Grizzly Bear Management
2017 Annual Report
NCDE Portion of Region 1
Montana Fish, Wildlife & Parks

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Introduction

In 1993, Montana Fish, Wildlife & Parks (MFWP) hired a Grizzly Bear Management Specialist for Region 1, to work closely with private landowners and agency personnel to minimize conflicts between grizzly bears and humans. More emphasis was placed on a proactive approach of prevention. In 1995, we began pre-emptive capture and releasing bears closer to or within their home ranges. In 1996, working with Carrie Hunt of the Wind River Bear Institute, we began using onsite releases and aversive conditioning in an attempt to modify the behavior of the bear. At the same time, we worked closely with the landowners to identify and secure attractants.

There has been a lot of interest in the methods and philosophy of the program from the bear management community and the public. This has generated local and national media coverage which has highlighted the importance of preventing bear problems in the first place and secondly, how to handle those bears if problems do occur. The methods and techniques developed in the field continue to be refined and improved. An interaction between grizzly bears and humans tends to be very individualistic which makes the analysis of data and presentation of results very complex.

In 2005, Montana Fish, Wildlife & Parks began an augmentation program of capturing grizzly bears with no history of conflict from the NCDE and releasing them into the Cabinet Mountains. Heather and Derek Reich were hired under contract with funding support from the Montana Fish, Wildlife & Parks Foundation and the National Fish and Wildlife Foundation. Since 2011, MFWP has continued the augmentation work with MFWP personnel.

This report is an overview of the work conducted during 2017. It includes prevention efforts, reported grizzly bear conflicts, management captures, releases, monitoring, mortality, use of technology, and the Cabinet Mountains augmentation program.

Goal and Objectives

Goal: Minimize conflicts between people and grizzly bears.

Objectives:

To minimize grizzly bear conflicts by working with landowners to identify, secure, or remove attractants.
To work with agencies to promote food storage on public lands to minimize grizzly bear conflicts.
To work with city, county, state, and federal governments to minimize grizzly bear conflicts.
To provide information to the media on how people can prevent grizzly bear conflicts.
To respond to grizzly bear conflicts on private and public lands.

Prevention

The best way to minimize conflicts between people and grizzly bears is to try to prevent conflicts from occurring in the first place. Prevention can include a wide range of options including education (brochures, press releases, presentations, Bear Fairs), increasing human tolerance, installing and maintaining an effective electric fence, and using approved bear resistant garbage containers. Perhaps the most effective, but also the most time consuming, is one-on-one communication with people that live and recreate in grizzly bear country. The one-on-one communication needs to be done before a conflict occurs. Unfortunately, most one-on-one communication tends to occur in response to a conflict that has already occurred.

In many cases people aren't aware that they live in or adjacent to grizzly bear habitat. People may not know that bears eat bird seed, pet food, chicken feed… basically everything people eat, what their pets eat, what they feed their livestock, their livestock, their fruit, harvested game, and their garbage. Once people know what attracts bears to their property or campsite, they can learn there are ways to properly secure, protect, or remove attractants so bears don't get access to them. Preventing bears from obtaining these types of foods can help prevent those bears from becoming food conditioned and therefore minimize conflicts.

It can be difficult to measure the effectiveness of a conflict prevention program because there are so many different variables involved. All people are different, all bears are different, and all situations are unique. More people are moving into the area (more attractants available), the grizzly bear population is increasing (more bears and bears in areas where people don't expect them to be), some people have the desire and means to secure attractants and some people don't, some grizzly bears totally avoid people and homes and some grizzly bears don't.

Even the definition of a conflict can vary greatly depending on the people that were involved. For some people, having a grizzly bear walk through their backyard is worthy of a call to 911 and they want MFWP to set a trap right away and get the bear out of there. For others, it is a unique observation that they are excited to see and MFWP doesn't hear about it. It is quite common to get these different reactions from people that are neighbors.

As in previous years, prevention of grizzly bear conflicts was again a major focus in 2017.

Electric Fencing: Electric fences are very effective at keeping bears from gaining access to attractants. Bear conflict specialist, Kim Annis based in Libby, has developed an electric fencing brochure that provides information on how to properly install and maintain an electric fence. We distribute that brochure to landowners and also provide them with a link to the MFWP website for additional information.
http://MFWP.mt.gov/fishAndWildlife/livingWithWildlife/beBearAware/bearAwareTools.html

A large part of our prevention work involved assisting landowners with protecting chickens, pigs, and fruit trees with electric fencing. We helped with the installation of 12 temporary and permanent electric fencing projects located near Eureka, Fortine, Trego, Columbia Falls, Whitefish, Creston, Bigfork, Ferndale, Condon, and the Bob Marshall Wilderness. Tim Thier, wildlife biologist based in Trego, and Kim Annis also helped landowners install electric fences in the Eureka, Fortine, and Trego areas.

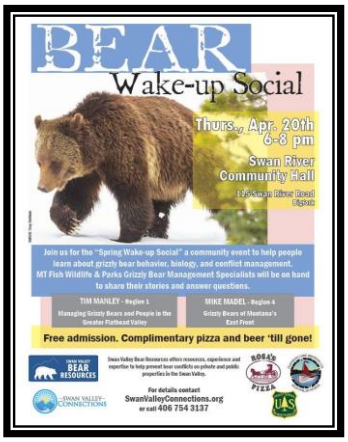
In several cases, Defenders of Wildlife would cost share with the landowners and assist with the design of the fences. We helped landowners with the design, selection of fencing products, construction and maintenance of the fencing as needed. Additional electric fencing projects are planned for 2018.

A temporary electric fence with a 12-volt battery and solar panel charger was installed around an outfitter camp in the Bob Marshall Wilderness Area.

Most of the electric fences were installed in the Eureka and Fortine areas. At least one family group and a single adult bear were involved with killing chickens at several different locations. Once the fences were erected and properly maintained, the bears moved on. As we have seen in previous years, more and more people are raising chickens. Three of the properties near Eureka where we erected electric fences were at residences where the landowners had moved in during the last two years. One resident had a large number of different types of livestock and we are planning to help construct a much larger permanent electric fence in the spring of 2018.

Bear Fairs and Wake-up Social: Several years ago, a group in the Swan Valley started a Bear Fair that was open to the general public. Over a few years, it grew from 50 people to over 300 people attending. Due to the success of reaching out to local residents, additional bear fairs were planned and hosted at the communities of Polebridge, Essex, Coram, and Ferndale.

In 2017 the Bear Fair was again held in Condon at the Swan Valley Community Hall and was organized and hosted by Swan Valley Bear Resources. Agency personnel from Montana Fish,



Wildlife & Parks, the U.S. Forest Service, and U.S. Fish and Wildlife Service set up booths and gave presentations. Private NGO's (Swan Valley Connections, Defenders of Wildlife, Living with Wildlife Foundation, Montana Outdoor Legacy Foundation) and company vendors (Counter Assault and Cenex Home Store) also put up displays and gave presentations on electric fencing, bear resistant containers, and the use of bear spray. Over 120 residents and tourists attended the event.

In addition to the Bear Fairs, Swan Valley Bear Resources also started a Bear Wake-up Social several years ago. This event is held during April when bears are emerging from their dens. This year, the event was held at the Swan River Community Hall near Bigfork. Presentations were given by Mike Madel, Grizzly Bear Biologist from Choteau and myself. Over 100 local residents attended the presentations.

Bear Resistant Containers: A new program that we initiated in 2004 was the purchase of bear-resistant roll out garbage containers from Unbearable Bins. The purpose was to be able to loan bins out to residents that needed them on a short-term basis because a bear was attempting to access their garbage or other attractant. The containers passed the bear testing protocol that was jointly developed by Patti Sowka and the Living With Wildlife Foundation (LWWF.org). The testing protocol was presented and approved by the Interagency Grizzly Bear Committee in December 2003. The loaner program was successful early on, and because of that success, Defenders of Wildlife purchased another 10 Unbearable Bins to add to our loaner program. We have found that once residents see the effectiveness and value of the bins, that they would purchase bear-resistant containers for themselves. It is hard to believe it has been 11 years since we started the loaner program.

In late 2015, a company called Kodiak Products, came out with a new automated 95 gallon bear resistant roll out refuse container. This container has been tested and passed at the Grizzly & Wolf Discovery Center (GWDC). The unique feature of the container is that it unlocks automatically when the garbage truck lifts to dump it. The older containers required someone to unlatch the lids to empty it. In 2016, through funding provided by the MT Outdoor Legacy Foundation, we added 12 Kodiak containers to our loaner program. In 2016 we added another 6 Kodiak containers.

During 2017, we loaned out 6 Kodiak containers to residents in the Eureka, Whitefish, and Bigfork areas. We also loaned containers to the Sprague Creek fire camp located near West Glacier.

County Waste Transfer Sites:
We continued coordinating and working with several counties on bear-proofing some of their transfer sites. The green box site at Coram, operated by Flathead County, has been a model for other transfer stations. It consists of a chain link fence and an electric fence on the outside. It was completed the spring of 2003 and since completion; we have not had any bears access the site.

Over the past 14 years, Flathead County has continued to consolidate and bear proof their waste transfer sites. In Flathead County, the sites at Coram, Ashley Lake, Olney, Pinnacle/Essex, and Bigfork are now fenced with chain link and electric fencing. Due to the success of bear-proofing these waste transfer sites in Flathead County, other counties have started to follow suit.

Within the NCDE, Lincoln County has bear-proofed the Glen Lake and Trego transfer sites. Both of those locations had a big problem with black bears and grizzly bears getting into the unsecured garbage dumpsters. Since those sites have been fenced, there have not been any issues with bears accessing the garbage. The Pinkham site is scheduled to be bear-proofed and discussions about the site at Fortine are planned. The green box site along Highway 93 near Stryker was removed by Lincoln County. Kim Annis and Tim Thier have been instrumental in working with Lincoln County.

Lake County maintains two waste transfer stations in this area. The Porcupine site is south of the community of Swan Lake. We helped design, build, and install an automated lid system for the 40 cubic yard dumpsters that Lake County uses. The Porcupine site modification has been in place for at least 16 years and seems to be working quite well. The transfer site at Ferndale also had the site modified to

automate the hydraulic lids on the 40 cubic yard dumpsters. Unfortunately, a leak developed in the underground hydraulic line, and Lake County has not made any effort to repair the leak. The site is still not bear resistant at this time.

The community of Condon in the Swan Valley has made a big effort to provide bear resistant garbage containers to both landowners and business owners. Swan Valley Connections along with Swan Valley Bear Resources put a lot of time and effort into educating landowners about the importance of keeping their garbage secure. It is always an ongoing educational effort that involves both new and long time residents of the Swan Valley, but they have been making a big difference.

The North Fork newsletter, written and distributed by local residents of the North Fork of the Flathead was first distributed in 2004. This newsletter summarizes bear activity in the North Fork and provides residents with information on preventing conflicts by identifying and securing attractants. This NFK Bear Newsletter is being modified for use in the Swan Valley and possibly the Middle Fork of the Flathead. The newsletter is mailed to every landowner in the North Fork Valley. The North Fork Newsletter and North Fork Landowners Association continue to provide information on grizzly bear activity in the North Fork.

Additional prevention efforts planned for 2018 include identifying and working with various organizations to provide bear-resistant containers at commercial and residential sites where bear problems have been a major concern. The communities of Whitefish, Columbia Falls, Hungry Horse, Martin City, Coram, Bigfork, Ferndale, and Swan Lake all need to have bear resistant garbage containers for residents and businesses. Kodiak Products are currently working on designing and testing a 65 gallon roll out container for homeowners and a 300 gallon container for commercial use.

Illegal Feeding of Grizzly Bears

In Montana, it is illegal to intentionally feed ungulates, mountain lions, and bears. We continue to try to get this message out to the public through personal contacts, news media, and feed stores.

Many of the conflicts occur when residents put out bird feeders, including hummingbird feeders. We recommend residents take in their bird feeders the 1st of April and not put them out until mid December. We also suggest that residents put out hanging flower baskets instead of hummingbird feeders. At one of the bear fairs, the USFS traded residents a flower basket for a hummingbird feeder.

We had several residents contact us about neighbors that were feeding deer and ultimately had grizzly bears show up. MT MFWP game wardens were notified and they made contact with those residents reportedly feeding wildlife.

The preferred prevention methods are education and working one-on-one with landowners. Helping landowners to understand why bears are attracted to their property and what they can do to secure attractants will be the most beneficial. We are already seeing results of this effort in the North Fork, Middle Fork, and Swan Valley.

Presentations, Meetings, and Training

A large part of grizzly bear management involves interactions with the public and agency personnel. This includes formal presentations, meetings, workshops and training. The following

is a list of the presentations, meetings, workshops, and training that I was involved with. The list is in chronological order, the type of interaction, date, and participants.

Most presentations are given during the winter months and most workshop and training sessions occur in the spring. Presentations are not typically scheduled during the field season due to the day-to-day unpredictability of the work. Presentations on grizzly bear conflict prevention were given at the following locations and dates:

January:
Interagency Trend Meeting in Kalispell. Meeting. January 4. Agencies.
MFWP Grizzly Bear Meeting in Helena. Meeting. January 10. MFWP employees.
Interagency Board of Review (Brad Treat Incident) in Kalispell. Meeting. January 24. Agencies.
DNRC Meeting in Kalispell. Meeting. January 26. Agencies.
Whitefish Legacy Trails Meeting in Whitefish. January 27. Agencies & NGOs.

February:
Swan Valley Bear Resources Meeting in Condon. Meeting. February 9. Agencies and NGO.
Flathead Valley Community College in Kalispell. Presentation. February 10. Public.
Montana Outdoor Legacy Foundation Meeting in Columbia Falls. Meeting. February 14. NGO.
North Fork Interlocal Meeting in West Glacier. Meeting. February 15. Agencies & Public.
BNSF Habitat Conservation Plan Meeting in Essex. Meeting. February 21. Agencies & BNSF.
Montana Outdoor Legacy Foundation Meeting in Ferndale. Meeting. February 23. NGO
USFS Meeting in Kalispell. Meeting. February 27. Agencies.

March:
MT Chapter TWS Meeting in Helena. Meeting & Presentation. March 8-10. Agencies & Public.
Bear Conflict Workshop in Bozeman. Workshop & Presentation. March 13-15. Agencies.
USFWS Bear Handling Workshop in Bozeman. Workshop & Presentation. March 16-17. Agencies.

April:
Vital Ground Meeting in Kalispell. Meeting. April 6. MFWP Employees & NGO.
NCDE Science Team Meeting in Missoula. Meeting. April 11. Agencies.
MFWP Meeting with Bob Inman in Kalispell. Meeting. April 13. MFWP employees.
Bear Wake-up Social in Ferndale. Presentation. April 20. Public.
USFS Meeting in Kalispell. Meeting. April 21. USFS employees.
USFS Meeting in Whitefish. Meeting. April 24. USFS employees.
GNP Meeting in West Glacier. Meeting. April 24. GNP employees.
NCDE Meeting in Kalispell. Meeting. April 25. Agencies & Public.

May:
Leadership Flathead in Columbia Falls. Presentation. May 5. Public.
USFS Bear Training in Hungry Horse. Presentation. May 8. USFS employees.
Vital Ground Meeting in Kalispell. Meeting. May 9. MFWP employees and NGO.
Seth Wilson and International Biologists Meeting in Kalispell. Meeting. May 25. Agencies.

June:
Bear Fair in Condon. Presentation. June 3. Public.
USFWS Hilary Cooley in Field. June 6-8. USFWS employee.
USFS Bear Training in Eureka. Presentation. June 19. USFS.

MFWP Biologists Meeting at Bull River. Meeting. June 20. MFWP employees.

July:
North Fork Landowners Association at Whale Creek. Presentation. July 1. Public.
Bonneville Power Administration in Kalispell. Presentation. July 13. BPA employees.
Jack Hanna Event by Montana Outdoor Legacy Foundation at Whitefish. Fundraiser. Public.
North Fork Interlocal at Sonderson Hall. Meeting. July 19. Agencies & Public.

August:
Glacier Park Conservancy in Whitefish. Presentation. August 9. Public and NGO.
BNSF Executive VIP Train Trip in Essex. Presentation. August 13. BNSF and corporate VIPs.

September:
Field Work.

October:
In the Field with Tom Dickson (MFWP Montana Outdoors Editor). October 4. MFWP.

November:
NCDE Subcommittee in Missoula. Presentation by Lori Roberts. November 29. Agencies & public.

December:
Montana Outdoor Legacy Foundation Meeting with Jane Ratzlaff. December 7. NGO.

Reported Grizzly Bear Conflicts

During the 2017, we received 188 calls related to grizzly bears. Of those calls, 75 were classified as actual bear conflicts. The other 113 calls were people wanting information about grizzly bears, grizzly bear sightings, media calls, or second hand reports that couldn't be confirmed. Of the 75 actual conflict reports, 56 were confirmed grizzly bears and the other 19 were black bears or unknown species.

Out of the 56 confirmed grizzly bear conflicts, 37 of the reports were determined to be multiple conflicts by the same bear or bears. For example, there were multiple reports of conflicts caused by the same two yearling grizzly bears in the Eureka area. There were 19 reported conflicts that were determined to involve different grizzly bears.

Fifty-three of the 56 confirmed grizzly bear conflicts occurred on private property. Three of the reports were on the Flathead National Forest. The majority of the calls involved bears that became food-conditioned and were seeking unnatural foods around homes and developments. This year we continued to see grizzly bears killing chickens and causing property damage to chicken coops. Livestock depredation by grizzly bears in this area is rare but eight sheep were killed by one subadult grizzly bear near Eureka. Two calls involved bears that were aggressive to humans or caused human injury. In late September, an adult female grizzly bear was shot and killed by a black bear hunter after the bear charged and attacked his hunting companion east of Hungry Horse Reservoir. In October, two big game hunters in the Swan Range shot at, wounded, and probably killed an adult female grizzly with two yearlings as she charged them. Both incidents were responded to and investigated by the MFWP Wildlife, Human Attack Response Team (WHART).

Reported grizzly bear conflicts involved bears getting into unsecured garbage, chest freezers left outside, pet food left outside, bird feeders, livestock grain, chicken feed, killing chickens, fruit trees, grape vineyard, and game carcasses from the hunting season. Grizzly bears also got up on porches, into garages, and sheds. Numerous calls were received because bears were feeding on grass in yards and being seen next to homes.

Chicken coop near Eureka. A solitary grizzly bear repeatedly broke into the chicken coop to get chicken feed and chickens. A trap was set but the bear was not captured.

In previous years, the number of calls reporting grizzly bear conflicts ranged from 10 in 1993 to over 250 in 1998. Since 1993, the number of calls has averaged about 100 each year. The number of calls is not necessarily an accurate measure of the level of grizzly bear conflicts for a given year (e.g. one grizzly bear in a subdivision may elicit a large number of phone calls as the bear moves from house to house).

Bear conflict specialists finalized a grizzly bear conflict database that standardize the way reported conflicts are recorded. This allows comparison of management reports and actions throughout the Northern Continental Divide Ecosystem (NCDE) and with other ecosystem reports.

Once a grizzly bear conflict report is received, an effort is made to contact the reporting party and determine if a site investigation is warranted. Once a site has been investigated, a determination is made as to what actions can be taken to prevent further conflicts. In most cases, identifying and properly securing the attractants takes care of the situation. In some cases, the decision is made to attempt to capture the grizzly bear or bears involved. The decision to capture the bear is not automatic and it is based on human safety, bear safety, the type of conflict, location, and behavior of the individual bear.

Emphasis is placed on trying to find solutions that will prevent problems from occurring at the same site again. With the landowner, we walk the property identifying why the bear was attracted to the site and how that attractant can be secured so that this bear or other bears will not visit the site and repeat the problem. Many times the solutions are simple and the landowners are willing to assist us by securing the attractants. Bird feeders, pet food, fruit, garbage, and poultry are the primary attractants we deal with and all are usually easily secured.

Grizzly Bear Management Captures

The decisions to capture grizzly bears for management reasons are not made without careful consideration. Human and bear safety are primary considerations. In many cases, the decision to capture and translocate a bear is made to give us time to properly remove or secure an attractant. In some cases, the decision has been made to remove a bear from the population due to repeat conflicts, level of property damage, or concerns about human safety.

In 2017, of the 56 confirmed grizzly bear conflicts, traps were set at 18 separate locations. Several of the traps were set in different locations in an attempt to capture the same bear. There were 21 captures of 15 individual grizzly bears (Table 1). The majority, 12 (57%) of the captures occurred in the spring, followed by 6 (29%) in the summer, 3 (14%) during fall. All of the management captures were in culvert traps.

Seventeen of the 21 grizzly bear management captures occurred on private property. Four of the captures were on the Kootenai National Forest, but the conflicts occurred on private land. The captures occurred in the main Flathead, North Fork of the Flathead, Stillwater, Swan, and Tobacco drainages (Figure 1). Seventeen of the 21 captures occurred outside the boundary of the Grizzly Bear Recovery Area.

The 15 individual grizzly bears that were captured included 2 adult females, both with 2 yearlings (3 males and 1 female), 6 subadult males, 1 subadult female, and 2 yearling females.

Grizzly bears that were captured and handled were anesthetized with Telazol or Telazol/Medetomidine administered by syringe pole or Pneudart. All grizzly bears were examined for injury, age, sex, breeding condition, lactation, and overall physical condition. Temperature and respiration were monitored and recorded. A pulse oximeter was used to monitor heart rate and oxygen level. Supplemental oxygen was provided.

Basic physical measurements were taken and recorded. Weights were recorded with a digital scale. A Bioimpedance Analyzer was used to measure resistance to calculate % body fat to quantify body condition. Bears over 2 years of age were radio-collared and in a special case, two yearling females were radio-collared. All grizzly bears were micro-chipped for identification.

Hair samples were collected for both DNA and stable isotope analysis. Blood was spun using a centrifuge and the serum and whole blood was collected, frozen and sent to Washington State University for stable isotope analysis.

Grizzly bears that we anesthetized were held overnight in culvert traps on a bed of straw until they recovered from the effects of the drugs. They were kept in an isolated area, monitored with minimal human contact and given water once they recovered from anesthesia.

Table 1. Grizzly bears captured for management in Flathead Portion Region 1, 2017.

Record	Bear ID	Capture Date	Sex	Age Class	CapNo	Capture Drainage	Release Drainage	Current Status
398	NWM227	5/11/17	Male	Subadult	2	Tobacco	Euthanized	Dead
399	NWM143	5/16/17	Female	Adult	3	Swan	SFK Flathead	Alive
400	NWM228	5/16/17	Male	Yearling	1	Swan	SFK Flathead	Alive
401	NWM229	5/16/17	Female	Yearling	1	Swan	SFK Flathead	Alive
402	NWM221	5/23/17	Male	Subadult	2	Tobacco	SFK Flathead	Alive
403	NWM230	5/31/17	Female	Yearling	1	Tobacco	Onsite	Alive
404	NWM231	5/31/17	Female	Yearling	1	Tobacco	Onsite	Alive
405	NWM231	6/8/17	Female	Yearling	2	Tobacco	Onsite	Alive
406	NWM230	6/8/17	Female	Yearling	2	Tobacco	Onsite	Alive
407	NWM219	6/14/17	Male	Subadult	2	NFK Flathead	NFK Flathead	Dead
408	NWM232	6/22/17	Female	Subadult	1	Stillwater	Stillwater	Alive
409	NWM233	6/23/17	Male	Subadult	1	Stillwater	SFK Flathead	Dead
410	NWM234	8/4/17	Male	Subadult	1	Flathead	Euthanized	Dead
411	NWM230	8/31/17	Female	Yearling	3	Tobacco	Stillwater	Alive
412	NWM231	8/31/17	Female	Yearling	3	Tobacco	Stillwater	Alive
413	NWM230	9/14/17	Female	Yearling	4	Tobacco	MFK Flathead	Alive
414	NWM235	9/16/17	Male	Subadult	1	Swan	MFK Flathead	Dead
415	NWM231	9/19/17	Female	Yearling	4	Tobacco	MFK Flathead	Alive
416	NWM150	10/2/17	Female	Adult	2	Flathead	SFK Flathead	Alive
417	NWM236	10/2/17	Male	Yearling	1	Flathead	SFK Flathead	Alive
418	NWM237	10/3/17	Male	Yearling	1	Flathead	SFK Flathead	Alive

NWM227 was a subadult male captured just north of Kalispell in 2016. He was fitted with a GPS radio collar and released in Whale Creek in the North Fork of the Flathead. He moved northwest toward Eureka. He denned in the Galton Range east of Eureka. In the spring he ended up crossing the Tobacco River south of Eureka. In May he moved west of Eureka where he ended up killing eight domestic sheep. He was captured by MT MFWP and Wildlife Services at the site of the depredations. GPS locations

confirmed he was at the ranch the night the sheep were killed. Since this was his second management capture and due to the sheep depredations, the decision was made to kill him.

NWM143 was an adult female with two yearlings, male NWM228 and female NWM229. The family group had been feeding on a dead deer near houses south of Ferndale. The bears ended up finding two small chest freezers that were sitting outside a mobile home. The bears got into the chest freezers and a temporary electric fence was put up around the freezers. The bears returned and were deterred by the electric fence. They returned a few nights later and knocked down the fence and got into the freezers again. The family group was captured. The adult female turned out to be the grizzly bear that swam across Flathead Lake in 2010. The female was fitted with a GPS collar and the family group was translocated and released in the Spotted Bear drainage. The family group eventually returned to the Swan Valley and spent most of huckleberry season in the Swan Range. After the huckleberries dropped off the family group moved west toward Crane Mountain and Flathead Lake. They returned to the Swan Range to den.

NWM221 was a subadult male that was captured in the town of Whitefish in 2016. He was translocated to the Frozen Lake area near the Canadian border. His GPS collar indicated he moved northeast to Waterton National Park and then south into Glacier National Park. He denned in the upper Bowman drainage. In the spring of 2017 he moved west crossing the North Fork River and Whitefish Range. He ended up east of Trego and was being seen in yards in the Deep Creek area. He was recaptured and released in the Spotted Bear drainage. He stayed in the Spotted Bear/Whitcomb drainages and dropped his radio collar inside the Bob Marshall Wilderness.

NWM230 and NWM231 were yearling females that were part of a family group in the Salish Range southwest of Eureka. They were the offspring of NWM160. A family group of grizzly bears had been reported at a house up Edna Creek. Traps were set in the area and the two yearlings were captured. Remote cameras at the site photographed the adult female with a radio collar (NWM160). The batteries on the GPS collar had died and we wanted to capture NWM160 to retrieve the collar and data. We held the cubs in the culvert trap for two nights at the site hoping to capture the adult female. She never returned to the site. We released the yearlings onsite and put out a road killed deer to see if NWM160 would return. She didn't, but the cubs stayed at the site feeding on the deer. A week later the yearlings were still visiting the bait site, but no photos of the adult female. We recaptured the yearlings, put a GPS radio collar on NWM231. NWM230 had a wound on her neck from an unknown cause so we decided not put a collar on her. The yearlings were then released onsite. They immediately left the bait site and eventually ended up on Lydia Mountain where they were born. They spent most of the summer together in the Salish Range. They were never observed with NWM160. In late August, they both moved down near the Tobacco River. They began feeding on serviceberries along the old highway and also started feeding on apples in yards. They were being observed a lot and getting very habituated to being around people and homes. We made the decision to recapture them and split them up. The wounds on the neck of NWM230 had healed and she was fitted with a GPS collar and translocated south to the Blessed Creek drainage. Her sibling (NWM231) was translocated to the Bowen Creek drainage also in the Salish Range. Both bears returned to the Eureka area and continued to feed on apples in yards and natural foods along the Eureka river walk trail. In mid-September, both yearlings were recaptured and translocated separately to the Puzzle Creek drainage near Marias Pass. NWM230 moved all the way to the Swan Valley near Condon, returned to Puzzle Creek, then moved south to the Spotted Bear drainage and denned. NWM231 moved south into the Spotted Bear drainage and then the South Fork of the Flathead. She dropped her radio collar along Bunker Creek.

NWM219 was a subadult male that was originally captured in 2016 in the North Fork of the Flathead drainage. He was habituated and spending time grazing on green grass in yards next to homes. He was radio-collared and released onsite. He spent all of 2016 in the North Fork drainage. He denned in the Trail Creek area. In the spring of 2017 he made a big moved south and ended up coming over the top of Big Mountain and ended up in the area around Columbia Falls. He traveled south along the Flathead River and then moved back into the North Fork drainage. His GPS collar malfunctioned the end of May. We recaptured him near Polebridge in June and put on a new radio collar. He was released and stayed in the North Fork. His collar came off in Red Meadow Creek in September. The second day of the general hunting season he was shot with an arrow from a crossbow along the Flathead River south of Columbia Falls. The incident is under investigation by the USFWS.

NWM232 was a subadult female that was captured with her male sibling (NWM233) along the Stillwater River northwest of Whitefish. They had tried to get into a dog kennel to get dog food and had also killed chickens downstream a few days earlier. NWM232 was fitted with a GPS collar and released at Bowen Creek in the Salish Range. She soon returned to the Stillwater drainage near where she was captured. She did not cause any more conflicts. She dropped her radio collar between Hwy 93 and the railroad tracks in the fall of 2017.

NWM233 was a subadult male that was captured with his female sibling (NWM232) along the Stillwater River northwest of Whitefish. They had tried to get into a dog kennel to get dog food and had also killed chickens downstream. NWM233 was fitted with a radio collar and released on the east side of Hungry Horse Reservoir. He moved northwest to the Firefighter area during the berry season. After the huckleberries dropped, he moved south and west to the Swan Valley. He was hit and killed by a vehicle on Hwy 83 near Condon in the fall.

NWM234 was a subadult male that was captured along the Flathead River in the lower valley. The bear had been photographed with its sibling getting into grain spilling out of a shed. A temporary electric fence was installed and the bears left. In August, this grizzly returned by itself and was feeding on apples next to the farmhouse. The bear was captured and while working on the bear we noticed that its front leg was very swollen and appeared to be broken. We took the bear to a Kalispell veterinary clinic and had X-rays taken. It turned out the bear had a broken front leg due to being shot. The bullet fragment was evident in the X-ray. The wound was about 4 months old and the bear was in tough shape. The bear was euthanized.

NWM235 was a subadult male that was captured along the Swan River east of Bigfork. We had numerous reports of a grizzly feeding on apples in that area and walking across backyards and a patio. The grizzly was captured where a road-killed deer had been drug into a front yard by the bear,

fed on, and buried next to a house. The male was radio-collared with a GPS collar and released at Packers Roost in Glacier National Park. That area was closed to the public due to the Sprague Fire. The bear traveled east over Logan Pass and down to the area St. Mary area. He was shot and killed in late November on the Blackfeet Indian Reservation north of St. Mary. The incident is under investigation by the USFWS.

NWM150, NWM236 & NWM237 was a family group of grizzly bears that were captured on the east side of the Flathead Valley south of Columbia Falls. The bears were feeding on apples in yards and had gotten into a grape vineyard. The adult female, NWM150, was previously captured in May of 2010 as a two-year old with its mother and male sibling near Martin City. That family group had been in the Glacier Hills subdivision feeding on green grass in yards next to houses. NWM150 was fitted with a GPS radio collar and was released in Wounded Buck Creek with her two yearling male offspring (NW236 and NWM237). A temporary electric fence was put around most of the vineyard and the caretaker harvested most of the grapes. The family group returned to the vineyard, but most of the grapes were gone. The bears traveled along the base of the Swan Range until moving up to den.

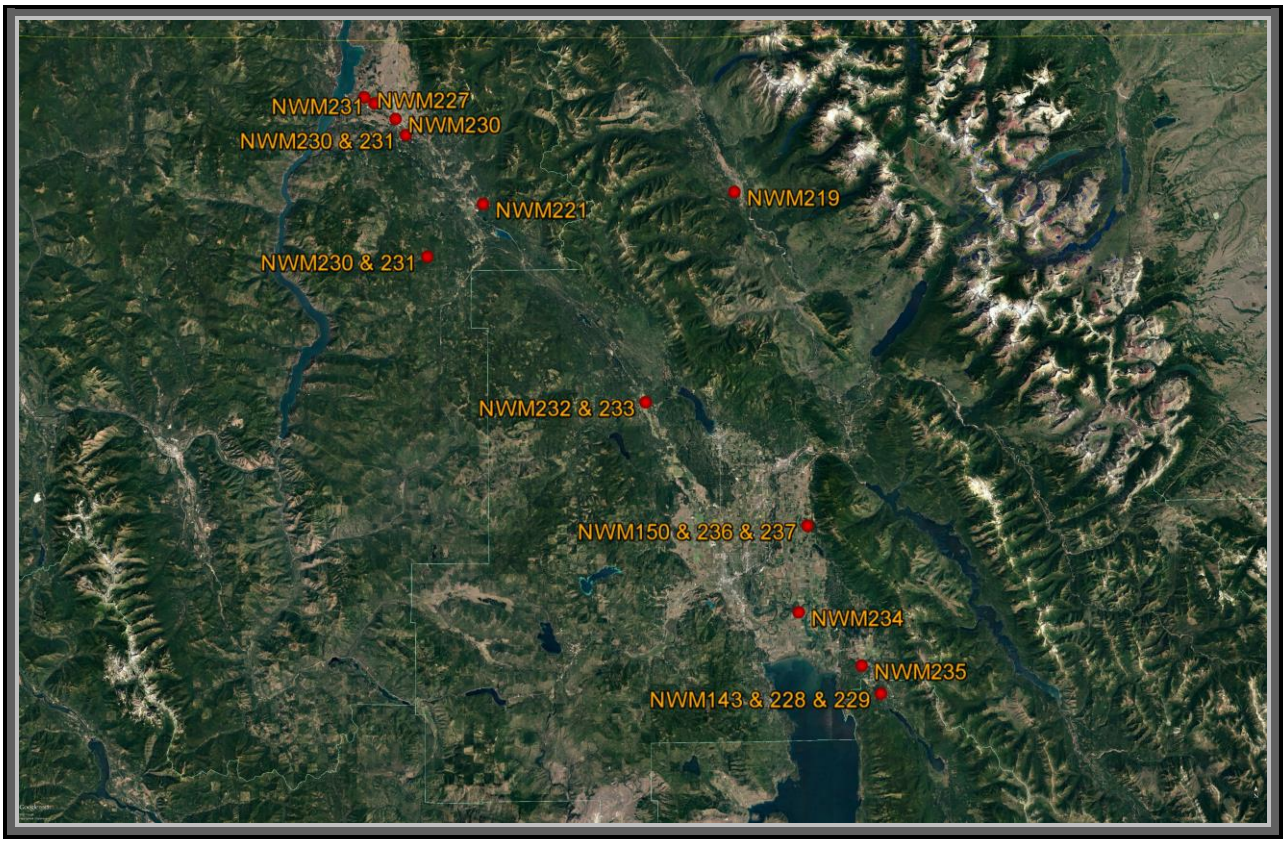


Figure 1. Locations of grizzly bear management captures in 2017. Numbers relate to Bear ID in Table 1.

Grizzly Bear Releases

Thirteen of the 15 grizzly bears that were captured for management reasons were released back into the wild (Figure 2). Two subadult males (NWM227 and NWM234) were euthanized. NWM227 was killed after killing 8 sheep near Eureka. NWM234 was euthanized after it was determined he had been shot and his front leg was broken. All of the grizzly bear releases are entered into the MFWP website.

The grizzly bears that were released were either translocated and released at approved sites or in 5 cases, they were released onsite with the permission of the landowner and the Kootenai Forest Service. One of

the translocated bears was released on the Kootenai National Forest and twelve on the Flathead National Forest, and one in Glacier National Park.

Prior to releasing any bears, we coordinated with the MFWP, USFWS, and the land management agency or landowner. We made sure that there were not any people working, hiking, camping, or parked at or near the release sites. If there was an unattended vehicle at the gate or near the site, we would move to an alternate location.

All the bears that were released had been held overnight or for a sufficient period of time for the anesthetizing drugs to have worn off. All of the releases were "soft" releases where we just opened the door and the bear left.

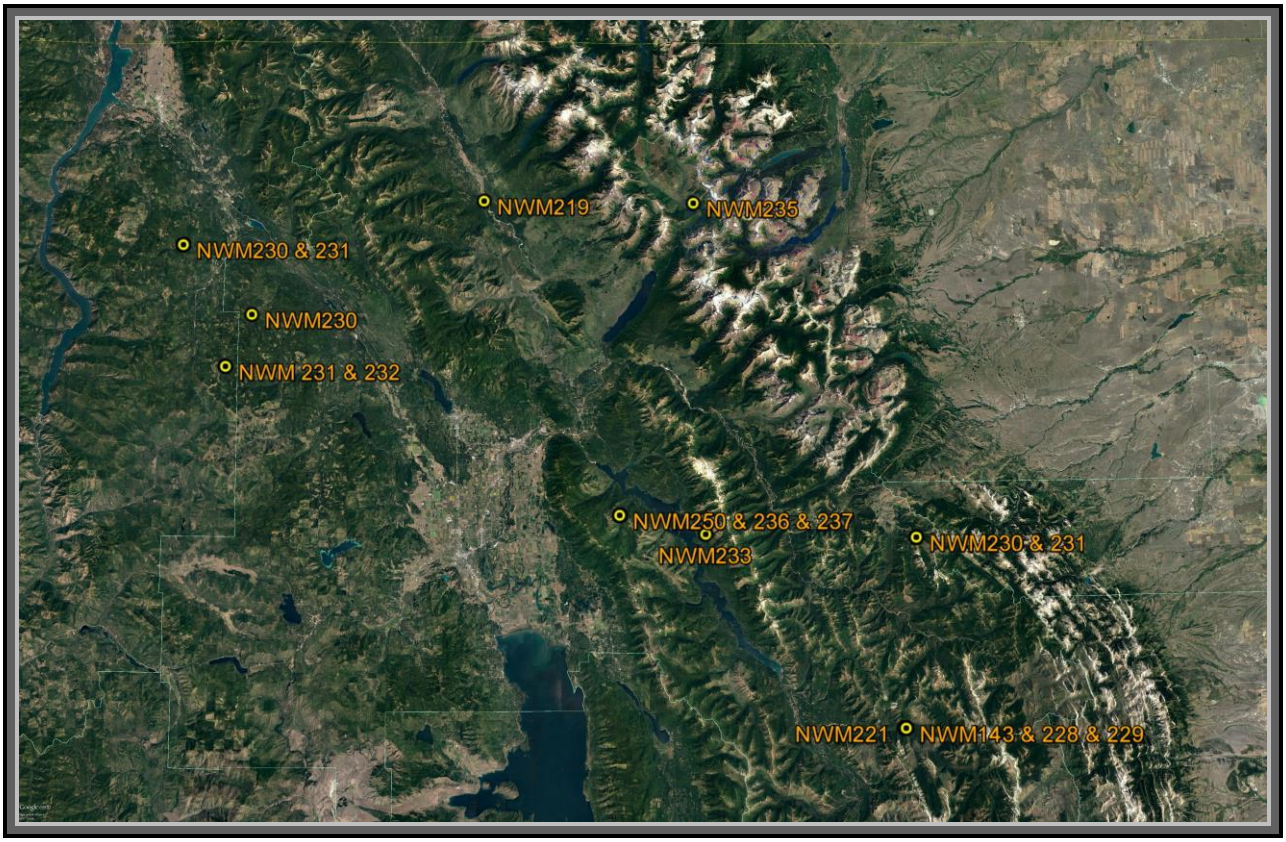


Figure 2. Locations of grizzly bear management releases in 2017. Numbers relate to BearID in Table 1.

Monitoring

Radio-collared grizzly bears were monitored from the ground and from the air. An attempt was made to fly monthly if bears could not be located from the ground. A total of 7 flights were conducted with MFWP helicopter pilots Ken Justus and Rob Cherot, Two Bear Air Rescue pilot Jim Pierce, and Red Eagle Aviation pilot Dave Hoerner.

Eight grizzly bears were fitted with Iridium GPS collars with geofence capability. Two of the 6 yearlings that were captured and released were radio-collared.

Funding for some of the collars and refurbishment of dropped collars was received from BNSF through NFWF and MTOLF. An additional 10 Iridium GPS collars were purchased through MTOLF with money donated from two private individuals. All of the Iridium GPS collars were programmed with geofence technology which allowed us to outline a polygon in Google Earth and then have that polygon programmed into the collar. For my area, the geofence incorporated all of the private property and then extended west into the Salish Range.

When a grizzly bear with the Iridium collar is within the geofence, a GPS location is acquired every 30 minutes. This allows us to get more detailed information on the grizzly bear's movements when it is on private lands. When the bear leaves the geofence, a GPS location is acquired every 6 hours. This still gives us information on where the bear is while saving on battery power.

The GPS/Iridium collar allows us to download all the locations of the bears every other day. This reduces the amount of flights while still providing us with updated information on the bears' movements.

Most flights were about 3 to 4 hours in duration. A typical flight from Kalispell would head north to the Canadian Border then east to Glacier National Park then south to Spotted Bear, then northwest back to Kalispell. In addition to management bears, population trend monitoring bears were also located.

During each flight we would attempt to get visuals on females to determine if they had young and how many young survived throughout the year. We also recorded the pulse rate of the radio signal to determine if a collar had gone to mortality mode.

If a signal was on mortality, an effort was made to go in on the ground to determine if the bear was dead or if the collar had just fallen off. Eleven of the transmitters that were operational during 2017 went to "mortality mode". Eight of those were collars that had dropped because they were programmed to drop, the spacer ripped on young bears, or the bear just pulled the collar off. Three were on bears that were killed.

Use of Technology in Grizzly Bear Management

Development of new technology such as an infrared imaging system, GPS/Iridium radio collars, the Automated Bear Trap, DNA analysis, and digital remote cameras has improved our ability to monitor and manage grizzly bears that are involved in conflicts with humans.

Two Bear Air Rescue and Infrared Imaging System:
During 2017, on two occasions, we were able to use the services of Two Bear Air Rescue and their Bell 429 Helicopter with its Electro-optic/Infrared Imaging System. Basically, the imaging system was three gyro-stabilized digital cameras that had tremendous zoom capabilities and both daylight and infrared

mode. This camera system allowed us to accurately locate grizzly bears, their dens, and to get counts of cubs. The infrared capability allowed us to see bears in dense brush and under the forest canopy.

GPS/Iridium radio collars:
Traditional methods of monitoring grizzly bears consisted of a VHF radio collar. This type of collar required that we monitor a radio signal from the ground or the air. Trying to locate a collar from the ground can be very difficult due to remote locations and rugged terrain.

Advances in GPS technology have allowed us to monitor some grizzly bears that were fitted with GPS radio collars. The cost of GPS radio collars has come down in recent years. A few years ago, you could buy almost 10 VHF collars for the price of one GPS collar. Today, if you calculate the cost of the VHF collars and the need to fly and the few locations that you get, it is more cost effective and more informative to purchase the GPS collars.

In late 2015, due to a grant from BNSF through NFWF and MTOLF, we were able to purchase six GPS/Iridium radio collars those collars allowed us to monitor management bears every other day. We delineated an area boundary, known as a geofence, and when the bear enters that area, the number of daily locations increased to every 30 minutes. For example, we delineate the area around the private property in the North Fork of the Flathead. When we put a GPS/Iridium collar on a bear in that area, we knew when that bear moved from the Whitefish Range down into the North Fork valley. This let us know when the bear was down around homes and the number of locations we got on a daily basis increased. We were able to better monitor that grizzly bear's activity and were able to identify areas where it was receiving food rewards (Figure 8).

The new Iridium GPS collars were deployed in 2016 on both female and male grizzly bears that were captured in management actions. The Iridium collars provided a lot of data during 2016 and we were able to purchase another 10 collars for 2017. The money for the new collars was provided by two private donors through the Montana Outdoor Legacy Foundation. All of the management grizzly bears radio-collared in 2017 were fitted with the Iridium collars.

Automated Bear Trap:
The Automated Bear Trap (ABT) was invented, tested, and used regularly over the last 11 years. The ABT is the only bear trap that we know of that can be monitored through the Internet. When the door drops, we are notified by email and voicemail. We can then log on to a computer and look at the camera to see what is inside the trap. If it is a non-target animal like a skunk, we can remotely raise the door, release the skunk and reset the trap all through the computer. This trap has saved us a lot of time and money over the years. It does require yearly maintenance but it has held up well over the years. The trap was donated to MT MFWP four years ago. Currently, the trap needs to be maintained annually.

DNA Analysis:
Since 1996 we have collected hair samples from captured grizzly bears and submitted the samples for DNA analysis. This has contributed to the grizzly bear DNA database that has proven very useful for both research and management.

We have used DNA to determine which bear broke into cabins. This allowed us to rule out and release other grizzly bears that were captured in the same area. By using DNA to identify which bear was actually causing the conflict, it ensures that if a bear is removed from the population, that it is the bear that was actually responsible for the property damage.

The grizzly bear DNA database also provides us information on where an individual bear may have originally come from. We are also interested in knowing the family relationships between bears; whether a bear we capture during a management action is the offspring of or somehow related to other bears that are causing conflicts.

Lori Roberts has been maintaining the DNA database and has started to look at relationships between bears by creating family trees. This may be very useful when we capture management bears to determine if they are the offspring or parents of bears we have already captured in management situations.

Remote Digital Cameras:
We have been using remote cameras to monitor grizzly bears since 1993. These cameras are an invaluable tool in our grizzly bear management program. We are able to monitor conflict sites to determine species, sex, and whether a single or multiple bears were involved. We use the cameras at bait and trap sites to determine what bears are visiting the sites. This has allowed us to reduce the non-target captures of black bears and adult males. This is very useful for augmentation trapping where we are trying to capture subadult grizzly bears.

The remote cameras also provide informative videos that demonstrate how bears manage to "beat the traps" and not get captured. We have also watched how cubs learn to test buildings and find food attractants around homes.

We have also used the cameras to document how effective or ineffective different bear deterrents might be. We have obtained footage of bears testing electric fences, critter gitters, and bear resistant garbage containers.

We received an order of remote cameras from money that was the result of a BNSF grant that went through the National Fish and Wildlife Foundation and the Montana Outdoor Legacy Foundation. Those cameras allowed us to monitor additional conflict, bait, and trap sites during 2017.

Grizzly Bear Management Captures (1993-2017)

Since 1993, 237 individual grizzly bears have been captured 418 times in management actions within Region 1. The number of new grizzly bears captured ranged from 1 in 1994 to 23 in 2004. The years 1998, 1999, 2004, 2011, and 2012 had a large number of grizzly bear captures because of the poor huckleberry crop the falls of 1998, 2004, and 2011 (Table 2).

Table 2. Grizzly bears captured in management actions within the NCDE portion of Region 1. 1993-2017.

Year	# Captures	# Ind. Bears	# New Bears
1993	2	2	2
1994	1	1	1
1995	16	12	11
1996	12	10	8
1997	15	13	9
1998	24	19	12
1999	26	13	8
2000	13	13	9

2001	15	12	7
2002	8	7	6
2003	14	13	13
2004	42	31	23
2005	8	8	6
2006	11	8	7
2007	21	15	10
2008	13	10	6
2009	13	10	7
2010	25	23	16
2011	45	31	19
2012	19	18	13
2013	12	10	6
2014	10	9	7
2015	15	13	11
2016	16	16	10
2017	21	15	10
R-1 Management Total	**418 (mean = 16.7)**		**237 (mean = 9.5)**

Management Grizzly Bear Mortality (1993-2017)

Of the 237 individual management grizzly bears captured in Region 1 since 1993, 114 (48%) are known to have died or have been sent to zoos (Table 3). The majority of the mortalities (56%) have been through management removals. There were no management removals in 1994, 2001 or 2014.

Human-caused mortality of female grizzly bears has a large influence on the recovery of the grizzly bear. Reducing the number of management removals of all grizzly bears, especially females, is a priority with this program. In the first three years (1993-1995), a total of 4 female grizzly bears were removed through management actions. In the following 7 years, 3 additional females were removed, 2 in 2000 and 1 in 2002. The year 2004 saw an all time high removal of female grizzly bears with 6 females removed through management actions. Three of the female management removals were 2 orphaned cubs and an orphaned yearling. None of the female grizzly bears captured for management died during 2017.

In 2017, six subadult males died. One subadult male (NWM227) was removed in a management action after killing domestic sheep near Eureka. One subadult male (NWM219) was shot and killed by a deer hunter using a crossbow during a close encounter (under investigation). Another subadult male (NWM233) was hit and killed by a vehicle in the Swan Valley. A subadult male (NWM234) was euthanized after being captured in the Flathead Valley after it was discovered the bear had a broken front leg due to a bullet. The fifth and sixth subadult males were shot and killed and are under investigation. One was found in the Salish Range (NWM218) and the other (NWM235) on the Blackfeet Indian Reservation near St. Mary by a landowner.

Table 3. Cause-specific and class-specific mortality records for 114 grizzly bears. Numbers represent known mortality of marked grizzly bears captured in management actions in Region 1. 1993-2017.

Class	Cause of Mortality								Total (%)
	Natural	Mistaken id	Self Defense	Management removal	Malicious	Handling	Vehicle/ Train	Unknown	
Adult									
M	0	0	1	13	1	0	1	4	20 (18)
F	0	2	3	9	1	0	1	0	16 (14)
Subadult									
M	0	0	2	15	11	0	5	4	37 (32)
F	1	1	1	6	3	0	2	0	14 (12)
Cub	4	0	0	16	0	1	2	0	23 (20)
Yearling	0	0	0	4	0	0	0	0	4 (4)
Total (%)	5 (4)	3 (3)	7 (6)	63 (55)	16 (14)	1 (1)	11 (10)	8 (7)	114

Since 2005, MFWP has been involved with the capture and translocation of both female and male grizzly bears into the Cabinet Mountains, south of Libby and Troy, Montana.

A total of 15 grizzly bears have been captured within the Northern Continental Divide Ecosystem (NCDE) and translocated to release sites that were approved for the Kootenai National Forest in both the West Cabinet and main Cabinet Mountains. To date, nine of the 15 augmentation bears were known to have remained in the Cabinet Mountains until their radio collars fell off. Two female grizzly bears were killed after being released in 2008. Two females and a male released in 2009 and 2010 returned to the NCDE. A subadult male in 2015 ended up in Idaho and was illegally killed by a black bear hunter.

In order to be part of the augmentation program, only grizzly bears with no known management or conflict history can be translocated. During the first four years of the program, only five female grizzly bears were translocated. In 2010 and 2011, both a female and male grizzly bear were moved each year. In 2014 two females were moved. One male was moved during 2012, another male each year in 2013, 2015, and 2016.

During 2017, we initiated an augmentation capture attempt in early August, but closed it down after a week due to extreme wildfire danger.

Plans for 2018 are to continue the trapping, capture, and translocation of 1-2 grizzly bears to the Cabinet Mountains for the augmentation program.

Two grizzly bear cubs of the year laying on top of the culvert trap. Their mother was captured and radio-collared for the trend monitoring project. Photo by Regi Altop.