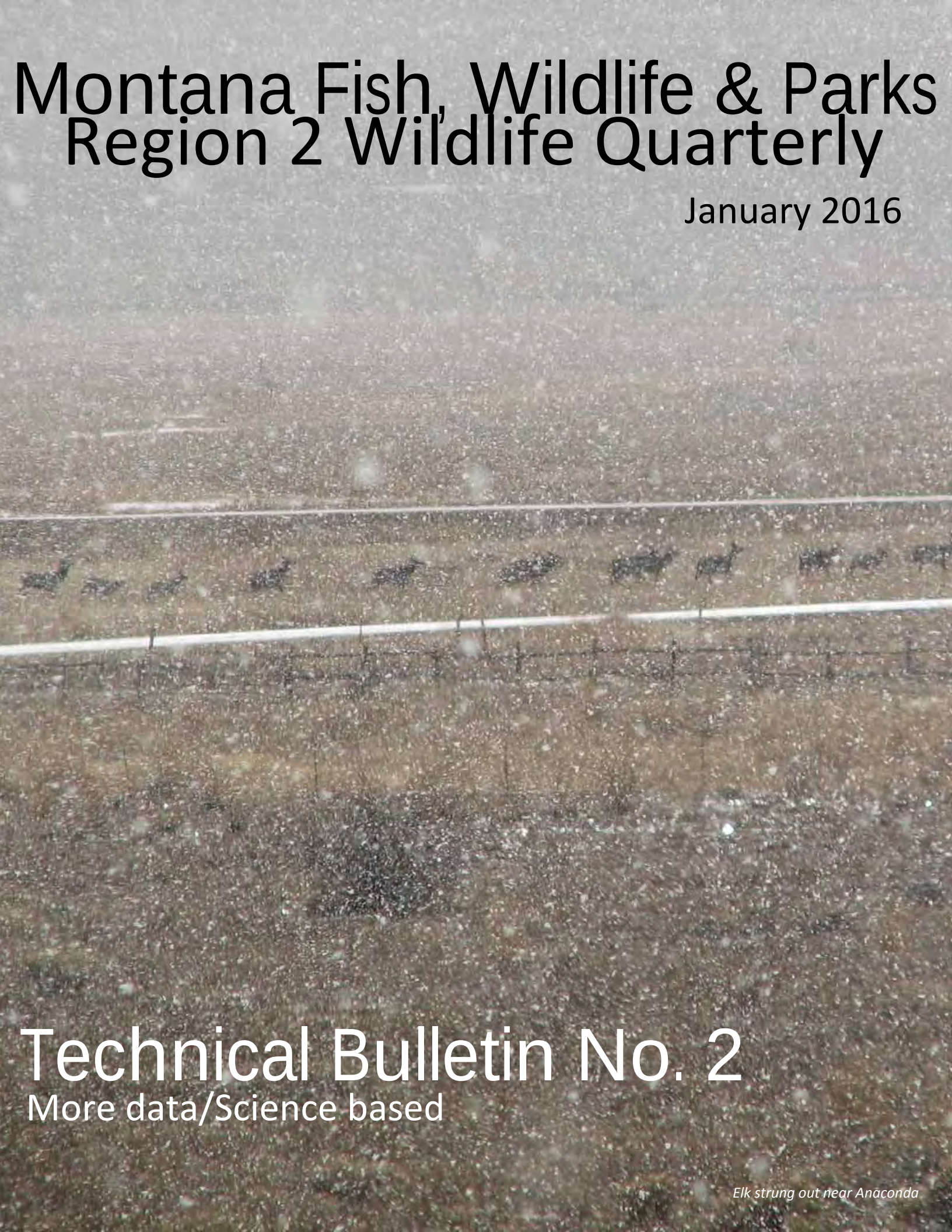
Montana Fish, Wildlife & Parks
Region 2 Wildlife Quarterly

January 2016



Technical Bulletin No. 2

More data/Science based

Elk strung out near Anaconda

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January 2016

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The Region 2 Wildlife Quarterly is a product of Montana Fish, Wildlife & Parks; 3201 Spurgin Road; Missoula 59804. Its intent is to provide an outlet for a depth of technical information that normally cannot be accommodated by commercial media, yet we hope to retain a readable product for a wide audience. While we strive for accuracy and integrity, this is not a peer-refereed outlet for original scientific research, and results are preliminary. October 2015 was the inaugural issue.

How Hunting Seasons Are Set

by the Region 2 Wildlife Staff

January 2016 is when the public will be asked to comment on proposed hunting regulations for the 2016-2017 hunting seasons. The process of collecting and analyzing data to inform hunting season proposals is an all-year, every-year job for FWP wildlife biologists, who also draw upon the observations and experiences of game wardens, FWP front office staff, and everyone with an interest in the outdoors. But, hunting season regulations are formally reviewed and adjustments proposed every two years, beginning in the year preceding the affected hunting season, and concluding in the following February. January 2016 is when FWP Region 2 biologists will hold evening public meetings in 12 cities and towns around the region to collect and discuss public input for the 2016-2017 biennium.

Rams rutting in Lower Rock Creek, Hunting District (HD) 210, on October 25, 2015. Two either-sex sheep licenses and two adult ewe licenses were allocated for HD 210 for 2014 and 2015 in the statewide special license drawing (above). FWP biologist, Scott Eggeman and UM students with an elk and hunters at Bonner Check Station on Opening Day, 2015 (below).

CHECK STATIONS

FWP biologists interview hunters and inspect harvested animals on weekends during every hunting season at check stations near Anaconda, Bonner, Darby and Fish Creek in Region 2. These check stations provide an opportunity for biologists to complete 16,000-20,000 interviews per year, including repeated visits by individual hunters. Biologists record the hunting districts where people are hunting, and record reports of wolf, grizzly bear and lion activity, while hearing hunters' impressions of the movements of deer, elk and other wildlife in their areas. It's also a time for hunters to share their

Continued on page 5.

A 3- (or 4-) year-old bull elk being checked at Bonner Check Station on Opening Day of the 2015 hunting season, judging by the dark, even staining across all of the teeth on the lower jaw, and the light wear on the inside cusps of the tooth indicated by the index finger of Biologist Eggeman. Permanent incisors have fully erupted as well—another sign of maturity. A specially fashioned tool is used for leverage to spread the stiffened jaws (above). A UM student interviews the driver of a vintage pickup on Opening Day, 2015, at the Darby Check Station (below left). Three generations—FWP Bitterroot biologist, Rebecca Mowry, with a student of wildlife biology at the University of Montana, who is the granddaughter of FWP's longtime research bureau chief (now retired).

Double trouble at the Darby Check Station on Opening Day, 2015.

attitudes and opinions, which help biologists better represent the public when formulating hunting season proposals. The ages of harvested deer, elk and antelope are the biological data obtained systematically only at check stations. An annually increasing average age of harvested female elk at the Bonner Check Station helped FWP's Seeley Lake biologist track a declining trend in elk calf survival in the middle and lower Blackfoot in the early 2010s, which led FWP to recommend regulations that allowed very little female harvest until calf survival improved. Ages obtained at check stations, in combination with an inspection of the antlers of deer and elk help biologists better interpret the antler point data that is obtained in the statewide hunter harvest survey.

MANDATORY HARVEST REPORTS

Hunters are required to report their harvests of bighorn sheep, black bear, mountain goat, mountain lion and wolf to FWP, and the harvest of some of these species further requires the hunter to personally present the harvested animal to FWP for inspection. These are species that are hunted by comparatively few hunters across a wide area and over a time period that extends well outside of the 5-week big game general season. These species also tend to be those that are more difficult to count in the living populations, or present unique management challenges, so FWP depends on reports or inspections of every harvested animal to a greater extent for recommending hunting season regulations for these species than for deer, elk and antelope.

FWP Biologist, Ray Vinkey, inspecting a bighorn ram harvested in Hunting District 212, near Garrison, in 2014.

STATEWIDE HUNTER HARVEST SURVEY

FWP conducts a statewide hunter harvest survey for most game animals in the months near or following the close of every hunting season. A random sample of hunters is selected from licensing records and hunters are phoned and asked specific questions that generate data on harvest success rates, species, sex, hunting districts, antler points, and other data. Hunters sometimes are surprised when the FWP telephone interviewer doesn't ask about the hunters' activities involving all harvested species; this is an artifact of the random sampling process in an attempt to extract the most statistically reliable results at the lowest effective expense. Wolf populations are estimated by phoning a sample of deer hunters to obtain the frequency and distribution of wolf observations, which can be converted into a wolf population estimate.

AERIAL SURVEYS

FWP Region 2 biologists conduct aerial surveys of elk, mule deer, antelope, bighorn sheep and mountain goats systematically, which means that biologists and pilots survey the landscape at the same time and in the same places, year after year, so that results from the current year may be compared with previous years to reveal whether the population is increasing, decreasing, or stable, and to identify whether more or less harvest of female animals is needed to meet management objectives. Some surveys, like for elk West of Missoula, and in the Bitterroot and Blackfoot, are flown when the buttercups and other forage bloom and green up every spring. For elk in the Clark Fork east of Missoula, it means surveying elk on open rangelands in the winter, when elk are most visible on that landscape. FWP uses a Super Cub for most elk and antelope surveys and a helicopter for most deer, sheep and goat flights.

Elk counted by helicopter on the Blackfoot-Clearwater Wildlife Management Area, HD 282. Inset: FWP pilot, Trever Throop, with new fabric on his Super Cub. Photos by FWP biologist, Jay Kolbe.

RESEARCH

FWP Wildlife staff processing a newborn elk calf in Spring 2011, as part of the Bitterroot Elk Study. The telemetry transmitter is visible in the calf's left ear. (Photo by Joe Rahn.)

FWP's Research Bureau employs a team of scientists who delve deeper into questions of wildlife ecology and management than FWP management biologists have the time to do for themselves across each of their 2,500 square-mile areas of responsibility in Region 2—or 10,549 square miles in the cases of the Region 2 non-game biologist or the bear, lion and wolf management specialists. FWP research projects involve some portion of every FWP Region in the state, and wherever they occur, FWP biologists and managers benefit from the availability of specific and detailed wildlife data and knowledge, which would be impractical for them to collect otherwise. Most importantly, FWP researchers and managers select study areas that offer the greatest opportunities for uncovering information that will be useful across broader areas than only the study areas. Partnerships with the Montana universities, private foundations and landowners/land managers allow FWP to extend its research effort and expertise to a far greater extent and effect than would be possible if FWP worked solely on its own. Outcomes of FWP research include information to help FWP biologists and managers make better use of their aerial surveys and harvest surveys, and to develop more effective and efficient ways of assessing the status of the wildlife populations that FWP manages. Generally, research biologists inform management biologists, who implement the research results in their management prescriptions and then feed their findings and concerns back to researchers for refinement.

BIENNIAL SEASON-SETTING PROCESS

The Montana Fish and Wildlife Commission—a 5-person, citizen board appointed by the Governor—sets hunting seasons and regulations on a biennial basis. Dr. Gary Wolfe currently represents the public in FWP Region 2 on the Commission. FWP biologists make hunting season recommendations to their respective wildlife manager in each FWP Region. In turn, regional wildlife managers seek concurrence from their regional supervisors, who forward approved proposals to the State Wildlife office in Helena, then to the FWP Director's Office and the Commission. The Commission reviewed FWP's hunting season proposals at its monthly meeting on December 10, 2015. In consideration of public comment received prior to and at the December meeting, the Commission approved the tentative hunting regulations for the 2016-17 biennium and opened a public comment period. Tentative hunting regulations are available for public viewing and comment on FWP's website online, and the Commission will consider and approve final biennial hunting regulations at its monthly meeting on February 11, 2016. Following is the schedule of public meetings in FWP Region 2 for January 2016.

The October 21, 2015 meeting of the Anaconda Sportsmen's Club, discussing upcoming hunting season proposals.

MEETING SCHEDULE

Date	Steps in the Biennial Process for Setting Hunting Regulations in FWP Region 2 for 2016-17
Aug 6 – Sep 3	Public Scoping for issues. An online opportunity for comment is provided.
Sep 4-Oct 15	FWP biologists and wardens collaborate in developing season proposals.
Oct 16-Nov 17	FWP Helena Staff review proposals and develop the Commission packet.
Nov 18-Dec 9	Helena Staff, Commission and the public personally review FWP proposals.
Dec 10	Commission Meeting (open to the public) and adoption of tentative hunting regulations for the 2016-17 biennium. Public comment period opens online.
Jan 4	Seeley Lake Public Meeting, Community Hall, 6:30
Jan 5	Hamilton Public Meeting, Bitterroot River Inn, 6:30
Jan 6	Lincoln Public Meeting, Lambkins Café, 6:30
Jan 7	Drummond Public Meeting, Community Hall, 6:30
Jan 11	Philipsburg Public Meeting, Granite County Museum, 6:30
Jan 12	Darby Public Meeting, Elementary School Lunch Room, 6:30
Jan 13	Lubrecht Public Meeting (lower Blackfoot), Conference Center, 6:30
Jan 14	Anaconda Public Meeting, Lee Metcalf Senior Center, 6:30
Jan 18	Helmville Public Meeting, Community Hall, 6:30
Jan 19	Deer Lodge Public Meeting, Community Center, 6:30
Jan 20	Superior Public Meeting, High School Multi-purpose Room, 6:30
Jan 21	Missoula Public Meeting, Doubletree Inn, 6:30
Feb 11	Commission considers revisions based on public comment and adopts final hunting regulations for the 2016-17 biennium.

Food Failure—*For Black Bears and Other Herbivores in Western Montana*

by the Region 2 Wildlife Staff

EFFECTS ON BLACK BEARS

Black bears in western Montana suffered a catastrophic food failure in the Fall of 2015. Montana Fish, Wildlife and Parks (FWP) bear specialists, wardens and biologists in Region 2 received 40-50 bear complaints and reports from the public daily, beginning on August 24, and continuing through October. It began with the unseasonably early ripening and passing of wild hawthorn, which attracted bears to low

Black bear cub at the FWP Wildlife Rehabilitation Center in Helena, November 5, 2015.

areas along the urban interface. As the hawthorn was depleted, ornamental fruits ripened on nearby private properties and parks, attracting dozens of black bears into civilization about one month earlier than normal. Conflicts between bears and humans continued unabated as bears backfilled areas from which FWP had removed offending animals. The situation progressed in Missoula to the point where some maternal female bears abandoned their young-of-the-year cubs, due to inadequate nutrition. The poor condition of bears going into hibernation may reduce the survival of cubs born in 2015, as well as those soon to be born in 2016.

In 2015, FWP recorded the mortalities of 377 black bears across the 10,549 square miles of FWP Region 2, in west-central Montana. Mortalities included hunter harvests, road-kills, human conflicts and all

Radioed black bear consuming apples in the Missoula urban interface, shown by Jerod Merkle, University of Montana, during his presentation to the 2010 annual meeting of the Montana Chapter of The Wildlife Society.

other causes. As expected, reported black bear mortalities were higher during the natural food shortage in 2015 than in any other year over the past 9 years, when comparable data were available for comparison. Black bears are more vulnerable to all mortality types when subjected to food stress.

THE CLIMATE PATTERN IN 2015

Temperature and precipitation charts for Missoula confirm that the growing season of 2015 was abnormally dry (Figure 1). The March-June period was extremely dry, and was coupled with a warmer than average June. Observers reported early ripening of huckleberries and other natural foods as spring turned to summer, and the seasons passed at a seemingly accelerated pace. A moist July was followed by a return to dry conditions in August and September. While forage may have been produced at an accelerated pace in 2015, forage depletion and senescence also occurred more rapidly than usual, leaving black bears with a food shortage in the months before hibernation.

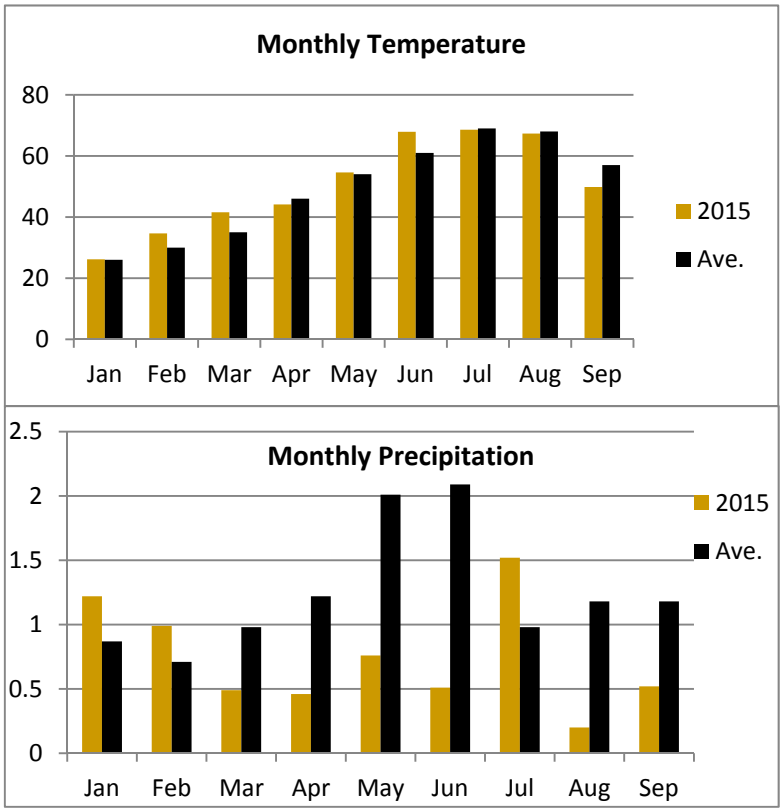

Figure 1. Climatological data for Missoula, from: http://www.usclimatedata.com/climate/missoula/montana/united-states/usmt0231/2015/8.

In recent years, considerable research attention has been directed toward the timing of forage production and quality in the growing season, and variation potentially associated with climate change. Effects of green-up rates in spring have been related to reproductive rates in elk, mule deer and mountain goats, at least. Gradual, extended periods of green-up—a long Spring season—are thought to be more beneficial to ungulates than short and rapid periods of green-up because green, growing forage provides the most succulent and digestible diet to meet the energy demands of late gestation and lactation.

EFFECTS ON MOUNTAIN GOATS

In coastal Alaska, mountain goat survival has been shown to decrease as winter snowfall and average daily summer temperatures increase. In a study published in 2011 by Kevin S. White and his coauthors in *The Journal of Wildlife Management* ("Mountain Goat Survival in Coastal Alaska: Effects of Age, Sex, and Climate;" Pages 1,731-1,744), researchers reasoned that summer temperature exerted an effect on goat survival in a number of ways. One possibility is that higher summer temperatures, over longer periods of the summer, melt the snow patches in goat habitat faster, causing a more rapid decline in succulent plant material along the shrinking edge of the snowpack. Another possibility is that higher summer temperatures stiffen the cell walls of forage plants and reduce the digestibility of the forage. A third possibility is that

Mountain goat observed by FWP Bitterroot biologist, Rebecca Mowry, and FWP pilot, Joe Rahn, during their survey of the Bitterroot Mountains on March 11, 2015.

higher summer temperatures increase the amount and duration of heat stress that a goat must endure, which increases the body's drain on energy reserves. These factors in some combination seemed to affect goat survival in the following winter, according to White and his coauthors.

EFFECTS ON ELK

In May 2011, visiting researchers Arthur Middleton and Matt Kauffman presented their findings on migratory and resident segments of a northwest Wyoming elk population to a large public audience at the Bitterroot River Inn in Hamilton. Subsequently (2012), Middleton completed his PhD dissertation, entitled, "The influence of large carnivore recovery and summer conditions on the migratory elk of Wyoming's Absaroka Mountains," at the University of Wyoming. Middleton wrote:

Elk crossing from green, agricultural crops to security cover on dry rangelands in the Deer Lodge valley in 2015. Crossing fences is a great way to get a seroma. (See page 13 for more on seromas.)

For the migratory elk we studied, the reduced pregnancy of young and lactating females coincided with phenological changes [i.e., changes in the timing and duration of green-up] that are consistent with observations of a severe, long-term drought in Yellowstone and the surrounding region. Prior research has revealed diverse influences of recent drought on the region's wildfire activity and snowpack (Westerling et al. 2006), amphibian populations (McMenamin et al. 2008), and bat reproduction (Adams 2010). . .

In temperate ungulates, parturition [i.e., birthing] is timed to coincide with peak forage quality so that females can meet the high energetic demands of lactation (Parker et al. 2009). Therefore, one likely mechanism for a climate-induced reduction in the reproductive performance of migratory elk is a "mismatch" between vegetation green-up and the period of lactation (Post and Forchhammer 2008). In migratory birds in Europe, such a mismatch between the springtime arrival of migrants and the phenology [i.e., green-up] of their breeding range may be linked to recent population declines (Both et al. 2006). In the only prior case for ungulates that we know of, recent arctic warming advanced vegetation green-up more rapidly than female caribou (Rangifer tarandus) advanced their parturition date, with negative effects on calf production (Post and Forchhammer 2008). The latter climate effect was thought to be mediated by a nutritional limitation on lactating females, similar to recent findings among Rocky Mountain bats, including migratory populations (Adams 2010). We found that poor performance of lactating female [elk] can also result from a reduction in the overall duration of optimal foraging opportunities

associated with green-up. Thus, our work suggests a new mechanism by which large-scale changes in vegetation phenology may reduce a key benefit of ungulate migration.

MANAGEMENT IMPLICATIONS

Climate related food shortages may have been exhibited most visibly by black bears in the yards, garages and along the roadways of western Montana in the Fall of 2015, but they may be indicative of food stresses that were endured by other herbivore species as well. FWP Region 2 is managing wildlife according to evidence that climate patterns drive the productivity and survival of wildlife populations, and that wildlife populations can withstand a greater degree of additive mortality—such as hunter harvest, predation and habitat change—during favorable climate patterns than during periods of climate-driven stress. During periods of climate-driven stress, it may be necessary to manage hunter harvest, predation and habitat to prevent additive mortality from reducing the most vulnerable wildlife populations below threshold levels of abundance that are required for population persistence.

Fibromas and Seromas—*Generally Not Harmful*

by the Region 2 Wildlife Staff

FIBROMA

Montana Fish, Wildlife & Parks (FWP) biologists and Front Office staff occasionally receive reports from the public about the growths that appear on some deer. The pendulous growth pictured at right is probably a fibroma—a benign tumor caused by a virus (similar to warts in humans). Also called "papillomas," the virus can be transmitted by biting flies or by direct contact with warts or lesions of an infected animal. Fibromas can range in size from quite small to very large and pendulous. They don't typically cause any problem for the animal unless they are large enough or in a location to interfere with sight, eating, walking or other activities. In some cases, they go away with time, but it could be a long time for larger ones. Fibromas are fairly common and pose no risk to humans.

A probable fibroma on a mule deer buck photographed by a member of the public and presented to FWP.

SEROMA

FWP less often receives reports of softball or larger growths on deer, called seromas. An excellent description of seromas is reprinted on the following pages, from the Internet source: http://esrd.alberta.ca/fish-wildlife/wildlife-diseases/documents/SeromaFactSheet-Sep-2012.pdf

A probable seroma on a white-tailed buck along Rock Creek on November 14, 2015.

Seroma in Alberta

Common name

seroma, hydrocyst, hygroma, water blister

Scientific name

(not applicable)

What's Bugging Wild Critters?

Fact sheet #33 : Seroma

Significance

Seromas generally are harmless accumulations of straw-coloured fluid. In wildlife they most often occur under the skin on the chest (brisket) of deer between the front legs. As far as we know most of the time they eventually dry up and don't even leave a scar. They DO NOT pose any health risk to humans.

What? Where? How?

Seromas start with an injury to soft tissues below the skin that causes thin clear yellow fluid to leak from damaged blood vessels and gather under the skin. Because there is no damage to the skin itself, there is no outlet for the fluid to drain away. Thus the fluid accumulates and the seroma gets bigger and bigger. By the time people notice it, the seroma is often the size of a football and can contain upwards of 5 litres of fluid.

The initial injury could be a blunt trauma to the chest or something as benign and simple as a rose thorn that works its way under the skin and becomes an ongoing irritation. In the latter situation, the thorn is so small that the original hole that allowed it to get in quickly closes and is sealed off. But as long as the thorn remains in place, there is ongoing irritation and associated leakage of fluid into the tissues. Sometimes the fluid is enclosed within a fibrous wall that develops in the space between the skin and the muscles and keeps the fluid all in one place.

The clear nature of the fluid indicates that there are no bacteria present and no infection at the damage site. It is likely that seroma fluids are eventually resorbed back into the blood vessels or perhaps the seromas burst or are torn open and the fluid finally drains away. Because there is no ongoing infection or involvement of vital tissues, the drained area closes quickly and is sealed without posing a risk to the deer.

Distribution in Alberta

About once a year the Wildlife Disease Unit receives photos, often from trail cameras or taken in someone's yard, showing a deer with a large football-sized lump between its front legs. On rare occasions the seroma is on the belly or in the groin.

Seromas can occur anywhere in Alberta and nearly always involve white-tailed deer, although we have seen a few cases in mule deer.

Pub. No:
I/578
ISSN
1710-4327
ISBN Print:
0-7785-9932-6
ISBN Online:
0-7785-9933-3

Seroma in Alberta

Importance for Wildlife Management

Seromas appear to be quite rare, although it is difficult to determine the actual occurrence rate. Similarly we seldom have the opportunity to document the eventual outcome of a seroma. But as far as we know they do not pose a significant risk or concern for most affected deer. It is possible that large seromas could affect mobility of the deer, and could interfere with effective escape from predators.

Public Significance

Seromas do not pose any public health concern. There is nothing 'infectious' in seromas. And they do not affect the meat of harvested animals that just happen to have a seroma.

Prevention/Control

Control of seromas in wild deer is not possible and not necessary. They occur rarely and do not appear to be a significant concern for affected deer.

Summary

Minor tissue damage, in the absence of bacterial infection, can cause clear fluid to gather under the skin and produce large visible distortion of the body outline. Such accumulations are rare and do not pose significant risks to affected deer. They occur naturally and appear to resolve naturally.

Additional Information

Michigan Dept of Natural Resources

http://www.michigan.gov/dnr/1,1607,7-153-10370_12150_12220-26655--,00.html

Alberta Sustainable Resource Development
Fish & Wildlife

December 2011

Wildlife diseases in Alberta: http://srd.alberta.ca/FishWildlife/WildlifeDiseases/

Directing Conservation—*Montana's State Wildlife Action Plan*

by the Region 2 Wildlife Staff

STATE WILDLIFE ACTION PLAN

Montana Fish, Wildlife & Parks (FWP) and partners recently completed an update of fish and wildlife conservation priorities for Montana. Congress generated the impetus for this planning process by making a State Wildlife Grant (SWG) funding program available to the states in the early 2000s. Montana's first *Comprehensive Fish and Wildlife Conservation Strategy* was approved by the U.S. Fish and Wildlife Service in January 2006, making Montana eligible for SWG funding. In 2015, FWP completed its first update, entitled *Montana's State Wildlife Action Plan* (SWAP). The 2015 SWAP is available online at http://fwp.mt.gov/fishAndWildlife/conservationInAction/swap2015Plan.html

According to the Plan: *This SWAP identifies priority community types, Focal Areas, and species to aid not only in informing FWP's priorities and decisions, but to assist other agencies and organizations in making decisions on where to focus their conservation efforts. The priorities outlined in this SWAP should guide conservation efforts to maintain Montana's tremendous biodiversity that makes this the last best place.*

BITTERROOT-CLARK FORK RIPARIAN CORRIDOR

This is one of two Terrestrial Tier 1 Focal Areas identified in FWP Region 2, occupying 372 square miles (Figure 1). This Focal Area contains Floodplain and Riparian, Open Water, Wetlands, and certain forests that are designated as Tier 1 Community Types of Greatest Conservation Need, outside the bounds of this Focal Area as well as within it. However, the Bitterroot-Clark Fork Riparian Corridor contains a diversity and aggregation of these community types that magnify the ecological importance of the whole, and these communities in this Focal Area are especially threatened with loss due to development.

Figure 1. Floodplain and Riparian community type within the Bitterroot-Clark Fork Riparian Corridor Focus Area, west of Missoula. Photo taken by Kristi DuBois on June 11, 2011.

PILEATED WOODPECKER

The pileated woodpecker is one of 29 bird species, along with 2 amphibians, 10 mammals and 2 reptiles, which occur in the Bitterroot-Clark Fork Riparian Corridor and are classified as Species of Greatest Conservation Need (Figure 2).

Figure 2. Pileated woodpecker on a cottonwood on the Lee Metcalf National Wildlife Refuge on Halloween, 2015.

The highest apparent density of pileated woodpecker observations in Montana is found in the Bitterroot-Clark Fork Riparian Corridor. In 1999, Riley and Patricia McClelland published their research findings on nest and roost trees of pileated woodpeckers in the Wildlife Society Bulletin (Volume 27, Pages 846-857). Their work focused on western larch forests in and around Glacier National Park. They found 113 active nests in 97 trees, indicating that a single tree may contain more than one active nest, and 51 active roosts in 40 trees.

"Most nest trees (81%) and roost trees (78%) were snags," wrote the McClellands. A snag is a standing dead tree, and some snags are more useful to pileated woodpeckers and other cavity excavating and cavity dwelling wildlife than other snags, due to their larger relative size and the amount and characteristics of decay. In the study by McClelland and McClelland, western larch was the most common tree species that attained suitably large size to serve as nest trees for pileateds. But, western larch is comparatively hard wood. Others have found that deep fire scars at the bases of western larch are important points of entry for heartwood decay organisms that can soften hard woods for excavation by woodpeckers. The McClellands found that heartwood rot was an important factor in making snags suitable for pileated woodpecker nesting, and that pileateds often nested in larch snags with broken tops—another point of entry for heartwood decay organisms.

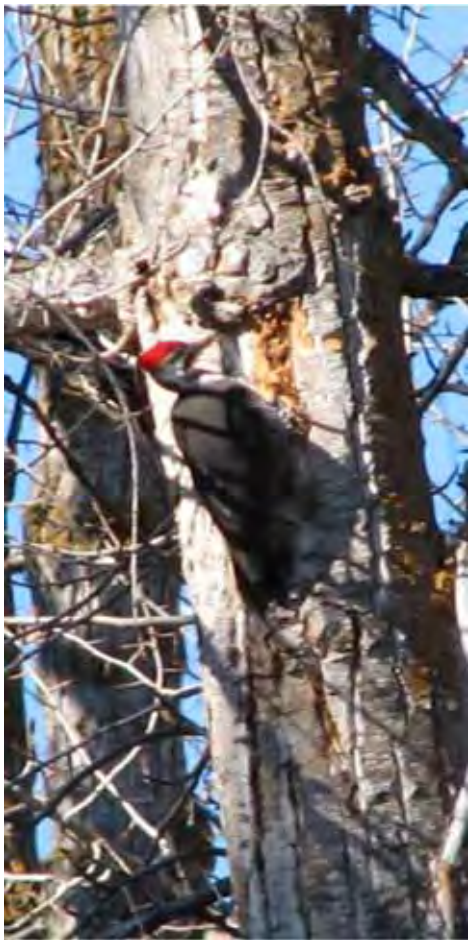

Figure 3. Pileated woodpecker excavating a cottonwood along the Clark Fork River in Missoula, on February 28, 2015.

In the Bitterroot-Clark Fork Riparian Corridor, pileated woodpeckers are found in cottonwood dominated woodlands as well as in upland coniferous forests. Cottonwood is a softer wood, so heartwood rot may not be as critical for pileated woodpecker nesting trees in cottonwood as in larch, and

cottonwoods attain sufficiently large size (Figure 3). Holes excavated by pileated woodpeckers are used by cavity-dwelling species that don't excavate their own holes, such as the wood duck, marten, flying squirrel and common merganser, among other species (Figure 4).

Figure 4. Common merganser hen on Rock Creek on May 16, 2015.

The pileated woodpecker overwinters in the Bitterroot-Clark Fork Riparian Corridor, as documented by observations reported to the Montana Natural Heritage Program (MNHP). (Figure 5). The MNHP's Montana Field Guide is online at http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNYF12020

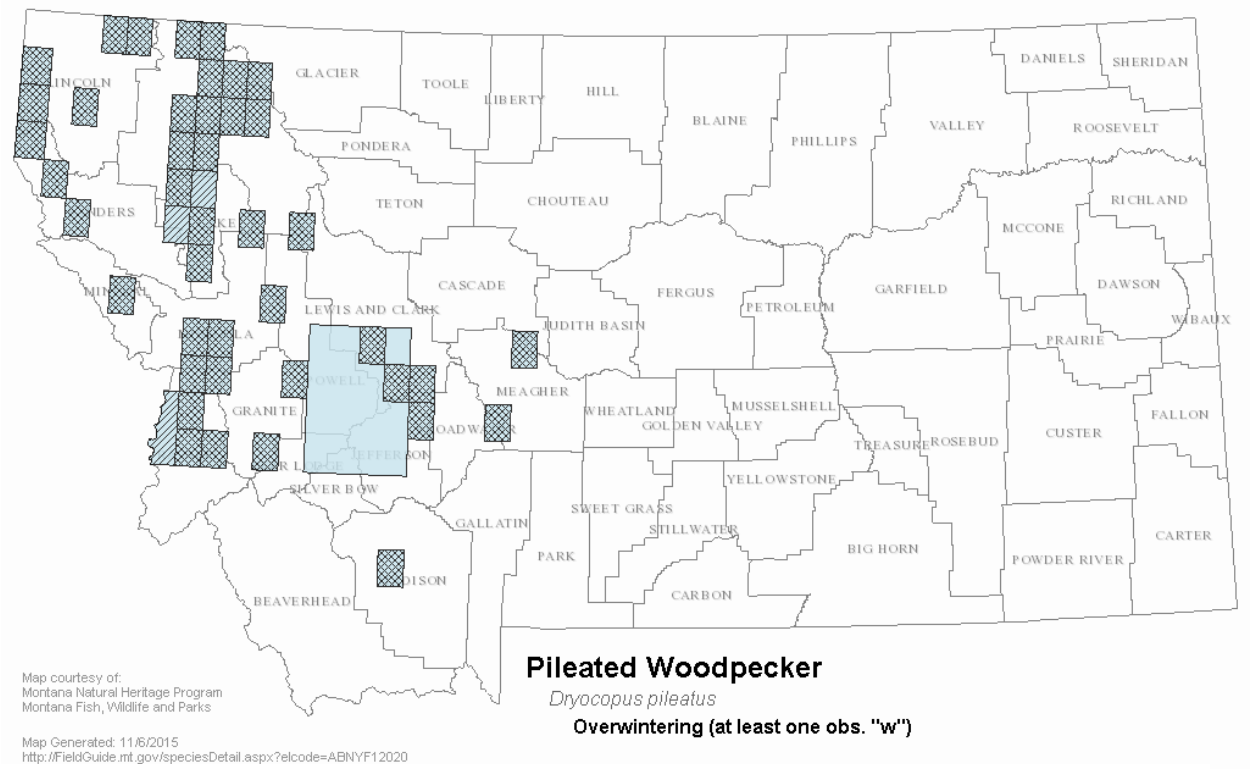

Figure 5. Distribution of observations of wintering pileated woodpeckers reported to the Montana Natural Heritage Program.

Latest Published Research—*Effects of Wolf Removal*

FWP wildlife biologist, Liz Bradley, earned "Featured Article" recognition in the November 2015 issue of The Journal of Wildlife Management, as the lead author among seven leading scientists and experts on an article entitled, "Effects of Wolf Removal on Livestock Depredation Recurrence and Wolf Recovery in Montana, Idaho and Wyoming." Liz is now responsible for all state-managed wildlife in the Missoula area and points west to Lookout Pass. Read about this wolf research in a coming issue of this Wildlife Quarterly.

Liz Bradley leading a tour of Fish Creek Wildlife Management Area on May 29, 2015.