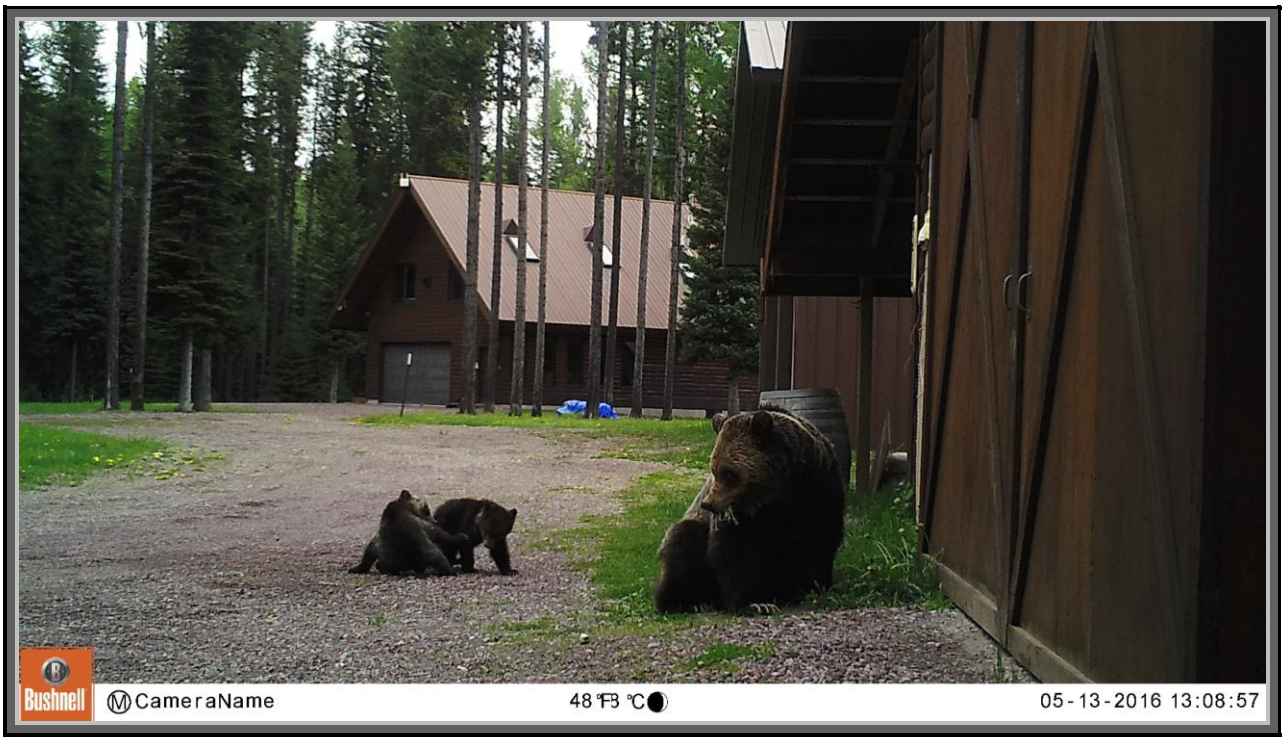
Grizzly Bear Management
2016 Annual Report
NCDE Portion of Region 1
Montana Fish, Wildlife & Parks



A female grizzly bear with two cubs of the year eating dandelions next to a garage in the North Fork of the Flathead drainage. As a preventative measure the man door was wired to an electric fence energizer so a bear would get shocked if it tried to push open the man door. This bear did not try to enter the garage even though she visited the property several times. (Remote camera photo).

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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 2016. 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 prevent grizzly bear conflicts by working with landowners to identify and secure attractants.
To work with agencies to promote food storage on public lands to prevent grizzly bear conflicts.
To work with city, county, state, and federal governments to prevent 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.

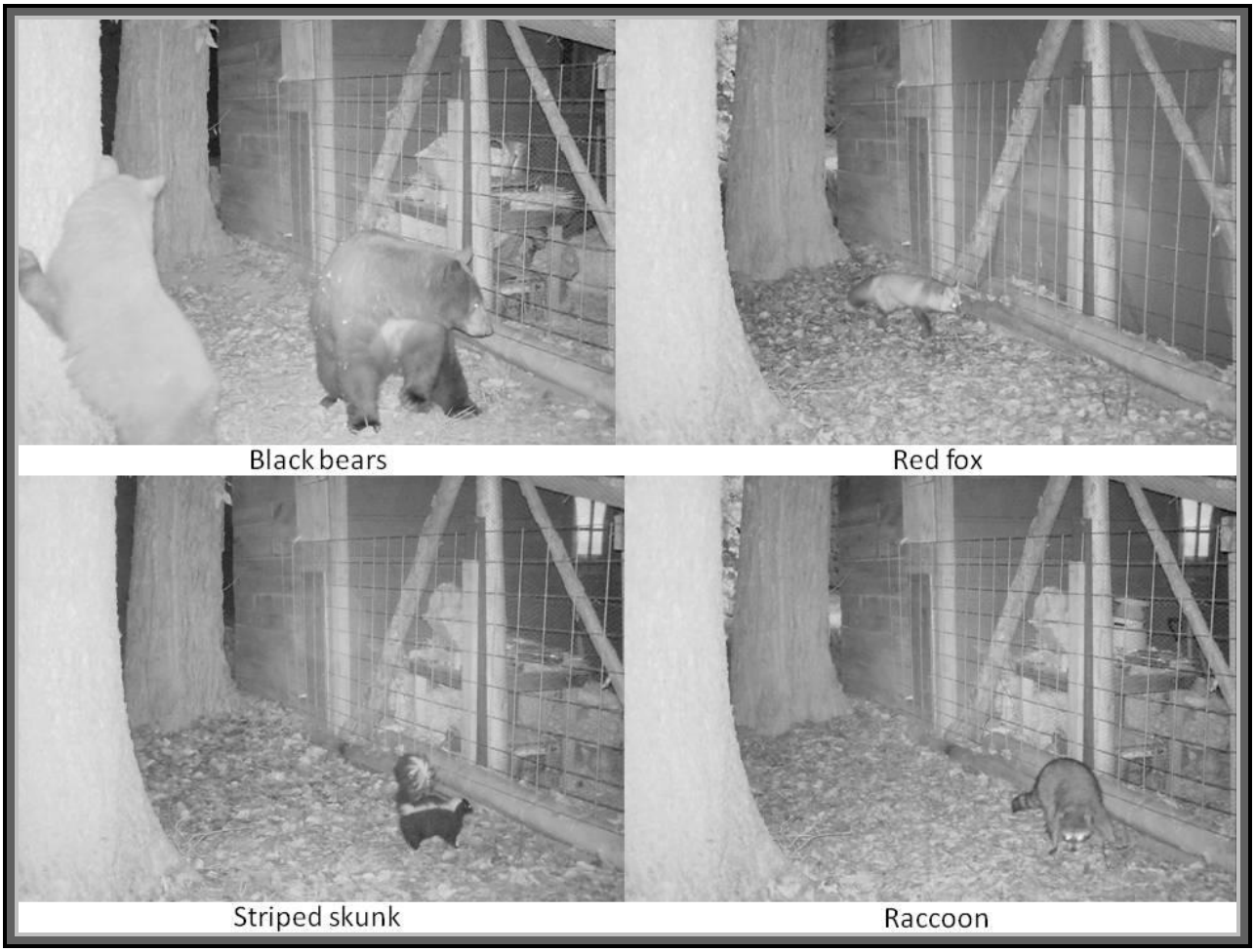
Prevention

Prevention of grizzly bear conflicts was a major focus of the 2016 field season.

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://fwp.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 14 temporary and permanent electric fencing projects located near Eureka, Fortine, Trego, Polebridge, Coram, Columbia Falls, Whitefish, Creston, Bigfork, Ferndale, and Swan Lake. Tim Thier, wildlife biologist based in Trego, and Kim Annis also helped landowners install electric fences in the Eureka, Fortine, and Trego areas.

In many cases, Defenders of Wildlife would cost share with the landowners and assist with the design of the fences. We would help landowners with the design, selection of fencing products, construction and maintenance of the fencing as needed. Additional electric fencing projects are planned for 2017.



An electric fence was installed around a chicken coop at Swan Lake. A remote camera shows the different wildlife species that were deterred by the electric fence. A grizzly bear was also deterred, but it was video footage. (Remote camera photos).

The largest permanent electric fencing project occurred east of Eureka. A landowner near the base of the Galton Range was raising more than 100 pigs and also had cows, chickens and domestic turkeys. This landowner had not had any previous conflicts with grizzly bears, but was in a location where it could become a major issue. Tim Thier was instrumental in bringing the situation to our attention. Defenders of Wildlife employee, Russ Talmo, coordinated the fencing project and funding. Over the course of several days, we managed to erect electric fence around all of the livestock pens and the pastures that the pigs used. The electric fencing project was completed in early June and was over 0.6 miles in length and enclosed 15 acres. There were no grizzly bear conflicts even though we had two radio collared grizzly bears (NWM223 & NWM227) that spent time immediately adjacent to the property (Figure 1) after the fence was installed.

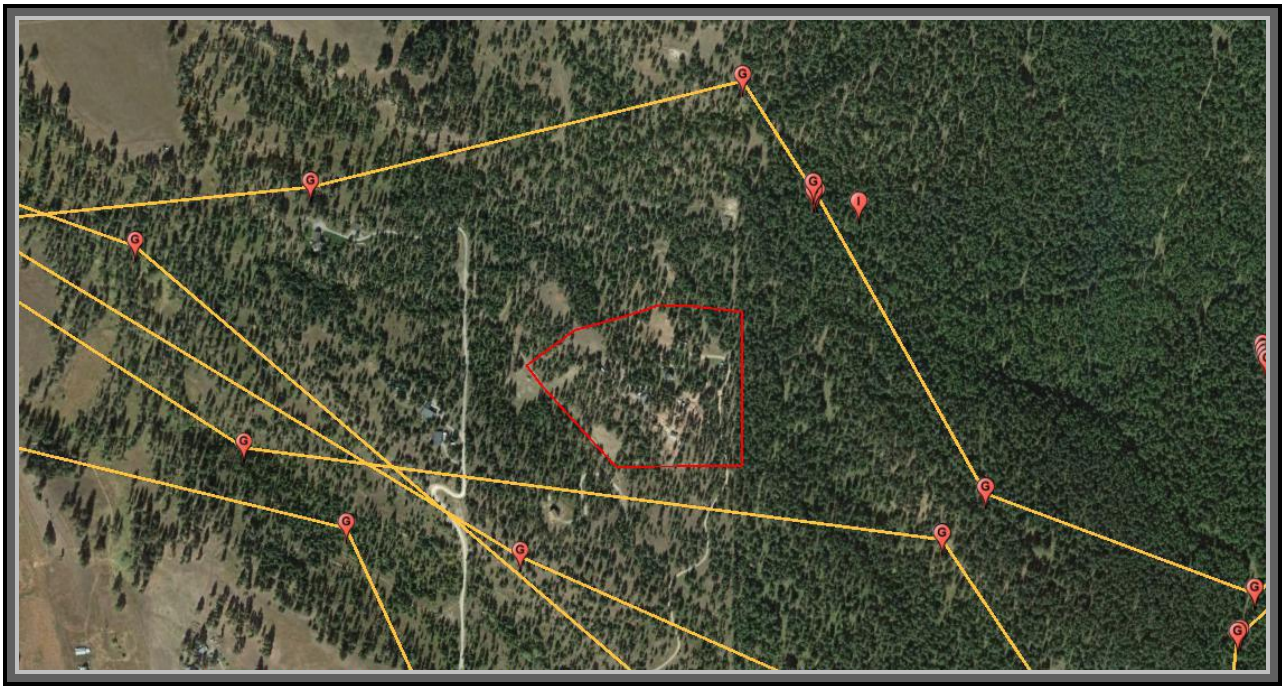


Figure 1. Locations and travel routes from two radio-collared grizzly bears around the 15 acres that was fenced east of Eureka. The red polygon is the perimeter of the electric fence. The grizzly bear locations were obtained every 30 minutes.

Another electric fencing project occurred at a meat processing facility south of Columbia Falls. The owner reported that several 55 gallon drums of meat scraps had been tipped over for several nights. He also had a meat pit with dead sheep in it. He said he put up a remote camera to see what was at the meat pit and he got photos of a single large grizzly bear. I told him we would set a trap, but we would also need to install an electric fence around his meat barrels and the pit. He agreed and we set a culvert trap. We ended up capturing a female grizzly bear cub the first night and the adult female the second night (see grizzly bear management captures section for more detail). After those bears were translocated, we set up a temporary electric fence around all of the attractants. We reset the trap for the adult male grizzly. That grizzly bear returned and was deterred by the electric fence (Figure 2). The single bear was not captured and moved on. The adult female and cub eventually returned to the site but were also deterred by the electric fence. A more permanent electric fence needs to be constructed during 2017 at this location.

The other electric fencing projects were all successful in preventing any grizzly bear conflicts. Unfortunately, most of the projects have been completed after a bear has already caused a conflict. Trying to get landowners to be more proactive and install electric fencing before a conflict has been difficult.

Figure 2. The adult male grizzly looking at electric fence that was installed at the meat processing facility south of Columbia Falls. (Remote camera photo).

Bear Fairs: 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, and Coram.

In 2016 the bear fair was held for the first time at Ferndale. The bear fair was hosted by the Junction Roadhouse and organized 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 150 residents and tourists attended the event.

The 2017 Bear Fair is planned for the Swan Valley at the Condon Community Center on June 3rd.

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. We hope to take this container to several of the haulers in the area during 2017 to see if they like the product and if it works with their trucks.

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 13 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. 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 2017 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 and 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.

Intentional feeding of grizzly bears occurred in the Ferndale area and that is covered in the section on Grizzly Bear Management Captures.

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.

February:
Natural Resources class, FVCC in Kalispell. Presentation. February 9. Students.
Great Northern Environmental Stewardship Area in Whitefish. Meeting. February 16. BNSF & agency.
North Fork Interlocal in Kalispell. Meeting. February 17. Agencies and public.
Montana Chapter of the Wildlife Society in Helena. Meeting. February 24-26. Agencies & public.

March:
FWP Wildlife Meeting in Kalispell. Meeting. March 3-4. FWP employees.
Flathead County Bee Workshop in Kalispell. Presentation. March 5. Public.
Grizzly Bear Trend Meeting in Kalispell. Meeting. March 23. Agencies.
FWP bear safety training in Kalispell. Training. March 24. FWP employees.

April:
Grizzly bear science team. Meeting. April 18. Agencies.
NCDE Subcommittee in Choteau. Meeting. April 19. Agencies & Public.
Bear Specialists in Kalispell. Meeting. April 26. Agency.

May:
Leadership Flathead in Kalispell. Presentation . May 6. Agencies & Public.
Bear Safety in Hungry Horse. Training. May 9. USFS employees.
Bigfork Chamber of Commerce at Flathead Lake Lodge. Presentation. May 10. Public.
MT FWP Wildlife Division. Meeting. May 17-19. FWP employees.

June:
MT FWP and Law Enforcement in Kalispell. Meeting. June 2. FWP employees.
Bear Fair at Ferndale. Presentation. June 4. Agencies and public.
FWP Work Plan in Missoula. Meeting. June 7. FWP employees.
USFS Orientation in Eureka. Presentation. June 14. USFS employees.
Day in the field with Jack Hanna. June 25. Public.

July:
North Fork Interlocal at Whale Creek Community Center. Presentation. July 13. Agency & public.
MTOLF "Wild Side" with Jack Hanna Fundraiser in Whitefish. Event. July 16. Public.

August:
Chris Morgan. Augmentation Program. August 1-4. Film Crew.
BNSF Executive VIP Train Trip in Essex. Presentation. August 14. BNSF and corporate VIPs.

September:
FWP Erin Focher Day in the field. Sept. 20. FWP employee.
Aaron Teasdale writer Sierra Magazine Article on Grizzly Bear Management. Sept. 21-22. Media.
MTOLF Day in the field with Carolyn Dietrich. Sept. 21. Public

October:
Swan Valley Bear Resources in Condon. Meeting. October 11. Agencies & public.

November:
NCDE Subcommittee in Missoula. Meeting. November 29. Agencies & public.

December:
Grizzly bear collaboration in Kalispell. Meeting. December 3. Agencies.
Region 1 Wildlife meeting in Kalispell. Meeting. December 8. FWP employees.

Reported Grizzly Bear Conflicts

During the 2016 field season, we received 224 calls related to grizzly bears. Of those calls, 86 were classified as actual bear conflicts. The other 138 calls were people wanting information about grizzly bears, grizzly bear sightings, media calls, or second hand reports that couldn't be confirmed. Of the 86 actual conflict reports, 63 were confirmed grizzly bears and the other 23 were black bears or unknown species.

Out of the 63 confirmed grizzly bear conflicts, 42 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 family group of grizzly bears in the Ferndale area. There were 21 reported conflicts that were determined to involve different grizzly bears.

Sixty-one of the 63 confirmed grizzly bear conflicts occurred on private property. Two 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. Two calls involved bears that were aggressive to humans or caused human injury and one call involved a human fatality.

As in 2015, the 2016 season began earlier than normal due to a subadult male grizzly that killed chickens north of Columbia Falls on April 9th. A majority of the conflicts were reported during the summer and autumn months.

Reported grizzly bear conflicts involved bears getting into unsecured garbage, pet food left outside, bird feeders, bee hives, livestock grain, chicken feed, deer blocks, fruit trees, meat scraps at a butcher shop, and game carcasses from the hunting season discarded along roads. Grizzly bears also got up on porches, into garages, sheds, and camp trailers. Numerous calls were received because bears were feeding on grass in yards and being seen next to homes.

2016 was unusual because this was the first year that we had both a human fatality and a human injury by grizzly bears in the area I cover. The human fatality occurred on June 30th, when a local resident, Brad Treat, was mountain biking and he collided with an adult male grizzly bear. The bear reacted and killed Mr. Treat. The MFWP Wildlife Human Attack Response Team (WHART) conducted an investigation and produced a report on the tragic situation. An interagency panel was formed to review the incident and produce a Board of Review report. Mountain biking has become more popular in the area and there is a concern about the safety of mountain biking in grizzly bear habitat.

The second incident involved a local resident in the Whitefish area walking with his daughter and dogs on a road in the Haskill Basin area. The man was knocked down by an adult female grizzly bear with two cubs. He was bitten but was able to deploy his bear spray in the face of the bear while she was on top of him. The bear left him after being sprayed. WHART responded to the scene and confirmed it was a female grizzly with two cubs that had been feeding on a deer carcass next to the road. The area was closed and monitored until the bears left the area. No trapping occurred because the interaction was considered to be a defensive reaction by the bear protecting her cubs and the carcass.

Camp trailer broken into by an adult female grizzly bear (NWM138) north of Polebridge, MT. This grizzly bear was captured and euthanized.

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

Jack and Sue Hanna spent a day in the field with us. We had captured a subadult male grizzly bear north of Polebridge. They helped us anesthetize, radio collar, and release the bear onsite. Before we put the bear back in the trap we had both of them smell the fur on the back of the bear. There is a common perception that bears "stink". We often have people smell the fur of the bear to demonstrate that they have a slight musky odor, but that they don't "stink".

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 2016, of the 63 confirmed grizzly bear conflicts, traps were set at 28 separate locations. Several of the traps were set in different locations in an attempt to capture the same bear. There were 16 captures of 16 individual grizzly bears (Table 1). The majority, 7 (44%) of the captures occurred in the fall, followed by 6 (38%) in the summer, 2 (12%) during spring and 1 (6%) in the early spring. Fourteen of the management captures were in culvert traps and two were with Aldrich foot snares.

Fourteen of the 16 grizzly bear management captures occurred on private property. Two of the captures were on Department of Natural Resources and Conservation (DNRC) forest land, but the conflicts occurred on private lands. The captures occurred in the main Flathead, North and Middle Forks of the Flathead, Swan, and Tobacco drainages (Figure 4). Ten of the 16 captures occurred outside the boundary of the Grizzly Bear Recovery Area.

The 16 individual grizzly bears that were captured included 2 adult males, 3 adult females, one with a female cub and one with 2 yearlings (1 male and 1 female), 6 subadult males, and 2 subadult 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. 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, 2016.

Record	Bear ID	Capture Date	Sex	Age Class	CapNo	Capture Drainage	Release Drainage	Current Status
382	NWM218	4/10/16	Male	Subadult	1	Whitefish	NFK Flathead	Alive
383	NWM219	5/11/16	Male	Subadult	1	NFK Flathead	Onsite	Alive
384	NWM220	6/25/16	Male	Subadult	1	NFK Flathead	Onsite	Alive
385	NWM209	7/15/16	Female	Yearling	2	Swan	Not Released	Zoo
386	NWM201	7/15/16	Female	Adult	4	Swan	Euthanized	Dead
387	NWM210	7/15/16	Male	Yearling	2	Swan	Not Released	Zoo
388	NWM138	8/1/16	Female	Adult	?	NFK Flathead	Euthanized	Dead
389	NWM221	8/10/16	Male	Subadult	1	Whitefish	NFK Flathead	Alive
390	NWM222	8/11/16	Male	Subadult	1	Whitefish	NFK Flathead	Dead
391	NWM103	9/21/16	Male	Adult	4	MFK Flathead	NFK Flathead	Alive
392	NWM223	9/21/16	Female	Subadult	1	Tobacco	NFK Flathead	Alive
393	NWM224	10/2/16	Female	Cub	1	Flathead	NFK Flathead	Alive
394	NWM225	10/2/16	Female	Adult	1	Flathead	NFK Flathead	Alive
395	NWM205	10/13/16	Female	Subadult	2	Tobacco	Stillwater	Alive
396	NWM226	10/19/16	Male	Adult	1	Flathead	SFK Flathead	Alive
397	NWM227	10/21/16	Male	Subadult	1	Flathead	NFK Flathead	Alive

NWM218 was a subadult male captured northeast of Columbia Falls. The initial report was a black bear killing chickens and Erik Wenum responded and set a trap. This was a first time capture for this male grizzly bear. He was fitted with a vhf radio collar and translocated to the Whale Creek drainage north of Polebridge.

NWM219 was a subadult male captured on private property in the North Fork of the Flathead drainage. He was observed several times very close to cabins and people while feeding in a yard. The bear was captured, fitted with a GPS radio collar and released onsite with permission of the landowner.

NWM220 was a subadult male that was an incidental capture in the North Fork of the Flathead drainage. He was captured at the location where an adult grizzly bear had gotten into a garage. Remote photos confirmed this was not the bear that entered the garage. He was with a sibling that was not captured. He was fitted with an GPS radio collar and released onsite with landowner permission.

NWM209 was a yearling female that was part of a family group in the Ferndale area. She was traveling with her mother (NWM201) and sibling (NWM210). They were all very food conditioned and the decision was made to remove her from the population. She will be sent to the St. Louis Zoo.

NWM201 was an adult female with two yearlings (NWM209 and NWM210) that spent time in the Ferndale area. This female had been captured on three previous occasions since 2014. She was extremely food conditioned and taught her cubs to go to houses to get food. This female was wearing a GPS collar that was put on in the spring of 2016. After she was captured and euthanized, we downloaded all of her radio locations. We were able to determine that she had spent a lot of time at one particular residence in 2015 and 2016 (Figure 3). A game warden contacted the landowners and discovered they had been intentionally feeding grizzly bears. He was cited and fined and said he would not put out any more food.

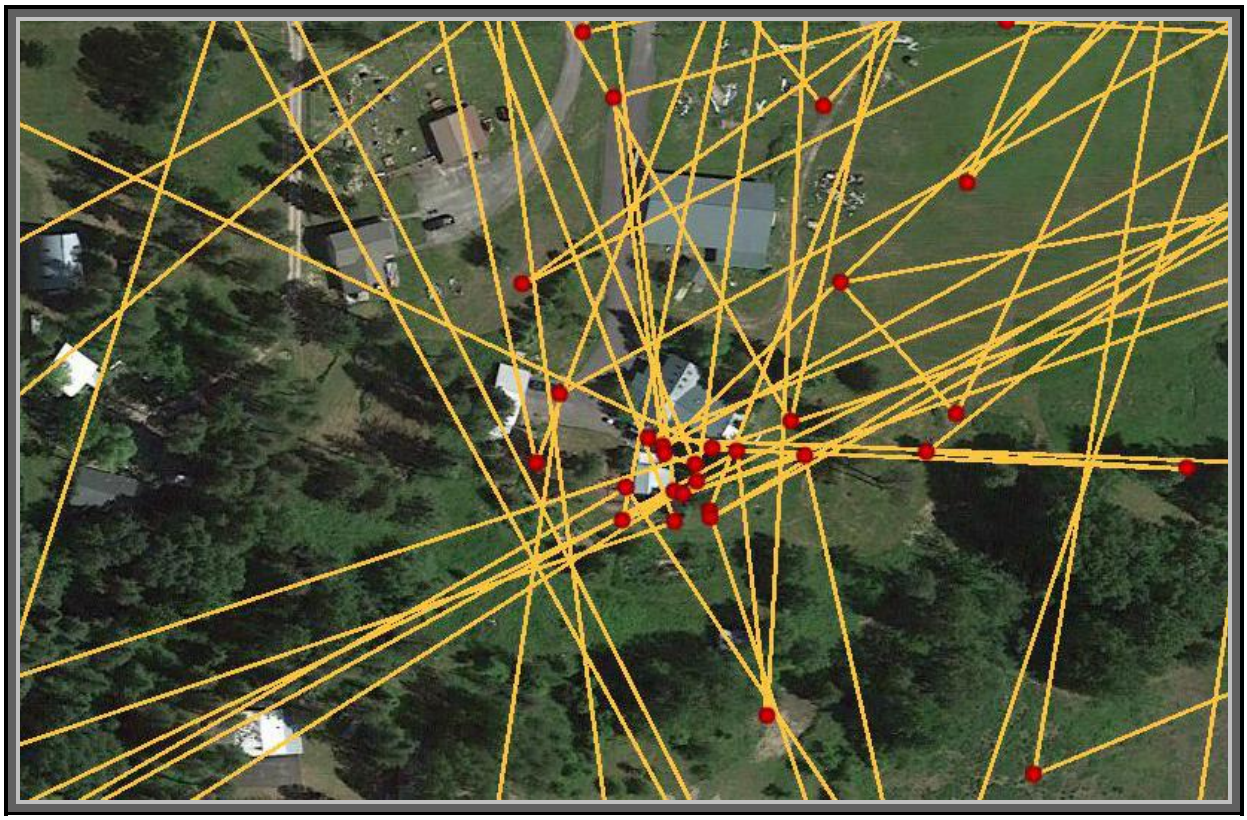


Figure 3. GPS radio collar locations and travel paths for adult female grizzly (NWM201) at a residence where the landowner was cited for illegal feeding of wildlife.

NWM210 was a yearling male that was part of the family group of grizzly bears in the Ferndale area. He was traveling with his mother (NWM201) and sibling (NWM209). The family group was very food conditioned and the decision was made to remove him from the population. He will be sent to the St. Louis Zoo.

NWM138 was an adult female that was captured after entering a garage and breaking into 3 camp trailers in the North Fork of the Flathead drainage. We believe this female had been previously captured in 2008. The bear was captured right next to a camp trailer that had been broken into the night before. DNA analysis will confirm if this is indeed bear NWM138. The decision was made to remove this bear due to the amount of property damage and the fact that she had entered several unoccupied camp trailers to get food.

NWM221 was a subadult male that was captured in the town of Whitefish. He had been getting into fruit trees in town. He also was habituated and was observed walking through backyards and parking lots during the day. This was a first time capture and he was fitted with a GPS radio collar and translocated to the north end of the Whitefish Range near the Canadian border.

NWM222 was a subadult male that was captured just south of Whitefish after getting into dog food on a porch. This was as first time captured and he was fitted with a GPS collar and released near the Canadian border in the Whitefish Range. The bear moved north into Canada and eventually ended up near Grasmere. He was shot and killed by a rancher at 2am because it was getting into horse feed and he was concerned about the safety of his dog.

NWM103 was an adult male that was captured for killing chickens near Coram. He was first captured in 2004 for getting cat food on a porch near Martin City. The decision was made to give him one more chance and he was fitted with a GPS radio collar and translocated to the north end of the Whitefish Range in upper Trail Creek.

NWM223 was a subadult female captured near the river walk trail south of Eureka. There had been numerous reports of grizzly bears feeding on Kokanee salmon along the Tobacco River. This bear was captured, fitted with a GPS collar and translocated to the Whale Creek drainage.

NWM224 was a female cub of the year that was captured at a meat processing facility south of Columbia Falls. This cub was with her mother (NWM225). This was a first time capture and she translocated into the Anaconda drainage in Glacier National Park with her mother.

NWM225 was an adult female grizzly with a female cub of the year (NWM224) captured at a meat processing facility south of Columbia Falls. This female was originally captured near Granite Park Chalet in Glacier National Park in 2007 as part of the population trend monitoring program. While radio-collared during that time, she spent most of her time in Glacier, but did travel to Teakettle Mountain, east of Columbia Falls during the summer to feed on berries. She had dropped her radio collar on Teakettle Mountain. Since this was her first management capture and we knew she spent most of her time in Glacier Park, the decision was made to fit her with a GPS radio collar and translocate her to the Anaconda drainage in Glacier.

NWM205 was a subadult female captured near Fortine for getting into pet food and livestock grain. This bear was originally captured in 2014 as a yearling for getting into cat food with her mother and sibling west of Fortine. The rest of the family group could not be captured and she was microchipped and released onsite at that time. In this situation, the decision was made to fit her with a GPS radio collar and translocate her into the Salish Range, which was part of her mothers home range.

NWM226 was an adult male captured on the east side of the Flathead Valley above Lake Blaine. Grizzly bears had been getting into fruit trees around houses. A culvert trap was set and a very large male grizzly

was photographed at the trap site but didn't enter the trap. A few nights later this grizzly bear was captured. It was a first time capture and he was fitted with a GPS radio collar and translocated to the east side of Hungry Horse Reservoir. It was unknown whether he was causing damage to the fruit trees or if this was an incidental capture.

NWM227 was a subadult male that was captured just north of Kalispell, east of Hwy 93 across from the Flathead County Landfill. This bear had been feeding on apples in a backyard. This was a first time capture and he was fitted with a GPS radio collar and released in the Whale Creek drainage.

There were at least 5 additional individual grizzly bears that were causing conflicts, but were not captured because they had moved on or would not enter the trap.

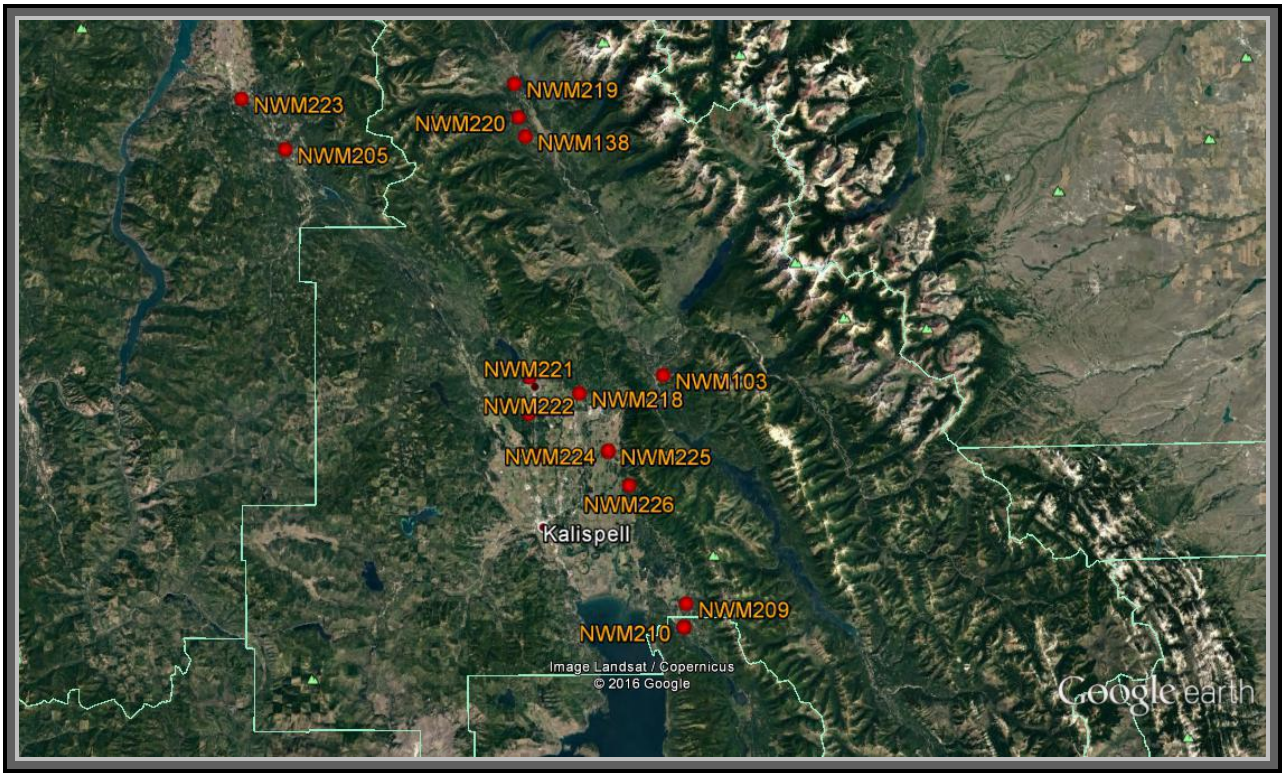


Figure 4. Locations of grizzly bear management captures in 2016. Numbers relate to Bear ID in Table 1.

Grizzly Bear Releases

Twelve of the 16 grizzly bears that were captured for management reasons were released back into the wild (Figure 5). Two adult females (NWM138 and NWM201) were euthanized due to multiple conflicts over several years including property damage. Female NWM201 had two yearlings (NWM209 and NWM210). Both of the yearlings were sent to the St. Louis Zoo. 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 two cases, they were released onsite with the permission of the landowner. Nine of the translocated bears were released on the Flathead National Forest. One subadult female was released on the Kootenai National Forest in the Salish Range. This female (NWM205) was known to have used the Salish Range as part of her home range while traveling with her mother as a cub and yearling. We felt it made sense to release her into an area close to her known home range.

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. Only one of the onsite releases was a "hard" release where we used bean bag, rubber bullet, and cracker shell rounds to make the bear leave once it left the trap. All of the other releases were "soft" releases where we just opened the door and the bear left.

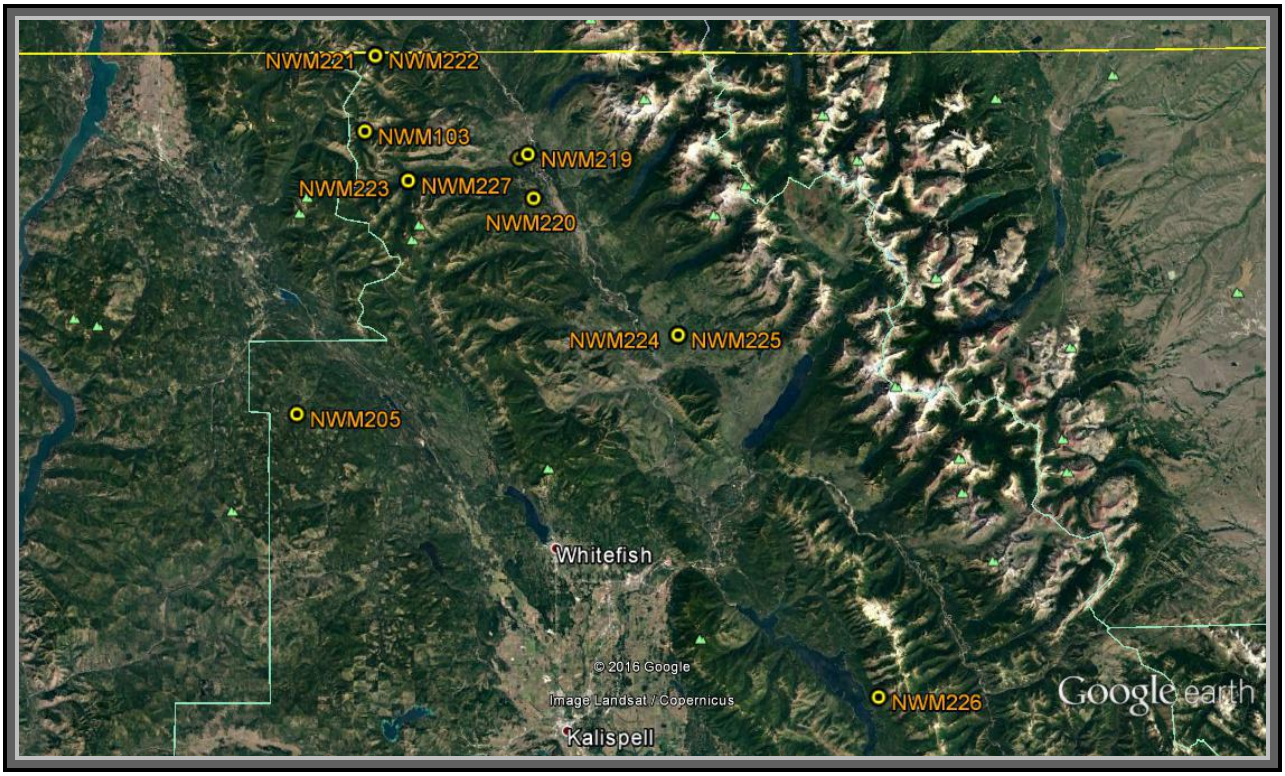


Figure 5. Locations of grizzly bear management releases in 2016. Numbers relate to BearID in Table 1.

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 17 flights were conducted with MT FWP helicopter pilot Ken Justus, Two Bear Air Rescue pilot Jim Pierce, and Red Eagle Aviation pilot Dave Hoerner.

One of the grizzly bears radio-collared in 2016 was fitted with a VHF collar. Ten grizzly bears were fitted with Iridium GPS collars with geofence capability. The female cub of the year was not given a transmitter. In order to locate the non-GPS transmitter, we had to locate the bear from the air. Unfortunately, we were only able to locate the collar of this bear twice after it was released.

Funding was received from BNSF through NFWF and MTOLF to purchase 6 GPS Iridium radio collars for management bears. These 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 (Figure 6) 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.

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. Four of the transmitters put on during 2016 went to "mortality mode". Three of those were collars that had dropped and the one was a dead bear (NWM222).

Figure 6. Adult female grizzly bear with three cubs of the year. One cub isn't visible in this photo.

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 2016, on occasion, 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. In one instance we could even see a grizzly bear and her cub inside their den (Figure 7).

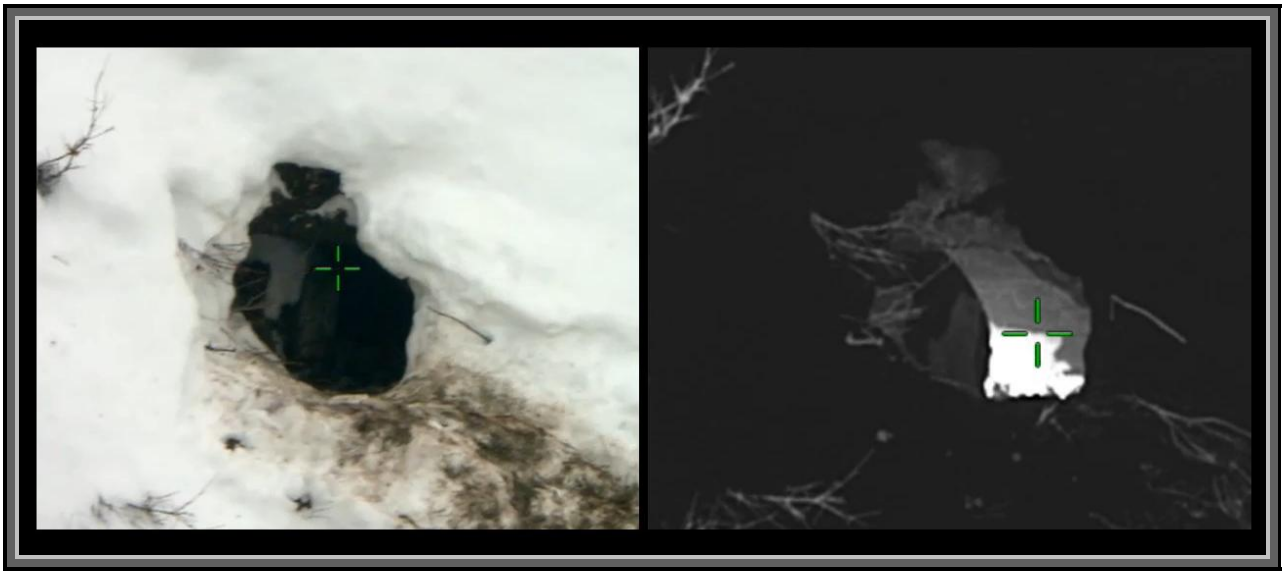


Figure 7. A Grizzly bear den in the Whitefish Range. On the left is the daylight image and on the right, the infrared image. You can see the head of the bear in the infrared image. Photo from Two Bear Air Rescue.

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 geofencing, 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.

Figure 8. GPS locations from a radio-collared subadult male grizzly bear at a private residence near Polebridge. The landowner had dumped out bags of corn that he had been feeding to deer. The landowner had quit feeding but dumped out corn that had started to rot. He has stopped feeding wildlife.

Automated Bear Trap:
The Automated Bear Trap (ABT) was invented, tested, and used regularly over the last 10 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 FWP four years ago.

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

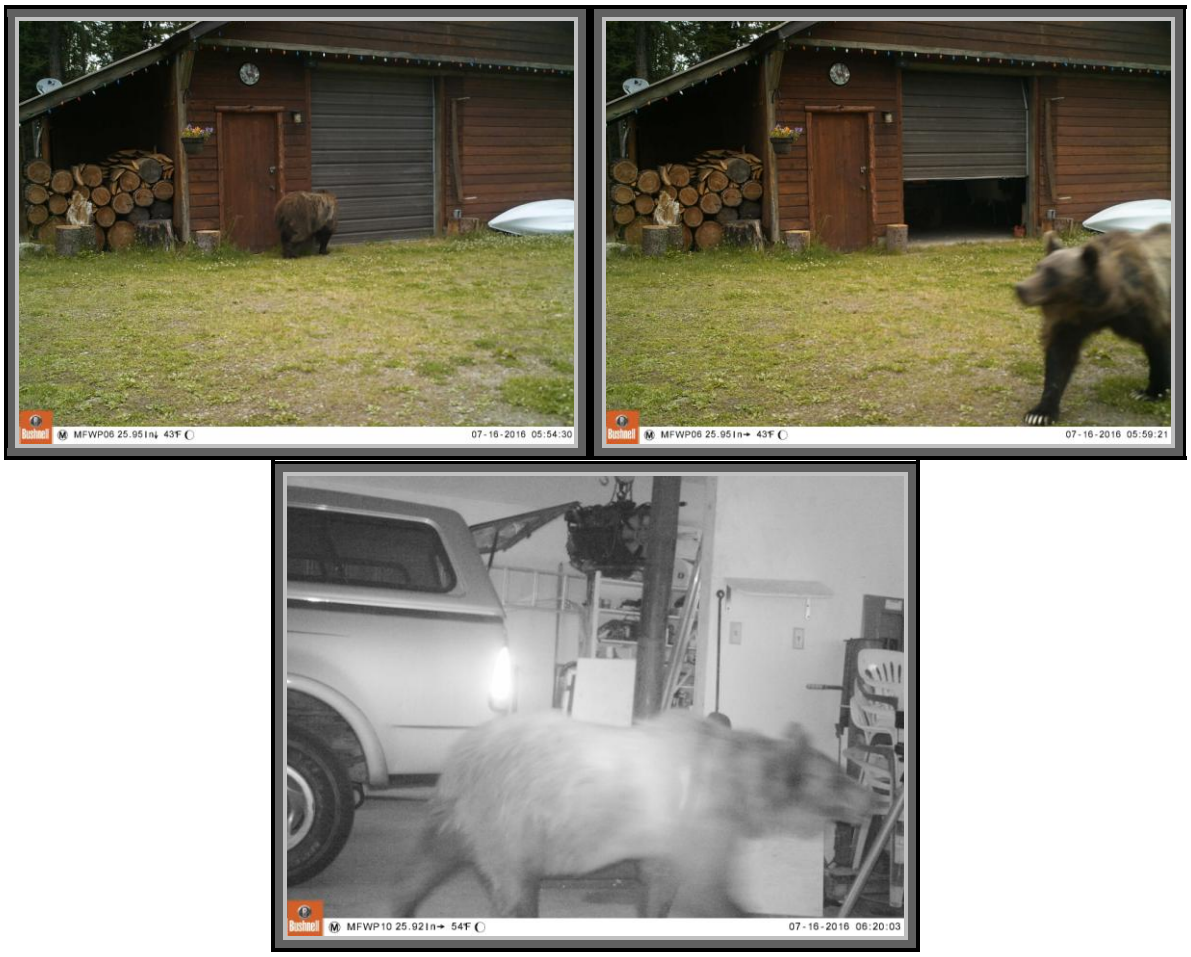
a bear we capture during a management action is the offspring of or somehow related to other bears that are causing conflicts.

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 Legacy Foundation. Those cameras allowed us to monitor additional conflict, bait, and trap sites during 2016.



Female grizzly opened the garage door and entered the garage in the North Fork of the Flathead drainage (Remote camera photo). This bear was later captured and euthanized.

Grizzly Bear Management Captures (1993-2016)

Since 1993, 227 individual grizzly bears have been captured 397 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. 1993-2016.

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
R-1 Management Total	**397 (mean = 16.5)**		**227 (mean = 9.5)**

Management Grizzly Bear Mortality (1993-2016)

Of the 227 individual management grizzly bears captured in Region 1 since 1993, 108 (48%) are known to have died or have been sent to zoos (Table 3). The majority of the mortalities (57%) have been through management actions. 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.

In 2016, one subadult male was shot and killed in British Columbia in defense of life and property. The bear was getting into horse feed when the landowner shot him in the middle of the night. Two adult females were euthanized due to repeatedly causing conflicts and property damage over multiple years. One of the females had two yearlings which were sent to the St. Louis Zoo. The Interagency decision was made to remove them from the wild due to their level of food conditioning.

Table 3. Cause-specific and class-specific mortality records for 103 grizzly bears. Numbers represent known mortality of marked grizzly bears captured in management actions in Region 1. 1993-2016.

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	3	19 (18)
F	0	2	3	9	1	0	1	0	16 (15)
Subadult									
M	0	0	1	14	9	0	4	4	32 (30)
F	1	1	1	6	3	0	2	0	14 (13)
Cub	4	0	0	16	0	1	2	0	23 (21)
Yearling	0	0	0	4	0	0	0	0	4 (4)
Total (%)	5 (5)	3 (3)	6 (6)	62 (57)	14 (13)	1 (1)	10 (9)	7 (6)	108

Cabinet Mountains Grizzly Augmentation Program

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. One male was moved during 2012, another male each year in 2013, 2015, and 2016.

During 2016, we captured a two-year-old male grizzly bear in the Swan Range and he was released at the West Cabinet release site. After he was released he stayed in the West Cabinets for most of the summer. He eventually moved east into the main Cabinets. He was not able to be located during the last few flights.

Plans for 2017 are to continue the trapping, capture, and translocation of 1-2 grizzly bears to the Cabinet Mountains for the augmentation program.