HUMAN WILDLIFE CONFLICT WORKING GROUP
MEETING MINUTES

Chair: Brian Wakeling (Montana)
Vice-Chair: Doug Brimeyer (Wyoming)

Thursday, September 9th, 2021*
1:00 AM – 3:00 PM (EDT)

Agenda

- Call to Order/Review Agenda/Introductions (B. Wakeling/D. Brimeyer)
- Approval of HWC WG Minutes from the AFWA Annual Meeting (B. Wakeling)
- Discussion on potential funding for national wildlife conflict issues (B. Wakeling)
- Report on progress toward the development of peer reviewed publications on human-wildlife conflicts (B. White) https://digitalcommons.usu.edu/hwi_monographs/
    - Urban Coyotes
- USDA-APHIS-Wildlife Services (Janet Bucknall)
- Berryman Institute (Terry Messmer)
- Development of an AFWA document on "humane dispatch of wildlife by agency personnel" (Colin Gillin, Tom DeLiberto)
- Update on USGS National Climate Adaptation Science Center: Impacts of Climate Change to Wildlife Conflicts (Kate Malpeli)
- Other topics of interest
    - TBD
- Roundtable: State/Federal/Tribal/Provincial/Regional Associations/AFWA Members
  One representative per agency highlights a couple of human wildlife conflict issues
- Wrap-up Discussion and Assignments for Next Meeting (B. Wakeling/D. Brimeyer)

Minutes

- **Call to Order/Review Agenda/Introductions (B. Wakeling/D. Brimeyer)**

    - Chairman Wakeling called the meeting to order
    - No agenda adjustments were requested
    - Introduction occurred via zoom "chat"

- **Approval of HWC WG Minutes from the AFWA Annual Meeting (B. Wakeling)**

    - A motion was made to approve the Minutes of the previous meeting. The motion was seconded and passed.

- **Discussion on potential funding for national wildlife conflict issues (B. Wakeling)**

    - Anis Aoude with Washington Department of Fish and Wildlife lead a discussion regarding challenges faced by WAFWA states noted in funding actions to address conflict situations. Several states, based on a WAFWA survey for their Human Wildlife Conflicts Committee, have limitations on addressing conflict due to adequate, eligible funding. The HWCWG intends to develop a survey of AFWA states and provinces to determine what the challenges may be and the priority of those challenges more broadly. **North Carolina and Washington indicated a possible interest in developing the survey, along with Berryman Institute. HWCWG intends to seek representation from each Regional Association in development, and this will be discussed further in March.** The Berryman Institute also offered to participate, and USDA Wildlife Services has recent survey data to assist.

- **Report on progress toward the development of peer reviewed publications on human-wildlife conflicts (B. White) https://digitalcommons.usu.edu/hwi_monographs/**

    - Urban Coyotes
    - First draft work is still ongoing, but a thoroughly reviewed and edited version should be available in about 1 month. This draft will be circulated among HWCWG and WRP membership review. Reviews will be incorporated, and a final draft distributed with adequate time prior to the meetings in March. HWCWG intends to request approval from WRP in March and to move ahead with publication, probably in the Human Wildlife Interactions/Berryman Institute Monograph Series as with the previous urban black bear and deer conflict papers.

- **USDA-APHIS-Wildlife Services (Janet Bucknall)**

    - Janet Bucknall (USDA-AHPIS-WS, Deputy Administrator) and Jason Suckow (National Wildlife Research Center, Director) provided a detailed briefing. See the Appendix for the full report.

- **Berryman Institute (Terry Messmer)**

    - For the full report see Appendix.
    - Highlights of the report included news on several workshops and symposiums, including the Wildlife Damage Symposium, and ongoing work on feral equids. The Berryman Institute is also publishing the second edition of Managing Cougars in North America for WAFWA, which should be available in late 2021.

- **Development of an AFWA document on "humane dispatch of wildlife by agency personnel" (Colin Gillin, Tom DeLiberto)**

    - Colin Gillin and Tom DeLiberto provided an update on the efforts to draft a document on Humane Dispatch for wildlife management and conservation industries. This is an effort supported by the AFWA Fish and Wildlife Health Committee as well as HWCWG. When complete, this manuscript is likely to be more prescriptive than most HWCWG documents. Approval for publication will require higher level approval for AFWA endorsement.

- **Update on USGS National Climate Adaptation Science Center: Impacts of Climate Change to Wildlife Conflicts (Kate Malpeli)**

    - Kate Malpeli with USGS had presented to HWCWG earlier, and this was a follow up presentation. She outlined concerns about the influence that climate change might have on wildlife conflict. Kate was seeking input on products that might be produced by USGS, including facts sheets describing challenges and options for individual species. Kate was not requesting HWCWG to undertake any development but offered the working group the opportunity to weigh in on specific species and products and sought potential reviewers for her work.

- **Other topics of interest**
    - See other reports that were provided in the Appendix

- **Roundtable: State/Federal/Tribal/Provincial/Regional Associations/AFWA Members**
  One representative per agency highlights a couple of human wildlife conflict issues

- **Wrap-up Discussion and Assignments for Next Meeting (B. Wakeling/D. Brimeyer)**

    - Among other topics at the next meeting, the HWCWG intends to address
        a. approval of the urban coyote manuscript
        b. survey about funding and related challenges for conducting wildlife conflict work nationally and international.
        d. climate change and wildlife conflict briefs in partnership with USGS
        c. update on grizzly bear population growth and distribution

Appendix:

- **Report from USDA-APHIS-Wildlife Services**
- **Report from Berryman Institute**
- **Report from USGS**
- **Report from Wyoming**

Report to AFWA Human Wildlife Conflict Working Group

AGENCY: USDA-APHIS-WS **DATE: September 2021**

WILDLIFE SERVICES (WS) LEADERSHIP CHANGES

- Headquarters
  Associate Deputy Administrator- Dr. Donna Lalli selected (started January 2021) following the retirement of Martin Mendoza
- Western Region
  - Western Region Office- Wendy Anderson selected as Assistant Regional Director (December 2020) to replace Mike Yeary
  - Western Region Office- John Steuber selected as Assistant Regional Director (July 2020) to replace Keith Wehner (hired as Western Regional Director)
  - Idaho- Jared Hedelius selected as State Director (March 2021) following the retirement of Todd Grimm
  - New Mexico- Jon Grant selected as State Director (July 2021) following the departure of Robert Gosnell
  - Oregon- Jeff Flores selected as State Director (July 2021) following the retirement of Dave Williams
  - Montana- Dalin Tidwell selected as State Director (August 2021) to replace John Steuber (hired as WS Western Region Assistant Regional Director)
  - Guam- Aaron Collins selected as State Director (August 2021) to replace Jeff Flores (hired as WS Oregon State Director)
- National Programs
  - Aviation Training and Operations Center (ATOC)- Thomas McLeary selected as National Coordinator (February 2021)
  - National Wildlife Disease Program- Dr. Julianna Lenoch selected as National Coordinator (May 2021)
  - National Feral Swine Damage Management Program- Michael Marlow (Assistant Program Manager) is acting Program Manager in September 2021, following the retirement of Dr. Dale Nolte

CONFLICT INCIDENT REPORT
One Health - Wildlife Disease Surveillance

MOST SIGNIFICANT ISSUES
APHIS WS works in a One Health capacity to integrate expertise from specialists in human health, agricultural animal health, wildlife, and environmental studies. Our shared vision and scientific understanding strengthen the knowledge, skills, and ability to detect, respond, and mitigate disease events and emergencies. In March 2021, President Biden signed the American Rescue Plan Act of 2021. Through that Act, USDA Secretary Vilsack designated APHIS as the lead agency to significantly increase and enhance the animal health community's capability to prevent, detect, investigate, and respond to emerging and zoonotic diseases, including SARS CoV-2, in susceptible animal species. This $300 million initiative represents a monumental shift

to ensure our Nation's—and APHIS'—ability to help prevent or limit the next global pandemic. This multi-year effort will focus on expanding SARS-CoV-2 surveillance to a wide range of animal species, increasing diagnostic testing capability and capacity, and investigating new animal detections and exposures and to build an early warning system that will help protect both people and animals from future disease threats. APHIS has developed a Strategic Framework that details how APHIS will lead the effort to significantly enhance the animal health community's capability to prevent, detect, investigate, and respond to emerging and zoonotic diseases in susceptible animals. The Strategic Framework provides additional details and is available on the APHIS website. APHIS will also be hosting a series of webinars (August 31-September 15) to give interested stakeholders the opportunity to learn more about the framework and ask questions before submitting written comments. The 45-day public comment period closes on October 8, 2021. Interested stakeholders can submit written comments via Regulations.gov. APHIS will review all written comments, incorporate feedback as appropriate and share the final framework, which will serve as our roadmap for implementation.

Specifically, APHIS WS National Programs are working on several diseases with known or potential spillover effects.

- **Human Health and Safety - SARS-CoV-2 Surveillance in White-tailed Deer**
  - The SARS-CoV-2 virus is of the highest concerning viral pathogens currently circulating in the United States and the potential for spillover to wildlife is worrisome both because of the public health impact and the possible establishment of a wildlife reservoir of the virus.
  - Studying the susceptibility of certain mammals, such as deer, to the SARS-CoV-2 virus helps to identify species that may serve as reservoirs or hosts for the virus, understand the origin of the virus, and predict its impacts on wildlife and the risks of cross-species transmission.
  - WS' National Wildlife Disease Program (NWDP) and National Wildlife Research Center (NWRC) conducted an exploratory survey to determine if free-ranging white-tailed deer had been exposed to SARS-CoV-2, and if additional, in-depth studies were warranted. WS collaborated with the APHIS National Veterinary Services Laboratory on this survey.
  - WS analyzed serum samples for antibodies to the virus to determine exposure of deer to SARS-CoV-2 (not identify animals with active infections). WS opportunistically collected samples in four states (IL, MI, NY, PA) in conjunction with ongoing wildlife damage management activities.
    - One serum set included samples collected from across the range of white-tailed deer in the United States during 2011 to 2019, before SARS-CoV-2 was detected in the country.
    - A second set included samples collected from January 2020 to March 2021 in IL, MI, NY, and PA, after SARS-CoV-2 was detected in the United States.
    - There were no detections of SARS-CoV-2 antibodies in the archive samples collected before January 2020. WS detected antibodies to SARS-CoV-2 in 33% of the 481 samples collected from January 2020 through March 2021, WS only observed 3 weakly positive samples in 2020; most of the positive samples were detected in 2021.
    - Examining only the 385 samples collected from January 2021 through March 2021,

WS detected antibodies in 40% of those samples. Note: The survey was not a systematic or random surveillance of deer, so this percentage may not represent the percentage of total deer exposed within a particular state and/or the country.

- The results of this initial survey indicate that certain white-tailed deer populations in IL, MI, NY, and PA were exposed to SARS-CoV-2. None of the deer populations surveyed showed signs of clinical illness associated with SARS-CoV-2 infection.
- The finding that wild white-tailed deer have been exposed to SARS-CoV-2 is not unexpected given that white-tailed deer are susceptible to the virus, are abundant in the United States, and often come into close contact with people.
- Further research is necessary to determine the significance of SARS-CoV-2 antibodies in free-ranging white-tailed deer, including how the deer were exposed to the virus and potential impacts, if any, to overall deer populations, other wildlife, and people.
- WS will continue to work closely with federal and state partners, including the Department of the Interior, Centers for Disease Control and Prevention (CDC), and the Association of Fish and Wildlife Agencies, to determine next steps.

- **SARS-CoV-2 Research**

  The NWRC, in collaboration with Colorado State University, is conducting experimental infection studies in wildlife species to help determine the risk of other potential reservoirs for SARS-CoV-2 virus.
  - To date, experimental infection studies have documented that deer mice, bushy-tailed woodrats, and striped skunks, are susceptible to infection and can shed the virus in respiratory secretions.
  - In contrast, cottontail rabbits, fox squirrels, Wyoming ground squirrels, black-tailed prairie dogs, house mice, and racoons were not susceptible to SARS-CoV-2 infection.

- **Feral Swine - African Swine Fever Surveillance**
  - The recent detection of African Swine Fever (ASF) in the Dominican Republic has initiated an APHIS-level emergency response, as the proximity to Puerto Rico and the Virgin Islands greatly increases the risk of importing the virus into the United States.
  - WS has responded to the detection by enhancing feral swine surveillance in Puerto Rico, the Virgin Islands, and high-risk states.
  - Through a cross-collaboration between agencies, WS is utilizing resources to assist in the efforts to control disease detection and spread at the wildlife-livestock interface.

- **Waterfowl - Avian Influenza Surveillance**
  - Over the past decade, WS has conducted national surveillance of wild waterfowl to monitor for avian influenza viruses. The introduction of highly pathogenic strains of avian influenza (HPAI) in wild birds could spill over to and cause severe disease in domestic poultry and have significant impacts to human health.
  - By monitoring wild birds, WS can detect highly pathogenic strains early, communicate with key stakeholders in the event of a HPAI detection, and provide data that can help assist in the response.
    - From July 2020 to March 2021, WS sampled 7,375 wild waterfowl in the Atlantic flyway, 656 in Alaska, and 368 in Idaho for HPAI, with no HPAI detections.

- Later this year, WS will deploy wildlife disease biologists to Alaska for HPAI surveillance and to assess waterfowl flock health before the southern migration.
- In total, NWDP expects to collect more than 15,000 samples in the upcoming year.

- **Red and Arctic Fox - Rabies and Canine Distemper Surveillance**
  - In March 2021, the Alaska Department of Fish and Game (ADFG) requested assistance from WS-Alaska with managing fox populations in and around Nome and the village of Savoonga after red foxes (in Nome) and an arctic fox (in Savoonga) tested positive for rabies.
  - The Savoonga fox management also focused on canine distemper in foxes in the instance distemper could transfer into the seal population, posing cultural and sustainability concerns.
  - WS biologists collected, sampled, and tested 87 fox for rabies (47 arctic fox and 40 red fox). ADFG is conducting all canine distemper testing.
    Preliminary results from rabies testing included:
    - Arctic fox: 2 indeterminate results, 45 negative
    - Red fox: 8 positive, 32 negative

CONFLICT INCIDENT REPORT

Cervid Health – Chronic Wasting Disease

Chronic Wasting Disease (CWD) affects cervid species and there is known spillover between captive and wild cervids. WS works with state partners to conduct surveillance on wild deer to detect areas with high disease presence and spillover risk to captive populations. Understanding disease prevalence can reduce the risk of transmission to captive herds.

SIGNIFICANT REGULATORY OR POLICY CHANGES OR ISSUES?

- In FY 2021, APHIS conducted a virtual stakeholder meeting to hear updates on FY 2020 Cooperative Agreements (CA) addressing gaps in CWD control, and to assist in the process of the FY 2021 CAs.
- APHIS will competitively award up to $5.6 million in CAs or grants to state wildlife and agriculture departments and Tribal governments to control or prevent the spread of CWD.
  - APHIS (WS) received 36 applications from 26 states and one tribal organization for the Wild Cervid Funding Opportunity. APHIS recommended 21 proposals for funding, totaling $2.5 million. APHIS notified all applicants of their funding status (fully funded, partially funded, or not funded). State Wildlife and Natural Resource agency wild cervid funding opportunity FY21 recipients include:
    - Arkansas Game and Fish Commission, The Florida Fish and Wildlife Conservation Commission, Tennessee Wildlife Resources Agency, Wisconsin Department of Natural Resources, Iowa Department of Natural Resources, Northwest Indian Fisheries Commission with support of twenty member tribes, Michigan Department of Natural Resources, Arizona Game and Fish Department, Nevada Department of Wildlife, West Virginia Department of Wildlife Resources, Minnesota Department of Natural Resources, Pennsylvania Game Commission, Indiana Department of Natural Resources-Division of Fish & Wildlife, Mississippi Department of Wildlife Fisheries and Parks, Kansas Department of Wildlife Parks and Tourism, New Mexico Department of Fish and Game, Georgia Department of Natural Resources-Wildlife

Resources Division, South Dakota Department of Game Fish and Parks, Nebraska Game and Parks Commission, California Department of Fish and Wildlife, and Virginia Department of Wildlife Resources.

- APHIS (WS) received 9 applications from 10 states for funding made available exclusively to Tribal governments. APHIS recommended 7 proposals for funding, totaling $300K. APHIS notified all applicants of their funding status (fully funded, partially funded, or not funded). Tribal funding opportunity FY21 recipients include:
  - Port Gamble S'Klallam Tribe (WA), Bay Mills Indian Community (MI), Leech Lake Band of Ojibwe – Division of Resource Management (MN), Navajo Nation Department of Fish and Wildlife (UT, AZ, NM), Oneida Nation – Oneida Conservation Department (WI), Fort Belknap Indian Community (MT), and Seneca Nation Conservation – Fish and Wildlife Department (NY).
- APHIS (Veterinary Services or VS) is currently working with applicants to fund and finalize agreements for the Farmed Cervid Opportunity.

- **CWD Research**

  In FY 2021, the NWRC received approximately $1.5M for CWD research.
  - The initial focus of the funding will be to purchase equipment and consumables for research purposes, convert and modify existing laboratory space to develop a prion lab, and establish cooperative agreements with university collaborators.
  - NWRC will be collaborating with various universities (Mississippi State, Colorado State, and Penn State) on research projects to evaluate the potential role of scavengers and other vectors in CWD epidemiology.
  - NWRC will primarily focus its in-house research on disease transmission and pathogenesis, and improved diagnostics.

- **CWD Surveillance**
  - WS conducts CWD surveillance in 17 eastern states and Alaska.
  - WS has Cooperative Service Agreements to remove wild deer in infected areas to help control the spread of the disease and provide CWD data to state wildlife agencies in five states (IL, MI, MN, PA, and TN).
  - WS assists APHIS Veterinary Services (VS) or state programs in collecting CWD samples from captive cervid facilities in five states (UT, FL, MN, PA, and WI).

CONFLICT INCIDENT REPORT
Human Health and Safety-Wildlife Attack Response

MOST SIGNIFICANT ISSUES
By request, WS is available to respond to wildlife attacks on humans. For FY21, to date, WS responded to 20 state agency requests related to attacks involving 8 species in 9 states (Table 1). Responses may include aiding in tracking, capturing, removing, consultation, and/or genetically testing suspected animals.

Table 1. Number of wildlife attacks on humans in FY21 that WS responded to by state and species.

	Coyote	Black Bear	Grizzly Bear	Mute Swan	River Otter	Red / Arctic Fox	Unknown
AK	-	-	-	-	-	1**	-
CA	9	1	-	-	-	-	-
CO	-	1*	-	-	-	-	-
FL	1	-	-	-	-	-	-
MT	-	-	1*	-	-	-	-
NJ	-	-	-	3	-	-	-
NV	1	-	-	-	-	-	-
TX	-	-	-	-	-	-	1*
WI	-	-	-	-	1	-	-
Total	11	2	1	3	1	1	1

**denotes human fatality*

***denotes that attacks occurred to domestic animals (i.e., dogs), but posed a human health and safety risk (i.e., rabies) to humans.*

CONFLICT INCIDENT REPORT
Animal and Human Health - National Rabies Management Program (NRMP)

MOST SIGNIFICANT ISSUES

The National Rabies Management Program (NRMP) was established in recognition of the changing scope of rabies. The goal of the program is to prevent the further spread of wildlife rabies and eventually eliminate terrestrial rabies in the United States through an integrated program that involves the use of oral rabies vaccination targeting wild animals.

NRMP Update

- **Aerial Rabies Bait Drop**
  - During August the NRMP continued to prevent the spread of raccoon rabies by safely and effectively distributing >4.7 million oral rabies vaccine (ORV) baits across 8 eastern states (ME, NH, VT, NY, MA, PA, OH, WV).
  - Challenges associated with implementing a multi-state operational program with >80 WS and contracted aviation personnel continued due to COVID-19 restrictions.

- **Cape Cod Contingency Response**
  - ORV baiting successfully eliminated raccoon rabies from Cape Cod, MA years ago, but in June 2021 the NRMP confirmed the first case of raccoon rabies on the peninsula in 8 years; likely a relocated rabid raccoon from the mainland.
  - A contingency response that included 17 WS and 3 CDC employees conducting trap-vaccinate-release (TVR) efforts near the index case. Response crews trapped, hand vaccinated, ear-tagged, and released more than 700 target animals (raccoons, skunks, foxes, and coyotes) without use of immobilization substances. The effort boosted the population immune response to >60% to stop the spread of rabies from the index case.
  - In July, 70,000 ORV baits were distributed by helicopter and hand near the case and over the TVR area to further boost wildlife vaccination levels.

- WS will continue enhanced rabies surveillance and testing of road-killed and strange-acting animals Cape-wide. No new cases have been detected since the July distribution of ORV baits.

- **Vampire Bat Monitoring Program**
  - The NRMP continue the vampire bat rabies monitoring program (via bat bite surveillance on livestock) in Arizona, New Mexico, Texas, and Florida.
  - In FY21, the NRMP conducted 188 surveys at livestock sales barns, dairy farms, feedlots, and ranches.
  - Through mid-August 2021, WS has examined nearly 85,000 livestock with no evidence of vampire bat bite wounds observed. WS will continue surveys examining livestock through the remainder of the fiscal year.

CONFLICT INCIDENT REPORT
Livestock and Property Protection - Black Vultures

MOST SIGNIFICANT ISSUES

New world vultures (turkey and black vultures) are expanding both spatially and numerically, causing an increase in reports of damage and depredation permits issued. For black vultures (BLVU), this conflict is increasing in a disproportionate manner, with damage to agriculture (livestock) and property (both personal and infrastructure based) occurring at a higher rate than human health and safety (airport hazards, disease concerns).

SIGNIFICANT REGULATORY OR POLICY CHANGES OR ISSUES?

- With multiple years of success from the KY/TN black vulture sub-permit pilot program, the statewide depredation permits have recently expanded to additional states. Currently Missouri, Oklahoma, Arkansas, Mississippi, Indiana, and Texas all have joined the pilot program this year, with additional states anticipated to join in the future.
- This expanded program provides a legally defensible, efficient, and biologically effective method to manage livestock / black vulture conflicts in a timely manner, while reducing regulatory burden on both livestock producers and USFWS permit staff.

RESEARCH

WS programs from 18 states are collaborating with the NWRC Florida Field Station on a pilot program to assess gaps in understanding BLVU life history and ecology, ways to improve upon existing take models, as well as test current and develop new management methods.

- States participating in the program began contributing to a new wildlife biologist position at the Florida Field Station to oversee the project, effective since September 2020 and will span five years.
- These states also participated in a survey that prioritized seven research areas, however, research will occur as resources allow. Prioritized research areas as follows (highest to lowest priority):
  1. Conducting field evaluations to determine efficiency of emerging vulture management tools.
  2. Improving demographic estimators for BLVU for modifying allowable take models.

3. Developing movement models for vultures and vulture response to field management actions.
4. Leveraging WS Operations activities to determine optimized methodology for roost dispersal.
5. Evaluating use of patagial tags and mark-resight data for estimating abundance and comparing mark-resight abundance estimates with those used to develop current allowable take models.
6. Evaluating damage and assessing risk of BLVU damage using existing data and social science-based surveys: private property and utility focused.
7. Replicating the Southern Indiana livestock vulture study to include a state within the historical range of BLVU.

- WS is researching the home ranges of BLVU to determine which factors (e.g., cattle density, road density) influence home range size. Results of this study will allow for more specific space use questions to be addressed and to better plan for future mark-resight studies aimed at local population estimates.
- WS Indiana, WS Kentucky, NWRC, and Purdue University are collaborating in Indiana to develop a BLVU research project on livestock depredation.
    - The research will focus on depredation site habitat and use livestock producer surveys and neonatal calf mortality diagnostic testing.
    - In December 2019, WS Indiana attended a meeting with livestock producers to communicate the logistics of the project, as well as convey how producers can participate in the research incentive(s) (i.e., information regarding coordination with the student for calf/cow pick-up following predation events, etc.).
    - This fall, WS will capture and release BLVUs with affixed transmitters in both southern Indiana and Northern Kentucky.

CONFLICT INCIDENT REPORT
Nonlethal Initiative for Livestock Protection from Large Carnivore Predators

MOST SIGNIFICANT ISSUES
WS assists producers with predator damage to livestock via direct control and technical assistance. Beginning in FY20, WS received congressionally allocated funds specifically to implement nonlethal methods of protecting livestock from large carnivore depredation.

SIGNIFICANT REGULATORY OR POLICY CHANGES OR ISSUES?
WS received the same amount of funding in FY20 and FY21: $1.38M, specifically for the implementation and research of nonlethal methods of protecting livestock from large carnivore predators.

- FY20 funds were distributed to 12 WS state programs (AZ, CA, CO, ID, MI, MN, MT, NM, OR, WA, WI, WY) and NWRC. FY20's initial activities upon receiving funds were to hire individuals and secure vehicles and other necessary equipment for operational mission delivery. WS programs were able to fill 18 positions (full-time, part-time, and seasonal), complete more than 180 projects for more than 225 cooperators.
- In FY21, WS expanded funding to a 13th state: Nevada. Nevada received a small allocation to purchase materials for fladry that they expect to use in early FY22, when the state observes seasonal conflict associated with transient wolves in northern portions of the state.

- Although the FY21 is not complete, to date, WS programs funded 23 positions (full-time, part-time, and seasonal) and has started or completed 559 projects for 286 cooperators.
- Most projects are fladry, electric fencing, or range riding projects. Some states have constructed large permanent predator fences or completed outreach events educating attendees on nonlethal tools and management practices which protect livestock from large carnivore depredation.

RESEARCH

- In FY20, NWRC analyzed data from research conducted alongside the operational work to determine the efficacy of various nonlethal methods. Results will inform management decisions and best application tools. NWRC also evaluated producers' attitudes towards using the methods and tools.
- Evaluation of the nonlethal methods suggested that nonlethal methods employed by WS in FY20 reduced depredations on livestock, especially range riding and fencing.
    - A high number of projects reported predator presence, yet there was low incidence of reported livestock depredations. This conclusion is further supported by the higher rate of self-reported depredations two years prior to the nonlethal initiative.
    - WS aims to increase historical data provided by livestock producers and evaluation of employed methods in FY21 and future years.
    - The nonlethal projects WS conducted in FY20 protected nearly 750,000 acres of land and more than 50,000 domestic animals.
- WS collected survey results from 40 producers WS provided nonlethal livestock protection services to in FY20. Noteworthy conclusions from the responses were that respondents found all but one of the methods used to be effective or somewhat effective at protecting livestock.
    - The greatest percentage of respondents found range riding to be effective or somewhat effective (90.9% of respondents), followed by electric fencing (72.7%), guardian animals (71.4%), nonelectric permanent fencing (66.7%), and fladry (57.1%).
    - 44.4% of respondents found "other audio/visual deterrents" ineffective or somewhat ineffective. 56.4% of respondents report that after receiving nonlethal assistance from WS, their level of interest in nonlethal methods increased.
    - When given the choice between lethal or nonlethal methods, 46.2% of respondents preferred lethal, 33.3% preferred nonlethal, and 20.5% reported no preference.
- NWRC is continuing both research projects in FY21.

Berryman Institute Update – September 9, 2021

Presented to AFWA Human-Wildlife Conflict Working Group

The Berryman Institute (BI, berrymaninstitute.org) is an international organization based in the Department of Wildland Resources, Quinney College of Natural Resources, at Utah State University. It is named after Jack H. Berryman to honor his distinguished career in wildlife management. The BI is dedicated to improving human-wildlife relationships and resolving human-wildlife conflicts through teaching, research, outreach, and extension. The BI mission remains to promote a dialogue among wildlife professionals and their stakeholders concerning contemporary human–wildlife management issues. This year marks the 27th year of the BI's existence.

Berryman Staff and Students

Faculty

Dr. Terry Messmer, Professor, Director of the Berryman Institute (terry.messmer@usu.edu)
Dr. David Dahlgren, Assistant Professor
Dr. Shandra Frey (Nicki), Extension Associate Professor
Dr. Jessica Tegt, Engagement and Outreach Coordinator

Staff

Lorien Belton, Program Coordinator
Rae Ann Hart, Staff Assistant
Rosanna Vail, Managing Editor, Human-Wildlife Interactions

Postdoctoral Fellows

Dr. Simona Picardi, Postdoctoral Fellow
Dr. Justin Small, Postdoctoral Fellow

Research

In addition to the independent research being conducted by BI faculty, students and staff (idenitifed above) the BI is celebrating our 15th year of publishing *Human–Wildlife Interactions* (HWI). HWI is the only scientific journal dedicated specifically to publishing manuscripts that report research, management case studies, and policy perspectives designed to enhance the professional management of human–wildlife conflicts. HWI is a self-funded journal supported by page charges and advertising. In 2018, in response to input provided by our stakeholders, HWI became an open-access journal that is published 3 times per year. Article submissions increased dramatically since going open-access. HWI's total article downloads in 2021 exceeds 86,000. We have now published 649 papers on all aspects of managing human-wildlife conflicts. Our current impact factor is 0.90

We attribute increases in submissions, published articles, impact factor, and downloads to the journal's indexing in the Directory of Open Access Journals in 2020 and our emphasis on special topic issues. We have three special topics issues slated for the next year on ravens, free-roaming equids, and island invaders.

Monographs and Books

The BI through HWI publishes books, monographs, and reports on all aspects of human-wildlife interactions. The Human-Wildlife Interactions Monograph Series can be found on Digital Commons along with information on how submit a monograph for consideration and to order copies of previous monographs. We have published three monographs and have one in review (Toolkit to Address Free-ranging Domestic Cats (*Felis catus*) on Agency Lands Managed for Native Wildlife and Ecosystem Health), and one in preparation (coyote management).The BI is working with Western Association of Fish and Wildlife Agencies to publish the second edition of the book "Managing Cougars in North America." This book is slated for publication in late 2021.

Education and Outreach

The BI continues to excel at organizing, hosting, coordinating, and sponsoring international, national, state, and local conferences, meetings, local working groups, and workshops.

Community-Based Conservation Program (CBCP)

We facilitate 10 adaptive resources management local working groups around the state of Utah. The groups serve as a place to centralize and coordinate local efforts and information on sage-grouse and wildlife conservation. We work with local stakeholders to collectively design and implement research projects to address locally pertinent natural resource questions related to sage-grouse and other wildlife. The LWGs have engaged over 50 different agencies, private entities, and other groups represented in the conversations. In the past year, the groups have discussed water management, fire management, feral horse issues, local infrastructure needs, changes in federal and state policy, and many other topics. A quarterly newsletter is distributed to over 1,500 participants.

Free Roaming Equids and Ecosystem Sustainability Network (FREES)

The Free-roaming Equid and Ecosystem Sustainability Network (FREES) to enhance communication and engage diverse stakeholder groups in meaningful dialogue to work together to address the problem of overabundant equids on rangelands. As of March 1, 2021, the BLM estimated that there were 86,189 free-roaming equids in BLM-administered herd management areas. This is more than three times the ecological balance. The goal is to promote *Healthy Herds on Healthy Rangelands*. We hosted FREES national Summits in 2017 in Salt Lake City, UT; 2019 in Reno, NV; and 2020 in Cody, WY. The Summit included delegates form over 90 organizations and agencies. Participation in FREES is open to all individuals and organizations, regardless of perspectives. FREES conducts its work through a working group process. FREES now has 4 members on our steering committee who are also members of the BLM Wild Horse and Burro Advisory Board. In August 2021 the Journal of Wildlife Management released a special issue highlighting new science regarding the management of free-roaming equids. The Associate Editors for the issue were Terry Messmer, Kate Schoenecker (USGS) and Sarah King (Colorado State University). In 2020, the AFWA Executive Committee considered and approved the formation of an AFWA Free-roaming Equid Task Force under the Federal and Tribal Lands

Relations Committee. Dr. Nicki Frey completed rigorous survey of 5000 U.S. residents to assess their knowledge and perceptions about free-roaming equids and their management. Most of her respondents valued free-roaming equid but knew little about the realities of the issue. Dr. Frey has created an educational website detailing the results of the survey alongside associated information.

Berryman Student Club

In 2019 and 2020, the Berryman Student Club resumed a presence within WILD, meeting monthly with guest speakers and participating in events with UDWR, USDA Wildlife Services, Utah TWS, and the Hunters and Anglers Club. Activities unfortunately had to be put on hiatus during the 2020 Academic Year, but will resume during the Fall of 2021.

Bird Damage Management Conference

The BI joined forces with USDA Wildlife Services, US Fish and Wildlife Services, and North Dakota State University to host the 2020 Bird Damage Management Conference. The first since 2006, this conference was attended by over 125 wildlife professionals across the country and focused on mitigation of damage by blackbirds, vultures, and corvids. Another conference is being planned in partnership with the National Wildlife Research Center for winter of 2023. The conference produced manuscripts for a *Human-Wildlife Interactions* Special Issue that was published in Spring 2021.

International Wild Pig Conference

The BI oversees the daily administration of the National Wild Pig Task Force (www.nwptf.org) and was able to pivot the 2020 in-person conference to be held in Jacksonville, FL, to a fully virtual platform complete with Plenary speakers, workshops, and a full docket of technical sessions. Over 3,000 participants from across 23 countries participated in this virtual event. The 2022 Wild Pig Conference is being held in Nashville, TN, April 25-29th with an option for live streaming. The Conference also produced manuscripts for a *Human-Wildlife Interactions* Special Issue that will be published fall of 2021 (https://digitalcommons.usu.edu/hwi/).

Conservation and Education Outreach Working Group Conference

The BI coordinated and hosted the 2020 CEO TWS Working Group Conference as a fully virtual event August 12-15th. This online conference featured speakers from across the country, a webinar workshop, and virtual field trips to sites that participate in education for urban residents. The next conference for CEO will be held online in the summer of 2022.

19th Wildlife Damage Management Conference

The BI coordinated the with TWS Wildlife Damage Management Working Group to host the19th Wildlife Damage Management Conference, held in April 2021. This virtual event garnered the largest audience in the conference's history and featured 4 days of live Plenary, Poster, and concurrent Technical sessions. There was also an online portal for interacting with sponsors, as well as virtual field trips and a Happy Hour Social. The WDM Working Group

Board selected USU as the first-ever western site for the 20th WDM Conference being held in-person, April 2023. The BI is also coordinating the Proceedings from the 2021 Conference.

Non-Lethal Predator Control Workshop

In May of 2021, the BI coordinated with USDA Wildlife Services Utah Program, Utah Division of Wildlife Resources, and USU Extension to provide a public webinar focused on non-lethal methods for predator control. This online event combined topics on research elements, human dimensions, modified husbandry approaches, and available resources to over 200 people from across the world! Additional webinars on bird damage management, beaver mitigation, and predator control are in development.

Social Media

Berryman Institute Facebook- https://www.facebook.com/USUBerrymanInstitute

BI Twitter- https://twitter.com/home?lang=en

YouTube Channels- https://www.youtube.com/channel/UCeMVIFLYRL-uPMYaej9hbVA

https://www.youtube.com/channel/UCpzNKfCPdg5om8PFmRRNUUA

Podcasts- 

A podcast series on human-wildlife interactions topics will launch on the Berryman website August, 2021.

Community Engagement

The BI is part of Wild Aware Utah consortium. In conjunction with The Hogle Zoo and Utah Division of Wildlife Resources, the BI participates in monthly media blitzes on timely wildlife topics, helps maintain website presence for WAU, and contributes articles, fact sheets, and information to the public to promote awareness for co-existence with wildlife across the state of Utah. Each year the BI is the centerpiece of WAU Day at The Hogle Zoo in which zoo visitors can learn about safely co-existing with wildlife around their homes and in nature. https://www.wildawareutah.org/

As part of our involvement, we provide a monthly commentary for broadcast in the Utah Public Radio Green Thumb series on how to live with wildlife. https://www.upr.org/programs/green-thumb#stream/0

Title: Human-Wildlife Conflict in a Changing Climate
Presenter: Kate Malpeli, USGS National Climate Adaptation Science Center

Goal: The goal of this presentation is to receive feedback on a proposed plan for moving forward with synthesizing information on how climate variability and change affect human-wildlife conflicts. The following two products are proposed:

1) A peer-reviewed synthesis publication on the effects of climate variability and change on human-bear conflicts in North America. This would be a formal synthesis publication, targeting an outlet such as *The Journal of Wildlife Management*, summarizing the existing literature on how climate affects black and brown bear life histories, population dynamics, habitat, food sources, etc. and what that means for the future of human-bear conflicts. The rational for focusing this synthesis on bears is the fact that, between the two species, bears are fairly ubiquitous across the country and are increasingly implicated in conflicts, and as such the results should be broadly relevant. This product would take 1+ year to complete.
2) A series of species-specific fact sheets, with each fact sheet summarizing the available information on the effects of climate variability and change on human-wildlife conflict for a specific species. Each fact sheet would explore how climate directly affects the species (e.g. life histories and population dynamics) and indirectly affects the species (e.g. via changes in habitat and natural food sources); how the species might respond to changes in climate (e.g. distribution shifts, behavioral shifts); and what this could mean for the future of conflict (e.g. frequency of interactions with humans). These fact sheets will incorporate climate projection data for variables that are most relevant to the species and will discuss management implications. These products could be produced on a faster timeline (e.g. ~3 months each) than a formal synthesis publication.

Specific questions for the working group include:

1) Do these products sound valuable?
2) If so, which species would members like to see fact sheets created for?
3) Could a sub-working group be formed to provide feedback on content and drafts of the fact sheets? For example, sub-group members would provide feedback on a) content and presentation of the information; b) which climate scenarios and time scales would be most valuable; c) management implications section; d) support distribution of the final products.

Report to AFWA Human Wildlife Conflict Working Group

AGENCY: Wyoming Game and Fish Department **DATE:**
STATE/PROVINCE/FEDERAL/TRIBAL:

Submitted by
(name)

Telephone: **E-mail:**

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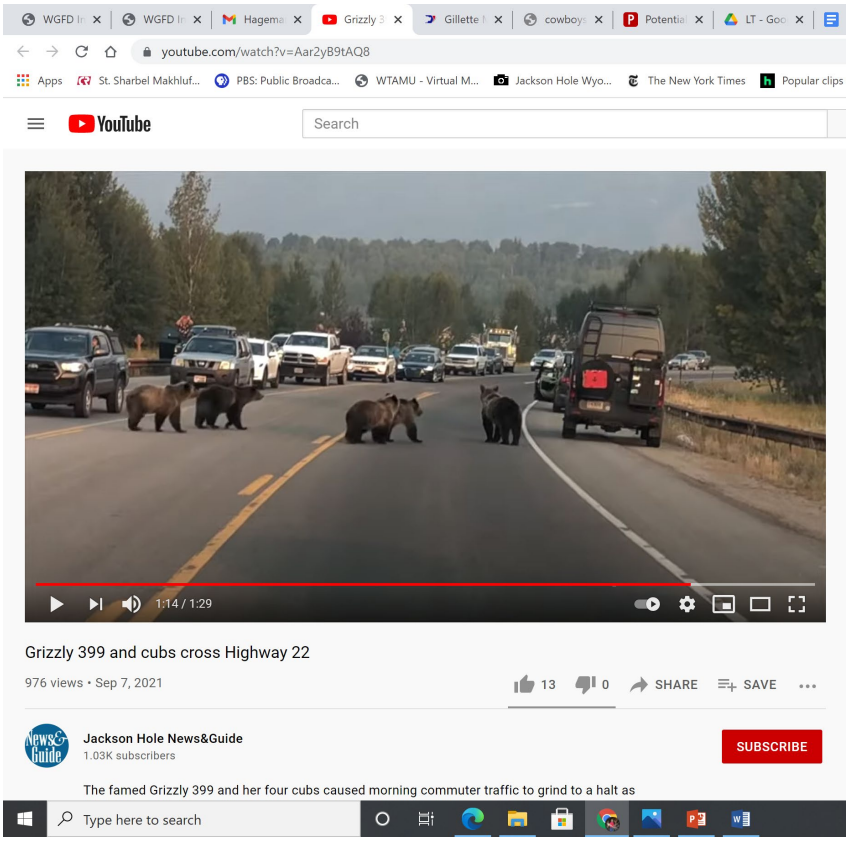
1. **MOST SIGNIFICANT ISSUES**
   a. **On-Going**

Continued expansion of large carnivores, primarily grizzly bears into more residential and agricultural settings and areas that are inherently more prone to conflict. There is increasing use of public and private lands by the public in areas with bears, wolves and mountain lions. Increased human use increases conflict potential and we have continued to reach out to raise awareness and educate the public throughout Wyoming. There is increasing scrutiny on management of large carnivores and it is increasingly polarized especially in the case of wolves. Public tolerance is always a factor on both sides of management issues regarding large carnivores and more pressure from outside entities to sabotage state management of large carnivores. Public sentiment towards carnivores and predators was at times volatile this past year, synergistic effects with Covid and political realities of society. Continued pressure on our damage compensation program.

   b. **Emerging**

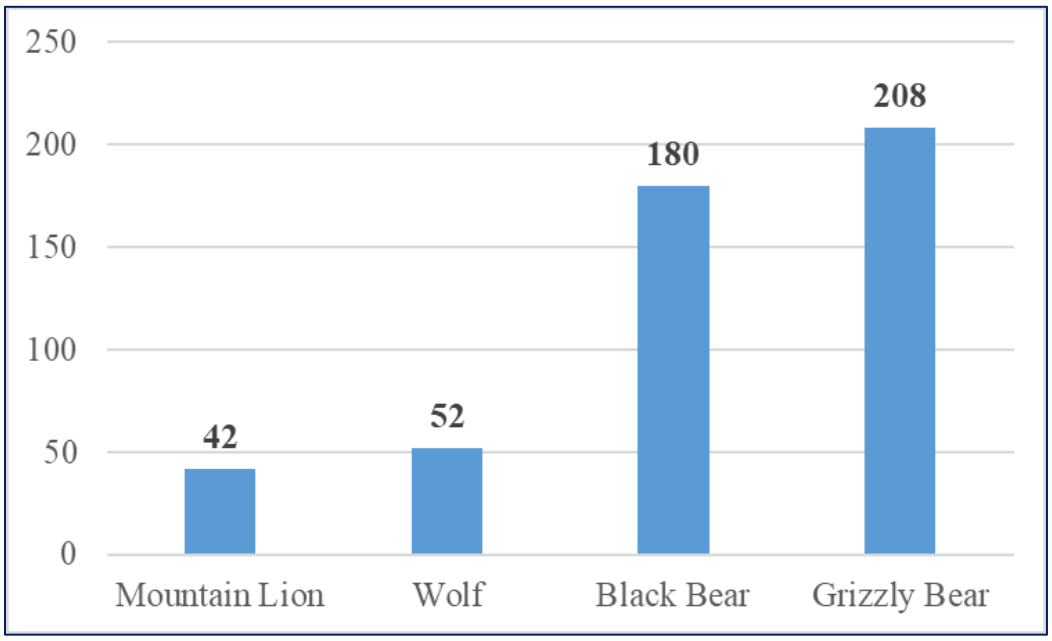
As stated in on-going, increasing human use and increasing abundance/distribution of certain carnivore species is continuous, but is also considered emergent in certain areas of the state. There was immense public interest and scrutiny on a few "celebrity" grizzly bears that garnered a great deal of our personnel's time. There are more issues related to seeking additional damage compensation for depredation and stress from bears, wolves, and mountain lions. Obviously the past year was anomalous from a global standpoint and with increased human use of areas occupied by carnivores it will be interesting to see how things continue in regards to interactions and conflicts between humans and carnivores into future years. Current drought issues have impacted current conflict activities especially with black bears. We have noticed fairly aggressive grizzly bear behaviour on carcasses throughout the course of the summer, likely a factor of high densities of bears and competition for these types of food sources.

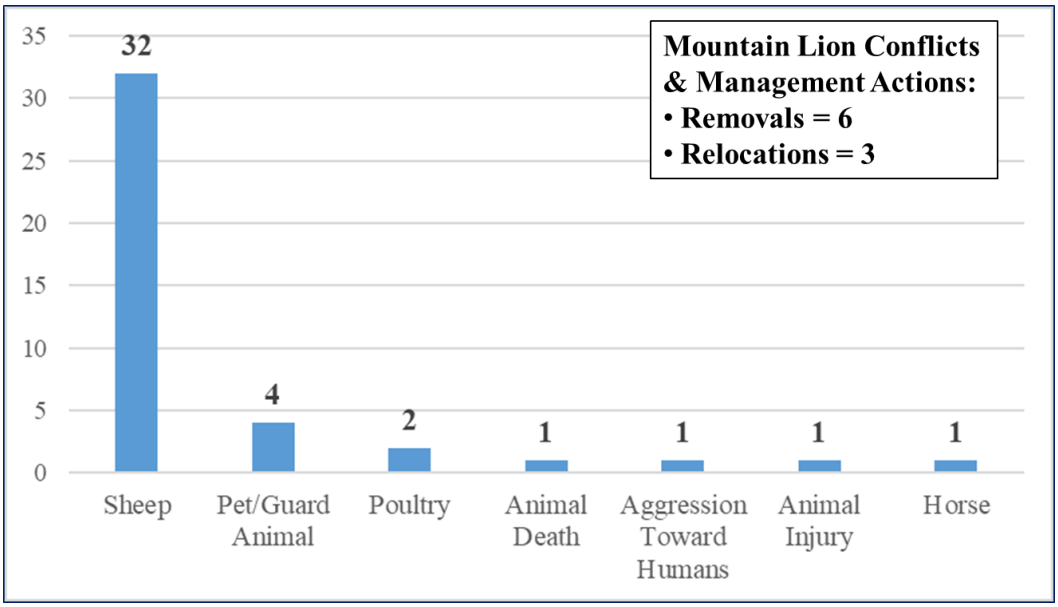
Increasing strategic and divisive tactics from multiple groups against hunting of large carnivores. The use of records requests for public information is being used as a tactic to burden personnel away from standard work duties and the use of litigation is beyond rampant.

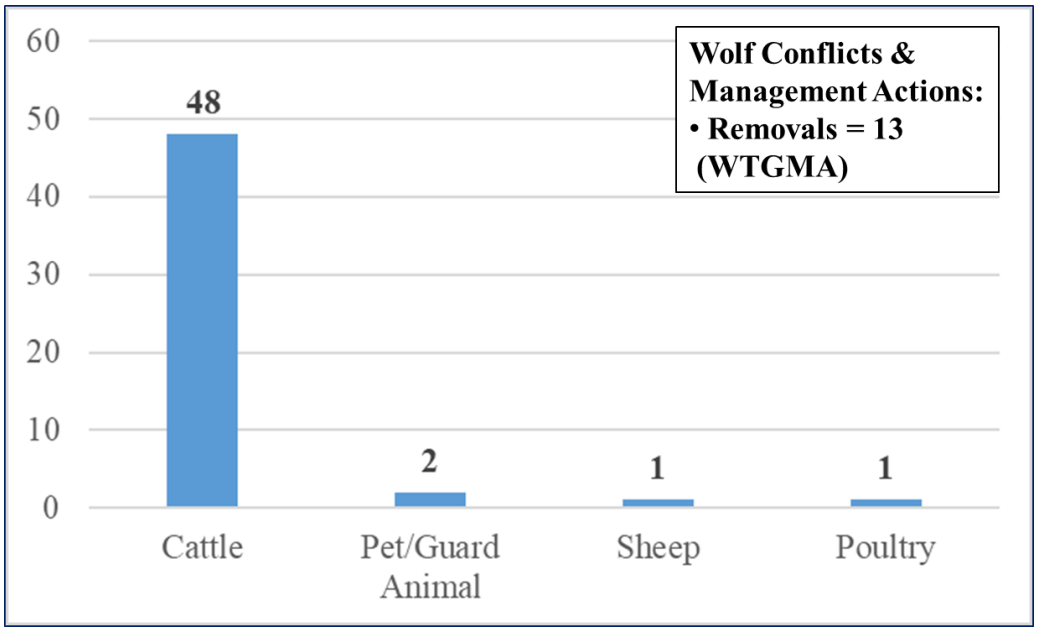


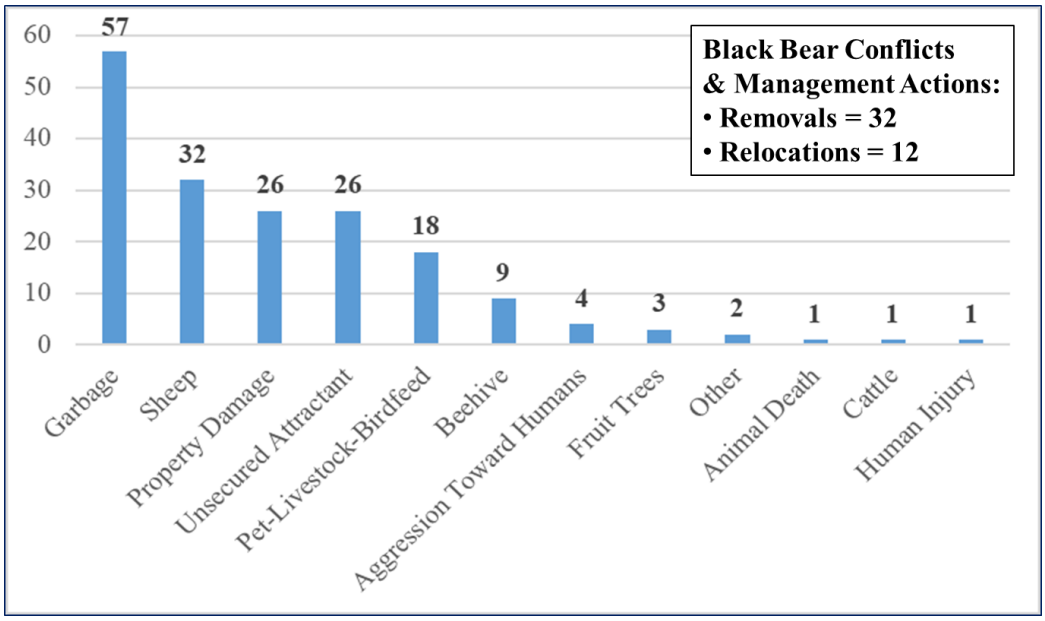
The use of social media and the interest in celebrity wildlife continues to increase in Wyoming. https://www.youtube.com/watch?v=Aar2yB9tAQ8

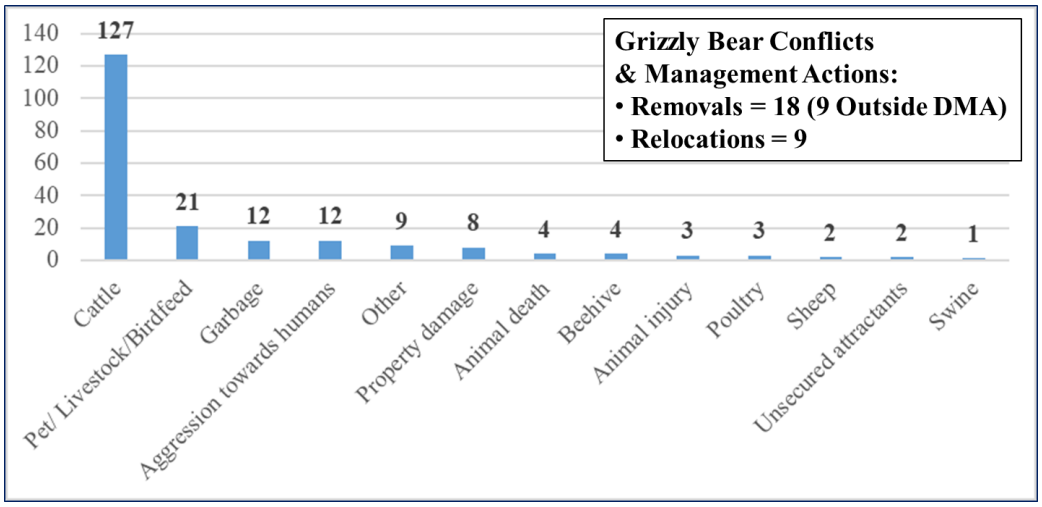
2. CONFLICT INCIDENT REPORT BY SPECIES


250
200
150
100
50
0
42
52
180
208
Mountain Lion
Wolf
Black Bear
Grizzly Bear


35
30
25
20
15
10
5
0
32
4
2
1
1
1
1
Sheep
Pet/Guard Animal
Poultry
Animal Death
Aggression Toward Humans
Animal Injury
Horse
Mountain Lion Conflicts & Management Actions:
• Removals = 6
• Relocations = 3


Wolf Conflicts & Management Actions:
• Removals = 13 (WTGMA)
60
50
40
30
20
10
0
48
2
1
1
Cattle
Pet/Guard Animal
Sheep
Poultry


Black Bear Conflicts & Management Actions:
• Removals = 32
• Relocations = 12
60
50
40
30
20
10
0
57
32
26
26
18
9
4
3
2
1
1
1
Garbage
Sheep
Property Damage
Unsecured Attractant
Pet-Livestock-Birdfeed
Beehive
Aggression Toward Humans
Fruit Trees
Other
Animal Death
Cattle
Human Injury



3. SIGNIFICANT REGULATORY OR POLICY CHANGES OR ISSUES?

There are no significant regulatory of policy changes of note, however, the continued Endangered Species Act protections for grizzly bears as a threatened population in the Greater Yellowstone Ecosystem continue to challenge on the ground management. The grizzly bear population is fully recovered and exceed all recovery criteria, yet due to litigation and court decisions grizzly bears are still classified as threatened. This classification impacts management but also brings into play multiple additional jurisdictional involvement regarding land use practices in areas with grizzly bears (biological opinions on grazing, development etc.)

4. RESEARCH /SPECIAL PROJECTS

We are currently engaged with a research project with University of California/Berkeley evaluating cause specific mortality of bovine calves in an area with an intact large carnivore guild and known depredation by wolves and grizzly bears on domestic cattle. We have engaged with USDA Wildlife Services on multiple permanent fencing structures and nonlethal measures to mitigate conflict between large carnivores and people and continue to evaluate our current data and procedures to increase our efficacy in dealing with conflicts and overall conflict management. We have initiated an in-depth research project with the University of Wyoming to evaluate the interactions between and apex predator (mountain lions) and chronic wasting disease (CWD) of mule deer in an area with high prevalence of the disease. We are evaluating what role predation may play in CWD prevalence and larger population level impact on mule deer populations.

5. OTHER