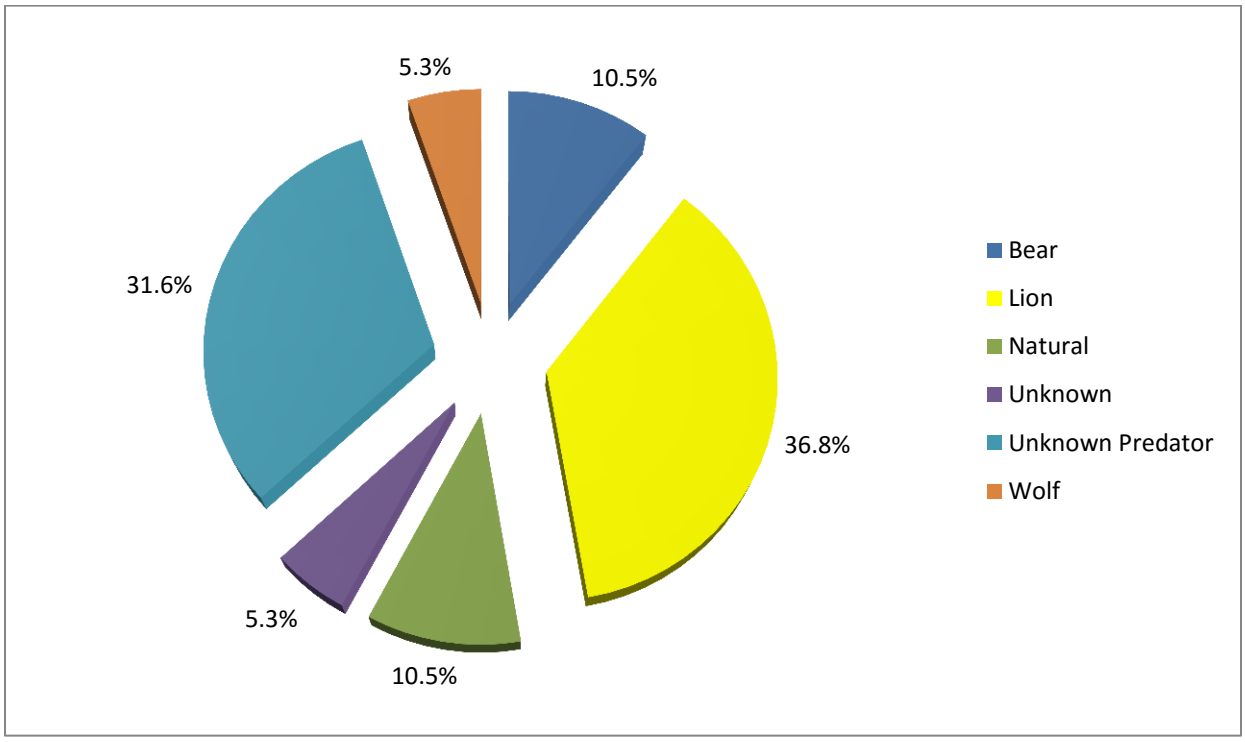


Figure X: Graph from Montana Fish Wildlife and Parks, showing causes of mortality for elk calves May 29, 2012-May 1, 2013, in the West Fork area of the study. This graph comes from the ARTICLE called, "Bitterroot Elk Study Progress Report_Spring 2013".

INCLUDE THIS FIGURE X in your presentation, as instructed above

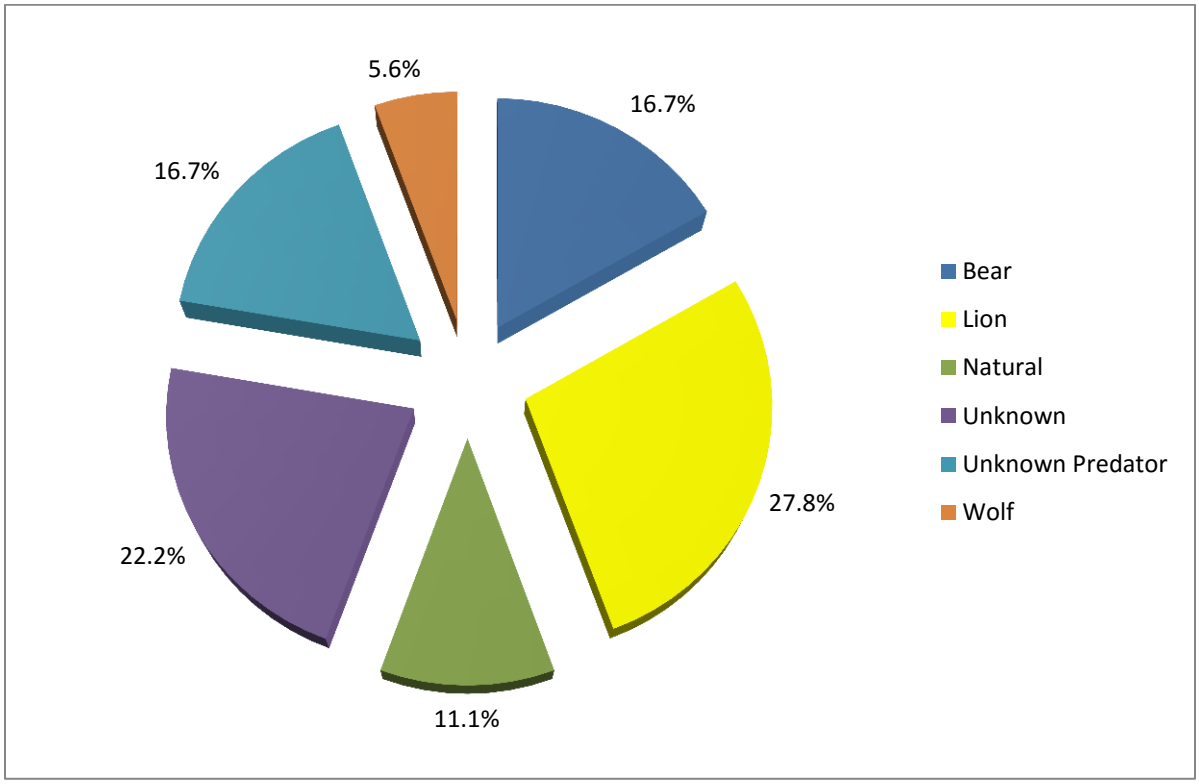


Figure Y: Graph from Montana Fish Wildlife and Parks, showing causes of mortality for elk calves May 29, 2012-May 1, 2013, in the East Fork area of the study. This graph comes from the ARTICLE called, "Bitterroot Elk Study Progress Report_Spring 2013".

INCLUDE THIS FIGURE Y in your presentation, as instructed above

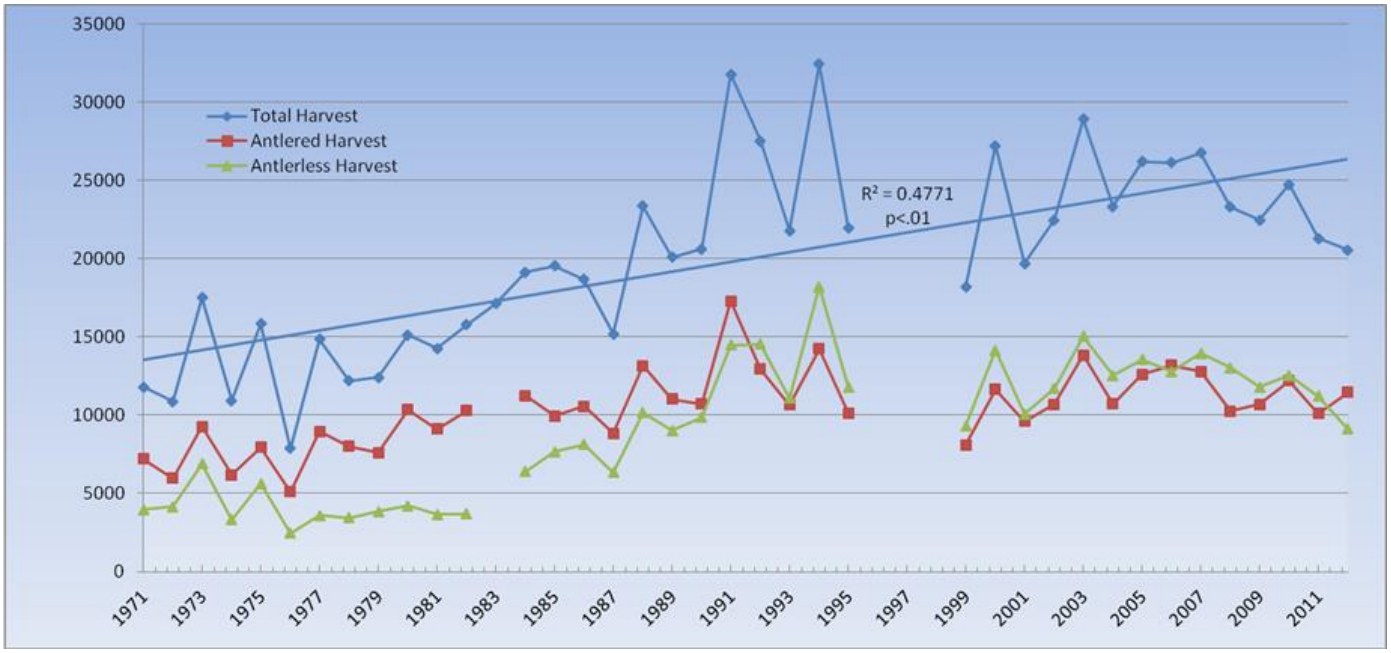


Figure Z: Graph from Montana Fish Wildlife and Parks elk biologist, showing that the number of elk harvested throughout the state of Montana has OVERALL increased since 1971.

INCLUDE THIS FIGURE Z in your presentation, as instructed above

This is a photo of a working livestock dog, which is one non-lethal technique that Montana Fish Wildlife and Parks promotes to help reduce livestock-wolf conflict. Notice the spikes on the dog's collar.

This is a photo showing another non-lethal technique for reducing wolf-livestock predation that Montana Fish Wildlife and Parks promotes. The technique is called "Fladry".

Research wolf collared by Montana Fish Wildlife and Parks

Another collared research wolf in Montana, collared by Montana Fish Wildlife and Parks.

Bitterroot Elk Project Progress Report
Spring 2013

Montana Fish, Wildlife and Parks and the University of Montana are now completing the second year of a three-year project investigating the influence of predation, habitat, and nutrition on elk population dynamics in the southern Bitterroot Valley. As we approach the end of the second year of intensive elk survival monitoring, we continue to see that lion predation is the dominant cause of elk mortality, and find mortality causes from year two were similar to those observed in year one. Heading into the summer, we will work to capture and radio tag the third and final cohort of neonatal elk, and monitor cause-specific mortality throughout the following year. This summer we also plan to complete the mountain lion population estimate, and the second and final year of vegetation monitoring.

Adult Elk Movements and Survival – Year 2

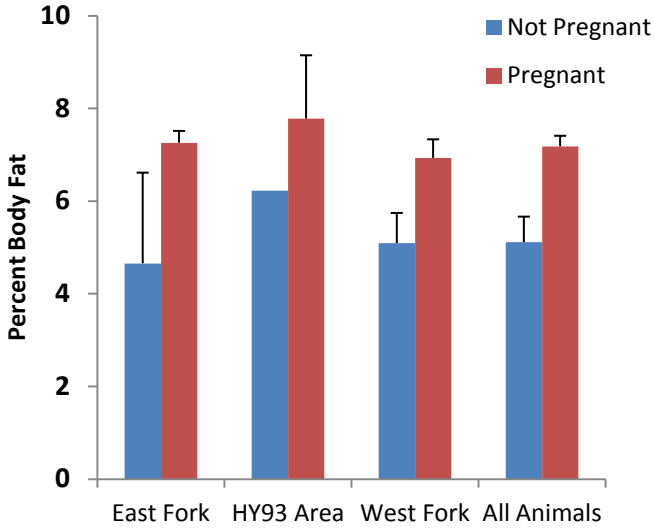
During the winter of 2011-2012, we captured and collared forty adult female elk. GPS collars recorded locations every thirty minutes and the collars dropped off in January 2013. Three animals died of capture related injuries. Over the monitoring period, two additional individuals died out of the remaining 37 collared adult elk. One West Fork elk was killed by wolves and one East Fork elk was killed by a lion.

Two of the animals captured in French Basin migrated over the continental divide to the Big Hole in late April and early May. These cows spent the majority of the summer along the main stem and North Fork of Big Hole River, moving up towards the continental divide in the fall, and finally migrating back to the East Fork and French Basin in late November and early December. Collared animals moved between hunting districts 250 and 270 (crossing Highway 93) both south of Sula and around Rye Creek, but the location data show almost no movement between hunting districts 250 and 270 between Conner and Sula. Several of the animals captured on the CB Ranch, north of Rye Creek, summered further east on public lands than observed during the first year. Most of the seasonal movement in the West Fork was from the lower reaches of various drainages to higher elevation summer ranges. One animal crossed briefly into Idaho near the head of the West Fork, and spent part of the late summer in and around the periphery of the 2011 Mustang Fire. Another crossed over the Bitterroot crest at nearly 8000 feet, spending much of July and August in alpine cirques along the crest, most of which were at or above 7000 feet.

During the winter of 2012-2013, we captured and collared 41 elk. Two of these elk have died. One West Fork elk was killed by a mountain lion in March and another West Fork elk was killed by an unknown predator during April. The remaining elk will be monitored until their collars drop off in January 2014.

Elk Pregnancy Rates and Body Condition

Over the three years of this study, a total of 127 elk were tested for pregnancy. Pregnancy tests are conducted in a laboratory by measuring the level of pregnancy-specific protein B in blood serum. Pregnancy rates averaged 92% in the East Fork (n = 61), 83% in the Highway 93 portion of hunting district 250 (n = 12), and 72% in the West Fork (n = 54). During 2011-2012 and 2012-2013, a sample of elk were tested for pregnancy in late November and a sample were tested in mid-February. Pregnancy rates were similar in both the November and February samples, and we found no evidence for declining pregnancy rates and pregnancy losses over the course of winter.

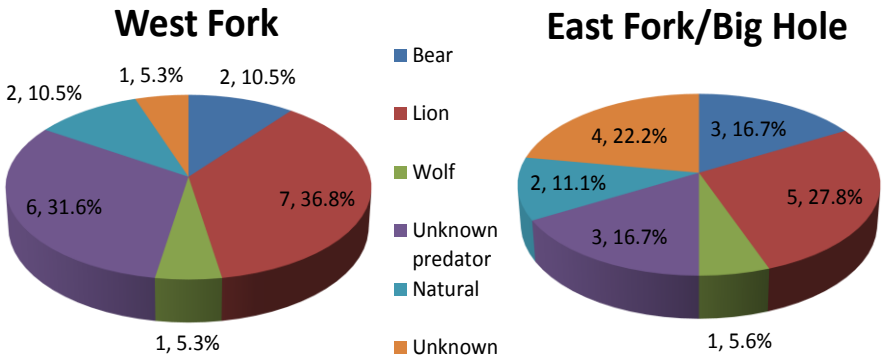


The late-winter percent body fat and pregnancy status of 83 adult female elk during 2011-2013.

Pregnancy rates varied annually and were related to body condition. We conducted a body condition assessment on each animal to estimate the level of ingesta-free body fat. The level of body fat is an indicator of nutritional condition, and reflects the nutritional quality of elk habitat. Body condition varied annually, and among herds. In both the East Fork and West Fork, body condition was lowest in February 2011 and highest in February 2013. In all years, body condition was lower in the West Fork than in the East Fork. The difference in condition between West Fork and East Fork animals was most pronounced during February 2011, when the winter was severe and all animals were in relatively poor body condition.

Elk Calf Survival - Year 2

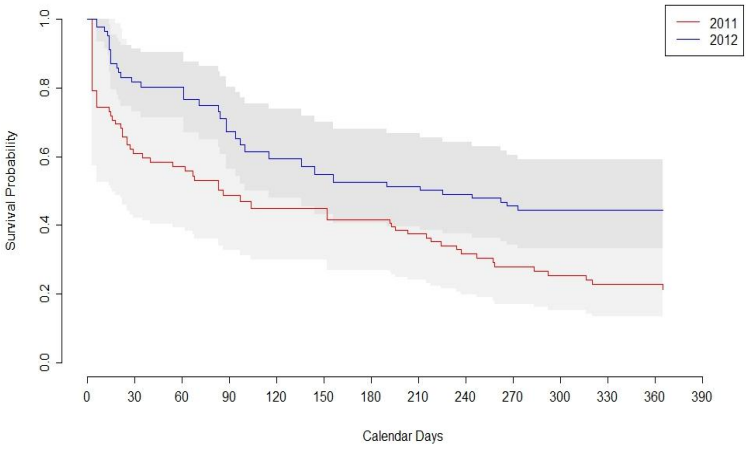
In late May and early June 2012, the second cohort of 76 neonatal elk were captured and marked with radio ear tags. The VHF ear tags emit a mortality signal if stationary for more than four hours. Calves have been monitored several times a week using aerial and ground telemetry. When a mortality signal was detected, we located the tag and conducted a thorough investigation of the site as well as a comprehensive onsite necropsy.



Causes of mortality for elk calves May 29, 2012 – May 1, 2013.

Montana Fish, Wildlife & Parks

The University of Montana



Above: The Kaplan-Meier survival estimates for calves in the 2011 and 2012 cohort. Calendar Day 0 represents the day the first calf was captured in each year. The risk from all causes of mortality combined for elk calves was significantly lower in 2012 than in 2011. The risk was significantly greater for male elk calves than for females, and this difference did not depend on the year.

During the summer and early fall of 2012, 18 calves survived, 30 calves died and 28 ear tags failed. The primary cause of mortality was lion predation (n=10). Other sources of summer-fall mortality included bear predation (n =5), wolf predation (n=2), natural causes (n=2), unknown predator (n=7), and unknown cause (n=4). In late-November, we captured and radio ear-tagged an additional 29 elk, bringing the total number of calves being monitored during the winter of 2012-2013 to 47.

Overwinter in 2012-13, 29 calves survived, 7 calves died, and 11 ear tags failed. Causes of overwinter mortality included lion predation (n=2), natural causes (n=2), unknown predator (n=2), and unknown cause (n=1).

This spring, we plan to capture up to 80 neonatal elk calves during late May and early June, and monitor this cohort of calves through May 2014. A new University of Montana Master's student, Dan Eacker, will lead the summer field efforts. This will be the third and final year of the calf survival study.

Mountain Lion Population Research

During the winter of 2012-2013, we initiated a project to estimate mountain lion density using DNA-based mark-recapture methodology. The purpose of the project is to estimate mountain lion density in the study area. The estimated lion density and observed lion-caused elk mortality rate will be used in our elk population modeling efforts to quantify the effects of lion predation on elk population dynamics, and to develop predictions as to elk population dynamics given lower or higher lion densities. Winter field teams worked with houndsmen to tree mountain lions and collect DNA samples using biopsy darting. The overall search effort totaled 705 hours, and 6,020 miles were covered. A total of 52 biopsy, 14 hair, 18 scat, 22 harvest, and 3 management action samples were collected from within hunting districts 250 and 270. DNA analysis to identify lion sex and probability of identity is currently underway. To date, 54 unique lions have been identified in the study area. Additional DNA results are pending.

Wolf Diet Analysis

During the summer of 2012, we collected 133 wolf scats from within the study area to investigate prey composition in Bitterroot wolf diet. Scat analysis is the most widely used method to determine diets of carnivores and this approach is inexpensive, relatively quick, and large sample sizes can be collected. Collection occurred primarily at rendezvous sites in the East Fork and West Fork, and opportunistically throughout the study area. Using a microscope to view hair morphology and cuticle scale patterns, the species and age class of prey in the diet can be identified. In the East Fork, adult elk comprised 61%, juvenile elk 20%, adult deer 7%, adult moose 6%, juvenile deer 5%, juvenile moose 1%, and small mammals 2% of wolf ingested biomass during summer. In the West Fork, adult elk comprised 39%, juvenile elk 33%, juvenile deer 11%, adult moose 8.5%, and adult deer 6% of the ingested biomass during summer.

With elk being the primary prey item for wolves during summer in the East Fork and West Fork, why does the cause-specific elk mortality data show such low wolf-specific mortality? Cause-specific mortality and diet studies of predator-prey systems yield different, yet complementary information about wolf-prey systems. Wolf diet results and simple predator-prey models show that it is completely possible that elk are the key prey species for wolves, and yet, because of the relatively low wolf density (relative to elk density and mountain lion density), wolves may comprise a relatively small proportion of the cause-specific mortality of marked elk. Understanding relative densities of predator and prey is crucial in relating cause-specific mortality and diet analysis. Simply put, wolves are eating elk, but the odds of a marked elk being killed by wolves are low. Our ongoing lion density estimation will complement this understanding by allowing us to compare relative wolf and lion densities.

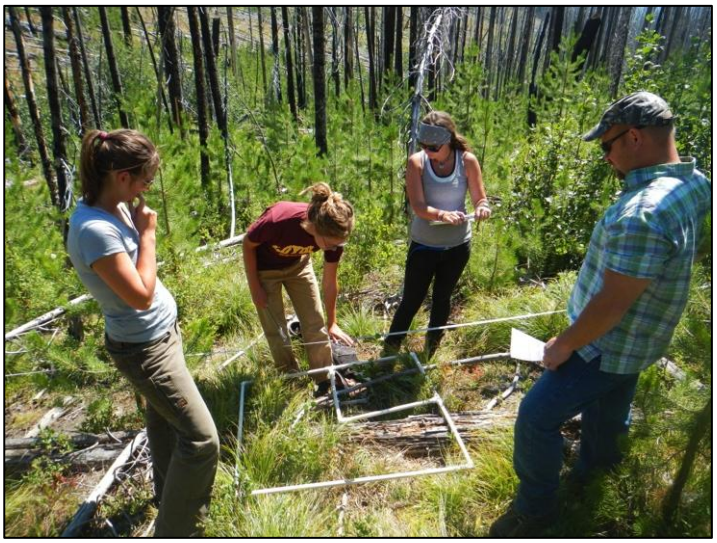
Elk Habitat and Vegetation Monitoring

As part of the Bitterroot elk project, we are assessing forage availability for elk across the study area on private, state, and federal lands. This component of our project is funded primarily by the USFS Region 1, MTFWP, the University of Montana, and NASA. This work has three main components: 1) assessing elk diet during summer and winter by collecting elk pellet samples, 2) assessing elk forage biomass availability across different landcover types during the peak of the growing season in July/August, and 3) assessing forage plant phenology during the growing season from April to October.

For all three research components, the bulk of the previous summer's samples are analyzed over the winter in collaboration with the Washington State University Wildlife Habitat Nutrition Lab (WSU-WHNL). Summer 2012 elk diet analyses using fecal plant fragment analysis are almost complete. With this information we will be able to answer questions about differences in diet between the East Fork and West Fork during summer, as well as guide our forage plant collections for forage quality analyses in the field this summer 2013. In addition, during winter (Jan – Mar) 2013, we collected elk pellet samples from winter ranges in the East Fork and West Fork to be able to understand winter elk diet and potential differences across the study area. Furthermore, plant sample

analysis for forage quality (i.e., % digestibility of plant matter) is also currently underway at WSU-WHNL for hundreds of plant samples collected from May – October 2012 from focal plant species preferred by elk.

Finally, during summer 2012, we collected almost 100 vegetation samples during the peak of the growing season in July and August throughout the summer range of the Bitterroot elk population. These data have been entered and examined over the winter, and we are currently re-assessing our sampling plan for 2013 based on preliminary information from 2012. Given the high variation in post-fire vegetation communities from an elk forage perspective, we expect to focus more on sampling within burned vegetation communities during summer 2013. Additionally, we will be focusing some sampling this summer in the new burns from 2012 to understand responses of elk forage immediately post-fire.



USFS biologists Eric Tomasik and Andrea Shortsleeve collecting vegetation data in July in a burn in the East fork of the Bitterroot with project vegetation technicians.

Our plan for summer 2013 is to repeat forage phenology and biomass sampling, with the goal of having 2 vegetation teams collecting forage biomass data during July and August. During Fall 2013 and into 2014, all laboratory analyses will be completed, and we will develop a seasonally dynamic spatial landscape model of elk forage biomass and quality to link to our estimates of elk nutritional condition and our overall project objective of understanding how elk forage affects population dynamics in the Bitterroot.

Acknowledgements

We thank the landowners that have allowed access for fieldwork and provided logistical support, and the organizations and individuals that have provided financial support for this project : Ravalli County Fish and Wildlife Association, Montana Bowhunters Association, Hellgate Hunters and Anglers, Rocky Mountain Elk Foundation, Safari Club International Foundation, Montana Fish, Wildlife and Parks Foundation, Western Montana Chapter of the Safari Club, the Shikar-Safari Club International Foundation, the Pope and Young Club, Montana Mapping & GPS, McIntire-Stennis Foundation (USDA), NASA, the U. S. Forest Service, the MPG Ranch, and private donations from individuals in the community. This work was supported by the National Science Foundation EPSCoR program under Grant # EPS-1101342 within the Montana Institute on Ecosystems. Funding was provided by revenues from the sale of Montana hunting and fishing licenses and matching Federal Aid in Wildlife Restoration grants to Montana Fish, Wildlife and Parks.

To learn more, please visit our website:
http://fwp.mt.gov/fishAndWildlife/management/elk/bitterroot/default.html

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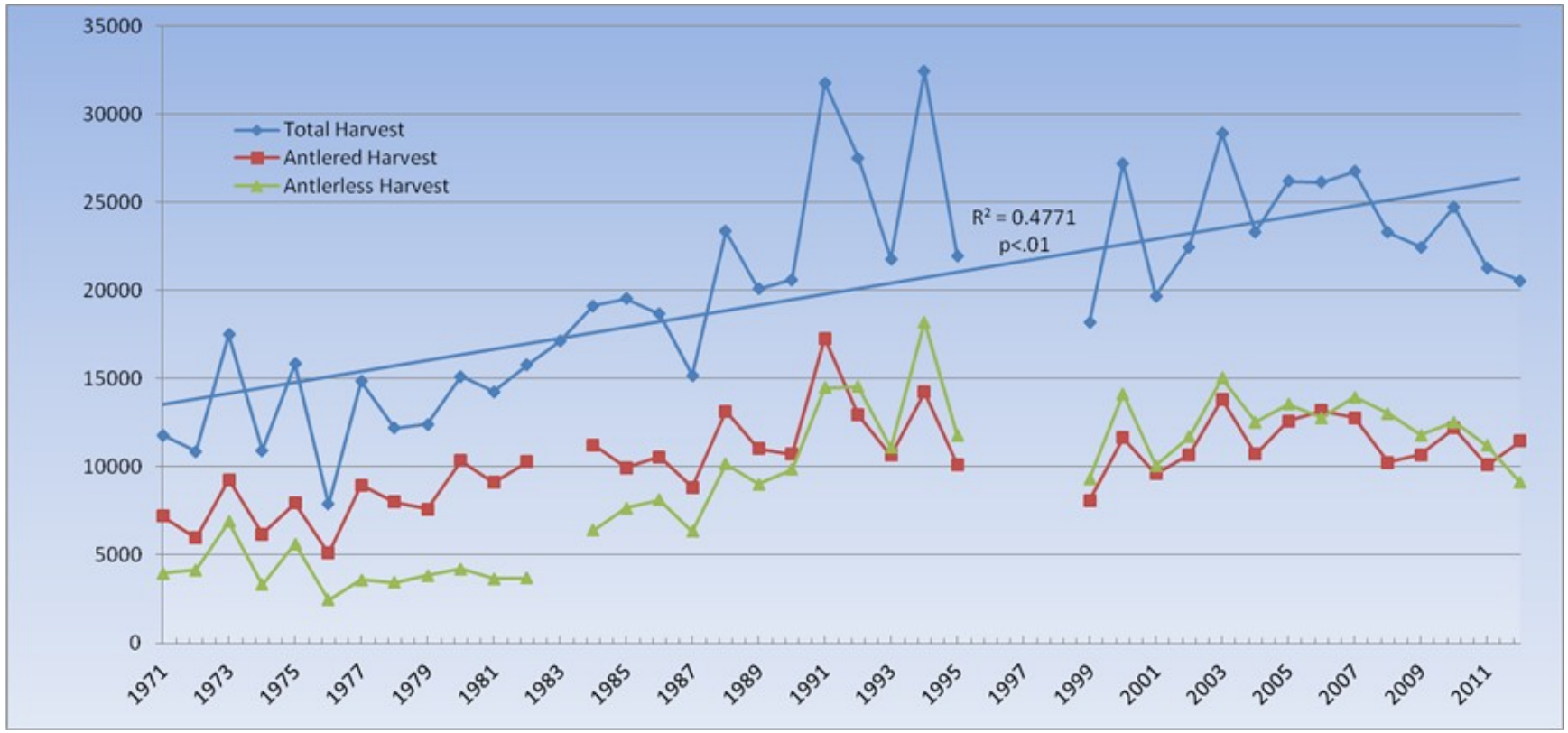
Figure 10: Total Elk Harvested Throughout the State of Montana, Years 1971-2012.



*Note: Data for years 1996-1998 were not reliable and, therefore, are not included in this graph.

Bitterroot Elk Study

Source: Montana Fish, Wildlife and Parks and University of Montana

Figure X. Causes of mortality for elk calves May 29, 2012-May 1, 2013, in the West Fork area of the study:

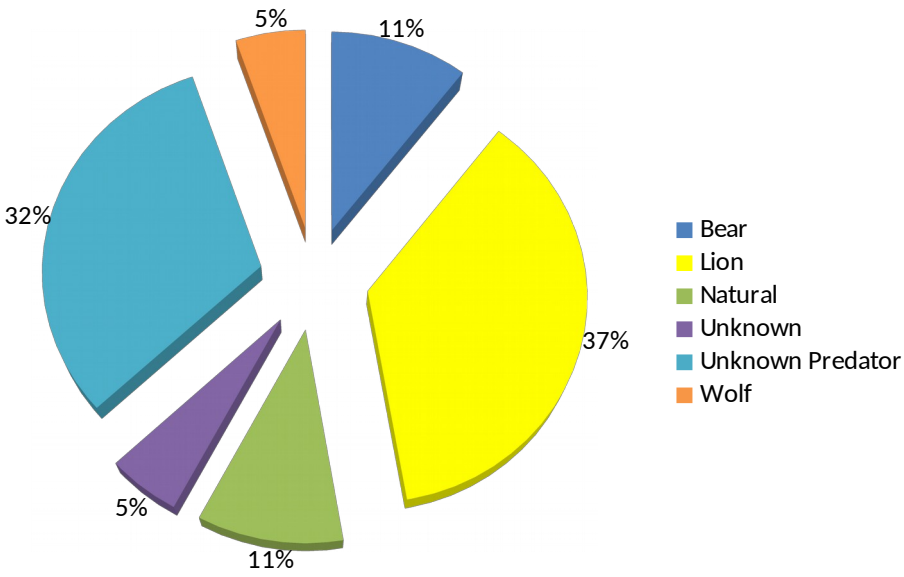
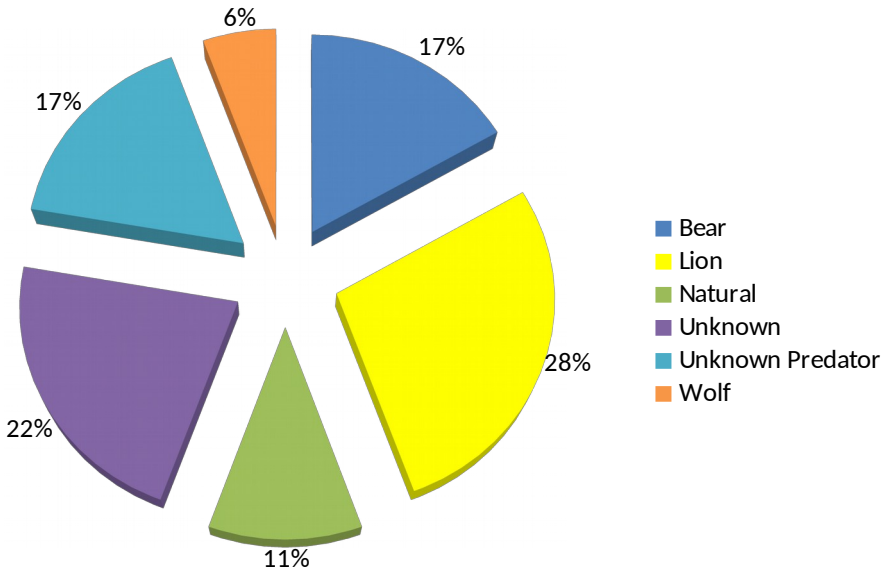


Figure Y. Causes of mortality for elk calves May 29, 2012-May 1, 2013, in the East Fork area of the study:



Finding a Way In

Millions of acres of public hunting land in Montana appear inaccessible. How hunters and others are figuring out ways to get there. By Paul Queneau

Lewistown bowhunter Kevin Kepler is a map-reading whiz. Twenty-one years as a U.S. Army pilot will do that to a fellow. So it's perhaps not surprising that, of all the hunters looking for ways to access portions of the nearby Big Snowy Mountains isolated by surrounding private land, it was Kepler who figured out a way to open up 18,000 acres of prime elk country to himself.

And, eventually, to everyone else.

For years the retired military aviator had been eyeing a vast tract of national forest—prime elk, mule deer, and black bear habitat cloaked in pines, aspens, and mountain meadows—tucked back in the Lewis and Clark National Forest. But after scouting the area on foot, Kepler knew that a cliff-faced canyon created a nearly impenetrable barrier.

Then, a few years ago, he spotted on a land ownership map what appeared to be a "back door" into that all-but-inaccessible U.S. Forest Service land. An oddity in the township grid caused a tiny 40-acre private tract along Red Hill Road, south of Lewistown, to overlap, for a mere 10 yards at one misaligned corner, with the national forest beyond. Parcels that meet at an exact corner can't be legally crossed without permission from all adjoining landowners, so the overlap proved crucial. It meant that Kepler would need permission from just one.

He called the parcel's owners, Marshall and Leslie Long, Montana natives living out of state. He struck up a conversation and eventually popped the access question. "No problem," the Longs told Kepler. They didn't ask for a trespass fee, just an over-the-phone handshake. Kepler spent the next two seasons hunting above the Longs' property.

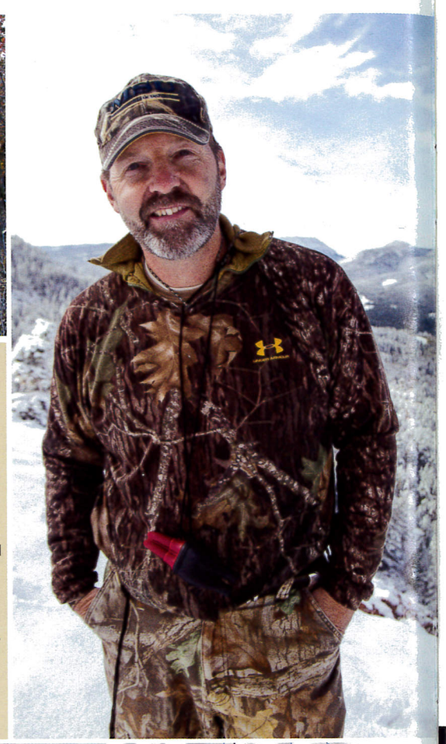
He pretty much had the entire 18,000-acre tract of national forest to himself and his family members.

Then he learned that the Longs had put the land up for sale. With the asking price well beyond his

PHOTO BY PAUL QUENEAU

UNOBTAINABLE NO MORE Thanks to a savvy hunter and a fast-acting elk conservation group, this 18,000-acre tract of the Big Snowy Mountains is now open to public access. Many other parcels across Montana, seemingly off-limits, may actually be accessible to hunters who possess new land ownership smartphone apps or the gumption to knock on a few doors.

budget, Kepler contacted the Rocky Mountain Elk Foundation (RMEF), of which he is a member. The Missoula-based organization, which has secured public access to more than 700,000 acres of elk country across the United States over the past 30 years, jumped at the opportunity, partnering with Fish, Wildlife & Parks and the Forest Service on the project. RMEF paid the $190,000 asking price, then sold the land to FWP for $50,000. Acquisition by the department ensured that the 40 acres, now called the Red Hill Wildlife Management Area, is open to hunting and year-round recreation access. Even more important, it provides a gateway to the national forest lands. "This gives the public access to some of the most incredible country in central Montana," says David Allen, RMEF president and CEO. For their part, the Longs say they were pleased to know their land would be protected and, along with the adjacent national forest block, open to all.

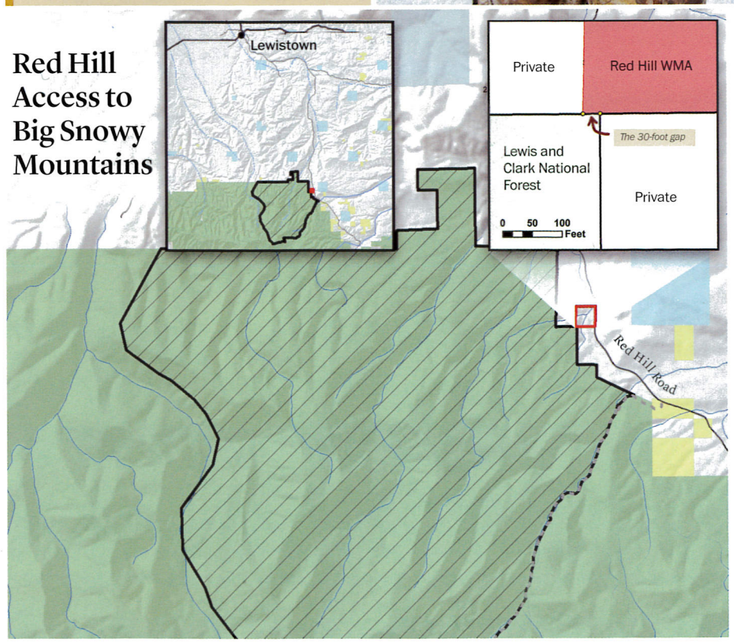


30 FEET TO PARADISE Right and below: Lewistown bowhunter Kevin Kepler was the first to figure out that a 30-foot gap between misaligned corners of a 40-acre tract of private land could, with permission to cross the property, allow him to reach 18,000 acres of Lewis and Clark National Forest. He later instigated a lengthy acquisition process by the Rocky Mountain Elk Foundation and then FWP that resulted in the tract becoming the Red Hill Wildlife Management Area south of Lewistown (above) and opening up thousands of acres of public national forest land. "As sportsmen, we must make sure we have a voice," says Kepler. "We have the ability to make a positive impact on access. All we have to do is look around and have the situational awareness to see these opportunities."

FINDING THE STRANDED LANDS

The Red Hill project represents just one way that hunters, conservation groups, and public agencies help people reach seemingly inaccessible public holdings. Though Montana contains more than 30 million acres of state and federal land, much of it sees little use by hunters. Some isolated or apparently inaccessible parcels are stranded by cliffs, rivers, or other natural barriers. Many are unmarked and unknown to most hunters. Others appear too small or out of the way to make hunting worth the effort. And a growing amount of public land, like much of the Snowy Mountains, is surrounded or otherwise blocked by private property and requires landowner permission for access.

Demand to reach isolated and oft-ignored public hunting land is growing. Reduced hunter access to private property has created a cascade effect, putting more pressure on public lands. That forces hunters to be more creative in finding overlooked parcels that might hold game. It has also spurred FWP and private groups to devise new ways for hunters to find their way onto the nearly 2 million acres of public lands surrounded by private holdings without guaranteed access (see sidebar, page 14).



ALL PHOTOS PAGE 12: ROCKY MOUNTAIN ELK FOUNDATION; PAGE 13: *MONTANA OUTDOORS*

Paul Queneau is conservation editor of Bugle, *the magazine of the Rocky Mountain Elk Foundation. He lives in Missoula.*

Most of these isolated public parcels are state school trust lands, managed by the Montana Department of Natural Resources and Conservation. In 1889, Congress granted to Montana more than 5 million acres of federal land comprising 1-square-mile sections for the state to lease for grazing, mining, and logging. The revenue Montana generates from leasing school trust lands, often identifiable as blue squares marked 16 and 36 on township grids, goes to college and K–12 education.

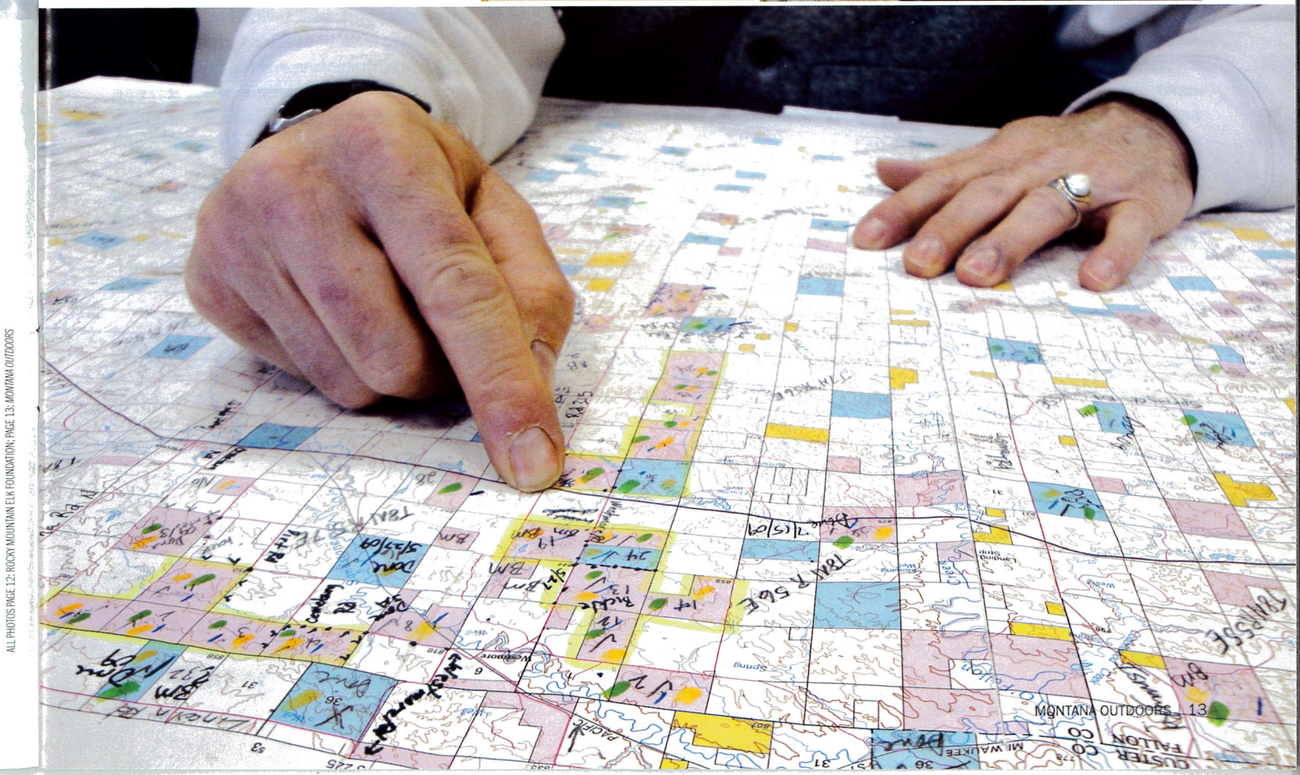
It's hard to hunt these and other public holdings if you don't know they're there. Fortunately, GPS devices and smartphone apps loaded with land ownership maps make locating public land and staying inside legal boundaries easy. At least two Montana companies sell electronic maps that display property boundaries, landowner names, game management and hunting units, as well as topography, roads, trails, waterways, and other geographic features. The digital maps work in PCs and Macs, many Garmin GPS handheld units, and Apple and Android phones and tablets using a designated app, which costs $30 to $100.

A less expensive option is to use the Montana State Library's Cadastral, an online land ownership map available at svc.mt.gov/msl/mtcadastral. Hunters can print the site's maps and use them with low-cost built-in GPS base maps or a smartphone app, such as the GPS Topo USA, to avoid inadvertently trespassing even in areas with no cell phone coverage.

Also helping hunters find public lands are people like Dwayne Andrews, a retired FWP employee in Miles City. For more than a decade, Andrews and several colleagues at state and federal land management agencies have installed thousands of small signs indicating legal entry and exit points to hundreds of thousands of acres of state and federal parcels across eastern and southern Montana. "It's all public land, but until we got those markers up most people didn't even know it was there," says Andrews.

Hunters can reach these and other public parcels via public roads, rights-of-way, access easements, streams and rivers, or adjacent

HUNT HERE Another way to open up public land is to identify it as such. Many state school trust and BLM tracts in eastern Montana lack boundary signs, which people like retired FWP employee Dwayne Andrews have been installing over the past decade.



public lands. Some have even resorted to hiring helicopter services to drop them into remote or isolated areas and pick them up later. Though legal and cheaper than some private-land trespass fees, renting a chopper is hardly feasible for most hunters. An easier way to reach many stranded lands is to obtain permission from an adjacent landowner.

That's an approach highly recommended by Alan Charles, FWP landowner/sportsman relations coordinator. As manager of Montana's Block Management Program, Charles has spent 18 years helping hunters gain and maintain access to public and private lands. As an avid big game and bird hunter himself, he is always on the lookout for unmarked or isolated public parcels. Charles says that every time he plans an outing, he searches for remote public lands surrounded by private property. When he spots an interesting one, he approaches the surrounding landowners with a smile and a handshake.

"Some of my best hunting experiences have been on places that glowed orange with 'No Trespassing' signs," Charles says. "We still have many landowners in Montana who appreciate that hunters need a place to go. Many may be traditional ranchers and farmers who know that not everyone is as blessed with land as they are. So even if they might not want you hunting on their own property, many will say, 'Sure, you can go up and access that public land—you bet.'"

HERE'S WHERE I AM New GPS and smartphone apps loaded with land ownership maps make it easy for hunters and others to know their exact location relative to private property. The apps display property boundaries, landowner names, hunting districts, Block Management Areas, and more. Right: Hunters are quickly figuring out how to access isolated public lands in Montana and reach deer and elk that previously had been considered beyond reach.

ALL PHOTOS: PAUL QUENEAU

THE STATE HELPS OUT

Recognizing that some people might need incentives to get to "You bet," the 2013 Montana Legislature created the Unlocking State Lands Program, which gives landowners an annual $500 tax credit for allowing public access to isolated state parcels. Qualifying large-acreage owners holding multiple state sections within their borders can write off as much as $2,000 in taxes per year.

Access through the new program is walk-in only but requires no reservations or special fees. It's also not limited to hunting, says Ken McDonald, head of the FWP Wildlife Division. State parcels made accessible may also hold fishing, bird watching, and other recreational opportunities. "One of the many things we like about the program is that it's paid for with state general fund dollars rather than hunting and fishing licenses revenue, typically the case with so much of public access, even when it benefits other recreational users," McDonald says.

Working with willing landowners, FWP has also acquired or is in the process of securing several right-of-way easements across parcels of private land to public holdings. "Some of these 'blockages' are only a quarter-mile to a half-mile wide," says McDonald. "We're working on one right now that will secure access to 40,000 acres of national forest." Funding the easements are license sales from the Come Home to Hunt Program, created by the 2009 Montana Legislature to give previous Montana residents now living out of state the opportunity to secure a deer or elk license.

Another route to public lands that should not be overlooked is through Montana's existing private-land access arrangements. Chinook rancher Richard Stuker allows access to isolated BLM parcels within land he has enrolled in FWP's Block Management Program. "I'm the second generation of my family to own this property," says Stuker, also a member of the Fish and Wildlife Commission. "My dad always allowed hunting and, as long as people obey the rules, I don't mind them out there."

Stuker says that whenever access involves private land, hunters need to employ their best etiquette in order to protect the privilege. As long as landowners feel respected, he says, hunters will be surprised at what gates open up, even—and perhaps especially—in situations like corner crossings.

> "Hunters may not realize that many parcels cut off by private property might be accessible to them right now."

THE CORNER CROSSING DEBATE

Corner crossings are a thorny issue, pitting the public's rights to access public land against landowners' rights over who sets foot on their property. The issue comes up where blocks of public land are intermixed, checkerboard fashion, with blocks of private land. The public parcels often touch each other at the corners, and hunters have long argued that, by literally jumping from one corner to another, they remain on public property and aren't trespassing on adjacent private holdings. The courts have yet to rule on the matter, but both FWP and the DNRC maintain that corner crossing constitutes trespassing.

A bill introduced in the 2013 legislative session would have made corner crossing legal, but it failed in committee. Stuker says such legislation may be unnecessary because many landowners are open to allowing corner crossings if asked. "If you can catch a landowner and say 'Hey, I know this is your property, do you mind if I cross?" it's really not a big issue if you cross right in the corner," he says.

John Gibson, president of the Public Land/Water Access Association (PL/WAA), is less convinced. He says his group regularly goes to court over access issues such as corner crossings, which often puts him at odds with some large landowners looking to restrict entry to public parcels abutting their property. The group is also fighting to maintain the legal status of hundreds of public roads in Montana that cross private land en route to key public ground. What exactly constitutes a public road can be a gray area in state law, says McDonald, adding that "FWP is working with legislators and the PL/WAA and other groups to keep public roads public to maintain public land access."

As for opening up more isolated tracts, FWP's Private Land/Public Wildlife Council—composed of legislators, sportsmen, and landowners—is currently working to enhance the Come Home to Hunt Program so it can fund additional access across private land. That won't completely solve the problem, says Charles, who acts as FWP's liaison with the council. But, like the Unlocking State Lands Program, it would provide additional financial incentives for landowners who allow hunters and others to cross their holdings. "It's a huge challenge trying to balance private property rights with the concept of public wildlife that belongs to everybody," Charles says. "But we've found that there are ways, like with Block Management and other FWP programs, to increase public access to wildlife."

In many cases, hunters already hold the keys to isolated public land in their hand. "They may not realize that many parcels cut off by private property might be accessible to them right now," Charles adds. "Pore over maps. Drive around and investigate. And then consider making that long walk up to the front porch and ringing the doorbell."

Montana the top western state in off-limits public land acreage

Recent analysis by the Colorado-based Center for Western Priorities shows that more than 4 million acres of public land in the West is inaccessible to the public. Topping the list is Montana, with nearly 1.96 million acres, followed by Wyoming (758,000 acres) and Colorado (541,000 acres).

In many areas, a quilt of public and private ownership results in state and federal tracts stranded within private holdings. In some cases, public roads that run through private land to public property are closed off, fenced, or illegally marked "Private."

Montana Senator Jon Tester is one of several members of Congress who have introduced bills, so far with no success, that would direct land managers to identify public property without public access and allocate funds to create permanent entry.

To read a copy of the report, "Landlocked: Measuring Public Land Access in the West," visit westernpriorities.org.

Public land in Montana inaccessible because the public can't cross corners	**724,000 acres**
Fully land-locked by private lands	**1,231,000 acres**
Total amount inaccessible and off-limits	**1,955,000 acres**

Mallards are one species of waterfowl protected by the Migratory Bird Treaty Act.

The North American Wildlife Conservation Model

by James L. Cummins

PHOTO BY WILD EXPOSURES - MICHAEL KELLY

Are you a hunter or angler? Or do you prefer to simply observe wildlife in their natural environment? Whichever activity you prefer in terms of wildlife, you have hunters and anglers to thank.

The crusade to manage and conserve fish and wildlife began in the mid-1800s when hunters and anglers realized the need to set limits in order to protect disappearing species. This cause led to the one-of-a-kind, time-tested conservation program known as the North American Wildlife Conservation Model in which hunters and anglers were among the first to call for the conservation of fish and wildlife. Even today, hunters and anglers are some of the foremost leaders in conservation efforts.

Providing habitat for species such as elk and deer is one component of the public trust feature of the North American Wildlife Conservation Model.

PHOTO BY JAMES L. CUMMINS

There are two basic principles relative to this model: 1) that our fish and wildlife belong to all North American citizens, and 2) that these resources are to be managed so that populations will be sustained indefinitely. These principles are explained and expounded upon through a set of guidelines known as the "Seven Sisters for Conservation." These seven features are what gives this conservation program its distinction and are vital to conservation, so let's take a closer look at these precepts.

Sister #1: Public Trust.

This states that in North America, natural resources on public lands are managed by government agencies to ensure that we always have fish and wildlife as well as wild habitats and places to enjoy. Simply put, this means that individuals in the United States and Canada do not individually own fish and wildlife, but rather they entrust the responsibility of managing fish and wildlife, and their habitats, to their governments. This concept of public trust affords all citizens the opportunity to view, hunt and fish these natural resources.

Sister #2: Prohibition on Commerce of Dead Wildlife.

In the late 1800s, the selling of meat, hides, feathers and other parts of wild animals was a growing business. This led to excessive hunting which severely depleted some species and drove others to near extinction. Many of these threatened species rebounded and began to thrive again once stronger laws were written to restrict these practices. Therefore, the logic behind these laws stated that because we all share in ownership of the wildlife, it is illegal to sell the meat of any wild animal. However, the hides, antlers, teeth, fur and horns of some game animals may be sold.

Sister #3: The Democratic Rule of Law.

This means that you and every other citizen of the United States and Canada have the right to help create conservation and management laws. Managing government agencies provide citizens with opportunities to attend public forums to gather ideas about wildlife and their habitat. Citizens are also given the opportunity to vote on ballot measures that impact fish and wildlife. Although conservationists want to protect, restore and enhance wildlife, they also want to be able to enjoy fishing and hunting. This is where our laws come in to regulate these activities. Federal, state and provincial conservation officers and game wardens are responsible for checking hunting and fishing licenses and tags among other things to ensure that people are adhering to the laws and regulations that are in place.

Sister #4: Hunting and Fishing Opportunities for All.

This upholds that regardless of your race, creed, social status, religion or gender, you have the right to legally hunt and fish on most public lands in North America. As mentioned before, hunters and anglers led the crusade for wildlife conservation. Before Theodore Roosevelt became president, he helped found the Boone and Crockett Club as I covered in one of the features in the last edition of *Wildlife Mississippi*. The Club's Fair Chase Statement was the first document outlining a code of conduct as well as ethics for hunters and anglers. This statement became a cornerstone for our gaming laws and reinforces the idea that hunting should be open to anyone wishing to participate.

Sister #5: Non-Frivolous Use.

This simply means that there are laws in place that restrict us from casually killing fish and wildlife. In North America, we can legally kill certain wild animals for food and fur, self-defense and property protection, but we cannot kill solely for feathers, horns or antlers or even to use only a small portion of the meat. These laws ensure that we show respect for wildlife and their habitats.

Sister #6: Wildlife and Fish as International Resources.

This recognizes that fish and wildlife are allowed to migrate freely across boundaries between states, provinces and countries and that we are all responsible for their protection. The Migratory Bird Treaty Act of 1918 is an example of this concept. This act demonstrates a cooperation between countries to protect wildlife making it illegal to capture or kill migratory birds, except as allowed by specific hunting regulations. Treaties now exist between the United States, Canada, Mexico and Russia to protect birds migrating between these countries.

Sister #7: Scientific Management.

This takes into account the supportive aspect of scientific management. This holds to the belief that applying scientific research is essential to managing and sustaining North American wildlife and habitats. For example, researchers have put radio collars on different species to learn more about their needs, habits and reactions to different components within their environments. This has been invaluable in making sure that our wildlife remains abundant.

So, you see, regardless of how you feel about hunting or fishing, it is the glue that holds together this unique, world-renowned North American Wildlife Conservation Model. And it is a large reason why we in North America have bountiful fish and wildlife resources that we and future generations can enjoy.

James L. Cummins is executive director of Wildlife Mississippi

Congressman Bennie Thompson enjoys most forms of hunting. He has been a leader in the U.S. House of Representatives to foster legislation for the conservation of fish, wildlife and forest resources.

PHOTO BY WILDLIFE MISSISSIPPI - JAMES L. CUMMINS

WEIGHING IN ON WOLVES

Montana works to strike a fair and biologically sound balance between having enough of the large carnivores and having too many. BY TOM DICKSON

SAME ANIMAL, DIFFERENT LENSES Many hunters see the wolf as competition for elk and deer. Ranchers consider the large carnivore a threat to livestock. Yet others, like wolf watchers who crowd Yellowstone National Park in winter, when viewing conditions are best (right), consider the large carnivore a natural wonder to be cherished and protected.

LEFT: CINDY GOEDDEL; RIGHT: ROBERT J. WESELMANN

DRIVING THROUGH THE FROZEN landscape of Yellowstone National Park's (YNP) Lamar Valley one recent morning, wolf watching guide Nathan Varley slows down and points to several ravens about a mile off. "There it is," he says, pulling over to set up his spotting scope and train it on a recent elk kill, which a few minutes earlier a colleague had told him was in the vicinity. For an hour we watch two wolves feeding on the carcass, a large gray male known to local watchers as "Crooked Ear" and a smaller black female called "Spitfire." The naming fosters anthropomorphizing, admits Varley, but it helps with identification, as do numbers given to about 20 percent of the park's wolves that wear radio collars for research purposes. Several other wolf watchers gather along the road in the bitter cold to view the large carnivores, clearly visible through high-powered optics. Crowded tour buses and minivans operated by wildlife-viewing companies pass by every 15 minutes or so, returning to Gardiner from another elk kill farther up the valley.

Varley, who lives in Gardiner, studied the park's carnivores for several years while earning a doctorate in ecology. But his primary concern with wolves these days is economic, not academic. "Every park wolf that steps over the border into Montana and Wyoming and gets shot is money out of our pocket," says the wildlife guide, who is also vice president of a local group called Bear Creek Council that tries

to increase tolerance for wolves and bison leaving the park. Varley and his wife run Yellowstone Wolf Tracker wildlife tours, one of a dozen or so guiding operations sanctioned by park officials. These kinds of services are at the heart of a thriving wolf watching tourism that a University of Montana study found pumps millions of dollars into counties surrounding the park each year.

That economic argument is just one used by wolf advocates critical of growing hunter and trapper wolf harvests in Montana, Idaho, and Wyoming. Some are like Varley, who has no gripe with wolf hunting elsewhere but wants a kill-free buffer around Yellowstone. Others, often from outside the Rocky Mountain West, want to halt all lethal action on an animal that was classified as federally endangered just a few years ago.

On the flip side are those who demand that Montana kill more wolves, which they say harm ranchers' bottom line and deplete elk and deer herds. "We'd like the state to take much more aggressive measures in certain areas to bring these predator numbers down to a more tolerable ratio with prey populations," says Rob Arnaud, president of the Montana Outfitters and Guides Association. "We've got hunting outfitters around Yellowstone going out of business because of wolves."

Montana Fish, Wildlife & Parks is listening to all sides. The department's job is to ensure there are enough wolves to maintain a healthy population in Montana, as mandated by its mission and federal law. At the same time, it works to limit livestock depredation, maintain abundant deer and elk, and foster public tolerance for wolves.

"Every park wolf that steps over the border into Montana and Wyoming and gets shot is money out of our pocket."

"We've got hunting outfitters around Yellowstone going out of business because of wolves."

It's a balancing act, and, with impassioned interests tugging every which way, not an easy one.

Tom Dickson is editor of Montana Outdoors.

Frustration fuels anger

The wolf has long represented conflicting views of untamed nature. Roman, Norse, and Celtic mythology celebrated wolves, yet the carnivores were feared and persecuted throughout Europe for centuries. Native American tribes revered wolves as guides to the spirit world. The United States nearly eradicated the carnivore with bounties and, later, wide-scale federal government extermination. In Montana alone, "wolfers" killed 100,000 wolves between the 1860s and 1920s, primarily with poison.

Public attitudes toward wolves began to change in the 1970s as part of the growing environmental movement. *Canis lupus*, nearly extinct in the Lower 48, became a symbol of the nation's vanishing wildness. In 1995-96, 66 wolves were live-trapped in Canada and set free in Yellowstone National Park and the wilderness of central Idaho. The goal: Restore wolves to a region where they had almost been eliminated. Western states objected but took some comfort knowing that management authority, which includes regulated hunting and trapping, would revert back to them once the wolf population reached federal recovery goals.

In the first decade after the Yellowstone introduction, the highly prolific carnivores grew rapidly in number and range. By 2001 the regionwide population count surpassed the federal goal of 300 in Idaho, Montana, and Wyoming combined (at least 100 in each of the three states). By 2007 it reached at least 1,500—five times the initial target. Yet as wolf advocates cheered the growth, stockgrowers were reporting more and more livestock losses. Hunters in some areas began seeing fewer deer and elk and attributed the disappearance to growing wolf numbers. With the large carnivores still under federal protection, wolf critics felt powerless to stem the rapid population growth. They grew increasingly vocal, holding rallies, proposing legislation to defy federal rule, and even threatening illegal actions. "Shoot, Shovel, and Shut Up," read one popular bumper sticker.

Anti-wolf furor lessened after 2011, when the U.S. Fish & Wildlife Service (USFWS) removed ("delisted") the Northern Rockies population from the federally threatened and endangered species list. Wolves could now be hunted under carefully regulated conditions. Still, many wolf opponents complained that too many wolves remained in areas where hunters were unable to reduce numbers. Demands grew for the state to kill pups in dens or, as Alaska and Idaho do, employ aerial gunning from helicopters.

FED UP **Frustrated that wolf numbers continued to grow far beyond initial federal recovery goals, anti-wolf protesters turned up the volume during the early 2000s. Wolves were finally delisted in 2011.**

LEFT: MONTANA FWP; OPPOSITE PAGE: KELLY GORHAM

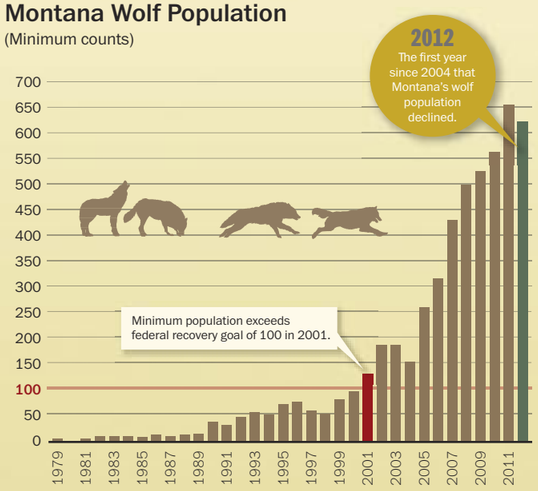
THE FACTS regarding concerns over Montana's wolf management

▶ PRO-WOLF BELIEF:

"Regulated hunting and trapping is decimating Montana's wolf population."

6X **FACT:** Montana's wolf population is still six times greater than the initial federal recovery goal of 100—a threshold reached in 2001.

Montana Wolf Population
(Minimum counts)

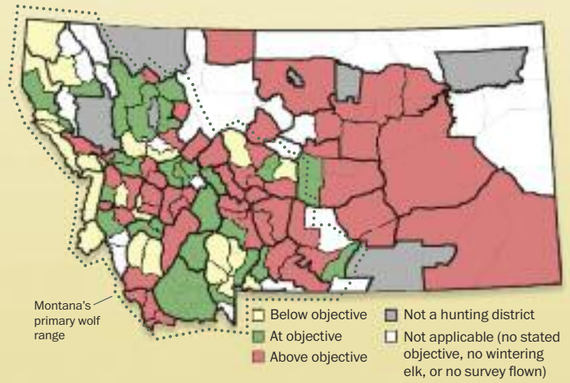


▶ ANTI-WOLF BELIEF:

"Wolves are decimating Montana's elk population."

81% **FACT:** Elk numbers are still at or over population objectives in 81% of hunting districts statewide. Numbers remain strong across most of the state's primary wolf range.

2013 Elk Population Objective Status by Hunting District



GRAPHICS: *MONTANA OUTDOORS*; SOURCE: FWP

Such radical proposals alarmed wolf advocates. With the species no longer under federal protection but instead subject to state control, they responded by ramping up their rhetoric and protests, just as wolf critics had a few years before. Public comments to FWP skyrocketed, from 500 on the first proposed wolf hunting season to more than 25,000 on the most recent. Most were coordinated e-mail "blasts" coming from outside Montana that denounced all wolf hunting.

▶ Outrage over killings

Much of the outcry from wolf advocates concerns the Yellowstone park wolves. Extensive coverage by the BBC, *National Geographic*, *The New York Times*, and other global media have detailed the carnivores' complex social interactions since reintroduction. Fans throughout the world track the Junction Butte, Blacktail, and other packs on blog posts and Facebook pages maintained by watchers who cruise the park's roads year round. Devotees can see where Tall Gray was spotted last week or learn how 686F is faring in Mollie's Pack, as though the wolves were characters in a reality TV show. Little wonder the Internet lit up this past August after a collared YNP wolf (820F) that had become habituated to humans was killed in Gardiner. "People become attached to these wolves that then leave the park and are shot. They get outraged," says Varley.

Yellowstone's wolf population has declined in recent years, not due to outside-the-park hunting, as some suggest, but mainly from a shrinking elk population. (All hunting is banned within the borders of national parks.) In the late 1980s and early '90s, the northern Yellowstone elk herd was one of the nation's largest. Reintroduced to this prey-rich environment, wolves grew from 41 in 1997 to a peak of 174 in 2003. As park biologists predicted, once elk numbers dropped (due to predation, weather, and

5% Today just over five percent of the 1,600 or more wolves in the Northern Rockies reside in Yellowstone.

6 Montana's wolf hunting season now lasts six months. Hunters and trappers may (though rarely do) take up to five wolves each.

liberal elk hunting seasons outside the park) so did the wolf population, which now numbers 86. Hunters have legally killed wolves that wander out of Yellowstone, but far more of the animals have died from wolf-on-wolf attacks, starvation, and disease. Mange alone has killed dozens.

Though the park's wolf decline understandably concerns watchers and guides, "the Yellowstone introduction was not designed to create wolf viewing opportunities or businesses," says Ken McDonald, head of the FWP Wildlife Division. "It was meant as the base for expansion far beyond the park's perimeter. Park visitors focus on individual animals, but here in Montana our responsibility is to manage wolves at a population level."

Wolf numbers in Montana and elsewhere in the Northern Rockies are robust, making the park's packs less significant to the regional population than their popularity would indicate, says McDonald. Today just over 5 percent of the 1,600-plus wolves in the Northern Rockies reside in Yellowstone. The species is thriving across the West and Midwest, despite recent claims by the Sierra Club that hunting "has driven the gray wolf nearly to extinction." According to the U.S. Fish & Wildlife Service, the Lower 48's wolf population has grown by 50 percent over the past decade to 5,360.

Outlandish claims show up on both sides of the issue. Some wolf critics still insist the carnivores are "wiping out" most of western Montana's elk populations. True, numbers are considerably down in some areas that have especially high wolf densities, notably the upper Gallatin, Blackfoot Valley, and Gardiner areas. But elk numbers remain at or above "population objectives" (what the habitat base and landowners will tolerate) in 81 percent of the state's hunting districts.

▶ Addressing reasonable concerns

Exaggerations aside, most apprehension over wolves is well within reason: A Dillon rancher needs to protect his sheep; a Missoula hunter wants to see elk next November; a Bozeman naturalist desires to live in a state with a healthy wolf population; a Florida tourist hopes her favorite Yellowstone wolf stays free from harm. "We take all reasonable concerns about wolves seriously," says Jeff Hagener, FWP director.

The department notes that livestock losses declined last year thanks to higher hunting and trapping harvest. Also credited are ranchers working with the department's six wolf specialists to protect sheep and cattle using fence flagging (fladry), carcass removal, and other measures.

Following reports of wolf predation on the southern Bitterroot Valley's elk herd, the department launched a large-scale investigation in 2011. Researchers recently found that mountain lions are more responsible for elk population declines there than wolves are. What's more, the southern Bitterroot elk herd is rebounding, likely thanks to favorable weather and habitat conditions.

As for criticism that Montana hasn't done enough to control wolf numbers, "FWP fought for years to restore state management authority that includes public hunting and trapping," says Hagener. Because wolves are wary and difficult to hunt or trap, FWP has supported liberalized regulations that now include a six-month season, electronic calls, and a wolf limit of five (a number that very few hunters or trappers actually take).

Montana is working to pare down the population of 600-plus wolves living here. But the state will not drive numbers low enough to trigger federal re-listing under the Endangered Species Act (ESA). "We can keep the ESA at bay only if we continue to show we have adequate regulatory mechanisms in place and are not advocating wholesale wolf slaughter," says McDonald.

In support of wolves, Montana's wolf conservation plan—the document that guides its wolf management—recognizes that many people value wolves, the large carnivores play an important ecological role, and the population must remain genetically connected to those in other states and Canada if it is to survive over time. FWP opposes poison, aerial gunning, and proposed legislation classifying wolves as predators that can be shot on sight. The department has created special hunting zones around YNP and Glacier National Park that reduce the chances that a park research wolf will be killed, and it urges hunters not to shoot radio-collared wolves.

> "As hard as it might be for some people to believe, allowing Montanans to hunt wolves actually builds tolerance for wolves"

FWP has also committed to keeping the population well above what the USFWS originally deemed sufficient for recovery.

Despite protests from wolf advocates, Montana will continue to allow hunters and trappers to kill wolves. That was part of the recovery agreement. Paradoxically, it's also in the wolf's best long-term interests.

"As hard as it might be for some people to believe, allowing Montanans to hunt wolves actually builds tolerance for wolves," says Hagener. He points out that overall anti-wolf anger in Montana, though still strong in some circles, has eased considerably since hunting and trapping seasons began in 2011. "As long as we can manage wolf numbers at what most Montanans consider an acceptable level, people here will accept having a certain amount of wolves on the landscape along with some loss of livestock and prey animals."

But without regulated harvest, Hagener says, "there'd be much more pressure to treat wolves like varmints that could be shot anytime, year round." Such relentless mortality would drive down Montana's overall wolf population. And it would prevent Yellowstone wolves from moving freely across the region to breed with counterparts in Idaho and northern Montana, threatening that population's genetic health and future survival.

Most people, including Montanans, want wolves to exist in the Northern Rockies. But how many, and where? It should come as no surprise that what is considered "enough" differs widely between those trying to live their lives on a landscape where wolves live, too, and those watching the drama play out from hundreds of miles away.

CLOCKWISE FROM TOP LEFT: JAIME & LISA JOHNSON; JAIME & LISA JOHNSON; BLUEDOLPHIN.COM; WIKIPEDIA; ARIZONA HISTORICAL SOCIETY; PUBLIC DOMAIN; PUBLIC DOMAIN

EATING OR STEALING? There's no argument that wolves kill prey animals and livestock to survive. Where tempers flare is over how much, if any, of that predation is reasonable.

HISTORICAL PERCEPTIONS OF WOLVES

In Roman mythology, the twins Romulus and Remus, raised by a she-wolf, found the city of Rome.

For centuries Europeans feared wolves. "Wolves Chasing Sleigh" was a popular subject for painters.

President T.R. Roosevelt declared the wolf a "beast of waste and destruction" as the U.S. embarked on systematic eradication.

In fables and cartoons, the Big, Bad Wolf uses cunning and deceit to trick Little Red Riding Hood, the Three Little Pigs, and other innocents.

Modern fans embrace the wolf as intelligent, sensitive beings restored to their rightful place.

Where Are All the Elk?

FWP researchers found them. Now they're trying to figure out how to get the animals back onto public land. By Tom Dickson

For most of the 35 seasons that Mike Harmon has been hunting elk in the Taylor Fork, a drainage of the upper Gallatin Valley near Yellowstone National Park's northwestern corner, he was confident that all five or six members of his hunting party would fill their tags. "We'd hunt hard, but eventually every one of us would get a bull," says Harmon, who lives near Three Forks.

That long string of success began to unravel in the late 1990s and early 2000s. Though the group continued to kill an occasional cow elk or spike bull, the days when everyone in the party would head home with a mature bull were long gone. "We started to go days without cutting a track," Harmon says. "It got kind of eerie."

Harmon and his hunting buddies are not alone. Each year across Montana's elk range, more hunters are reporting fewer elk on state and federal lands, especially national forests. Yet when FWP biologists conduct winter aerial counts of elk, they see as many, in most areas, than ever. In fact, populations are over "objective"—the number that biologists believe the habitat will support and landowners will tolerate—in 50 percent of elk hunting districts.

The striking disparity between what hunters see while hunting public land and the actual number of elk in their hunting district raises questions that strike at the heart of Montana big game hunting and management: Where are those elk going? Why? And is there any way to get them back?

Private Land Magnet

For several years Julie Cunningham, FWP wildlife biologist in Bozeman, had been hearing from hunters who could no longer find elk in the Taylor Fork, a nationally known hunting area that historically held 1,600 elk during fall and early winter. She set out to learn when and to where the animals were moving, and how that compared to previous decades. Cunningham and senior research biologist Ken Hamlin, now retired, compared elk locations of the Madison Range herd documented by FWP biologists from 1976 through 1986 to locations documented in 2005-06 by FWP crews and a Montana State University graduate student. During both periods, elk summered high in mountain meadows of the Madison Range (the Upper Gallatin) and stayed there through August (see maps on page 37). As is common with elk, cooler weather in fall pushed some of the animals downhill—in this case west into the Madison Valley. But in the 1970s and '80s, many elk still remained in the high timber, and when rifle season opened in late October, the animals were accessible to hunters in the Gallatin and Beaverhead-Deerlodge National Forests. Those elk did not move to winter

DISAPPEARING ACT Hunters report seeing fewer elk on national forests. Yet FWP winter surveys show as many or more elk in most hunting districts than ever. In recent years researchers have been following the "missing" elk to see where they go.

PHOTO ILLUSTRATION BY LUKE DURAN/*MONTANA OUTDOORS*

range until cold weather set in, often as late as December or January.

By 2005-06, all that had changed. Cunningham and Hamlin found that by mid-October, just before the rifle opener, more than half the elk had already moved down to the Madison Valley. There they settled on a growing number of private ranches off-limits to public hunting or on national forest tracts behind the ranches, miles from public roads and access. By November—during the heart of the hunting season—almost every elk had vanished from the Upper Gallatin. "No wonder hunters in the Taylor Fork weren't seeing elk," says Cunningham. "They'd been down in the valley for weeks."

What Cunningham documented has also occurred across other western Montana national forests, says Eric Tomasik, regional wildlife program leader for the U.S. Forest Service Northern Region in Missoula. "Historically, you'd likely see elk [on national forests], at least if you were willing to hike a bit," he says. "Now in many areas you might not see any. Then you get up on a ridge and look down in the valley and glass an entire herd on private land. It's frustrating."

"It's basically a risk analysis by elk. They generally prefer to go down to private land with limited hunting access rather than stay in forests where vegetation may be more sparse and hunting pressure is greater."

And not just for hunters. "Without the tool of public hunting, we as an agency can't meet our legal responsibilities of managing Montana's elk herds in the public trust," says Ken McDonald, head of the FWP Wildlife Division. "What that means for many livestock operations is more depredation problems, and for public hunters less access to big game. It's become one of the biggest wildlife management problems in Montana."

The Main Driver

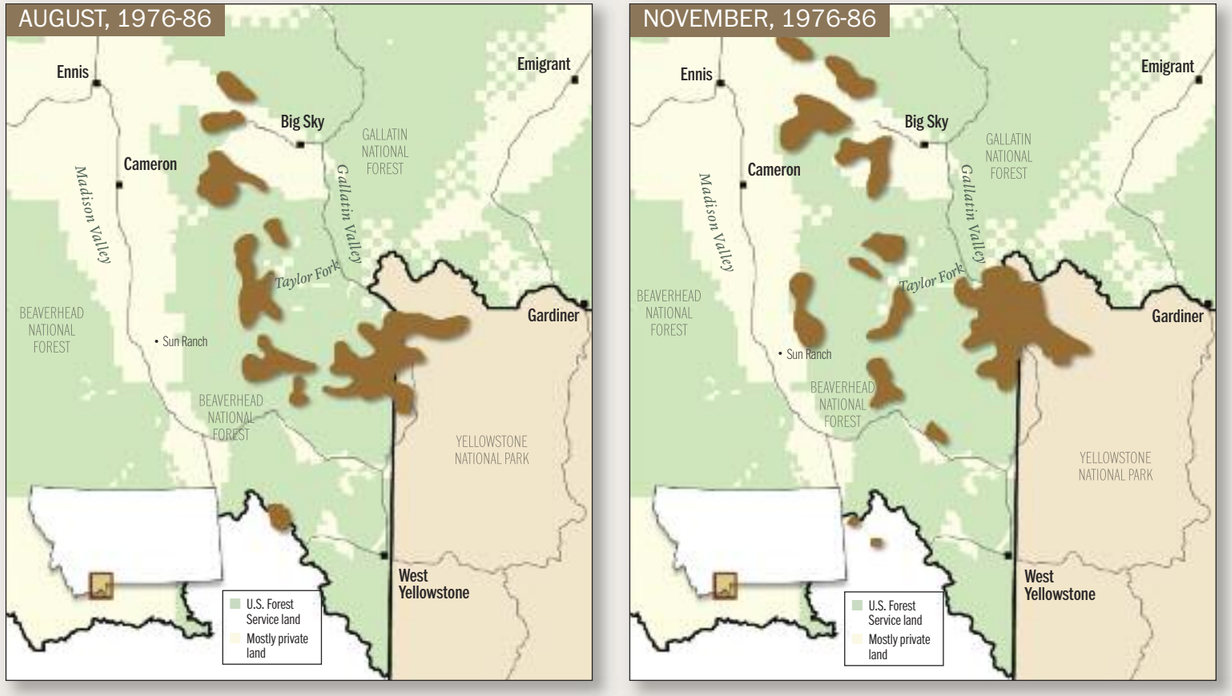
What changes over the past two decades have caused the new elk behavior? Possible reasons, say wildlife officials, are more irrigated bottomland attracting elk, greater hunting pressure on public land, wolves and other large carnivores more abundant in the mountains than the valleys, and less grass and other forage in forests due to fire suppression and logging curtailment. "But the main driver seems to be the massive change in land ownership starting in the mid-1990s," Cunningham says. "It went from working ranches that usually allowed public hunting to 'amenity' ranches owned by people who did not want public hunting. It's not surprising that elk have figured out that the best place to spend the hunting season is where hunters are not allowed."

To find out if the elk movement documented in the Madison is taking place elsewhere in Montana's elk range—and, if so, what contributes to that behavior—FWP conducted several elk movement studies. For one project, led by Bozeman-based FWP research scientist Kelly Proffitt, researchers

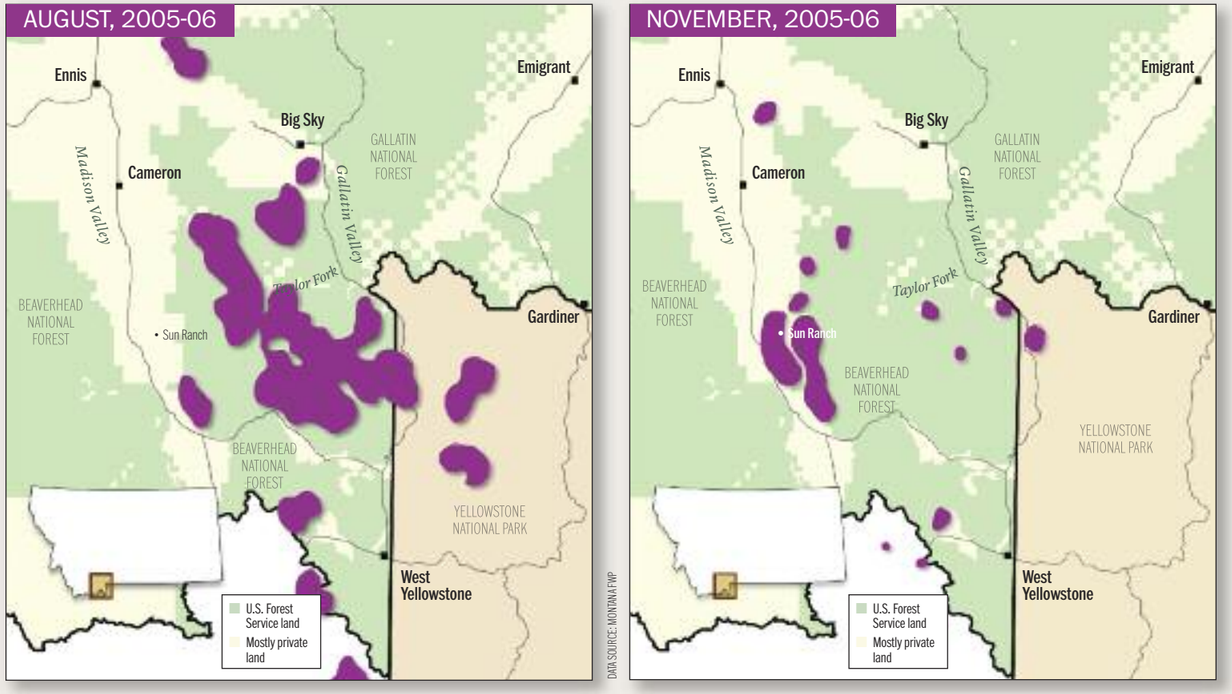
Tom Dickson is editor of Montana Outdoors.

BAD MIX In addition to grazing pasture and eating haystacks, elk in some areas pose a brucellosis risk to livestock during spring calving season when the animals may mingle. Private land closed to hunting allows elk to settle into bottomlands, increasing opportunities for transmitting disease.

PHOTO BY JESSE LEE VARNADO, INFOGRAPHICS BY LUKE DURAN/*MONTANA OUTDOORS*



LEARNING TO AVOID HUNTERS Above: The maps show, in brown, general elk locations in August and November during various study years from 1976 to 1986. The locations show elk summering in the Beaverhead and Gallatin National Forests. By start of the firearms elk season in November, most of the elk were still on the national forests, accessible to public hunting. Below: The maps show, in purple, general elk locations in August and November in 2005 and 2006. Elk continue to summer in the national forests, as was the case 20 to 30 years before. The big change comes in November. Now elk have moved almost completely out of the national forests and congregated on the Sun Ranch and other private land generally off-limits to public hunting. "Elk aren't stupid," says one Forest Service biologist. "They go where it's safe and there's lots of food. These days that means private bottomlands that are closed to public hunting."



DATA SOURCE: MONTANA FWP

captured and radio collared 45 cow elk in the western Paradise Valley and followed 49 cow elk previously collared in the Madison Range. Researchers tracked the animals, recording 190,000 separate locations and documenting factors that might cause them to move or stay put. Factors included the ratio of public to private land, human hunting pressure, presence of motorized vehicles, wolf densities, and the amount of forest hiding cover (200-acre parcels of high-elevation timber at least a mile from roads, where elk can escape hunting pressure).

One surprising new finding was that elk were less likely to use hiding cover in national forests than previously believed, unless it was far from motorized vehicle traffic. "It's basically a risk analysis by elk," says Proffitt. "They generally prefer to go down to private land with limited hunting access and longer growing seasons rather than stay in forests, where vegetation may be more sparse and hunting pressure by humans is much greater, even if there's hiding cover up there."

Compounding the problem is that "elk may be spending more time down on private land may lose their migratory habits and not pass that knowledge on to their young," says Proffitt. Meanwhile, elk that retain the travseling urge are more vulnerable once hunting season comes around. "These days it's mainly migratory elk being harvested, since those are the ones more accessible to hunters," says Proffitt.

Socializing, as much as science, may be part of the solution. FWP, hunting groups, and others will need to meet with landowners who limit elk hunting and find out what they want in exchange for opening their gates.

After analyzing data from the study, Proffitt devised a way to estimate where elk will be in November in each hunting district, based on factors such as the percentage of national forest land or the level of hunting pressure. Says Justin Gude, head of FWP wildlife research, "Now our biologists can recommend regulations aimed at distributing elk where they want them to be, while the Forest Service can use the information to adjust their forest plans."

Possible Solutions

Another part of Proffitt's study, as well as others ongoing in the northern Sapphires and Missouri Breaks, aims to identify how various management activities influence the number of elk on public land and available to hunters. "For instance, do nutritional differences on public versus private land drive these changes [in elk movement]?" she says. "Can we manipulate habitat on public land—maybe with prescribed burns or aspen regeneration or targeted timber harvest that opens areas to sunlight—especially for late summer and early fall, when cows need to put on fat for their next pregnancy?"

Research by Proffitt and others is causing forest managers to rethink elk management policy, says Tomasik. In the past, national forest elk management plans focused on creating hiding cover for elk and security from hunters using motorized vehicles during the hunting season. "That made sense back when FWP was trying to grow the statewide elk population," Tomasik says. The dense forest far from roads allowed biologists to provide liberal seasons with no bull harvest restrictions, giving hunters abundant opportunity while ensuring bulls weren't overharvested. That approach, it now turns out, may be insufficient. "In addition to maintaining hiding cover and security to hold elk during hunting seasons, we may need to create more forage that will entice elk, especially cows, to stay on national forests earlier in the year," Tomasik says.

NO LONGER ENOUGH? Since the 1980s, national forest managers have created 200-acre blocks of hiding cover where bull elk could escape hunting pressure. As elk increasingly abandon forests for the safety of private bottomlands, managers may need to also find other ways to lure—or push—elk back to the mountains.

BELOW: JESSE LEE MARNADO; ABOVE RIGHT: DUŠAN SMETANA

In other words, retain the thick, remote habitats but also produce grass to lure elk away from irrigated bottomland.

Another way wildlife managers can move elk to more desirable locations is by adjusting hunting seasons and regulations. "An option might be to temporarily decrease the number of cow tags in some national forest hunting districts," says Gude. "That way you would have less hunting pressure up there for a few years and elk would get used to not being bothered." That would require hunters to give up some current opportunities, says Gude, "but it might be worth the trade-off in producing more accessible elk in the future."

According to McDonald, FWP could also stagger season dates to create random pulses of hunting pressure that keep elk moving—hopefully from private land to public. Or, as it already does in some areas, the department could limit cow hunting to private bottomlands only, making nearby national forests safer for antlerless elk. "For this to work, regulations have to be customized for each area in cooperation with local landowners and hunters, as has been the case in recent years in the Madison, Missouri Breaks, Bitterroot, and Devil's Kitchen areas," says McDonald. "A one-size-fits-all approach won't fly because too many different factors are at work."

Socializing, as much as science, may be part of the solution. FWP, hunting groups, and local communities will need to meet with landowners who limit or prohibit access in hunting districts where elk have abandoned public forests. They'll have to find out what property owners want in exchange for opening their gates—such as, for nonresident landowners, tags, permits, and licenses to be more accessible. And they'll need to make a more compelling case than just "it's the public's wildlife" for why more hunters should be allowed on closed properties.

For Mike Harmon, the Taylor Fork hunter, the new elk movement patterns make sense. "Back 150 years ago, elk were in the valleys and we drove them up into the mountains," he says. "Now they're coming back down again to where they used to be." Forest and wildlife managers say that more hunters will need to understand why elk aren't where they once were, what can be done to change that, and how elk management in Montana has been transformed. "Many people still don't comprehend how radically things have changed from 20 or 30 years ago, when FWP was trying to increase herd size," says McDonald. "Now Montana has surpassed elk population objectives in much of the state, and we need to reduce numbers."

McDonald acknowledges that the concept of "too many elk" doesn't register with hunters seeing fewer cows and bulls every fall. "But in most cases, the elk are definitely still in the hunting district," he says. "The problem is that too many are now on private land beyond the reach of hunters. That's the problem we're trying to solve."

To participate in a community group working on local elk management, contact your local FWP wildlife biologist. To comment on the elk habitat component of management plans in a national forest where you hunt, call the supervisor's office and ask if planning is under way and how you can be involved. Participation can range from emailing comments to taking part in meetings and discussions.

Landowner versus landowner

If ranchers don't want elk on their property—because the animals eat hay and forage meant for livestock and, in some areas during spring calving season, can increase risk of disease to cattle—then why don't they open their land to public hunting?

For the most part, those landowners do.

When it comes to elk and elk hunting, there are two basic categories of landowners. A growing number have bought ranches then reduced or discontinued the cattle operation. They enjoy having lots of elk on their land—either to see the animals or sell exclusive hunting access, mainly for trophy bulls, via outfitters. The more elk, the better.

That's not the case for nearby working ranchers who are losing hay and grass to overabundant elk in the valley. Because they want elk numbers trimmed, many of these landowners open their property to public hunting.

The problem is, elk are highly mobile. When rancher Johnson allows hunting in November on his working cattle ranch, the animals simply move next door to landowner Wilson's property, which is off-limits to hunting. The animals hang out there all hunting season, not harming Wilson's bottom line because Wilson runs no cattle. Then in December, after the season closes, elk jump the fence and eat Johnson's haystacks and graze his pasture. And if they stick around during calving, in some parts of Montana they can increase the risk of brucellosis transmission to cattle.

"What it can get down to is landowners who don't allow public access doing actual harm to their neighbors' financial situation," says Ken McDonald, head of the FWP Wildlife Division. "It's an issue that needs to be resolved between landowners as much as it is an issue between our department and landowners." ■

HERE THEY COME After the hunting season ends in late November, elk that found refuge on private land off-limits to hunting head to neighboring ranches to eat hay and forage meant for livestock.