**Preliminary recommendations for reducing bear-human conflicts and grizzly bear mortalities in the Yellowstone Ecosystem: a report to the Yellowstone Ecosystem Subcommittee**

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**Background**

Introduction: During their 2018 winter meeting, members of the Interagency Grizzly Bear Committee (IGBC) discussed grizzly bear conflicts and mortality trends for the Greater Yellowstone Ecosystem (GYE) and Northern Continental Divide Ecosystem (NCDE) populations. During this review, it was noted that the number of human-bear conflicts and mortalities has increased, primarily due to continued grizzly bear population increases and range expansion. However, it was also recognized that grizzly bear mortalities continue to generate interest among a wide range of stakeholders and deserve further attention by managers. The IGBC tasked three advisors to form a working group to identify if and how subcommittees should address trends in grizzly bear conflicts and mortalities. This working group advised that each subcommittee should evaluate current trends in grizzly bear mortality along with actions currently being taken to reduce mortalities, and then develop recommendations for reducing grizzly bear mortality in the future. The IGBC subsequently directed subcommittee chairs to develop a list of priority issues related to grizzly bear mortality for the 2019 summer IGBC meeting, a list of recommendations addressing each of these issues for the winter 2019 IGBC meeting, and a final implementation strategy to be presented to the IGBC by summer 2020.

During the spring 2019 meeting of the Yellowstone Ecosystem Subcommittee (YES) in Bozeman, Montana, subcommittee members developed a list of priority topics to be addressed. This list was determined by reviewing recommendations and subsequent accomplishments from a 2009 report prepared by the Interagency Grizzly Bear Study Team (IGBST) for reducing grizzly bear mortality in the GYE. YES members then voted on the items they felt were most important to address, given the current concerns associated with grizzly bear mortalities and the accomplishments since the 2009 report. The five priority issues identified by the YES were: 1) backcountry recreation and hunting-related conflicts; 2) front county conflicts and community planning; 3) efficacy of information and education efforts; 4) livestock conflicts and livestock producer outreach; and 5) targeted community outreach in grizzly bear expansion areas.

At the fall 2019 meeting of YES in Cody, Wyoming, a workshop was conducted to include the public in this effort. This involved group discussions focusing on the same 5 topics addressed by the agency representatives. Their comments were documented topically and then compared against the original agency list to highlight new ideas.

This report presents a review of the current GYE grizzly bear population status, including an assessment of mortality trends. For each of the five priority issues identified by YES, it also discusses actions currently being taken as well as providing preliminary recommendations for future actions to manage grizzly bear mortality and human-bear conflicts. The authors of this report felt that it was important to also include recommendations for reducing human-bear conflicts rather than only including recommendations specific to bear mortality.

Summary of current grizzly bear population and mortality data: ***Unless otherwise indicated, data presented within this report are from the Interagency Grizzly Bear Study Team. These data are preliminary and subject to revision, and are not for citation or distribution.***

Within the GYE, the grizzly bear Recovery Zone (or Primary Conservation Area) is approximately 23,800 $km^2$ within the core of the ecosystem where population and habitat conditions are to be maintained to ensure a recovered grizzly bear population is sustained for the foreseeable future. Land ownership within the Recovery Zone is primarily National Park Service (NPS, 39.4%) and United States Forest Service (USFS, 58.5%), with only 2.1% private lands. The Demographic Monitoring Area (DMA, approximately 49,900 $km^2$) is the area that encompasses the Recovery Zone and where demographic recovery criteria apply (IGBST 2012). Demographic parameters including observations of females with cubs and grizzly bear mortalities documented inside the DMA are assessed annually to determine whether demographic recovery criteria are met. Outside of the DMA, observations of females with young and grizzly bear mortalities are opportunistically documented but do not count towards assessments of demographic recovery criteria. Lands outside of the DMA are increasingly comprised of private ownership, and land uses such as agricultural production and residential development that are less compatible with long-term grizzly bear occupancy are more common.

The 2018 estimate for the GYE grizzly bear population was 714 bears, using the Chao2 method which is a conservative estimator that underestimates the true population. Estimates for population growth projected from vital rates derived from radio-marked bears in the GYE were a robust 4-7 % increase per year during the period 1983-2001 (Schwartz et al. 2006). During 2002-2011, the population growth rate derived from our radio-marked sample of bears had slowed to 0-2 % per year (IGBST 2012). Similarly, counts of unique females with cubs of the year (Knight et al. 1995) increased at a robust rate during the 1980s and 1990s, then slowed in the early 2000's and has been relatively unchanged to slightly increasing since 2012 within the DMA (Haroldson et al. 2019). Population trend is not estimated for the area outside the DMA, but multiple lines of evidence including an increase in the observed number of females with cubs and continued range expansion indicate that the population in this area is growing (Bjornlie and Haroldson 2019, Haroldson et al. 2019)

Grizzly bear range in the GYE has also increased substantially (Figure 1). Using the Bjornlie et al. (2014) technique to estimate occupied range based on 15-year moving windows, Bjornlie and Haroldson (2019) estimated grizzly bear range in the GYE has increased steadily at a rate of 4% annually, from 23,000 $km^2$ during 1976-1990, a distribution contained almost entirely with the Recovery Zone to over 68,000 $km^2$ during 2004-2018. This represents a 3-fold increase in occupied range. The amount of private lands

within estimated occupied range has increased considerably over the same period, from 600 $km^2$ to nearly 12,000 $km^2$.

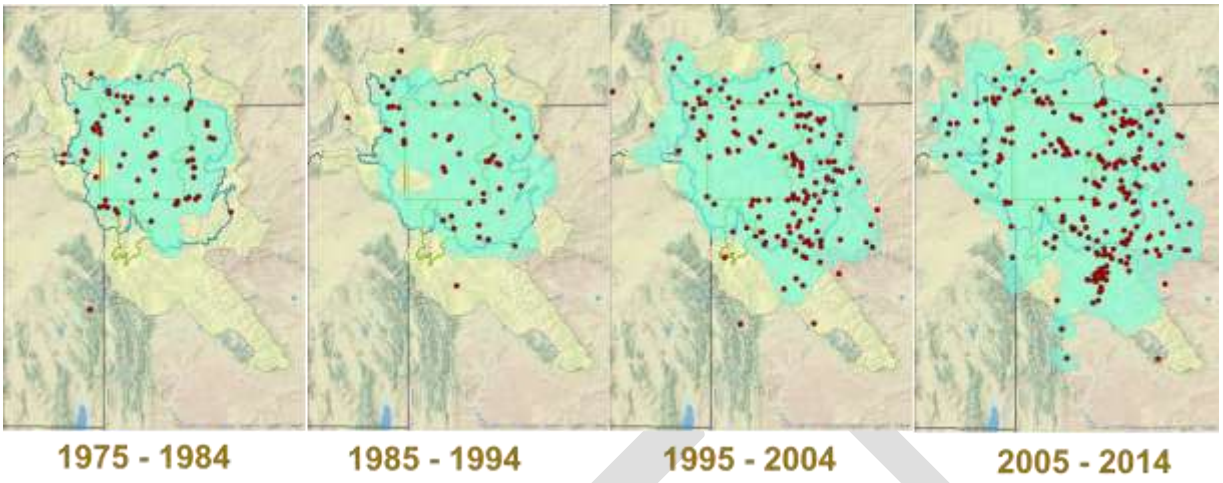


*Figure 1. Estimated range extent and known and probable mortalities for independent aged bears (≥2 years) by decade since ESA listing of the species in 1975.*

Analysis of trends in documented grizzly bear mortalities in the GYE have included only independent-age bears (i.e., ≥2 years of age). Dependent young (cubs and yearlings) were not included because their survival is generally associated with that of their mothers and managers have little chance to influence their fates independent of their mothers. Grizzly bear life history typically involves greatest mortality (i.e., lowest age-specific survival) early in life, with relatively low mortality rates (high probability of survival) once they reach adult age. About a third to half of all dependent young die before they reach the age of 2, presumably of natural causes, and are generally undocumented. Most documented mortalities of dependent young are associated with the loss of their mothers.

Since 2002, the long-term average mortality rate (7.0%) estimated for independent female grizzly bears within the DMA is below the threshold of 7.6% to maintain a stable population (Table 1, Figure 2). The estimate for total mortality includes an estimate of unknown and unreported mortality. In addition, the population estimate derived from counts of unique females with cubs is known to be very conservative, thus the actual mortality rate since 2002 is likely lower than 7.0%. These mortality rates have allowed for continued population growth and range expansion of the GYE bear population, increasingly including areas outside the DMA. The long-term average mortality rate for independent males is 9.6% of the annual population estimate (Table 2, Figure 2), which is also below the established mortality limit for males.

Table 1. Estimated percent mortality for independent aged (≥2) female grizzly bears inside the DMA, 2002-2018.

| Year | Estimated N | Documented mortality | Estimated total mortality | Estimate % mortality |
|---|---|---|---|---|
| 2002 | 194 | 8 | 14 | 7.2 |

| | | | | |
|---|---|---|---|---|
| 2003 | 202 | 5 | 13 | 6.4 |
| 2004 | 211 | 10 | 18 | 8.5 |
| 2005 | 220 | 2 | 5 | 2.3 |
| 2006 | 229 | 2 | 3 | 1.3 |
| 2007 | 238 | 11 | 20 | 8.4 |
| 2008 | 248 | 14 | 30 | 12.1 |
| 2009 | 242 | 9 | 18 | 7.4 |
| 2010 | 250 | 14 | 23 | 9.2 |
| 2011 | 245 | 12 | 26 | 10.6 |
| 2012 | 250 | 8 | 12 | 4.8 |
| 2013 | 258 | 10 | 18 | 7.0 |
| 2014 | 263 | 5 | 9 | 3.4 |
| 2015 | 249 | 12 | 25 | 10.0 |
| 2016 | 240 | 6 | 12 | 5.0 |
| 2017 | 250 | 12 | 21 | 8.4 |
| 2018 | 246 | 13 | 17 | 6.9 |
| | | | **Average =** | **7.0** |

Table 2. Estimated percent mortality for independent aged (≥2) male grizzly bears inside the DMA, 2002-2018.

| Year | Estimated N | Documented mortality | Estimated total mortality | Estimate % mortality |
|---|---|---|---|---|
| 2002 | 194 | 9 | 17 | 8.8 |
| 2003 | 202 | 7 | 11 | 5.4 |
| 2004 | 211 | 12 | 23 | 10.9 |
| 2005 | 220 | 7 | 10 | 4.6 |
| 2006 | 229 | 7 | 11 | 4.8 |
| 2007 | 238 | 6 | 12 | 5.1 |
| 2008 | 248 | 22 | 40 | 16.2 |
| 2009 | 242 | 10 | 18 | 7.4 |
| 2010 | 250 | 21 | 39 | 15.6 |

| | | | | |
|---|---|---|---|---|
| 2011 | 245 | 13 | 19 | 7.8 |
| 2012 | 250 | 18 | 31 | 12.4 |
| 2013 | 258 | 7 | 10 | 3.9 |
| 2014 | 263 | 11 | 17 | 6.5 |
| 2015 | 249 | 21 | 32 | 12.8 |
| 2016 | 240 | 19 | 37 | 15.6 |
| 2017 | 250 | 20 | 33 | 13.2 |
| 2018 | 246 | 23 | 36 | 14.7 |
| | | | **Average =** | **9.7** |

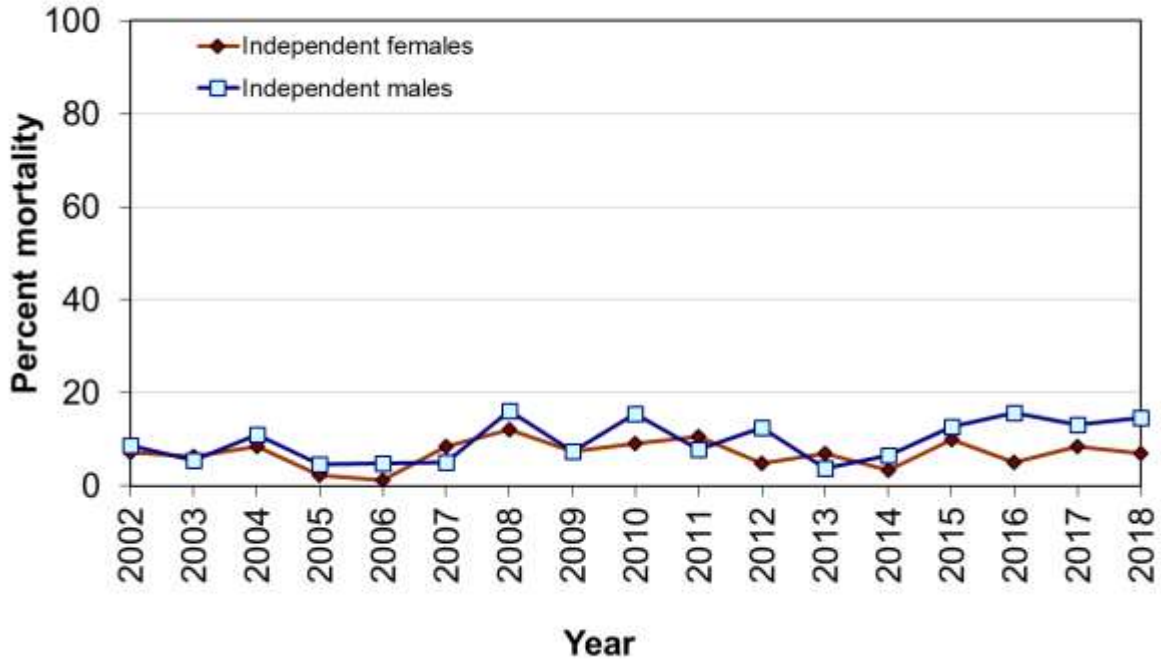


*Figure 2. Estimated percent mortality for independent aged (≥2 years) female and male grizzly bears inside the Demographic Monitoring Area, 2002-2018.*

Within the Recovery Zone, major causes of documented mortalities and specific mortality categories were similar for the decades 1999-2008 and 2009-2018 (Tables 3 and 4). Primary sources of documented, human-caused bear mortalities within the Recovery Zone have remained relatively unchanged and were associated with anthropogenic site conflicts and self-defense kills. Outside the Recovery Zone but within the DMA, mortalities from livestock conflicts and self-defense kills are the

primary sources of documented mortalities. Outside the DMA, livestock and site conflicts are the primary sources of mortalities.

Table 3. Total and average annual human-caused mortalities for independent aged grizzly bears (≥2 years) by mortality category and area, 1999-2008. Primary categories are highlighted in yellow.

| | In RZ | | | Out RZ in DMA | | | Outside DMA | | |
|---|---|---|---|---|---|---|---|---|---|
| Mortality Category | Total | % | Mean/yr (range) | Total | % | Mean/yr (range) | Total | % | Mean/yr (range) |
| Site conflicts | 23 | 25 | 2.3 (0-4) | 11 | 26 | 1.1 (0-6) | 6 | 46 | 0.6 (0-1) |
| Self-defense | 41 | 44 | 4.1 (0-9) | 9 | 21 | 0.9 (0-4) | 1 | 8 | 0.1 (0-1) |
| Illegal | 9 | 10 | 0.9 (0-3) | 4 | 9 | 0.4 (0-2) | 0 | 0 | 0 |
| Mistaken ID | 7 | 8 | 0.7 (0-4) | 5 | 12 | 0.5 (0-2) | 3 | 23 | 0.3 (0-1) |
| Livestock | 0 | 0 | 0 | 10 | 23 | 1 (0-4) | 3 | 23 | 0.3 (0-1) |
| Accidents | 13 | 14 | 1.3 (0-4) | 4 | 9 | 0.4 (0-3) | 0 | 0 | 0 |
| | 93 | 100 | 9.3 (4-18) | 43 | 100 | 4.3 (1-10) | 13 | 100 | 1.3 (0-3) |

Table 4. Total and average annual human-caused mortalities for independent aged grizzly bears (≥2 years) by mortality category and area, 2009-2018. Primary categories are highlighted in yellow.

| | In RZ | | | Out RZ in DMA | | | Outside DMA | | |
|---|---|---|---|---|---|---|---|---|---|
| Mortality Category | Total | % | Mean/yr (range) | Total | % | Mean/yr (range) | Total | % | Mean/yr (range) |
| Site conflicts | 28 | 29 | 2.8 (1-6) | 17 | 14 | 1.7 (0-6) | 31 | 39 | 3.1 (1-7) |
| Self-defense | 36 | 38 | 3.6 (2-7) | 33 | 27 | 3.3 (1-6) | 8 | 10 | 0.8 (0-2) |
| Illegal | 12 | 13 | 1.2 (0-3) | 6 | 5 | 0.6 (0-2) | 1 | 1 | 0.1 (0-1) |
| Mistaken ID | 8 | 8 | 0.8 (0-3) | 4 | 3 | 0.4 (0-1) | 3 | 4 | 0.3 (0-1) |
| Livestock | 2 | 2 | 0.2 (0-1) | 54 | 44 | 5.4 (-11) | 31 | 39 | 3.1 (1-8) |
| Accidents | 10 | 10 | 1 (0-2) | 9 | 7 | 0.9 (0-5) | 6 | 8 | 0.6 (0-4) |
| | 96 | 100 | 9.6 (6-15) | 123 | 100 | 12.3 (2-20) | 80 | 100 | 8 (3-17) |

There is an increasing trend in grizzly bear mortality outside the Recovery Zone and outside the DMA for all three of the major mortality causes (Figure 3, 4, and 5), which corresponds to the increase in occupied range of grizzly bears and the increased potential for conflicts as bears disperse from suitable habitats in the DMA.

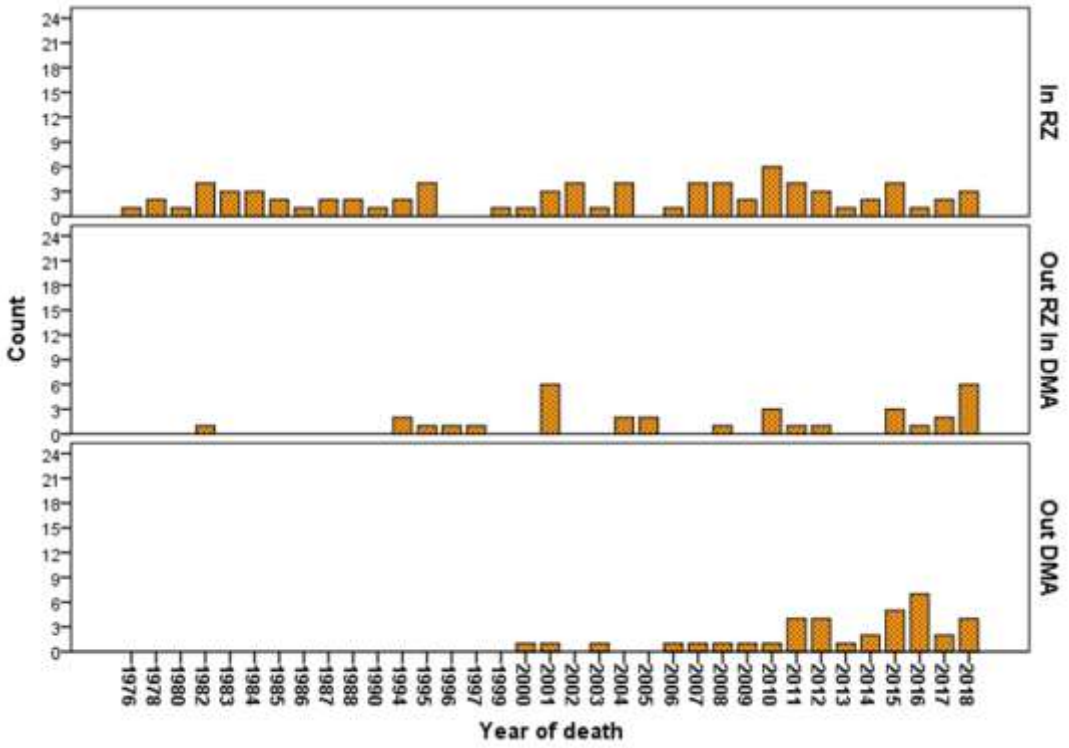


*Figure 3. Annual number of mortalities from site conflicts by area for independent aged grizzly bears (≥2 years) in the GYE, 1975-2018.*

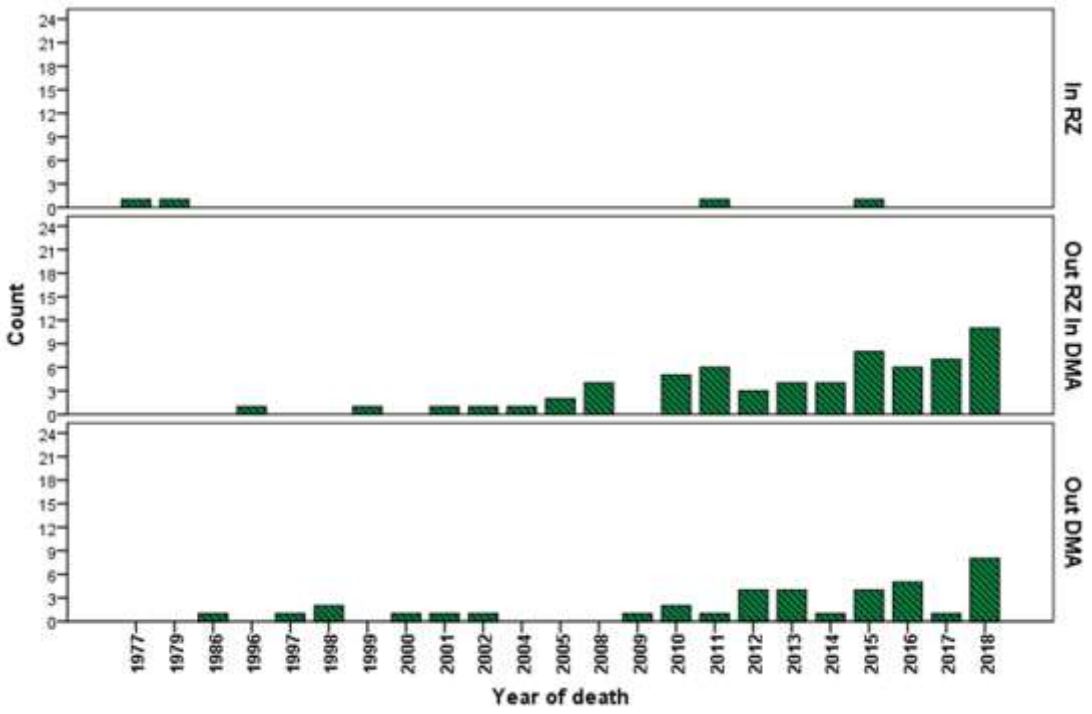


*Figure 4. Annual number of mortalities from livestock conflicts by area for independent aged grizzly bears (≥2 years) in the GYE, 1975-2018.*

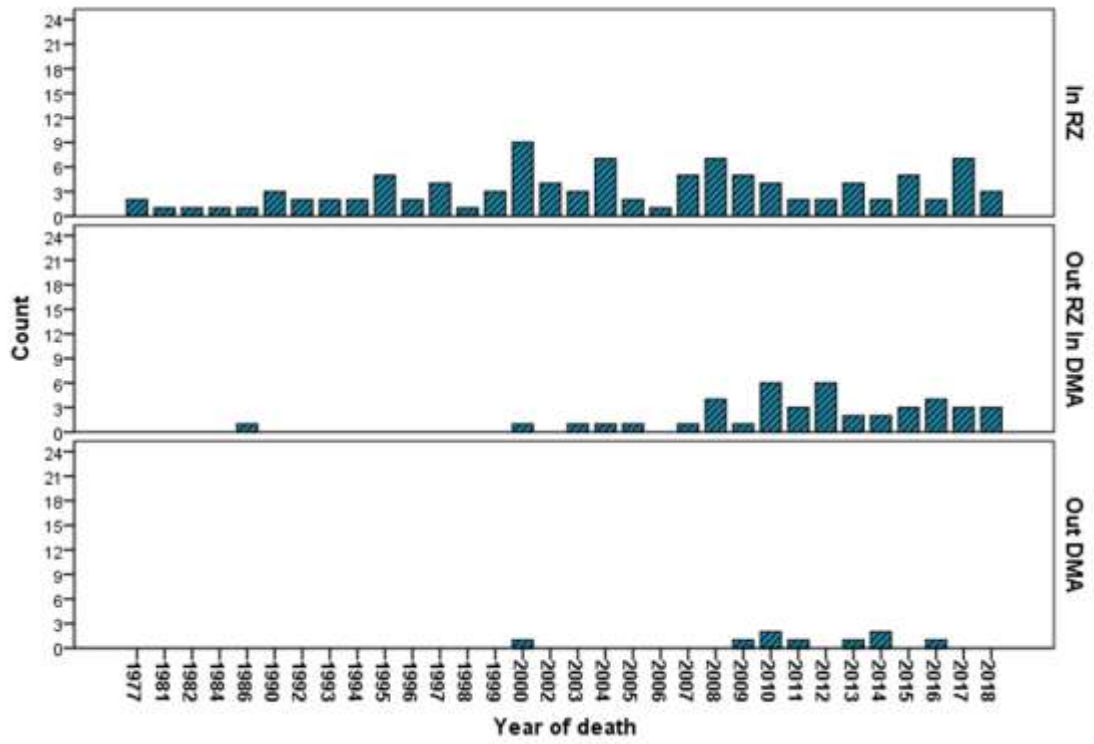


*Figure 5. Annual number of mortalities from self-defense kills by area for independent aged grizzly bears (≥2 years) in the GYE, 1975-2018.*

There is an increasing trend in the percentage of mortalities occurring on private lands outside the Recovery Zone but inside the DMA, and outside the DMA (Figure 6). During 2009-2018, 74% of mortalities outside the DMA occurred on private lands. Seventy-one percent of those deaths were male bears, and those bears outside the DMA tend to be younger (mean age 8) than bears dying with the Recovery Zone (mean age 12). This is consistent with an expanding population, with dispersing males primarily responsible for range expansion. The increasing trend in mortalities outside the Recovery Zone and outside the DMA is primarily a function of grizzly bear range expansion and increasing bear densities in these areas, where private land ownership is greater and habitat conditions are generally less favorable for grizzly bears compared with inside the Recovery Zone.

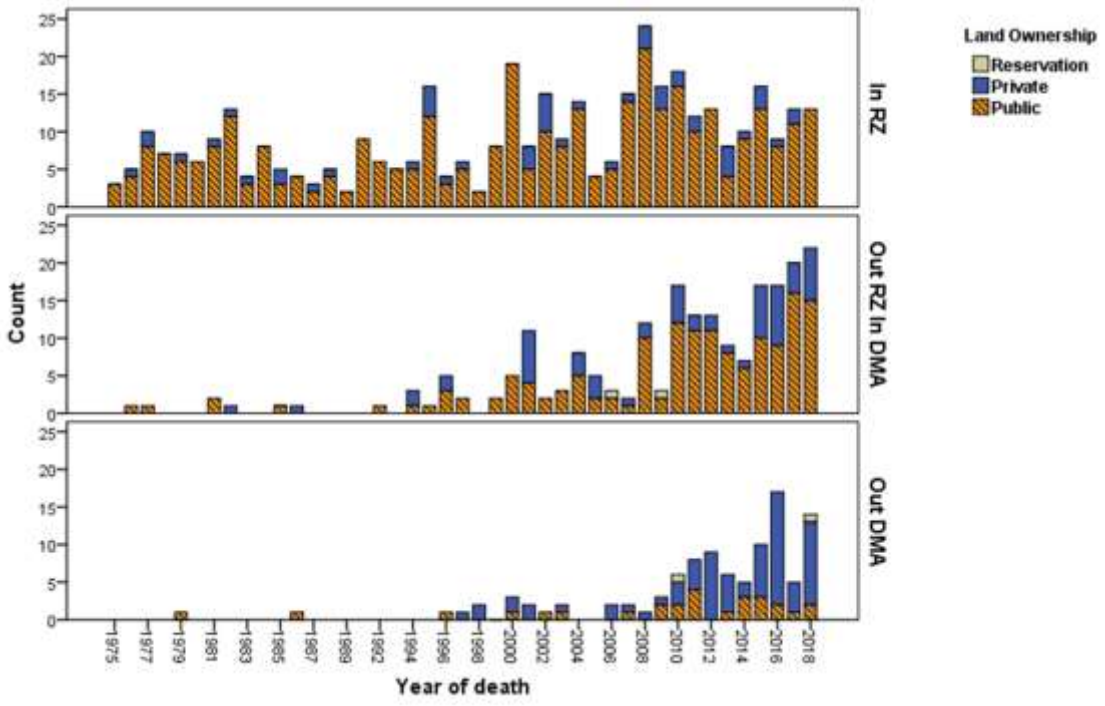


*Figure 6. Land ownership at sites of documented mortalities for independent aged grizzly bears (≥2 years) by year and area in the GYE, 1975-2018.*

Trends in the distribution and causes of grizzly bear mortalities reflect the realities of a healthy grizzly bear population that has increased in numbers and expanded its occupied range in an ecosystem with a rapidly increasing human population and human footprint on the landscape. Hansen and Phillips (2018) reported that "human population has doubled, and housing density has tripled in the GYE since 1970 and both are projected to double again by 2050. Human development is now estimated to cover 31% of the GYE." Data compiled by the Greater Yellowstone Inventory and Monitoring Network (McIntyre and Ellis 2011) show that from 1990 to 2010, the human population in and near the GYE increased nearly 50% (from approximately 220,000 to 323,000). About 27% of land in the counties that comprise the GYE is privately owned. Much of the growth occurred in rural residential areas.

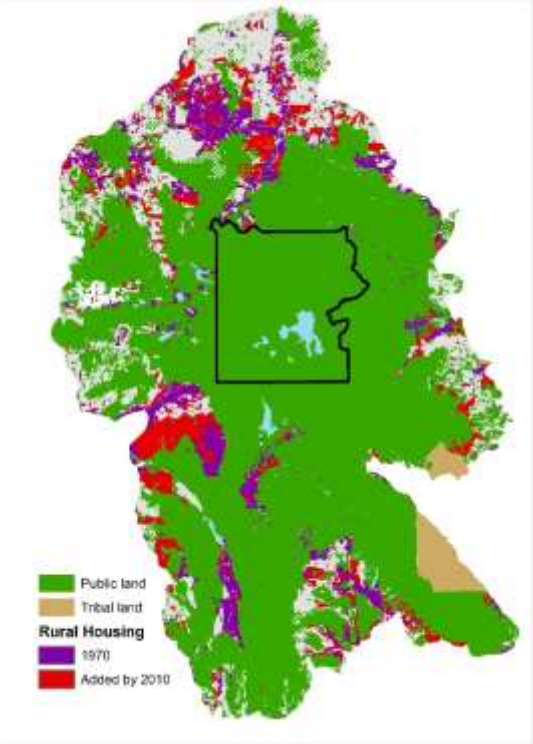


*Figure 7. Progression of rural residential development in the GYE from 1970-2010 (from McIntyre and Ellis 2011).*

**Preliminary recommendations to reduce future grizzly bear mortalities and human-bear conflicts**

The following discussion describes actions that have been implemented to reduce the potential for grizzly bear mortality and human-bear conflicts in the GYE for each of the five priorities identified by the YES. The examples provided are not all-inclusive, but reflect some of the primary actions that have been and continue to be used to reduce grizzly bear mortality risk and human-bear conflict potential. These actions have been largely responsible for the successful recovery of the GYE grizzly bear population. Additional preliminary recommendations for reducing mortalities and human-bear conflicts are then presented. As grizzly bear numbers increase and their range continues to expand well beyond the DMA, it may not be possible to reduce the number of bear mortalities and human-caused grizzly bear mortalities are expected with a recovered population. Importantly, raw numbers of mortalities are poor indicators of patterns and trends. Additional context regarding population size, areas of interest, sex and age of individual bears, and other factors is essential. The IGBST monitors mortalities in terms of sex and age specific mortality rates (i.e., as a function of population size or demographic cohort). The mortality rates established within the Conservation Strategy for bears inside the DMA are being met, and observed mortality rates have allowed for the recovery and continued expansion of the GYE grizzly bear population. The goal of these preliminary recommendations is to ensure that grizzly bear mortalities continue to be managed within the established limits inside the DMA and that efforts continue to minimize human-bear conflicts throughout the GYE.

Backcountry Recreation & Hunting-Related Mortalities

Backcountry related grizzly bear mortalities, including those associated with hunting, are a source of mortality for grizzly bears in the GYE. Many backcountry conflicts resulting in human injury or fatality, or bear mortality are the result of surprise encounters between people and bears, some of which are unavoidable. However, agencies have been taking actions to reduce bear mortalities and increase human safety in the backcountry for decades. Central to this has been outreach efforts by state, federal, and tribal (Wind River Reservation) agencies to inform hunters and other backcountry users on how to minimize conflicts with bears. A variety of methods are used including posting information on agency websites; providing public service announcements; printing bear safety information in hunting regulations and license holders; mailing bear safety information to special hunting permit holders; presenting bear safety information to hunter safety classes; working with producers of TV hunting shows; hosting public events for people recreating in grizzly bear country; and participating in interactive social media discussions, expert panels, and podcasts. A wide range of signing efforts have occurred to inform hunters and backcountry users throughout the GYE. As just one example, Montana Fish, Wildlife, & Parks (MFWP) has posted over 275 permanent metal signs with information on bear safety and hunting in grizzly bear country at trailheads and access points on National Forest lands in southwest Montana. All GYE agencies also engage in concerted efforts to promote the carrying and use of bear spray, including through targeted information and education efforts or through events like those that have been sponsored by the Wyoming Game and Fish Department (WGFD) and Idaho Fish and Game Department (IDFG) in cooperation with NGOs where bear spray is given to the public at no charge.

Agency presence and making public contacts during hunting seasons is a priority for the three state agencies as well as the USFS units. The goal of these contacts is to provide hunters with important information on ways to minimize conflicts with bears, promote the carrying and use of bear spray, ensure food storage regulations are being met, gather information about bear activity that can be used to proactively prevent conflicts, and provide a timely response to conflicts when they do occur. The USFS and state agencies work closely with outfitters to ensure that measures are in place to prevent conflicts in camps, especially for proper storage of food, game carcasses, and livestock feed. State agencies have provided portable electric fencing and grain storage containers to outfitters for many years where extra measures are needed to prevent conflicts in certain camps. Many USFS units provide backcountry infrastructure for properly storing food and carcasses, although there are inconsistencies across forests and ranger districts in how these are applied (particularly within designated wilderness). Carcass storage poles have also been installed on state lands across the GYE, as well as on the Wind River Reservation. To help improve compliance with food storage regulations in the backcountry, several USFS units also offer IGBC approved bear resistant containers for loan to the public.

Conflict data from the last decade indicate that while conflicts and mortalities in the Parks are relatively rare, backcountry areas should be the NPS's priority to reduce the potential for human conflicts or injuries and grizzly bear mortalities in the GYE. There are three National Park Service (NPS) units in the Greater Yellowstone Ecosystem (GYE) including Yellowstone National Park (YNP), Grand Teton National Park (GTNP), and the John D. Rockefeller Jr. Memorial Parkway (JODR). Eighty-six percent (2,197,675 acres) of these lands have been protected through recommended, potential, or eligible wilderness designation. Wilderness designation significantly reduces access-related causes of grizzly bear mortality. In addition to wilderness designation, YNP has designated 16 Bear Management Areas encompassing

464,638 acres (21% of YNP) of the highest quality bear habitat within the park, where recreational activity is closed or access restricted on a seasonal basis. Bear Management Area designation reduces habituation, human-bear encounters, and human-bear conflicts by limiting recreational access to important high quality bear habitat during the seasons the habitat is most critical to grizzly bears. GTNP and the JODR similarly restrict use of important bear habitat by seasonally closing Willow Flats (2,640 acres) to public entry. YNP, GTNP, and the JODR implement designated campsite and/or zone camping systems in backcountry areas. Backcountry camping permit systems limit the total number of people and parties that can camp in the backcountry on each night, thereby reducing the probability of conflicts. Backcountry campers are required to obtain a permit for an assigned site or zone and receive training that includes bear safety, food storage requirements, reacting to bear encounters, and use of bear spray. Each backcountry campsite in YNP contains a food storage pole or bear resistant food locker to facilitate bear-proof food storage. GTNP provides food storage lockers in some designated backcountry campsites and requires all backcountry recreationalists in Zone Camping areas to use an IGBC approved food storage container. Hikers in the three NPS units are strongly encouraged to carry bear spray. Elk hunters in GTNP are required to carry bear spray. Backcountry rangers regularly make public contacts to provide visitors with information and to ensure compliance with food storage regulations. Collectively, these actions have been highly successful at reducing the number of human-caused grizzly bear mortalities in backcountry areas on NPS lands.

Preliminary recommendations for reducing future grizzly bear mortalities related to backcountry recreation and hunting:

1. Ensure that training continues for outfitters and guides operating in grizzly bear country on ways to reduce the potential for human-bear conflicts, especially those associated with hunting. For example, the Wyoming Outfitters and Guides Association, in cooperation with the WGFD and the USFS, is planning to develop training for their members.
2. To improve outreach efforts for backcountry users, state agencies and the USFS could continue to sponsor public workshops to provide information on best practices for minimizing human-bear conflicts for different backcountry user groups.
3. Recognizing that backcountry use patterns in many portions of the GYE are changing, continue to adapt messaging to more effectively reach backcountry users on private and public lands (including National Parks and National Forests) regarding best practices for hunting, hiking, camping, and recreating safely in grizzly bear country. This could include more effective use of social media and working with hunter advocacy groups to promote conflict minimization measures prior to them engaging in their activities.
4. Continue to improve infrastructure for storing food and game carcasses in backcountry campsites used by outfitters and the public, and improve public information on the location of these structures and/ or the existence of bear resistant container loan programs.
5. Seek additional funding to continue or expand outreach programs such as bear spray giveaways.
6. Re-evaluate the Bear Management Area program in YNP and evaluate the potential for implementation of Bear Management Areas in GTNP and the JODR to determine areas within these park units with the greatest potential to reduce human-bear conflicts, potential human injuries, and subsequent human-caused grizzly bear mortality.

Public workshop recommendations for reducing future grizzly bear mortalities related to backcountry recreation and hunting:

1. The mechanisms for delivering educational material should be modernized to make the best use of technology and to appeal to the broadest audience. A more strategic approach is needed.
2. Identify important, specific audiences and find targeted ways of reaching them (e.g. hunters at point of purchasing licenses). This especially applies to high-risk groups.
3. Hunting areas in the GYE occupied by grizzly bears should be identified in the regulations.
4. The contents of hunter education material should be expanded and updated to include an understanding of new (and safer) hunting and carcass handling techniques. This would reflect the knowledge that there are more bears in more places and that grizzly bears are exploiting harvested game and gut piles at an increased rate and in new locations. In part, this information would include moving carcasses out of cover and into the open and flagging these locations for easy site identification for retrieval and safe assessment of grizzly bear presence.
5. Permit holders on NF land should be given the authority to use aversive conditioning to deal with problem bears.
6. Continue to promote education regarding the use of bear spray, including the need to have bear spray accessible at all times. Find new and compelling ways to reach and convince reluctant audiences.
7. Find more ways to make bear spray available to the public, including rentals.
8. The type and placement of information signs related to safety in bear country continues to be a problem. Signs are often too wordy and are hard to locate among many signs on bulletin boards. Also, they should be more thoughtfully designed. Signs should be placed as stand-alone for easy recognition and viewing; e.g. beyond (down the trail) or set apart from the trailhead bulletin boards.
9. Infrastructure (food/carcass poles and metal storage boxes) should be made available to the public in the wilderness and there should be a standardized policy on the types used, their construction, and placement. Agencies and Forests should coordinate and take this issue and responsibility seriously.
10. Regulations involving bear baiting should be revisited to do everything possible to make sure grizzly bears do not receive food rewards and are not shot at these locations.
11. Bear baiting should be prohibited in the grizzly bear Demographic Monitoring Area/occupied habitat
12. The use of electric fences by permittees should be encouraged and the materials and information for use should be more available.
13. Permitted outfitters and guides should be required to use electric fences to secure camp perimeters and attractants.
14. Educational requirements for non-resident hunters should be revisited and enhanced; e.g. tied to license purchase.
15. There should be more effort invested in finding was to connect with non-hunting recreationists, especially atypical ones; e.g. those who start their trip outside of grizzly bear country and have a destination within occupied bear areas.

Front Country Conflicts and Community Planning

Considerable progress has been made over the past 30 years to reduce front country conflicts and related grizzly bear mortalities on public lands, especially inside the DMA. Food storage and sanitation regulations have been in place on public lands for many years, starting in the 1970's in Yellowstone National Park and the 1980's on surrounding national forests. The area covered by these regulations has gradually increased over time, and they have proven highly effective for reducing conflicts between humans and bears. Food storage regulations are now in place on all National Park and National Forest lands, as well as all MFWP lands (wildlife management areas, fishing access sites, boat launches), in the DMA. The USFS and NPS have been providing food storage dumpsters and bear resistant garbage containers at campgrounds, lodges, and other front country sites since food storage became required. A highly successful partnership between the USFS and Greater Yellowstone Coalition started in 2014 has resulted in the purchase and installation of such infrastructure at every developed USFS campground in the GYE. The Bureau of Land Management has also added food storage infrastructure at several front country sites they manage within grizzly bear habitat in the GYE. Through a partnership with the Western Bear Foundation, the WGFD has installed bear boxes and poles on lands they administer. MFWP has also provided funding to improve food storage infrastructure on public lands, and has partnered with local governments, businesses, and NGOs to place over 2,500 bear-resistant garbage containers in the Montana portion of the GYE. This, combined with agency education and enforcement efforts, has been highly successful at reducing grizzly bear mortalities associated with front country sites on public lands.

Significant reductions in conflicts and subsequent grizzly bear mortalities at front country sites on private lands have also been achieved by agencies working closely with the public. On most private lands inside the GYE, there are no sanitation regulations requiring that attractants be stored so they are unavailable to bears. Exceptions to this include county ordinances or zoning regulations requiring proper attractant storage in areas such as Teton County, Wyoming and portions of Gallatin County, Montana. Additionally, Montana state statute 87-6-216 makes it unlawful to feed wildlife (including bears) on public and private lands. However, state agencies have been working to reduce sanitation and attractant related conflicts on private lands for many years by providing bear resistant garbage storage containers, and installing electric fencing sites at landfills, transfer stations, apiaries, and orchards to exclude bears. In addition, considerable efforts have been made to work closely with local communities to implement voluntary conflict reduction measures. An example of this is the Bear Wise Community program in Wyoming. Other outreach methods commonly used to inform private landowners on ways to minimize human-bear conflicts have included posting information on agency websites, staffing public events, and placing signs at strategic locations. Additionally, state agencies routinely provide comments to city or county governments for private-lands subdivision plans to incorporate considerations for reducing human-bear conflicts.

Preliminary recommendations for reducing future grizzly bear mortalities related to front country conflicts:

1. Where needed, improve garbage storage infrastructure at sites on private and public lands inside the DMA by continuing to work with private landowners, local communities, city and county governments, and sanitation companies.

2. Purchase and install bear boxes at approximately 1,000 sites in developed campgrounds in Yellowstone National Park.
3. Improve consistency and messaging of signing related to human-bear conflict prevention measures on USFS and NPS lands.
4. Work with local communities to ensure enforcement of existing sanitation ordinances and regulations, or to enact new local sanitation orders where they are needed.
5. Continue educational and electric fencing installation efforts on private lands in occupied grizzly bear habitat (focusing on areas within the DMA) to reduce conflicts associated with orchards and small/exotic livestock (i.e., hobby ranches).
6. Recognizing that managing roadside bears outside of national parks in the GYE will continue to be a collaborative effort among state and federal agencies with varying authorities and jurisdictions, identify strategies for managing these issues and additional resources needed to accomplish this increased workload.
7. Work with interested NGO's to increase available funding for recommendations 1-6.

Public workshop recommendations for reducing future grizzly bear mortalities related to front-country conflicts:

1. There should be a clear policy addressing bear resistant containers to allow county and municipal sanitation departments to more readily identify, purchase, and utilize them.
2. The compatibility (or lack of) of bear resistant containers and equipment for removal (garbage trucks) should be addressed.
3. The unintentional consequence of carcass removal should be considered and addressed; e.g. the movement of bears (route taken?) to these sites (best location?) to find food. Carcass removal is necessary, but how the practices are implemented can negatively impact front-country human activities.
4. Develop and utilize phone alert systems to send a message letting the public know when they are entering bear country.
5. Address trust issues (lack of) related to the relocation of managed bears ("red shirt fear"). More understanding should be provided to the public to address the sense that this is a game of "musical bears" by state organizations without regard to public concerns.
6. IGBC should take a more active role in developing safety in bear country messaging, standardizing infrastructure, and the process for moving forward with programs for coexisting with bears in front country areas.
7. Develop/create compelling social-media character(s) to engage younger generations.
8. The entire system of providing incentives for complying with attractant storage requirements should be reassessed.

<u>Efficacy of Information and Education Efforts</u>

Agencies have long been engaged in efforts to inform the public and various stakeholder groups about ways to minimize conflicts between grizzly bears and people. However, there have been comparatively few efforts to evaluate the success of these efforts to determine which methods have been most effective in the GYE. Personnel on the Gallatin National Forest conducted surveys of backcountry users in the Absaroka-Beartooth Wilderness during the 1990's-2000's to evaluate which sources of agency-provided information were most effective at informing visitors about food storage requirements and the

use of bear spray. Grand Teton National Park cooperated with university experts to evaluate the success of their signing and other bear safety messaging products, resulting in a 2011 report summarizing the results (WYSAC 2011). Personnel with YNP have conducted extensive public survey efforts to determine how well visitors comply with bear safety recommendations, the results of which have been reported annually in the IGBST's annual reports since 2015. However, these surveys have not been designed to specifically evaluate the efficacy of information and education efforts. The WGFD has conducted surveys of the public at bear spray distribution events to determine which efforts have been most helpful in informing people about bear spray.

Preliminary recommendations for evaluating and improving the efficacy of future I&E efforts:

1. Work with agency or university social science and human dimensions experts with contextual knowledge of grizzly bears and humans to evaluate the most effective methods of outreaching to important user groups including people who live, work, and recreate in areas occupied by grizzly bears. Studies should be designed to evaluate which I&E methods have been successful in changing people's behavior towards recommended practices for minimizing human-bear conflicts.

Public workshop recommendations for evaluating and improving the efficacy of future I&E efforts:

1. IGBC should play a larger role in the "safety in bear country message": consistency, assessing efficacy, where to find the best material, developing new material, distribution/dissemination.
2. Funding is an issue: how to get the best return for the effort involved; finding new sources for education and enforcement.
3. Is what we are doing working? How do we know?

<u>Livestock conflicts and producer outreach</u>

To better manage livestock conflicts and related grizzly bear mortality, agencies have for many years been engaged in efforts to improve our understanding of factors that drive depredation risk and techniques that may reduce that risk. This work began years ago with efforts such as an early analysis of livestock depredation by grizzly bears conducted by the IGBST (Knight and Judd 1983) and a research project led by personnel from the WGFD (Anderson et al. 2002). More recently, the Forest Service, WGFD, and USGS-IGBST cooperated with a graduate student from Montana State University to analyze grizzly bear depredation risk associated with USFS grazing allotments in the GYE (Wells et al. 2018). These studies have helped managers better understand livestock-grizzly bear depredation dynamics but have largely been unsuccessful in identifying grazing management practices that will reliably reduce depredations, particularly in the context of large wildland environments typical of most public lands grazing allotments.

During the same time, there have been significant changes in grazing allotment management on USFS lands in the GYE which have generally resulted in fewer domestic sheep and cattle grazing on public lands and fewer allotments. Over the past 10-15 years, several domestic sheep allotments inside the DMA with chronic grizzly bear conflict histories have been vacated, closed, or converted to cattle grazing (Ash Mountain and Iron Mountain: Gallatin National Forest; Tosi Creek, Elk Ridge, Lime Creek, Rock Creek: Bridger-Teton National Forest). The Meyers Creek Allotment is the only active domestic sheep allotment inside the grizzly bear Primary Conservation Area, but it has not been grazed since 2008.

Numerous cattle allotments with chronic grizzly bear conflicts have been vacated or closed as well (Blackrock, Spread Creek, Bacon Creek, Fish Creek: Bridger-Teton National Forest; upper pastures of Dunoir Allotment: Shoshone National Forest). Other allotments within the PCA or DMA have been vacated or closed due to other resource concerns as well (Horse Butte, Wapiti, Cache-Eldridge, South Sixmile: Gallatin National Forest). Most of these actions over the past 15 years were the result of 3rd party transactions, in which non-agency affiliated groups have provided financial compensation to permittees who agreed to waive their grazing permits back to the USFS.

State agencies in Wyoming, Montana, and Idaho have also worked extensively with livestock producers to minimize conflicts and grizzly bear mortality. Agencies meet with producers annually to discuss viable options for reducing conflicts, which also facilitates dialogue to allow for quick resolution of livestock conflicts. All three states have programs to provide financial compensation for verified livestock depredation by grizzly bears. Such programs help minimize the economic impact of livestock depredation for livestock producers. Federal, state, and tribal agency personnel strive to respond quickly to livestock conflicts, which builds trust and helps increase tolerance for grizzly bears with livestock producers as well as providing better opportunities for conflict resolution. Examples of ways in which agency personnel have worked with producers to minimize depredation risk or mitigate conflicts after they have occurred include providing electric fences to livestock producers to help protect livestock in sheep bedding areas or calving pastures, securing attractants such as grain storage bins, and capturing and relocating or removing bears that kill livestock. State agency personnel and independent programs train range riders to improve their capability for managing livestock and detecting depredation issues as soon as possible. Local governments and conservation groups have also implemented measures that may help reduce livestock-related grizzly bear conflicts such as the programs in Park County, Wyoming and Madison County, Montana which pay for local contractors to haul livestock carcasses to the landfill, thereby reducing bone yards that attract bears near livestock production operations.

Additionally, state agencies have worked to provide livestock producers with information they need to minimize livestock-related conflicts. Examples include MFWP's "Living with Grizzlies – Farmers and Ranchers" brochure and incorporating this information into public education forums and presentations for agricultural interests.

Livestock depredations and associated bear mortalities have proven very difficult to alleviate and some will continue to occur given the increase in bear densities and expansion of grizzly bears beyond the DMA into more areas devoted to livestock production. Livestock depredation and subsequent management actions are the reality of a recovered grizzly bear population, with continued expansion of occupied range well beyond DMA boundaries.

Preliminary recommendations for reducing future livestock-related conflicts and associated grizzly bear mortalities and improving outreach to livestock producers are somewhat limited and primarily involve continuing the existing efforts that have been most successful, including:

1. Continue to engage with livestock producers that are new to managing livestock in areas occupied by grizzly bears to assist them with understanding grizzly bear management regulations, and promote awareness of compensation programs, agency procedures for responding to and mitigating depredation events, and management options that help reduce depredation risk.

2. Continue to work with livestock producers to evaluate depredation risk relative to livestock management practices such as livestock breed or husbandry practices, as well as other potential methods for minimizing grizzly bear depredation risk.
3. Continue to disseminate information to livestock producers and others on management strategies that have been tested and their efficacy for minimizing livestock conflicts, such as using electric fencing around small-scale calving pastures and carcass management programs. The Western Landowner's Guide to Reducing Conflict with Grizzly Bears, Wolves, and Elk (2018) summarizes many of these strategies in one publication for livestock producers.

Public workshop recommendations for reducing future livestock-related conflicts and associated grizzly bear mortalities and improving outreach to livestock producers:

1. Create an event(s) that really appeals to the participants where this information could be presented, or capitalize on existing events such as livestock grower's meetings.
2. Replicate the "Ruby Valley strategy"; all in one- i.e. producer initiated, locally driven (MT)
3. Partnering with the Stockgrower's Association could be a good starting point.
4. There are many NGOs who could be willing partners- make it a priority to network with new NGOs; find out who can help and what they can offer
5. The use of electric fencing as a deterrent should be more aggressively explored and electric fences should be much more readily available. Better information on the use of electric fencing is needed. A discussion about the reliability of electric fencing material/equipment is needed.
6. In each state, explore/implement differential compensation rates for producers who invest in conflict management programs. Producers who invest in conflict management programs should be recognized and compensated.
7. Expand funding for Wildlife Services to conduct non-lethal work.
8. Help producers deal with carcasses that are hard to access. This could mean expanding the use of explosives.
9. Producers should be compensated for the loss of guard dogs in all states.
10. There should be much more emphasis on prevention than reaction.
11. Other partners – Need to involve more people who are actually on the ground "the producers"; this effort needs more credible partners.
12. Agency managers are often on the scene too late to address conflicts. A more rapid response is needed by whatever means, including more funding for more staff. We know that the existing staff is stretched-thin.
13. Find and highlight examples of livestock operators have found ways to coexist with predators. Find areas where it is "working"- figure out why it works and showcase these efforts.
14. Need acknowledgment regarding how natural systems work. This awareness in managing range allotments rather than simply managing by dates on the calendar. Need more flexibility and more options outside of standard operations.
15. How do we deal with livestock lost to larkspur (carcasses)? Allow permittees more flexibility to move among pastures to avoid larkspur. Producers are losing useful tools in rangeland management "tool box" to deal with this and other problems.
16. Producers should be allowed more flexibility within grazing permits to address conflicts

<u>Targeted Community Outreach in Grizzly Bear Expansion Areas</u>

As grizzly bear range expansion in the GYE progresses, agencies have expanded efforts to minimize human-bear conflicts and grizzly bear mortality. Food storage regulations on National Forest lands in the GYE have expanded such that these are now in place throughout the entire Beaverhead-Deerlodge, Custer Gallatin, Caribou-Targhee, and Shoshone National Forests; and on all Bridger-Teton National Forest lands and MFWP lands within the DMA. Additionally, food storage regulations are in place on almost all USFS lands in the area between the GYE and Northern Continental Divide Ecosystems (NCDE). Through the partnerships between the Greater Yellowstone Coalition and USFS, and between the Western Bear Foundation and WGFD, infrastructure for storing food and garbage has also been installed in developed campgrounds in areas recently occupied by grizzly bears as their range has expanded in the GYE (see IGBC website, http://igbconline.org/food-storage-regulations-2/).

The Montana Bear Education Working Group is another relatively recent effort to reduce human-bear conflicts and grizzly bear mortality in the GYE, NCDE, and the mosaic of public and private lands between these two grizzly bear populations. It is a partnership between MFWP, the USFS, and U.S. Fish & Wildlife Service along with considerable support from NGOs including the Wildlife Conservation Society, People and Carnivores, the Cinnabar Foundation, the Rocky Mountain Elk Foundation, the Vital Ground Foundation, and Montana's Outdoor Legacy Foundation. This partnership has funded a position focused on education and information efforts tailored towards local landowners, hunters, livestock producers, local publics, and others to minimize human-bear conflicts and grizzly bear mortality. The Montana Bear Education Working group has presented bear awareness, safety and conflict reduction information in 54 communities, contacting nearly 42,000 people in the area between the GYE and NCDE.

Additionally, state and federal agencies are applying their regular conflict management programs, including many of the actions discussed elsewhere in this document, over a larger area as grizzly bears expand their range and increase in numbers. However, agency capacity is limited and it will be challenging to respond over a larger area of conflict potential. MFWP has created two additional bear management technician positions located in Deer Lodge and Red Lodge to help manage conflicts and educational efforts in areas of recent grizzly bear range expansion. WGFD has increased seasonal and full-time personnel within their Large Carnivore Section, and also created a full-time outreach and education position (Bear Wise Wyoming Coordinator). Agencies respond to all conflicts regardless of where they occur, but expectations for securing attractants or providing habitat security for grizzly bears differs depending on whether the location is inside the Recovery zone, outside the Recovery Zone but inside the DMA, or outside the DMA. In Montana's connectivity zone between the GYE and NCDE, MFWP responds to conflicts and works to increase awareness and education efforts to allow natural movement of conflict-free bears between the two ecosystems.

Preliminary recommendations for reducing grizzly human-bear conflict potential through targeted community outreach in grizzly bear expansion areas:

1. Improve signing and messaging related to human safety and grizzly bear conflict reduction practices on public lands in grizzly bear expansion areas.
2. Work with permittees (outfitters, livestock grazing, resorts, etc) on USFS lands in areas where grizzly bear occupancy is new or anticipated to increase their awareness and safety. Where appropriate, incorporate human-bear conflict prevention measures into their permits and/or operations.

Public workshop recommendations for reducing future grizzly human-bear conflict potential through targeted community outreach in grizzly bear expansion areas:

1. Be very proactive about providing subsidies for purchasing and installing bear-proof infrastructure.
2. Have carcass removal programs in place before this becomes an issue; i.e. before bears are active in the area.
3. Have very intentional and high quality (expert) educational efforts and discussions with the public in grizzly bear expansion areas. This should include bear biology and behavior, how to prevent/reduce conflicts and encounters.
4. Strive for consistency among agencies and locations regarding messaging, regulations, reporting, and infrastructure.
5. Commission IGBC to identify and prioritize the most important areas to target for outreach
6. More accountability of homeowners involved in bear-human conflicts is needed.
7. Develop phone trees/text chains to communicate information directed at reducing bear-human conflicts
8. Seek partners/organizations that can effectively reach larger local audiences and specific non-local audiences.
9. Time outreach efforts to target specific seasons with higher risk of bear-human conflicts; e.g. when chicken operations begin annually.

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# Appendix A

## 1. Backcountry Recreation and Hunting-related Conflicts

- Modernize educational delivery
- More targeted delivery (i.e. at purchase of hunting license)
- Promote increased bear spray accessibility and education on use (i.e. rentals)
- Regs identify units in occupied GB habitat
- Permit holders authority to use aversive conditioning
- Expand education on hunting practices
    - Carcass in the open
    - Flagging site

**Session #1 Aversive Conditioning for learned behavior**

- Use of the right dogs
- Bean bag gun loads, air horn, strobe lights
- Use of bear spray beyond aggressive behavior/charging
- Enticing a bear to bite a can of spray
- Infrastructure policy in wilderness (standardized)
- Availability of electric fences
- Regulating Bear baiting

**Session #2**

- O&G required to use electric fence
- Sign placement – beyond trailhead
- Educational requirements for non-res hunters (tied into license purchase)
- Connecting to non-hunting recreationists and those that start outside bear country
- Prohibit baiting DMA occupied GB habitat
- Secure ???

## 2. Front Country Conflicts and Community Planning

- Education and Enforcement
    - Ordinance and fines
    - Peer shaming
    - Understanding complexities
    - Changing the message
    - Help public understand repercussions
- Feel good community pride
- Photos
    - Shaming and education
- Tackle stores selling wildlife feed. Removal of source?
- Clear policy for bear resistant canisters to allow sanitation department to utilize. Deal with equipment compliance issues
- Unintentional consequence of carcass removal – bear movement to find food
- Phone alert when entering bear country, park, etc – message
- Trust/understanding process for public (red shirt fear) “musical bear” messaging
- IGBC help with messaging, develop bear-wise, infrastructure, process for moving forward

- Social-media character creation to engage younger generations and through influence other generations
    - Smokey messaging? Change
    - Benadette bear "Do your part, be bear smart"
    - Bear meter (activity gauge)
- Assessment of incentives
- Early removal of problem bears

### 3. Efficacy of information and education efforts

**Issue 1: What recommendations do you have to reduce future grizzly bear mortalities and to address grizzly bear/human conflicts?**

- Consistent messaging is needed across the ecosystem.
- Increase awareness & education efforts:
    - Outreach to hunters during the license application process by including "pop-up" information about areas where bear safety measures need to be implemented (e.g., food storage, etc.). This could also be part of license packets that are mailed.
    - Messaging needs to be expanded to be available to both resource professionals and the community. Model the Bear Wise Program after the Fire Wise model and create a community certification program.
        - Tourists may often only come into contact with community members. Identify ways to reach the general public to help them have the tools to share the consistent message.
- Consider working with press releases where bears are mentioned to have safety messages included.
- Identify easily accessible and digestible media information: geotagging, QR code use, videos (e.g., attractants versus rewards, bear behavior).
- Showcase real success stories – e.g., hikers who didn't think they needed bear spray, brought it along, and the way it prepared them for a bear encounter.
- Increase enforcement efforts – often I&E can be too lenient. Warnings may not always be best.
- Youth advocacy groups
- Implement a targeted approach outside the DMA in key areas such as where genetic connectivity is needed to sustain populations and cultivate recovery.

**Issue 2: What actions are you or your organization already taking?**

- Currently using a "shotgun" approach to I&E efforts.
- Annually educating folks inside the DMA.
- Info sharing/teaching at various events and venues.

**Issue 3: Are there areas of interest for additional actions?**

- Consistent messaging.
- Increase awareness efforts.
- Support Recommendations in Report: Need to include a social science component in order understand and utilize proven methodologies for I&E.

**Issue 4: What other partners are needed to take effective action?**

- In order to create a consistent message the following are recommended:
  - Social Scientists that can complete a data-gap analysis, identify what other entities might already have for consistent bear messaging (e.g., British Columbia), & how to monitor for success
  - Need an expert in marketing to "sell" the message
  - House the consistent messaging in one location such as with the IGBC I&E chair.
  - All agencies have to come to agreement on the message.

**Recommendations**

- Consistent messaging across the ecosystem
  - Reach out to other agencies, in organizations or other areas that have focused efforts
- Outreach to hunters during app process or with license materials – electronic "pop-up" notifications
  - Annual education efforts outside the DMA
- Work with media releases to make sure bear safety messages are included – example: news
- Social science understanding (audience and specific messages)
  - How successful are these?
  - Agency, state, multiple universities: collaboration research
  - Comparative and gap methodology analysis
- Professional, consistent messaging in the field and for the public
  - 3x5 info cards
- Education – educate base community and visitors
  - Expand bear-wise program na "fire wise" model – community

**Additional Actions/Rec.**

- Education: bear behavior – update video (series)
  - Digestible chunks
  - Geotagging and QR code
  - Understanding attractant as reward
  - Youth advocacy groups I&E
  - Showcasing success stories – proper bear country preparation
  - Enforcement of camp management, food storage and/or cease and desist vs. a warning
- Money
  - Education
  - Enforcement
  - Infrastructure

**Current Actions**

- Events teaching a wide range of users (various venues)
- Annual education inside the DMA

**What Else? Who Else?**

- Coordination among agencies (for messaging)
- Clearinghouse for messages: I&E chair (IGBC)
- Social scientists involved in message formulation and assessment of I&E efforts, monitoring for success
- Marketing expertise and Nat. Res. Interpretation

**4. Livestock conflicts and livestock producer outreach**

**Recommendations you have:**

- Create an event that's "beloved" participant-wise
  - Livestock growers meeting – could we have a session there?
- Ruby valley strat. all in one: producer initiated, locally driven (MT)
- How do we deal with livestock lost to larkspur – carcasses
  - Move pastures
  - Losing tools in rangeland management "tool box"
- MT does not have multiplier, MT paying for some guard dog loss (prevention)
  - i.e. changing from reaction to prevention
- Other partners – need people who are actually on the ground "the producer"
- Managers/ranchers/producers need authority to address problem situations – ranches can't sustain current/growing levels of losses
  - Most difficult – in accessible backcountry, often not there in time to address
  - Taking out problem bears early is most effective
- Need for broader access to/life of Farm Bill Equippe funding – to help with electric fencing
- Explore/implement differential compensation rates for producers who invest in conflict management programs – not existent in all states
- Set up broader clearinghouse of conflict tools/science/funding, etc.
  - Eg. Western Lands Alliance brochure
- Funding increase for wildlife service non-lethal work
- Allow producers more flexibility within grazing permits to address conflicts
- How to deal with carcasses we cannot access?
  - Not possible to get them all
  - Can use explosives ???

**How to share knowledge:**

- Western Landowners Alliance is a good example
  - Have developed a publication
- Who converes?
- Partnering with Stockgrower Association could be a good place to start
- NGOs are a willing partner, figure out network of new NGOs can help, what they offer
- Relationships key between FS and permit holder for grazing allotments (trust)
- How do we achieve this flexibility
- How do we share knowledge, BMPs, observations, and so on?
- Various intl. examples of livestock ops and predators
  - Where it's working
- Capability and capacity of the network of non-profits and other entities that may be able to help
- Administrative flexibilities/options within the SOP
- Flexibility acknowledging the natural systems not the dates on the calendar
- Documenting and explaining observations, decisions of field load when adjustments are made
- Relationships are essential and critical for success.
  - Communication and trust

5. **Targeted community outreach in grizzly expansion area**
   - Subsidy for Bear-proof infrastructure
     - Residency areas
     - Money – realize reality and accountability
   - Carcass removal programs in place ahead of time
   - Expert education and discussions with public in expansion areas
     - Biology/behavior – reduce conflict potential
     - Public bear training academy/seminars
   - Use success stories to educate
     - Tom Miner Basin
     - North Fork Bear Wise Community Program
     - WLA – Ownership
   - Accountability
   - Partners
     - Western Landowner Alliance
     - Outfitter/Guides
     - Landowners/Ranchers
     - Builders
     - Resorts, Dude Ranches
     - Realtors
     - HOA, Landowners Associations
     - Youth Advocacy Programs – counties
   - Go to "their turf"
   - Consistency among systems
   - County commissioners, local governments
   - IGBC prioritize and identify high priority areas to outreach
   - Homeowner accountability for conflict
   - Incentivize and/or punish
     - Peer pressure
   - Phone tree, text chain
   - Incentivize permanent infrastructure
   - Partners and organizations that reach larger audiences and non-local
   - Timing and "fencing initiatives"
     - Chick week