

1. Measuring Public Attitudes toward Bears

Mark Damian Duda, Responsive Management

Abstract

An important aspect of bear management is being aware of public knowledge of and attitudes toward bears. In general, wildlife management plans built upon not only understanding wildlife but also understanding people are more effective. Human dimensions research is the scientific examination of social attitudes, opinions, behaviors, values, and activities that can be used to better understand how public knowledge and opinion relates to wildlife, wildlife management, and wildlife policy. In this presentation, Mark Damian Duda, executive director of research firm Responsive Management, will provide an overview of human dimensions research methodology, share lessons learned from implementing human dimensions research, and discuss public attitudes toward bears based on the research his firm has conducted over the years.

The overview of human dimensions research methodology will cover both qualitative and quantitative methods. Qualitative methods discussed will include focus groups, public meetings, and online public forums. Quantitative methods discussed will include scientific surveys by telephone, mail, and online. The various methodologies each have advantages and disadvantages to consider when designing a human dimensions study.

Duda will also review the major lessons learned from years of implementing human dimensions research for fish and wildlife agencies. Some of these lessons are cautionary in nature, such as recognizing that the loudest constituents may not reflect the opinions or values of the majority of constituents. Other lessons emphasize beneficial strategies. For example, state fish and wildlife agencies typically hold high credibility with the public and should use it accordingly.

Understanding public knowledge of and attitudes toward bears is an important component of developing a successful bear management plan. Responsive Management's human dimensions research on attitudes toward bears will be discussed, focusing on studies conducted in multiple states that examine such areas as knowledge of bears, opinions on the size and location of bear populations, experiences and conflicts with bears, opinions on bear management strategies, willingness to take precautionary actions to prevent human-bear conflicts, and more.

Notes

2. Wildlife in the Cloud: Using Technology to Enhance Human-wildlife Conflict Management

Sarah Barrett, Florida Fish and Wildlife Conservation Commission

Abstract

The Florida Fish and Wildlife Conservation Commission (FWC) has experienced an increase in the number of human-wildlife conflict calls from the public over the last few decades. Several species programs adopted individual electronic databases to better track the increasing reports. As technology quickly advanced over the last several years and human-wildlife call volume continued to increase, the programs outgrew their existing individual databases. Therefore, in 2015 the FWC adopted a new, multi-species Wildlife Incident Management System (WIMS) that uses an out-of-the-box, cloud-based solution, Salesforce, which was modified to the FWC's requirements using outside vendors. This solution has allowed programs to combine resources to obtain a superior single product that also incorporates many species that were not previously being tracked. This database allows the FWC's Office of Information Technology to focus its resources on a single program versus numerous databases that used different programming. The new system has many features that have streamlined staffs' duties. WIMS maintains caller contact information in one place, allowing staff to see all related interactions with the resident, regardless of why the person called the FWC. Built in mapping allows staff to see emerging trends and visualize events over defined distances or time. Previously manual tasks are now automated, allowing staff to identify appropriate contracted trappers and electronically assign and pay out work orders. Trappers can update results from the field through a 'self-service portal' feature. The system is flexible and can grow as new species programs (or other agency areas like derelict vessels or permitting) are incorporated. WIMS is an efficient and comprehensive approach to collecting, managing, and analyzing human-wildlife conflict information, while providing excellent customer service.

Notes

3. A Qualitative Assessment of the Polar Bear-viewing Experience: A Tool for Identifying Experience Indicators in the Arctic National Wildlife Refuge

Jessica Fefer, Clemson University

Jeffrey Hallo, Clemson University

Robert Dvorak, Central Michigan University

Jennifer Reed, Arctic National Wildlife Refuge

Abstract

The purpose of this research is to help inform visitor-use management decisions in the Arctic National Wildlife Refuge off the shore of Barter Island in Kaktovik, Alaska. Using the Interagency Visitor-Use Management Council (IVUMC) Framework, the Arctic National Wildlife Refuge is working to manage boat-based polar bear viewing activities. The IVUMC framework uses an indicators and thresholds-based approach, which has been applied extensively in public recreation sites (Manning, 2011), but is relatively new for managing human-wildlife interactions. Indicators are observable variables that are measurable and manageable (e.g., people at one time in an area). Thresholds refer to the resource or experiential condition that represents the level where an indicator reaches an unacceptable level (e.g., when the number of people at one time becomes too many). Due to the novelty of the approach in wildlife refuges, and how variable indicators can be based on context, it is crucial that the development of indicators is systematic and scientifically based. This research uses a qualitative approach to understand indicator variables for managing the polar-bear viewing experience on Arctic Refuge waters. Semi-structured interviews were used to solicit responses from visitors who viewed polar bears on the refuge waters. Photo-elicitation was used to compliment the interviews, where visitors were asked to share photographs that represented the most important, unique, and/or negative aspects of their experience. Other questions asked respondents to reflect on anything that might have detracted from their experience. Semi-structured interviews were transcribed, and open-coding was used to highlight emergent themes and unique responses. Photos were also analyzed and thematically organized to highlight potential measurable indicators of the visitor experience. Preliminary results suggest that the distance to bears, the behavioral responses of the bears being viewed, and crowding of boats around polar bears are important to the visitor experience. Visitors also signified that the information provided about bears and the local community impacted their experience. Personal safety was of concern to fewer visitors than expected. Results will be used to inform a second phase of research, which will determine acceptability thresholds for selected indicator variables.

Notes

4. Assessing Survival and Spatial Ecology of American Black Bears Released from the Appalachian Bear Rescue

Coy Blair, University of Tennessee

Joseph D. Clark, U.S. Geological Survey, Southern Appalachian Research Branch, University of Tennessee

Dr. Lisa Muller, University of Tennessee

Abstract

Prior to making any decisions regarding orphaned and/or injured American black bear (*Ursus americanus*) cubs and yearlings, wildlife managers need more information about their options. Current options include not intervening, humane euthanasia, attempting to reunite bears with their biological mothers, fostering bears to wild, adoptive females, transporting bears to a permanent captive facility, or transporting bears to a rehabilitation facility for eventual release back into the wild. The optimal solution would be placing bears back with their biological mothers, but this is usually not feasible. For cubs-of-the-year, fostering would be a great alternative if possible. Euthanasia may be the only option for bears that are severely ill or injured, but there are more alternatives to leaving young, orphaned and ill bears alone by choosing not to intervene. Placing bears in permanent captive facilities or sanctuaries is not ideal for wild bears, but placing them in temporary, rehabilitation facilities with the goal of releasing them back into the wild would be. This type of individually-focused care will not only aid the bear and wildlife manager, but help foster relationships between resource management agencies and the public as well. Well-established bear rehabilitation programs such as the Appalachian Bear Rescue (ABR) offer all of these resources to managers. As with the majority of animals released from other rehabilitation centers, however, little is known about the post-release success of bears released from ABR. Out of 214 bears released to the wild from ABR between 1996 and 2017, post-release information is only known for 12 bears (<6%). During 2015 and 2016, ABR received 56 bears for rehabilitation. Forty-two of these bears were released with Global Positioning System (GPS) wildlife tracking collars during this same time period to Great Smoky Mountains National Park (GSMNP) or Cherokee National Forest (CNF) lands. Collar fix rates were set for every 3 hours and programmed to release on their own after 60 weeks. All location data was analyzed to assess survival and spatial ecology including movements, space use, and denning preferences of bears.

Notes

5. Use of Gps-Radiocollared Bears to Identify and Delineate a Community “Bearwise” Zone

Jessica Giacomini, Department of Forestry, Wildlife and Fisheries, University of Tennessee
Joseph D. Clark, U.S. Geological Survey, Southern Appalachian Research Branch, University of Tennessee
William H. Stiver, Great Smoky Mountains National Park
Dan Gibbs, Tennessee Wildlife Resources Agency

Abstract

Great Smoky Mountains National Park (GRSM) straddles the border Tennessee and North Carolina and has an estimated population of 1,600 American black bears (*Ursus americanus*). The park is adjacent to several cities and communities including the popular tourist city of Gatlinburg, Tennessee. Many of these areas likely offer novel anthropogenic food sources interspersed within suitable bear habitat which may facilitate human-bear interactions. In 2000, the city of Gatlinburg enacted City Ordinance 2188 to reduce human-bear conflicts, requiring that all dumpsters or equipment used to store garbage be animal resistant or enclosed within a fence or other structure preventing animal access to garbage. The ordinance zone includes the entire area within Gatlinburg city limits on the west side of Foothills Parkway, encompassing an approximate area of 6.32 km² (2.44 mi²). From 2015 through 2017, a total of 51 black bears were captured on the Tennessee-side of GRSM and were equipped with GPS radio-collars as part of a conflict bear study being conducted by the University of Tennessee in partnership with Tennessee Wildlife Resources Agency and the National Park Service. Approximately 71% (n=36) of the radio-collared bears left GRSM boundaries and accessed private land surrounding the park. While 28 of the 36 bears that exited GRSM entered the city of Gatlinburg where animal resistant garbage containers are required, only 7 of these bears' movements were limited to Gatlinburg exclusively. A total of 29 bears accessed private land outside of Gatlinburg city limits, and these areas do not currently require the use of animal resistant garbage containers. The movement patterns of these radio-collared bears suggest that the current area covered by City Ordinance 2188 may need to be increased and that other communities bordering GRSM should consider passing similar ordinances in order to reduce human-bear conflicts region-wide.

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6. Efficacy of Bear Spray versus Polar Bears

James Wilder, U.S. Fish and Wildlife Service

Abstract

Little scientifically-validated information exists on effective deterrents for use against polar bears (*Ursus maritimus*). An objective understanding of the effectiveness of different deterrents in mitigating human-polar bear conflicts is critical to ensuring both human safety and polar bear conservation. Although considerable attention has been focused on understanding black (*U. americanus*) and grizzly (*U. arctos*) bear conflicts with humans, there have been few attempts to systematically collect, analyze, and interpret available information on human-polar bear conflicts across their range. To help fill this knowledge gap, a database was developed (the Polar Bear-Human Information Management System, PBHIMS), to facilitate the range-wide collection and analysis of human-polar bear conflict data. We populated the PBHIMS with data collected throughout the polar bear range, analyzed the use of bear spray versus polar bears, and found that it is an effective deterrent. We analyzed 17 uses of bear spray versus wild polar bears between 2000-2016 distributed among 3 of the polar bear Range States (Canada, Russia, and the United States) that resulted in zero human or polar bear fatalities or injuries. Bear spray stopped polar bears' undesirable behavior 94% of the time. The available data indicates that bear spray is an effective alternative to lethal force and should be considered as an option for personal safety for those recreating and working in polar bear country. This work represents an important step towards improving our understanding of an effective deterrent for polar bear conflict mitigation. Continued collection and analysis of range-wide data on polar bear interactions and conflicts will help increase human safety and ensure the conservation of polar bears for future generations.

Notes

7. Evaluating Conducted Electrical Weapons as an Aversive Conditioning Tool for Nuisance Black Bears in Great Smoky Mountains National Park

Ryan H. Williamson, Great Smoky Mountains National Park
Joseph G. Yarkovich, Great Smoky Mountains National Park
William H. Stiver, Great Smoky Mountains National Park

Abstract:

Conducted Electrical Weapons (CEWs), such as Tasers, are being used by some state and federal wildlife agencies throughout the country as a form of aversive conditioning to mitigate human-bear conflicts. Evaluating the effectiveness of CEW's is difficult without the ability to monitor post-exposure movements and identify unique individuals. However, GPS collar technology can be used to provide a measure of results over time and space. Since 2016, Great Smoky Mountains National Park (GRSM) has been using CEW's as an aversive conditioning tool for severe offensive black bear (*Ursus americanus*) incidents such as entering a building/shelter, tearing into a vehicle or tent, flipping dumpsters, area persistence and severe human habituation. The objectives of this study were to determine practical field application, develop standardized methodology, and evaluate the effectiveness of CEW's as an aversive conditioning tool for black bears. From June 2016 to August 2017, we deployed CEWs on 11 black bears (4 females and 7 males) a total of 14 times. Nine of these individuals were equipped with GPS collars that have collected >35,517 locations post deployment. Of the 11 research bears, 5 remained a persistent problem in the same area and 1 had to be recaptured after a one year interval. Four bears never returned to the site of capture. A more detailed spatial analysis which accounts for factors such as age, sex, degree of habituation/food conditioning, and degree of neuromuscular incapacitation received will provide measureable results of CEW effectiveness as an aversive conditioning tool.

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8. Conducted Electrical Weapon Use for Wildlife Management in Alaska – Adapting Law Enforcement Tools and Technology to Natural Resource Conservation

Larry L. Lewis, Alaska Department of Fish and Game, Division of Wildlife Conservation

Abstract

Wildlife management and public safety officials routinely respond to reports of wild animals posing public safety risk, causing property damage or are entangled, entrapped, sick or injured. During an agency response, immediate physical restraint or alteration of an animal's behavior may need to be achieved in order to help safely and effectively resolve a situation. Agency response is typically conducted utilizing a force-continuum of available tools and techniques that may range in effect and severity from human presence and vocalization, up to lethal force removal of the animal. Due to the increased risk of injury or death to both the human respondent and subject animal during any close-quarters investigation and subsequent action; continually evolving methods, tools and technology are adapted and adopted by field staff in order to help insure safer, more efficient and humane interventions.

The use of incapacitating drugs, pyrotechnical devices, less-lethal to lethal projectiles and the myriad of other tools and techniques commonly used by trained professionals for the restraint and/or behavioral modification of wildlife can, at times, be controversial, but most are generally accepted in practice. Conducted Electrical Weapons (CEW's) have been used by law-enforcement agencies for the restraint and behavioral modification of humans for over 40 years, although this use is not without some controversy of its own. In July of 2005, the Alaska Department of Fish and Game's (ADF&G) Division of Wildlife Conservation began studying and adopting the use of hand-held CEW's for the purposes of field staff personal safety; short-term restraint, hazing and aversive conditioning of wildlife. We collected information on the post-CEW exposure behavior and survivability of Alaskan Brown Bears (*Ursus Arctos*), Moose (*Alces alces*), Wood Bison (*Bison bison athabascae*), Black Bear (*Ursus americanus*), Muskox (*Ovibos moschatus*) and Reindeer/Caribou (*Rangifer tarandus*) subjected to CEW exposure, as well as other animal species in other states. While we conducted research on the overall efficacy and physiological effects of CEW exposure, we also developed codified regulatory language, Standard Operating Procedures, field-use recommendations, as well as training and record keeping standards. We developed a CEW program based on scientific research that will help our trained personnel fulfill their management mission and also allow a staff instructor to train other agency's personnel and public and private sector entities to incorporate CEW into special use hazing permits issued by ADF&G. CEW's are a safe and effective "tool on the tool belt" for authorized personnel to use as a compliment or alternative to the use of other traditional mitigation and safety tools.

Notes

9. Coexisting with Grizzly Bears

Gillian Sanders, Grizzly Bear Solutions, Kaslo, BC

Abstract

Reducing human-bear conflict is becoming increasingly important as human populations expand, especially with increased interest in raising local eggs, meat, and crops in semi-rural areas and backyards. The Kootenay Region of British Columbia, Canada, has high densities of black bears and southern grizzly bear populations are slowly recovering from formerly threatened status. Grizzly Bear Coexistence Solutions aims to improve human-grizzly bear coexistence through education, collaboration, and use of practical tools. To assist with grizzly bear population recovery, my work is focused in linkage areas between core grizzly bear populations to improve connectivity through low elevation human dominated habitats, but also serves to reduce black bear conflicts. From 2013-2017 I installed 200 electric fences to protect chickens, beehives, livestock, fruit trees, crops, and other attractants from bears. Electric fencing is known to be an effective tool to deter bears, but needs to be properly installed and maintained to be successful. The project provided advice, a 50% cost share on fencing supplies, and help with installation when needed, but fence maintenance was solely resident's responsibility. I tracked the success of fences installed through ongoing communication and outreach with residents. I found that a variety of fence designs were effective, and was able to deter individual bears from remaining livestock after predation occurred by these individuals before the fencing was installed. I found that tolerance for grizzly bears improved when livestock predation and associated property damage was reduced, and some formerly intolerant residents became promoters of project goals. I also found the ability to collaborate with a wide spectrum of worldviews was important, along with providing options for attractant management without giving unsolicited advice about private property management. This work may be a useful study for other communities in linkage areas between core populations of bears or areas of high human-bear conflicts.

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10. Brute Force: Reducing Food Attractants through Modification of Trash Containers

Mike Orlando, Florida Fish and Wildlife Conservation Commission

Abstract

The Florida Fish and Wildlife Conservation Commission (FWC) has experienced an increase in the number of human-wildlife conflict calls from the public over the last few decades. Approximately 1/3 of bear related calls that are received by the FWC involve bears accessing unsecured garbage. In 2017, FWC awarded \$825,000 in cost-share grants to 11 counties, 3 cities, and 2 homeowner's associations (HOAs) to offset the costs for residents and/or businesses to buy bear-resistant containers or modify regular containers to make them bear-resistant. One challenge was presented by multiple counties in areas with high levels of human-bear conflicts, because their residential waste was collected solely by fully-automated waste service systems. Traditional bear-resistant trashcans require a person to unlock the can before it can be serviced, which would make them incompatible with fully-automated waste service systems. The FWC reached out to local government staff and trashcan manufactures to pre-test prototypes of new bear-resistant trashcans that were designed to be compatible with fully-automated waste collection systems. Once cans were pre-tested with bears, waste collection trucks, and residents, the can manufacturers submitted their designs to be tested and certified by the [Interagency Grizzly Bear Committee](#). In addition to commercially-manufactured bear-resistant trashcans, the FWC also tested a new experimental method developed by a member of the public to make regular trashcans bear-resistant. The new method adds another option to what the FWC already advocates for modifying trashcans. The FWC also works with local welding companies to modify regular commercial dumpsters to make them bear-resistant. The FWC's involvement in the development of new and modified bear-resistant containers increased availability this equipment to Floridians, and will ultimately help reduce human-bears conflicts over the long term.

Notes

11. Grizzly Bear Recovery and Delisting: Progress Report

Hilary S Cooley, USFWS Grizzly Bear Recovery Program

Abstract

The grizzly bear was listed as a threatened species in the lower 48 states in 1975. Accordingly, The U.S. Fish and Wildlife Service (Service) developed a Grizzly Bear Recovery Plan and updated that plan as necessary. The Greater Yellowstone Ecosystem was the first population to achieve recovery and on June 30, 2017, the Service issued a final rule delisting the Greater Yellowstone Ecosystem Distinct Population Segment. The Service is now reviewing recovery of grizzly bears in the Northern Continental Divide Ecosystem. We review progress toward grizzly bear recovery and delisting in the six grizzly bear recovery zones, including litigation challenges and future management once delisting has been achieved.

Notes

12. Hikers vs. Bears – Management Challenges on a Long-Distance Trail

Morgan Sommerville, Appalachian Trail Conservancy

Abstract

The 2190-mile-long Appalachian National Scenic Trail, administered by the National Park Service, traverses 14 states, six other national parks, eight national forests, two TVA reservations, 67 state owned parks, 287 local planning jurisdictions and private lands. In other words, management of A.T. lands, resources and visitors varies considerably from place to place. One thing in common to virtually all of these locations is campers with food and bears. Adding to the management challenge is increasing day and overnight use of the A.T., with long-distance hiking along the A.T. increasing at about 14% per year to record levels. At the same time, black bear populations appear to be increasing and bears may be found along all of the A.T., from Georgia to Maine. Increased use by inexperienced or naïve A.T. campers along with increasing association by bears of humans with food has led to increasing numbers of bear/human incidents along the A.T. with related A.T. facility and Trail segment closures and food storage regulations. The Appalachian Trail Conservancy, the non-profit that coordinates management of the whole A.T., has recently begun a formal visitor use management program, using the Interagency Visitor Use Management Council framework. One key priority of our VUM work is to avoid injuries from human/bear interactions along the A.T. We would like to prevent euthanized bears and injured campers and are actively seeking optimal solutions to food storage and hiker education, in hopes of diminishing the frequency and severity of human/bear incidents along the A.T., and by extension, other long-distance trails and trail systems.

Notes

13. Managing Bear across Jurisdictional Landscapes in Canada

Jay Honeyman, Alberta Environment and Parks

Steve Michel, Natural Resource Conservation Branch, Parks Canada Agency

Abstract

Grizzly bears occupy large home ranges in the Canadian Central Rockies Ecosystem that often span several different agency jurisdictions (National & Provincial Protected Areas, Municipal & Provincial Crown Lands, First Nation Reserve Lands) during their seasonal (and occasionally, daily) movements. Inevitably, bear management takes place at a jurisdictional scale, creating inconsistencies and challenges as bears move across their home ranges. Within the highly developed Bow Valley region of Alberta these various jurisdictions have individual agency management priorities, varying levels of risk tolerance, distinct land use complexities and divergent expectations of stakeholders and residents. Agencies may have different techniques, tools and staff capacity for managing both people and bears within their boundaries. Challenges can occur both at the field level with operational bear management staff as well as with senior agency management. We will discuss these challenges through actual case studies of how grizzly bears are being managed as they move between National Park and Alberta Provincial lands.

Notes

14. Human-Sloth Bear Conflicts: A Significant Challenge to Conserve the Real Baloo of India

Nishith Dharaiya, Wildlife and Conservation Biology Lab, HNG University, Patan (Gujarat) India
Arzoo Malik, Wildlife and Conservation Biology Lab, HNG University, Patan (Gujarat) India

Abstract

Sloth bears (*Melursus ursinus*) are confined to the Indian sub-continent and distributed in highly fragmented habitats which are very close to the human settlements. Frequent visits of sloth bear in to the villages as well as human use of forest resources are being one of the main reasons for human-sloth bear conflicts in almost all the sloth bear distribution range. More than 60% of human-sloth bear conflicts are bear attacks on human, the rest of the conflict issues are crop damage, damage to the infrastructure. The sloth bear attacks on human are increasing since last decade in the central part of India. As per our recent study, more than 200 cases of sloth bear attacks are recorded per year in India and out of which most attacks occurred in the non-protected areas or close to the villages. This situation has increased the hostility of people towards sloth bears which apparently resulted in killing of sloth bear either by the people or the forest managers. India is holding more than 85% of the sloth bear population and hence have more responsibility to save this real 'Baloo'. Our study revealed that alleviating sloth bear attack in order to save the sloth bears, it is very important to train the forest staff especially to rescue the sloth bear, monitoring of sloth bear population and its associated habitat. Recent issues of sloth bear killing also urge that there is an urgent need to formulate the guidelines to deal with the sloth bear straying in human habitat.

Notes

15. The Savage Bear: A Case Study of Individual Bear Management in Denali National Park and Preserve

Patricia A Owen, Denali National Park and Preserve

Abstract

Most of Denali National Park and Preserve's 6 million acres is accessed by a single 90 mile road. Private vehicle access is allowed only in the first 12 miles. Opportunity to experience the park for most visitors is provided by a bus system beyond that point. The furthest extent of the unrestricted section of the road is the Savage River. This popular destination, especially for independent travelers, includes parking/rest areas, picnic areas, a campground, and hiking trails. It is in this area that for a good portion of the summer of 2016, a young male bear exhibited particularly bold and aggressive behavior toward people and came to be known as the Savage Bear. This bear was identified as habituated and food conditioned, charged people repeatedly and caused minor injury to one person. The behavior of this bear escalated over a number of weeks and necessitated management actions on the part of the wildlife team that included hazing, aversive conditioning, trapping attempts, and area and trail closures. Staff involvement from all work groups across the park was extensive and posed greater management challenges than typical bear-human conflicts in Denali. This case study will chronicle the drawn out saga of human conflict with one bear and show how management decisions and actions were adjusted frequently to adapt to constantly changing circumstances. It will discuss education efforts, providing social media content, and dealing with the press. The situation revealed gaps in the current Bear-Human Conflict Management Plan where guidance on management actions is missing or unclear. After action review provided valuable lessons learned that may prove valuable to others in similar situations.

Notes

16. Human–Asiatic Black Bear (*Ursus Thibetanus*) Interactions in the Kaghan Valley, Pakistan

Ashfaq Ali, Huazhong Agricultural University, Wuhan PR China

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Saquib Ali, Huazhong Agricultural University, Wuhan, PR China

Muhammad Ishaq, Huazhong Agricultural University, Wuhan PR China

Abdul Haseeb, School of Forest Sciences, University of Eastern Finland

Achyut Aryal, School of Life and Environmental Sciences, University of Sydney

Abstract

Few studies have reported on the distribution, food choices, general behaviour, and interactions of the Asiatic black bear (*Ursus thibetanus*) with humans. We explored the conservation status of the species and its conflicts with humans in the Kaghan Valley, northwest Pakistan. From September 2013 to December 2015, residents from 24 villages in three major regions of the Kaghan Valley were interviewed about human–bear conflicts. In parallel, a survey for signs of bear presence was conducted to assess bear presence, including bear attacks and crop damage that occurred during the survey period. Most interviewees (70%) confirmed that human–bear conflicts exist, and that they arise primarily from crop raiding ($n = 40$), followed by attacks on livestock ($n = 32$) and humans ($n = 15$). Most interviewees stated that they actively disliked bears (47.3%), or had a generally negative perception of bears (63.3%). Such responses were strongly associated with living close to or within bear habitat. Bears raided approximately 3.8 ha of maize per year, mainly from July to September. Our survey revealed that bears used habitats ranging from dense forest to scrub lands, but preferred steep, high-altitude habitats with dense tree cover. Anthropogenic activities (such as hunting, clear-cutting, expansion of infrastructure, and conversion of forest to agricultural land) were the main causes of conflict between humans and bears. Future studies should collect data on the movement and habitat use of individual bears to facilitate the development of appropriate management strategies to conserve this species effectively. We also recommend training Wildlife Department employees to interact with the local communities to implement acceptable mitigation measures to reduce the currently high conflict levels and thus improve acceptance for bear presence and conservation.

Notes

17. Understanding Sloth Bear Attacks in Gujarat for Formulating Future Conservation Strategies

Arzoo Malik, Wildlife and Conservation Biology Lab, HNG University, Patan (Gujarat) India

Nishith Dharaiya, Wildlife and Conservation Biology Lab, HNG University, Patan (Gujarat) India

Abstract

The sloth bear habitats in Gujarat consist of forests that are fragmented and degraded providing poor habitat conditions for bears and increasing the potential for human-bear encounters. Frequent bear attacks on human and crop damage turn the local people hostile toward bears. Such hostility of local villagers may become an obstacle to efforts to conserve sloth bears in its remaining habitats. Optimizing human-bear coexistence in the area may be one of the sustainable ways out to promote bear conservation. In order to understand the characteristics and probable reasons for bear attacks, we studied more than 600 cases of sloth bear attacks taken place in past ten years. We also visited the villages and interviewed the sloth bear victims to achieve our objectives. Our study revealed that majority of the sloth bear attacks are occurred close to the human settlements and more than 80% of attacks were accidental when the female bear encountered with cubs. We found that most attacks were happened during the winter or pre summer season and during the crepuscular time. It can be said that the sharing of resources between human and bear can be one of the major driver leading to conflicts. We overlaid the sloth bear attack locations on the land use land cover layer to identify the potential zones of human and sloth bear encounters using Geo-spatial techniques. Moreover, the information collected from the bear victims and locals along with the potential conflict zone map can be utilized for formulating the future conservation strategies and to prepare a conflict mitigation plan for the state of Gujarat.

Notes

18. Is it Addiction? Food-Conditioning in Grizzly Bears of Alaska's North Slope

Dick Shideler, Alaska Department of Fish & Game

Abstract

The effects of food-conditioning on grizzly bears in Alaska's North Slope oilfield region will be discussed in the context of demographic characteristics, selection of den locations, and individual characteristics such as body size. The potential role of genetic influences will also be presented. These will be compared with bears that reside in the same area but feed only on natural foods. Data from this long-term study suggest that for at least some bears there are physiological requirements that facilitate or even mandate their tendency toward food-conditioning. However, these are also flexible in that these bears never completely rely on anthropogenic food and some may revert to a natural food diet entirely. This has implications for management of individual bears, especially if bears can be deterred from anthropogenic sources early in the process of food-conditioning. These results also can inform decisions about whether an individual conflict bear should be lethally removed.

Notes

19. Research, Conflict Management, and a Network of Organizations Reduces Conflict Mortality of Grizzly Bears to Reverse Conservation Decline of Threatened Populations in the Trans-border Region of Canada and USA

Michael Proctor, British Columbia Ministry of Kaslo, BC
Wayne Kasworm, US Fish and Wildlife Service
Grant MacHutchon, Trans-border Grizzly Bear Project
Gillian Sanders, Grizzly Bear Solutions
James Barber, British Columbia Conservation Officer Service
Clayton Lamb, University of Alberta
Nancy Newhouse, Nature Conservancy Canada
Harvey Locke, Yellowstone to Yukon Conservation Initiative
Chris Servheen, US Fish and Wildlife Service

Abstract

We have been researching conservation issues and implementing a multi-faceted comprehensive program to reduce human bear conflicts (HBC) for over a decade in the trans-border region of southern Canada and NW USA across several small fragmented threatened populations. We found that HBC patterns significantly contributed to these populations' threatened status by causing population declines, fragmentation, and isolation, and decreasing habitat effectiveness. Our population monitoring has found clear evidence that our efforts to reduce HBCs have resulted in reduced human-caused mortality, increased inter-population connectivity with larger healthy populations, and improved habitat effectiveness resulting in increased reproduction, survival, and fitness. The composite effect of our programs across several population processes has resulted in an improvement in conservation status. Our program includes strategic private land purchases to reduce human densities in valley bottom connectivity zones, a farmer, rancher, and rural landowner program to secure bear attractants where human settlement and agriculture exists. Attractant management includes a cost-share electric fencing or other securement techniques, bear resistant garbage container program for home sites, and deadstock containment techniques. We also teach bear safety courses and bear spray training to increase tolerance and give residents, recreationists, and hunters tools to avoid potentially dangerous encounters with bears. We use non-lethal management methods on potential conflict bears and radio collar all managed bears. We have a ~90% success rate on females. We have identified the most important backcountry foraging habitats for protection with access controls to reduce backcountry conflicts and mortality to provide security to reproductive females. The composite effects of working across these conservation arenas and habitat types, (front country valley bottoms and backcountry foraging habitats) has resulted in a significant reduction in human-caused mortality, increased connectivity, increased habitat effectiveness, increased reproduction and improved conservations status of several otherwise

threatened populations. Several challenges remain including a plethora of offspring from productive female bears living adjacent to agricultural areas. We discuss strategies to incorporate a vision for success into conflict reduction programs, something we have yet to complete. What to do with all the bears?

Notes

20. Challenges to Becoming a BearWise or Bear-Smart Community: Tourists and Hikers

Joel G. Zachry, Smoky Mountain Field School

Abstract

Human-bear close encounters can pose serious threats to each other. Tourists and hikers alike often engage bears in unfavorable circumstances due to a lack of awareness, education, and recognition that bears are wild animals capable of inflicting personal injury or even death if surprised or provoked. Tourists visiting bear habitat often do so with little useful knowledge of bear behavior and often react out of fear rather than prudence when traveling in bear country. Managers must often react to circumstances where unsuspecting tourists place themselves in harm's way with a bear, and more so with a female bear and her cubs. This can result in both serious injury or death of the visitor and the necessary decision to euthanize the animal. Many tourists travel into bear country without receiving so much as a warning pamphlet advising them of the dangers of co-mixing with wild animals. Dayhikers and backpackers exploring lands where bears dwell are all too often naïve and unassuming of the dangers that might lurk ahead. Like tourists, they fail to make a proper amount of noise as they advance through the woodlands and to show calmness and withdrawal when an encounter is evident. Both visitor types often are not astute in managing their food, especially those camping overnight in the wilderness. Sometimes there is an assumption that "It won't happen to me". If we as humans are to co-exist with large iconic mammals, such as the bear, as our population increases and habitat shrinks, we must do a better job of instilling awareness of potential threats and their successful outcomes. We must make greater strides about potential conflicts in educating those who visit wild areas. Managers interacting with the public must work to convince the public, that while wild animals may sometimes appear docile and approachable, the wild, unpredictable element of behavior has prevailed in their genes for thousands of years.

Notes

21. WildsafeBC: Current and Future Outlook

Mike Badry, Ministry of Environment, BC Parks and Conservation Officer Service Division

Abstract

Human-wildlife conflicts have been a growing issue over the last decade in both urban and rural environments in British Columbia. Over the last 5 years the BC Conservation Officer Service has received almost 30,000 conflict calls/year. Managing these conflicts for the benefit of both people and animals requires the development of effective and sustainable solutions. In May 2013, the Ministry of Environment, in partnership with the BC Conservation Foundation, launched WildSafeBC, an expansion of the highly successful Bear Aware program. The mission of the WildSafeBC program is to reduce the number of human-wildlife conflicts in communities through education, innovation and cooperation. Key to the success of the WildSafeBC Program is the focus placed on resolving the root causes of human-wildlife conflict and changing people's perceptions and attitudes concerning their own behaviors. The WildSafeBC Program hires, trains and deploys community coordinators who lead wildlife conflict reduction education at the community level. In the past 3 years the program was delivered in more communities, to more people and addressed human-wildlife conflicts with more species than in any year previously. This, however, has resulted in major challenges with meeting the demand of new communities applying for programs, and with pursuing further innovative conflict reduction initiatives. WildSafeBC is striving to: ensure the program has the security and resources to better plan activities for each season; provide a WildSafeBC program in all communities throughout the province that have requested one; deliver programs in high priority grizzly bear conflict management areas; purchase and deploy effective wildlife conflict deterrents such as electric fencing and bear-resistant containers; and, increase their engagement with First Nations and the agricultural community.

Notes

22. A Stakeholder's Perspective of Successes and Challenges with the BC Bear Smart Communities Program

Mike Badry, Ministry of Environment, BC Parks and Conservation Officer Service Division

Abstract

The Bear Smart Communities Program was introduced by the Province of BC in 2004 to assist communities and wildlife management agencies in reducing conflicts with bears. The program has evolved over the years and is providing guidance and best practices, combined with incentives for communities to participate in the Program. The program has achieved or contributed to some substantial successes including over 20 communities in BC that are actively working to achieve provincial "Bear Smart" Community Program criteria and eight communities (Kamloops, Squamish, Lions Bay, Whistler, Port Alberni, Naramata, New Denver and Coquitlam) that have successfully attained official "Bear Smart" Community status. Over the last 10 years there has been a decline in the number of bears killed annually in response to conflicts from approximately 1000 to 650 bears. However, despite high levels of human-bear conflict many communities are still not engaged in, or aware of, the program. Although extensive resources (staff time, volunteer time, educational material, etc.) have been put toward bear conflict reduction by the province, as well as by municipalities, organizations and individuals, many people still do not take responsibility for proper management of bear attractants (garbage, bird feeders, fruit trees, compost, barbeques, outdoor freezers, pet food, etc.). We invited Mayor, Council, and Regional Government Representatives of all eight designated Bear Smart Communities in the province to participate in an interview process to discuss the successes and challenges with receiving and implementing the BC Bear Smart Community Program. The goal of the review process was to provide specific recommendations to further improve program efficacy in reducing human-bear conflict through revised structure, delivery, funding and/or content of the Bear Smart Communities Program. Common themes identified included leadership, communication, effective behavior change, and design and planning.

Notes

23. Management Techniques to Minimize Backcountry and Frontcountry Bear-Human Conflicts in Glacier Bay National Park, Alaska

Tania Lewis, Glacier Bay National Park and Preserve

Ashley Stanek, Glacier Bay National Park and Preserve

Abstract

Managers and biologists at Glacier Bay National Park and Preserve have tracked black and brown bear-human conflicts since 1959. There were few conflicts through the 1960s, but two bear-caused human fatalities and a rapid increase in the number of conflicts from the late 1970's through late 1980s inspired the park to implement new food storage regulations which led to an immediate decrease in bear-human conflicts. Conflicts increased again as backcountry visitation rose in the late 1990s, so the park implemented an educational campaign in 2003 encouraging people to stand their ground with approaching bears. This action, possibly in addition to a slight decline in backcountry visitation, led to another decrease in bear-human conflicts. Additionally, new fishing regulations in 2011 led to a decrease in fishing related conflicts. Between 2011 and 2017, backcountry conflicts have fluctuated relative to the number of backcountry visitors but remain relatively low (range: 1-7 per year). Bear-human conflicts in the frontcountry, however, appear to fluctuate depending on female and sub-adult bear presence more than numbers of visitors. Food and other attractants are largely secured from bears, so most frontcountry bear management efforts are directed at monitoring habituated bears and hazing them from heavy human-use areas such as roads, trails and buildings. Over the past 12 years, park biologists have experimented with several novel non-lethal hazing techniques that have proven effective in moving black bears from designated no-bear zone. We have found yelling and cracking a 10 foot bullwhip to be an extremely effective hazing technique for subadult black bears, whereas gentle arm gestures and soft voices are a much more effective technique for moving family groups. We have also used several other techniques with varying success, including super soaker squirt guns and slingshots as well as more traditional methods such as non-lethal beanbag rounds fired from shotguns. We will further discuss and demonstrate the novel techniques that have proven effective in managing bears in Glacier Bay National Park.

Notes

24. Addressing Human-Bear Conflicts in the Cabinet-Yaak Ecosystem: Montana's "Other" Grizzly Bear Population

Kimberly M. Annis, Montana Department of Fish, Wildlife & Parks

Abstract

In 1975, the US Fish & Wildlife Service listed the grizzly bear as a threatened species in the lower 48 states under the Endangered Species Act. The Cabinet-Yaak Ecosystem (CYE), with a population estimated around 50 bears, is one of 5 designated recovery zones where grizzly bears currently exist. Located in northwest Montana, several challenges towards population recovery efforts exist, primarily local feelings towards grizzly bears, human-caused grizzly bear mortality, and human-bear conflicts. Perhaps the greatest success towards recovery efforts for the grizzly bear in the state of Montana has been Montana Department of Fish, Wildlife & Parks (MFWP) development of grizzly bear specialist positions, which foster public awareness, tolerance, and support for grizzly bear management and conservation. In response to a growing need for on-the-ground assistance and public outreach, MFWP created a grizzly bear specialist position for the CYE in 2007. The CYE bear specialist 1) focuses on attractants as the root cause of human-bear conflicts, 2) provides proactive solutions for those attractants, 3) provides effective tools for when conflicts occur, while 4) not overly burdening residents, and 5) maintaining support for grizzly bear recovery efforts. The results of the first 10 years of managing human-bear conflicts in the CYE are discussed, including the effectiveness of the electric fencing loan program and the public land sanitation program.

Notes

25. Polar Bear Attacks on Humans: Implications of a Changing Climate

James Wilder, U.S. Fish and Wildlife Service

Abstract

Understanding causes of polar bear (*Ursus maritimus*) attacks on humans is critical to ensuring both human safety and polar bear conservation. Although considerable attention has been focused on understanding black (*U. americanus*) and grizzly (*U. arctos*) bear conflicts with humans, there have been few attempts to systematically collect, analyze, and interpret available information on human-polar bear conflicts across their range. To help fill this knowledge gap, a database was developed (Polar Bear-Human Information Management System [PBHIMS]) to facilitate the range-wide collection and analysis of human-polar bear conflict data. We populated the PBHIMS with data collected throughout the polar bear range, analyzed polar bear attacks on people, and found that reported attacks have been extremely rare. From 1870–2014, we documented 73 attacks by wild polar bears, distributed among the 5 polar bear Range States (Canada, Greenland, Norway, Russia, and United States), which resulted in 20 human fatalities and 63 human injuries. We found that nutritionally stressed adult male polar bears were the most likely to pose threats to human safety. Attacks by adult females were rare, and most were attributed to defense of cubs. We judged that bears acted as a predator in most attacks, and that nearly all attacks involved ≤ 2 people. Increased concern for both human and bear safety is warranted in light of predictions of increased numbers of nutritionally stressed bears spending longer amounts of time on land near people because of the loss of their sea ice habitat. Improved conflict investigation is needed to collect accurate and relevant data and communicate accurate bear safety messages and mitigation strategies to the public. With better information, people can take proactive measures in polar bear habitat to ensure their safety and prevent conflicts with polar bears. This work represents an important first step towards improving our understanding of factors influencing human-polar bear conflicts. Continued collection and analysis of range-wide data on interactions and conflicts will help increase human safety and ensure the conservation of polar bears for future generations.

Notes

26. *Non-Fatal Black Bear Attack Associations, Manager Perceptions of Risk Management and Litigation*

Janel Scharhag, University of Wisconsin Stevens Point
Dr. Cady Sartini, University of Wisconsin Stevens Point

Abstract

Injuries to humans by black (*Ursus americanus*) and grizzly bear species (*Ursus arctos*) is increasing in the United States. State and federal agencies that are responsible for bear management are required to make decisions that mitigate public risk. To both reduce risk to the public and better protect agencies from litigation, there has been a call for a more refined management model to assess attack risk by bear species. There is information and statistics regarding fatal attacks of both black and grizzly bears, and non-fatal attacks by grizzlies. There is little valid research on purely non-fatal black bear attacks. Our study will address this information gap and provide additional insight on litigation and risk management by: 1) analyzing 17 metrics involved in confirmed non-fatal black bear attacks in the United States 2) survey perceptions of bear managers regarding risk management and assess their likelihood of using a risk management model 3) review the history of the law and litigation against agencies involving cases of bear attacks. Our project results will provide meaningful statistics that will assist in the evaluation of attack risk, reveal important manager attitudes, and expose the legal issues surrounding bear attacks.

Notes

27. Human-Black Bear Conflict in Urban Environments of Colorado: Results of 11 Years of Research Investigating the Impacts of Human Development on Black Bears and Strategies for Reducing Conflict.

Stewart W. Breck, USDA-Wildlife Services-National Wildlife Research Center

Heather E. Johnso, Colorado Parks and Wildlife

David L. Lewis, Colorado Parks and Wildlife and Colorado State University

Sharon Baruch-Mordo, Colorado State University

Jared Laufenberg, Colorado State University

Abstract

Human-black bear conflicts within urban environments have been increasing throughout North America, becoming a high priority management concern. In response to this issue, we conducted 11 years of research in 2 towns in Colorado (Aspen and Durango) experiencing high levels of conflict with specific focus on understanding the influence of urban environments on bear behavior and demography, and the effectiveness of ‘bear-proofing’ for reducing conflicts. We will present relevant details of our research findings, share lessons learned, and end by posing questions to stimulate discussion. **Influence of human development on bear behavior:** From a multisite analysis, we found that bear use of development is dynamic and highly influenced by natural food shortages; challenging the assumption that bears will consistently rely on human food subsidies (“a fed bear is a dead bear”). When bears did come to town, we found that they overwhelmingly foraged on garbage; justifying a focus on urban bear-proofing as an important line of defense. We also demonstrated that warmer weather and use of anthropogenic food subsidies reduced the length of hibernation; suggesting that climate and land-use change will lengthen the active period and likely result in increases in human-black bear conflicts and human-caused black bear mortalities. **Influence of development on bear demography:** In Durango, we simultaneously collected genetic mark-recapture, individual vital rate, and telemetry data to evaluate the impact of human development on black bear abundance, population growth rate, fitness traits, and the spatial distribution of female black bears. Using an integrated telemetry-mark-recapture analysis, we quantified a 57% decline in female bear abundance over a 1-year period immediately following the natural food shortage. The decline coincided with increased bear use of development, and subsequent increases in human-caused bear mortality (e.g., vehicle collisions, harvest and lethal removals), which resulted in a significant shift in the bear distribution. Known-fate vital rate analyses revealed that increased bear use of development was associated with reduced adult and cub survival, but increased fecundity. Although development influenced vital rates differently, population models showed that collective costs of development outweigh any benefits for bear populations. **Bear-proofing for reducing conflicts:** From Aspen, theoretical modeling indicated that reducing the availability of human foods to bears by 55–70% would significantly reduce bear use of urban development. In Durango, we purchased and deployed ~1,200 bear resistant garbage containers in a large scale garbage reduction experiment conducted from 2013–2016. We found that trash-related conflicts were 60% lower in treatment areas than control areas, resident compliance with local wildlife ordinances (properly locking away trash) was 39% higher

in treatment areas than control areas, and the effectiveness of the new containers was immediate. Importantly, and matching theoretical predictions from Aspen, we found conflicts dramatically declined as resident *compliance* with wildlife ordinances increased to ~60% (by either using a bear-resistant container or just locking trash in a secure location). Our results indicate that changes in waste management can reduce conflicts, bear use of development, and presumably other consequences on bears and people. Our work adds to the body of literature finding that the greatest reductions in conflicts are associated with changes in the availability of anthropogenic foods, thus we end by asking what barriers preclude management agencies from successfully implementing such strategies.

Notes

28. Visitor Management of Commercially-Guided Polar Bear Viewing: A Collaborative Strategy for the Arctic National Wildlife Refuge

Robert Dvorak, Central Michigan University
Jeffrey Hallo, Clemson University
Jessica Fefer, Clemson University
Jennifer Reed, Arctic National Wildlife Refuge

Abstract

The Arctic National Wildlife Refuge contains and showcases some of the nation's most pristine and important natural resources. One such resource is the polar bear (*Ursus maritimus*). Given the significance of the polar bear as a threatened species and iconic symbol of the Arctic ecosystem, it is not surprising that there is a demand to see and experience these unique creatures. Over the past several years, commercially-guided, water-based polar bear viewing has rapidly increased at the Refuge as it offers one of the most consistent and reliable ecotourism opportunities in the world. Viewing occurs in the context of the Inupiat village of Kaktovik, AK, where Alaska Natives continue rich cultural traditions and subsistence hunting practices. However, viewing also occurs in a multi-jurisdictional context where numerous stakeholders are asked to cooperate and negotiate in achieving very diverse goals. The purpose of this presentation is to describe how a collaborative strategy has been developed in the Arctic National Wildlife Refuge to manage polar bear viewing. It will examine the various partners and stakeholders vested in the management of polar bear viewing. It also investigates the establishment of a multidisciplinary team tasked to determine the best management practices and strategies needed to operate a successful and sustainable polar bear viewing program. Finally, it will address both the competing and shared values amongst federal agencies, commercial guides, local communities, and tribal governments that must be negotiated to operate a polar bear viewing program that is safe for the bears, community, and visitors.

Notes

29. The 'Endangered' Polar Bear Viewing at the Arctic National Wildlife Refuge: Inputs to Science-Based Visitor Management and Experiential Capacities

Jeffrey Hallo, Clemson University

Robert Dvorak, Central Michigan University

Jessica Fefer, Clemson University

Jennifer Reed, Arctic National Wildlife Refuge

Lauren Miller, Clemson University

Abstract

The waters in the Arctic National Wildlife Refuge near the Inupiat Eskimo village of Kaktovik, AK are the premier (and only) place in the U.S. to reliably view polar bears. Given the significance and notoriety of the polar bear, it is not surprising that there is a demand to see and experience this unique creature in the wild. The listing of the polar bear in the U.S. as a threatened species and the well-publicized influence of climate change on it seem to be markedly increasing demand by the public to view the polar bear. The popularity of polar bear viewing is reassuring because it suggests growing public interest in the species' conservation, but it also presents substantial management challenges. Too many visitors may cause unacceptable impacts to fragile arctic resources, change the rich Inupiat culture of Kaktovik, and degrade the quality of the polar bear viewing experience itself and its potential conservation outcomes. While the polar bear is strictly protected and managed, the opportunity to enjoy and learn from the experience of seeing polar bears in the Arctic Refuge is endangered by an absence of a formal visitor use management plan, including limits on the number, types, and activities of polar bear viewers or their commercial guides. The authors present and discuss the process and outcomes of social science efforts to help provide science-based information to inform such a plan, which is now being formulated. Results from visitor surveys employing normative methods and photo simulations are used to suggest experiential thresholds for 1) proximity to a polar bear and 2) number of boats gathered around a polar bear. Survey results are shared that help understand visitors and their attitudes towards a range of management alternatives being considered for implementation. Lastly, results from a social media assessment of broader public sentiment towards polar bears at the Arctic Refuge are presented. As a whole, these social science data provide a strong, defensible empirical basis to aid planning and management actions intended to ensure that opportunities to view polar bears at the Arctic Refuge are as well-protected as the animals themselves.

Notes

30. Black Bear Management at Big Bend National Park: A 25 Year Perspective

Raymond Skiles, Big Bend National Park
Price Rumbelow, Big Bend National Park

Abstract

By 1944, when Big Bend National Park (BIBE) was founded, black bear (*Ursus americanus*) were nearly extirpated in the state of Texas. However, black bears persisted in the mountains of adjacent Northern Mexico and observations in the park continued sporadically. In 1988, females with cubs were observed and black bears began a successful recolonization of the Chisos Mountains. Between 1988 and 1993 black bear encounters increased to a threshold that required a major response program. Park managers designed a strategy to ensure success of the population and minimize bear-human conflict. The program included education, compatible facilities, regulations/enforcement, management ability, and research. This resource protection strategy was initially expensive and time consuming but has resulted in removal of only a single black bear from BIBE in the past 25 years. As black bears expand to reoccupy their historic range, Big Bend can provide a model for successful reintegration.

Notes

31. Wildlife Connectivity in the Pigeon River Gorge: A Proactive Approach to Mitigating Wildlife-Vehicle Collisions

Jeff Hunter, National Parks Conservation Association

Abstract

In February 2017, NPCA convened a gathering of stakeholders including federal land management agencies, state wildlife agencies, representatives from a number of NGOs and the Eastern Band of Cherokee Indians. The group discussed issues related to wildlife-vehicle collisions (WVCs) surrounding Great Smoky Mountains NP. With a black bear population growing at an estimated 6% annually, and a growing herd of elk expanding beyond the borders of the park, this collaborative group is looking at a number of issues including mortality data, and how wildlife is interacting with Interstate 40. The group is customizing the ArcGIS Survey123 App, and is camera trapping in the corridor. In addition, a number of agencies have fitted elk, bear and hogs with GPS collars to look at their movements across the landscape. Hunter will discuss the group's efforts to improve functionality of existing wildlife passage structures, and explore the potential for new wildlife overpasses in this heavily trafficked interstate corridor.

Notes

32. Massanutten Village: An Imperfect Success Story

David M. Kocka, Virginia Department of Game and Inland Fisheries
Glenn Mitchell, Virginia Department of Game and Inland Fisheries

Abstract

Massanutten Village is a four season resort located at the southern-most tip of Massanutten Mountain, in Virginia's Shenandoah Valley. Approximately 6,000 acres have been developed into three ownerships; Massanutten Resort with over 2,000 condominiums and various recreational pursuits: Mountainside Villas with 175 condominiums; and Massanutten Property Owners Association with approximately 2,300 private homes. Annual visitation to the area exceeded 16 million persons in 2016, which was an increase of 18% over the previous year. An abundant bear population exists in this county which produces between 5-10% of Virginia's statewide bear harvest annually. Prior to 2009 black bear issues were a significant drain on DGIF resources. Massanutten Resort maintains 200 dumpsters and provides trash service for the entire village. In 2010, dumpsters in areas visited by bears were replaced with bear resistant models fabricated locally. "Success" was reflected in a reduction of bear related calls by Massanutten Resort and Mountainside Villas. Despite some improvements, the property owners association has been reluctant to require homeowners to take similar steps to manage potential bear food sources. Examples of successes and failures will be shared.

Notes

33. *Sharing the Range*

Andrea Morehouse, Waterton Biosphere Reserve

Abstract

Southwestern Alberta is where the mountains meet the prairies. Strong winds shape the landscape, and the Rocky Mountains transition rapidly to agricultural lands. The area is part of the Crown of the Continent, home to the Waterton Biosphere Reserve, and arguably one of the most beautiful places in Alberta. Unlike other regions of the province, however, there is little public land in this area and the home ranges of large carnivores including grizzly bears (*Ursus arctos*), black bears (*Ursus americanus*), wolves (*Canis lupus*), and cougars (*Puma concolor*) overlap substantially with agricultural land uses. This high degree of overlap means that there is the propensity for conflict. *Sharing the Range* is a short film about the challenges that can arise when people and large carnivores share the landscape. In the film, we attempt to tell a small part of the story about people and large carnivores in the Waterton Biosphere Reserve, and detail some of the work that is currently underway through our Carnivores and Communities Program. Waterton Biosphere Reserve's Carnivores and Communities Program works with landowners and producers to help mitigate large carnivore-agricultural conflicts. Some of our initiatives include electric fencing projects, grain bin retrofits, a deadstock removal program, and bear safety workshops. Through the efforts of many dedicated farmers, ranchers, biologists, and land managers, we are working to find ways to maintain both sustainable populations of carnivores and economically viable rural communities. The film, *Sharing the Range*, is a small piece of that story. For further information on the film, please visit: www.sharingtherange.com . For further information on Waterton Biosphere's Carnivores and Communities Program, please visit: <http://www.watertonbiosphere.com/projects/carnivores-communities/>

Notes

34. Changing Bear Feeding Prohibitions in Florida: Education through Notification

Sarah Peltier, Florida Fish and Wildlife Conservation Commission

Abstract

Access to human-provided foods like unsecured garbage, pet food, and bird seed is the primary cause of human-bear conflicts in Florida. The Florida Fish and Wildlife Conservation Commission (FWC) has been addressing this issue in a number of ways, including changes to rules related to feeding wildlife and their associated penalties. In July 2015, a species-specific feeding prohibition for black bears was added to the Florida Administrative Code (FAC) 68A-4.001, as well as a new subsection that differentiates intentional and unintentional feeding of black bears to make the rule more effective and enforceable. In addition to rule language changes, the 2015 Florida Legislature approved the creation of a tiered penalty structure that goes from a civil penalty and fine to a criminal penalty, fine, and potential jail time, for violations of all of the FWC's wildlife feeding rules, with the exception of marine fish. The FWC compared law enforcement activities related to the feeding rule before changes went into effect and after. Between 2007 and 2014, the FWC issued an average of 17 warnings and 5 citations per year related to the bear feeding rule. Between July 2015 and June 2017, the FWC issued 250 notices of non-compliance (i.e., unofficial warnings) related to the new bear rule (116 in fiscal year 15-16 and 134 in fiscal year 16-17). The FWC feels that the new rule has allowed for increased enforceability of the feeding prohibitions. Because the notice of non-compliance is not an official law enforcement action, residents who receive the notices seem to be taking actions to remedy the situation without having to receive an official penalty such as a warning or citation.

Notes

35. Human Conflict – Lessons from the Field

Erin Edge, Defenders of Wildlife

Russ Talmo, Defenders of Wildlife

Abstract

For over 20 years Defenders of Wildlife staff has worked directly with residents, livestock producers and state, federal and tribal agencies on the ground helping to prevent and mitigate bear-human conflict, investing over \$600,000 on such projects. Our discussion will feature two programs that use different approaches at mitigating human-bear conflicts, with the potential for replication elsewhere or on a broader level. Missoula Bears is an outreach tool designed to improve communication between agencies and the public while Defenders of Wildlife's Electric Fence Incentive program, is a practical approach at making bear-resistant electric fencing an affordable and flexible solution to preventing conflicts. **Missoula Bears** – Missoula Bears is an informational resource for residents living with wildlife in the valleys around Missoula including the Bitterroot, Blackfoot, upper Clark Fork, lower Clark Fork and Mission valleys. This website is a result of years of working to minimize human-bear conflicts, beginning with Missoula residents in one neighborhood in 2004. In 2009 we expanded our efforts to include all of Missoula County and now, due to increased interest and an expanding Northern Continental Divide (NCDE) grizzly bear population, we are covering the five valleys around Missoula. The goal for Missoula Bears is to help minimize conflicts with wildlife, particularly bears and mountain lions while also: improving communication between residents and wildlife management agencies; increasing human safety; minimizing bear mortalities; improving sanitation in our neighborhoods and reducing the amount of time Montana Fish, Wildlife and Parks (MTFWP) spends addressing bear conflicts each year, allowing MTFWP to use their time more effectively in other areas of concern. On the website, residents can report bear and mountain sightings as well as potential bear attractants. This has allowed MTFWP to respond efficiently to reports and minimize rumors. In addition, Missoula Animal Control can respond to reports of garbage left out and accessible by bears and issue tickets for violations of city code. The website also provides general outreach and resource information. In response to public demand we have included a Facebook page which quickly became popular. Social media has created challenges but has also increased the speed at which we can reach people and the demographic of residents that are engaged. **Electric Fencing Incentive Program** - A primary cause of human-related grizzly bear mortality is anthropogenic attractants. Conflicts not only result in bear mortality but can also reduce human tolerance for species' presence. Defenders initiated the Electric Fencing Incentive Program in 2010, in response to rapidly increasing conflicts between bears and backyard chickens. The Program provides financial and technical assistance to help landowners secure anthropogenic attractants such as small livestock, apiaries, gardens and other bear attractants on private lands. Defenders works directly with individuals, landowners, non-profit organizations, small businesses and government agencies on a wide variety of electric fence projects, primarily on private lands. The Program provides the financial support, technical expertise and guidance necessary to build electric fence systems that effectively deter grizzly bears and other carnivores from accessing anthropogenic

attractants. This program is designed to be proactive in preventing conflicts, though priority is given to landowners with past bear conflicts. We are seeing a direct reduction in human-bear conflicts and other wildlife conflicts at these sites where fences are completed and maintained. Prior to the program, Defenders tried various iterations of outright purchasing and installation of electric fences but found that a “cost-share” approach is far more effective for long term success of electric fencing projects. Initially, this program reimbursed landowners \$100 towards an electric fence around an identified grizzly bear attractant. In 2012, we improved the program to reimburse residents within priority counties in Montana, Idaho, Wyoming and eastern Washington, 50 percent of the cost of electric fencing around any grizzly bear attractant, up to a maximum incentive of \$500 per landowner, while providing direction on design and materials aspects. The Program has completed more than 292 fencing projects to date and the popularity and familiarity of the program continues to grow each year.

Notes

36. Incentives for Local Governments to Become BearWise

David Telesco, Florida Fish and Wildlife Conservation Commission

Abstract

Unsecured trash is the primary reason that bears linger in neighborhoods and come into conflict with people in Florida. In 2017, the Florida Fish and Wildlife Conservation Commission (FWC) received a total of \$825,000 to share the cost of bear-resistant equipment with local governments. At least 60% of the funding was required by the state legislature to go to local governments who implemented BearWise ordinances that required trash be kept secure from bears. A panel of FWC staff evaluated the 19 grant applications, and awarded funding to 11 counties, 3 cities, and 2 homeowner's associations (HOAs), who in turn provided a total of \$429,000 in matching funds and in-kind services, resulting in an overall 34% match to grant funds. The projects ultimately resulted in 5,200 bear-resistant trashcans, 3,800 sets of hardware that can be added to regular trashcans to make them bear-resistant, and 3 bear-resistant dumpsters. In addition to providing over 9,000 residents with bear-resistant equipment, the funding also provided incentives to local governments to pass ordinances requiring trash be kept secure from bears. After the funding was announced, three counties (Lake, Orange, and Santa Rosa), one city (Fort Walton Beach), and several HOAs passed ordinances requiring trash be kept secure, which will result in community-wide reductions in human-bear conflicts. The funding also precipitated needed technological advances from bear-resistant trashcan manufacturers. Several counties in high human-bear conflict areas have fully-automated waste collection systems, and so had concerns about using traditional bear-resistant trashcans that need a person to unlock them before servicing. Before announcing the funding, only one company (Northland Products) offered bear-resistant trashcans that were compatible with fully-automated waste service systems. After the announcement, the FWC worked with two additional companies (Rehrig Pacific and Toter), and now all three companies are offering this advanced technology. In addition to meeting the needs of more advanced waste collection systems, the increase in the number of companies offering this product helps bring down the cost of these cans, and therefore increases their use, among residents and businesses. Between 2007 and 2017, the FWC will have provided a total of over \$1 million in incentive funds to local governments, private businesses, and Florida residents to assist them in securing garbage and other attractants to reduce human-bear conflicts.

Notes

37. Partnering with the Air Force to Reduce Human-Bear Conflicts

Kaitlin Goode, Florida Fish and Wildlife Conservation Commission

Abstract

In 2009, Tyndall Air Force Base (TAFB) in Bay County, Florida requested a permit that would allow their Natural Resource staff to manage human-bear conflicts on the installation, including trapping, relocation and euthanasia. The Florida Fish and Wildlife Conservation Commission (FWC) approved the permit, which is the only one of its kind in the State. This permit reduced the workload for local FWC wildlife management area staff and empowered TAFB to address and prevent conflicts. Subsequently, TAFB outfitted most housing with bear-resistant trash cans. However, in 2013 housing was privatized on the installation and Balfour Beatty Communities was awarded the housing contract for TAFB. As bear-resistant trash cans were damaged, Balfour Beatty replaced them with regular trash cans. A combination of a growing bear population, an increase in unsecured garbage and the abundance of oak trees in housing areas lead to a gradual increase in human-bear conflicts. In spring 2017, several high-profile human-bear conflict incidents occurred in just a few months, leading the Base Commander to ask for State assistance. FWC staff met with TAFB Natural Resource staff, Wing Command staff and Balfour Beatty Communities staff over several months to identify problem areas, specific bears that presented a public safety risk, opportunities for outreach and education, and enforcement of Florida's rule that prohibits feeding bears. All parties agreed to allow FWC Division of Law Enforcement to begin to enforce the FWC's feeding rule on the installation. In addition, all human-bear conflict calls were routed to the FWC Regional Office to allow the agency to track bear activity and ensure appropriate levels of response to human-bear conflicts. FWC and TAFB Natural Resource staff canvassed all 800 residences on the installation to educate people on bear behavior, Florida's bear feeding rule, and asked residents to call the FWC's Regional Office to report human-bear conflicts. Intense trapping efforts were initiated to decrease the risk to public safety posed by several habituated and food-conditioned bears. Over a 30-day period, 10 bears (8 adults, 2 cubs) were removed from housing areas. All adult bears were euthanized, and cubs were placed in a rehabilitation facility to be released in late Fall 2017. Since enforcement efforts began, FWC has issued 8 letters of non-compliance with the feeding rule, a required first step in the process of citing residents who are unintentionally feeding bears, e.g., not securing their garbage. In August, 2017, Balfour Beatty Communities announced they would exchange all regular trash cans in housing areas for bear-resistant trash cans that are compatible with fully-automated waste service systems. By working closely with TAFB administration, Balfour Beatty Communities, and people who live and work on the installation, the FWC has built a model for cooperative relationships resulting in a reduction in human-bear conflicts and increased public safety.

Notes

38. Collaborative Conservation: Coping with Increasing Polar Bear Use of Alaska's Coastline

Susanne Miller, U.S. Fish and Wildlife Service, Marine Mammals Management

Jennifer Reed, U.S. Fish and Wildlife Service, Arctic National Wildlife Refuge

Todd Atwood, U.S. Geological Survey, Alaska Science Center

Abstract

As sea ice diminishes, polar bears are increasing their use of terrestrial habitat along the northern coast of Alaska during summer and fall months, raising concerns for public safety in rural villages and industrial work areas, as well as for the welfare of polar bears. Recent studies indicate that the proportion of polar bears using the Beaufort Sea coast has increased, and that trends of earlier arrival, increased length of stay, and later departure back to sea ice are occurring. The highest density of polar bears along the Beaufort Sea coast of Alaska occurs at Barter Island, home to the small Inupiat community of Kaktovik, whose residents rely on the annual fall harvest of bowhead whales for food sustenance. The un-salvaged remains from this harvest are deposited in a "bone pile" that attracts a large aggregation of polar bears annually. Over the last decade, the predictable presence of polar bears around Kaktovik has also led to an increase in polar bear tourism and commercial filming. This increase of both polar bears and humans along the coast, particularly around Kaktovik, presents unique management challenges and a collaborative approach during a time of rapidly changing environmental conditions. This presentation provides an overview of actions being taken by federal managers and researchers to cope with the increased presence of bears along Alaska's Beaufort Sea coast, as well as the human visitors who wish to view them. Specific actions include: 1) conducting biological monitoring and research on coastal use by polar bears; 2) improving emergency response capabilities involving oiled, injured or sick polar bears; 3) implementing deterrence programs in villages and industrial areas; 4) managing polar bear viewing, tourism, and commercial filming around Kaktovik; 5) managing food attractants around Kaktovik; and 6) developing outreach and education materials.

Notes

39. *Private Contractors Extend Agency Reach in Resolving Human-Bear Conflicts*

Alyssa Simmons, Florida Fish and Wildlife Conservation Commission

Abstract

The Florida Fish and Wildlife Conservation Commission (FWC) is responsible for managing human-bear conflicts in Florida. The number of human-bear conflicts has increased dramatically over the last few decades. In 2002, the FWC created the Bear Response Contractor Program (BRCP), which is composed of private individuals located in areas with high levels of human-bear conflicts who are trained by the FWC on how to assist agency staff with certain tasks associated with human-bear conflicts. The BRCP started as a pilot project with a few individuals in the FWC's Northeast Region. The FWC trained individuals how to collect data from and properly dispose of bear carcasses, set and monitor trailer-mounted bear traps, and provide residents and businesses with technical assistance on how to avoid conflicts with bears. Individuals in the BRCP are paid a flat fee per task, and are only contacted on an 'as needed' basis. Between fiscal years 2011-2012 and 2016-2017, the BRCP responded 242% more requests for assistance from the public. The FWC has expanded the BRCP to include 24 individuals statewide covering all five of the FWC's regions. The BRCP tasks have also been expanded to include canvassing entire neighborhoods to pass out literature and meet with multiple residents, scaring bears with paintball guns, performing outreach at festivals, schools, and civic group meetings, transporting equipment and/or bears, constructing electric fencing systems as loaner equipment for residents, and repairing bear management equipment. Education and outreach-oriented tasks of the BRCP are used most often (60%), followed by more 'hands-on' bear-related activities like capture assists and carcass retrievals. The BRCP is almost entirely responsible for documenting the over 200 bears that are killed by vehicles annually, which accounts for over 80% of the known cause of death for bears in Florida. The BRCP has allowed the FWC to not only keep up with the increasing demand for assistance with human-bear conflicts, but also to maintain support for bear conservation efforts by providing the public with a face-to-face response in situations where technical assistance over the phone is not enough. The BRCP has decreased the response time and increased the efficiency of human-bear conflict resolution in Florida.

Notes

40. Building Partnerships to Reduce Grizzly Bear Conflict in the Bow Valley, Alberta, Canada

Jay Honeyman, Alberta Environment and Parks

Abstract

The Bow Valley of Alberta has been described as one of the busiest landscapes in North America that continues to share that landscape with grizzly bears. The Bow Valley incorporates multiple jurisdictions and stakeholders including Canada's first National Park - Banff National Park, Kananaskis Country – a 4,000 km² provincial multi-use recreation area, the Town of Canmore (population 17,000) and multiple Hamlets. The valley also borders the Stoney First Nation Indian Reserve. The valley is bisected by the 4 lane Trans-Canada Highway and an east / west continental twin track rail line. There have been multiple examples of how the various stakeholders in this busy, multi-jurisdictional landscape have worked to live with wildlife over the last 20 years. These include: Garbage-the region is recognized as a world leader in bear proof waste management systems; Aversive Conditioning-the longest running Aversive Conditioning Program for grizzly bears in North America; Crossing Structures-the Region has become the model for highway crossing structure mitigation around the world; Wildlife Corridors: the first formal wildlife corridor guidelines in North America that are now a legal requirement in the local development approval process; Bow Valley WildSmart: Long Running , nationally recognized Wildlife Education Program. This story has been told through the creation of the film 'Living with Wildlife' <https://vimeo.com/214597705> . The film was recently selected to be shown at the 2017 International Banff Mountain Film Festival.

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