
12th
WESTERN
BLACK BEAR
WORKSHOP
CANMORE, ALBERTA 2015


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CANADIAN PARKS AND WILDERNESS SOCIETY
SOUTHERN ALBERTA CHAPTER


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WORKSHOP COMMITTEE AND VOLUNTEERS

ALBERTA

Paul Frame
Provincial Carnivore Specialist,
Alberta Environment and Sustainable Resource Development

Jay Honeyman
Human Wildlife Conflict Biologist,
Alberta Environment and Sustainable Resource Development

Jon Jorgenson
Senior Wildlife Biologist,
Alberta Environment and Sustainable Resource Development

John Paczkowski
Park Ecologist,
Kananaskis Country, Alberta Parks

Sandra Code
Assistant to Operations Manager
Kananaskis Country, Alberta Parks Division

Paul Jones
Senior Biologist
Alberta Conservation Association

IDAHO

Craig White
Southwest Regional Wildlife Manager,
Idaho Department of Fish and Game

WASHINGTON

Rich Beausoleil
Bear & Cougar Specialist,
Washington Department of Fish and Wildlife

VOLUNTEERS

Menno & Margaret Froese

Gian-Duri Giger

Kevin & Kathy McCormick

Georg McKay

David Minifie

Susan Minifie

Tom Partello

Stefan Seifert

Marion & Jack Whitworth

Marilyn Wilson

MONDAY, MAY 11 2015

12:00 pm – 8:00 pm	**Registration** (Coast Hotel)	
6:00 pm – 8:00 pm	Workshop Social and Cash Bar	

TUESDAY, MAY 12 2015

7:00 am – 2:00 pm	**Registration** (Coast Hotel)	
7:00 am – 8:00 am	**Breakfast** (included with registration – Coast Hotel)	
7:30 am – 8:25 am	Tuesday presenters load presentations at Cornerstone Theatre	
8:30 am – 8:40 am	Welcome	
8:40 am – 9:20 am	Opening address: *Understanding black bear aggressive behavior*	**Dr. Stephen Herrero**
Session 1: Bear Status Reports (Cornerstone Theatre)		**Session Chair:** **Paul Frame, ESRD**
9:30 am – 9:45 am	Nevada Status Report	**Carl Lackey**
9:45 am – 10:00 am	Washington Status Report	**Richard Beausoleil**
10:00 am – 10:15 am	Colorado Status Report	**Jerry Apker**
10:15 am – 10:30 am	Utah Status Report	**Leslie McFarlane**
10:30 am – 10:45 am	**Break** (Cornerstone Theatre) (Sponsored by Town of Canmore)	
10:45 am – 11:00 am	Arizona Status Report	**April Howard**
11:00 am – 11:15 am	Alberta Status Report	**Paul Frame**
11:15 am – 11:30 am	Idaho Status Report	**Jim Hayden**
11:30 am – 11:45 am	Wyoming Status Report	**Dan Bjornlie**

11:45 am – 12:00 pm	Montana Status Report	**Tonya Chilton**
12:00 pm – 1:30 pm	**Lunch** (included with registration – Coast Hotel)	
Workshop 1: Bear Management (Cornerstone Theatre)		**Workshop Chair:** **Richard Beausoleil** Washington Department of Fish and Wildlife
1:30 pm – 2:00 pm	Jurisdictional Survey Results	**Richard Beausoleil**
2:00 pm – 3:00 pm	An evaluation of agency black bear data collection and Interpretation	**Dr. Joseph D. Clark** U.S. Geological Survey
3:00 pm – 3:15 pm	**Break** (Cornerstone Theatre)	
3:15 pm – 5:00 pm	Open Forum: *Bear management: Innovation vs. Continuation (recorded)*	
5:00 pm – 7:15 pm	**Dinner** (on your own)	
5:00 pm – 7:15 pm	Poster session (Coast Hotel)	
Session 2: Orphan Cubs and Rehabilitation (Cornerstone Theatre, Cash Bar)		**Session Chair:** **Richard Beausoleil** Washington Department of Fish and Wildlife
7:30 pm – 7:50 pm	Development of black bear cub rehabilitation and release techniques at Cochrane Ecological Institute, Cochrane Alberta	**Clio Smeeton** Cochrane Ecological Institute, Cochrane, AB, Canada
7:50 pm – 8:10 pm	Management implications for releasing orphaned, captive-reared black bears back to the wild	**John J. Beecham** International Fund for Animal Welfare, Boise, ID, USA
8:10 pm – 8:30 pm	Successful American black bear rehabilitation near urban areas	**Valerie Stephan – Leboeuf** Idaho Black Bear Rehab, Inc. Garden City, ID, USA
8:30 pm – 8:50 pm	Rehabbing black bears and grizzlies in British Columbia	**Angelika Langen,** Northern Lights Wildlife Society, Smithers, BC, Canada
8:50 pm – 9:10 pm	Strategies and guidelines for captive-rearing and releasing orphaned bears back to the wild	**John J. Beecham** International Fund for Animal Welfare, Boise, ID, USA
9:10 pm – 9:30 pm	What to do with offspring of conflict bears: Genetic insights from the Greater Yellowstone Ecosystem	**Mark Haroldson** U.S. Geological Survey, Bozeman, MT, USA

WEDNESDAY, MAY 13 2015

7:00 am – 11:45 am	**Registration** (Coast Hotel)
7:00 am – 7:50 am	**Breakfast** (included with registration – Coast Hotel)
7:00 am – 7:50 am	Wednesday presenters load presentations at Cornerstone Theatre
8:00 am – 8:15 am	Housekeeping / Announcements

Workshop 2: Panel Discussion and Workshop: Bear conflict management in the private sector (Cornerstone Theatre)

Workshop Chair:
John Paczkowski
Alberta ESRD

This panel discussion will have input from a spectrum of participants from the private sector in Alberta. Panel members will describe operational and organizational considerations related to bears and bear conflict management. Panel members will also discuss some of the costs, benefits and challenges of doing business in bear country.

8:15 am – 8:30 am	**Wendy Crosina** Weyerhaeuser
8:30 am – 8:45 am	**Doug Wood** Silvertip Golf Resort
8:45 am – 9:00 am	**Paul Knaga** Shell Albian Sands
9:15 am – 9:30 am	**Wayne Lowry** Alberta Fish and Game Association
9:30 am – 9:45 am	**John Thornton** Banff Mount Norquay Ski Area
9:45 am – 10:00 am	**Break** (Sponsored by Alberta Professional Outfitters Society)
10:00 am – 10:15 am	**Christine Lambert** Suncor Energy Inc.
10:15 am – 10:30 am	**Jeff Bectell** Waterton Biosphere Reserve - Carnivore Working Group
10:30 am – 10:45 am	**Jill Jamieson** Camp Chief Hector
10:45 am – 11:00 am	**Dan LaGrandeur** Bear Scare Ltd.
11:00 am – 12:00 pm	**Open discussion with the panel and audience**
12:00 pm – 1:00 pm	**Lunch** (included with registration – Coast Hotel)

Field Trip: Proactive bear management activities in a highly developed landscape.

1:00 pm – 4:30 pm	**Field Trip** (Buses leaving from the Coast Hotel)	
6:00 pm – 8:30 pm	**Dinner Banquet with Deer/Elk Workshop** *Polar bears, northern cultures, and environmental variability*	**Banquet speaker:** Dr. Ian Stirling

THURSDAY, MAY 14 2015

7:00 am – 8:30 am	**Breakfast** (included with registration – Coast Hotel)	
7:00 am – 7:45 am	Thursday presenters load presentations at Coast Hotel	
Workshop 3: Aversive Conditioning; Jurisdictional Applications (Cornerstone Theatre)		**Workshop Chair:** **John Paczkowski,** Alberta ESRD
8:30 am – 10:00 am	Aversive conditioning has been used as a tool in wildlife management for many years. This workshop presents successes, failures and challenges for the future from a number of agencies who have been involved in delivering aversive conditioning across North America on both black and grizzly bears. This will be followed by a broader question and answer between the audience and panel members. Reports from Alberta, BC, Nevada, Montana, and Washington, as well as Wind River Bear Institute.	
10:00 am – 10:15 am	**Break** (Coast Hotel)	
Session 3 : Bear Predation on Ungulates (Coast Hotel)		**Session Chair:** **Carl Lackey,** Nevada Department of Wildlife
10:15 am – 10:35 am	A long-term study of elk-cougar relationships in western Washington: removal can recover small herds	**David Vales** Muckleshoot Indian Tribe, Auburn, WA, USA
10:35 am – 10:55 am	Using ungulate biomass to estimate abundance of wolves in British Columbia	**Gerry Kuzyk** Ministry of Forests, Lands and Natural Resource Operations, BC, Canada
10:55 am – 11:15 am	Spatial interactions and predation risk in multiple carnivore communities in the upper Red Deer River of Alberta	**Eric Spilker,** University of Alberta, Edmonton, AB, Canada
11:15 am – 11:35 am	Feeding vs. fleeing: the foraging cost of wolf predation risk for deer	**Apryle Craig** University of Washington, Seattle, WA, USA
11:35 am – 11:55 am	Black bear carnivory of ungulates: global positioning system cluster analysis as a tool for estimation	**Sara Kindschuh** New Mexico State University, Las Cruses, NM, USA
11:55 am – 12:00 pm	Closing comments (deer/elk folks are done at this point)	
12:00 pm – 1:00 pm	**Lunch** (included with registration – Coast Hotel)	

THURSDAY, MAY 14 2015 (CONTINUED)

	Workshop 4: **Bear: Managing Bears in a Socially Diverse and Risk Varied Landscape** (Cornerstone Theatre)	**Workshop Chairs:** **Jay Honeyman** Alberta ESRD **Craig White** Idaho Department of Fish and Game
1:00 pm – 2:30 pm	**Panel presentations** A main challenges for bear managers is recognizing and dealing with the social diversity and associated tolerance levels and risk of people (and agencies) towards bears. This diversity comes from traditional values, personal experience, and education (or lack thereof). As bears move through landscapes where people have varying tolerance levels, are bears managed differently and does this varied tolerance affect how the general public and wildlife managers perceive and manage risk? This session will discuss the issue of tolerance and risk within agencies and the public at large.	**Jay Honeyman** ESRD *Field Case Study – Grizzly bear 105* **Geoff Skinner** Parks Canada *Agency, protected area* **Chris Servheen** USFWS *Multi-jurisdictional responsibility* **Jim Hayden** IDFG *The Public Trust* **Kevin Van Tighem,** author/Parks Canada, retired *Non-agency* **Tony Bruder** Rancher *Non-agency* **Adam Driedzic** Environmental Law Centre *Legal perspective* **Bill Snow** Stony First Nation *First Nations* **Dan Carney** Blackfeet Nation *Agency, non-protected area* **Heather Johnson** Colorado Parks & Wildlife *Research*
2:30 pm – 2:50 pm	**Break** (Cornerstone Theatre)	
2:50 pm – 3:05 pm	Sharing the Range Video – Waterton Biosphere Reserve	
3:05 pm – 4:30 pm	Moderated discussion	
4:30 pm – 5:00 pm	**Business meeting:** Discuss location of 13th WBBW	
5:00 pm – 6:30 pm	**Dinner** (on your own)	
7:00 pm – 9:00 pm	**Public Presentation** (Cornerstone Theatre) Will speak about 34+ years of Grizzly Bear Recovery in the lower 48 of the United States. Chris will also be discussing how this issue relates to the current Threatened population of grizzly bears in Alberta.	**Chris Servheen,** Grizzly Bear Recovery Coordinator - US Fish and Wildlife Service

ABSTRACTS

Session 2: Orphan Cubs and Rehabilitation

DEVELOPMENT OF BLACK CUB REHABILITATION AND RELEASE TECHNIQUES AT COCHRANE ECOLOGICAL INSTITUTE, COCHRANE ALBERTA

CLIO SMEETON, *Cochrane Ecological Institute*, PO Box 484, Cochrane, AB, T4C 1A7, CANADA

ABSTRACT: Cochrane Ecological Institute, CEI, has been involved with black bear cub rescue, rearing and release in two provinces, for thirty years. CEI's objective is the successful return of orphaned black bears to suitable habitat where they will not encounter anthropogenic disturbance. The numbers of cubs received by Wildlife Rehabilitation Centres, with the facilities to accept bear cubs, is governed by provincial regulations and government support (non-financial) of the concept. CEI receives orphaned young-of-the-year bear cubs between February and June. Cubs are orphaned for different reasons but all due to human/wildlife interaction: den destruction, logging, road accident, forest fire and spring bear hunt. Well wooded and isolated, CEI is comprised of 140 acres sited in the foothills of the Rocky Mountains. CEI bear facilities are purpose built, consisting of indoor nurseries, indoor/outdoor cub enclosure and large 2 to 5 acres enclosures of native Montane habitat. Unrelated cubs of the same age can be grouped together; but first year cubs are separated from juveniles. CEI's large treed enclosures give a vertical as well as an horizontal space for their occupants. Over time CEI has developed methods of rearing bear cubs maximizing natural behaviours and minimizing contact. The goal of the CEI is to release bears into suitable sites where they are unlikely to come into contact human activity and infrastructure, and to release bears that are fit, larger and heavier than their age/class in order to reduce the likelihood of their being pushed out of a suitable release site by resident bears. Initially CEI released in Autumn when there is plenty of food, but the drawback is the country is unknown to the released animals and it is hard, in Alberta, to find release sites closed to Fall bear hunting. Therefore, Winter releases have appeared to be more inclined to success At all times the CEI has worked with provincial authorities in selecting release sites. Post-release monitoring has shown that the bears, have not come into contact with people or become "nuisance bears" post release.

MANAGEMENT IMPLICATIONS FOR RELEASING ORPHANED, CAPTIVE-REARED BEARS BACK TO THE WILD

JOHN J. BEECHAM, *Idaho Department of Fish and Game,* 600 S. Walnut Street, Boise, ID 83707 USA and International Fund for Animal Welfare, 7252 N. Pierce Park Lane, Boise, ID 83703 USA

Miguel De Gabriel Hernando, C/ Carnicerías 3, 2ºI, León 24003, SPAIN

Alexandros A. Karamanlidis, *Arcturos, Civil Society for the Protection and Management of Wildlife and the Natural Environment,* Florina 53075, Greece and Department of Ecology and Natural Resource Management, Norwegian University of Life Sciences, Ås 1432, NORWAY

Richard A. Beausoleil, *Washington Department of Fish and Wildlife,* 3515 State Highway 97A, Wenatchee, WA 98801, USA

Kelcey Burguess, *New Jersey Division of Fish and Wildlife,* 141 Van Syckels Road, Hampton, NJ 08827 USA

Dong-Hyuk Jeong, *Species Restoration Technology Institute of Korea National Park Service,* 53-1, Hwangjeon-ri, Masan-myeon, Gurye, Jeonnam Province, SOUTH KOREA

Mathew Binks, *Laurentian University, Sudbury,* Ontario, Canada and 104 David Street, Sudbury, ON P3E 1T1, CANADa

Leonardo Bereczky, *Association for Conserving Natural Values, 1*st December Street Number 22, Balan 535200, ROMANIA

N.V. Kunhunu Ashraf, *Wildlife Trust of India,* F13, Sector 8, Noida, Uttar Pradesh, 201301, INDIA

Kira Skripova, *Vladivostok Branch of Russian Customs Academy* 16v, Strelkovaya Street, Vladivostok 690034, RUSSIA

Lisa Rhodin, *Montana Wildlife Center at Montana Wild,* Post Office Box 200701, Helena, Montana 59601 USA

Janene Auger, *1110 Monte L. Bean Museum, Brigham Young University,* Provo, UT 84602 USA

Bae-Keun Lee, *Species Restoration Technology Institute of Korea National Park Service,* 53-1, Hwangjeon-ri, Masan-myeon, Gurye, Jeonnam Province, SOUTH KOREA

ABSTRACT: Orphaned bears have been captive-reared and released back to the wild for more than 3 decades, often without a clear understanding of their fates because post-release monitoring is not a common practice. As a result, management agencies lack efficacy data and are often reluctant to encourage increased use of this technique. We evaluated the potential management and conservation implications of releasing captive-reared bears by documenting post-release survival, cause-specific mortality, human conflict activity, homing behavior and reproduction for 550 American black, brown and Asiatic black bears reared in 12 captive rearing programs around the world. Survival rates ranged from 0.50 to 1.00 and were similar among the three species. The primary causes of mortality for American black bears was sport hunting and road kills, intra-specific predation and illegal kills for brown bears and natural mortalities and illegal kills for Asiatic black bears. While post-release conflict activity occurred for American and Asiatic black bears, the majority of released bears (94%) were not documented in conflict situations. Movement patterns of captive-reared American black and brown bears showed no homing tendencies toward their rearing facility. Twenty captive-reared bears produced 21 litters. Reducing the length of time American black bears were held in captivity and releasing them at heavier weights resulted in increased survival. Our analyses reduce many of the uncertainties surrounding the fate of bears released as yearlings and provide evidence that releasing captive-reared bears is a defensible management alternative.

JOHN J. BEECHAM 7252 N. Pierce Park Ln., Boise, ID 83714 (208) 859-5344
Email: john.beecham@gmail.com

SUCCESSFUL AMERICAN BLACK BEAR REHABILITATION NEAR URBAN AREAS

VALERIE STEPHAN-LEBOEUF, *Idaho Black Bear Rehab, Inc*. Garden City ID, 83714, USA

ABSTRACT: The American Black Bear (*Ursus americanus*) can be successfully rehabilitated at facilities near urban areas, if given opportunities to socialize with other cubs, obtain sufficient fat reserves at time of release, and be released into sustainable habitat where the potential for human interactions during the first 30 days post-release is low. At Idaho Black Bear Rehab, Inc. (IBBR), additional considerations for successful rehabilitation have been developed that include a variety of enclosure designs, customization of dietary and medical protocols, remote observation tools, and cub-appropriate caregiver techniques. Data recovered over the past 26 years indicates that IBBR bears have documented survival up to 6 years post-release. Radio collar tracking and post-mortem retrieval of ear tags show that few IBBR bears have become involved in conflict situations within 30 days post release (< .015), or within 31 days to 1 year post release (< .02). Most bears (> .96) are considered successfully released. In addition, some IBBR bears were studied up to 6 years post-release and were not only surviving but were documented to produce multiple sets of surviving offspring. Despite release success, rehabilitation still remains an under-utilized technique for dealing with orphan cubs. Ethical and science-based protocols for rehabilitation are rarely incorporated into black bear policies and management plans because consistent standards have yet to be developed. Black bear rehabilitators can contribute to black bear management and agencies could integrate the fluid nature and adaptive needs of rehabilitation when drafting policies and procedures.

For details of projects and publications: Email: vleboeuf@cableone.net Cell: 208-859-0648

Idaho Black Bear Rehab, Inc. (IBBR), 6097 Arney Lane, Garden City, Idaho, 83714, USA

REHABBING BLACK BEARS AND GRIZZLIES IN BRITISH COLUMBIA

ANGELIKA LANGE, *Northern Lights Wildlife Society* Smithers, BC, V0J 2N7, CANADA

ABSTRACT: Orphaned bear cubs are an unfortunate but not uncommon occurrence in today's human dominated world. Many cubs re orphaned because of human's (road and train accidents, legal and illegal shootings, property protection etc). NLWS has accepted 339 bears in the past 24 years including 3 Kermode bears and 18 grizzly cubs (under a pilot project that started in 2007) We would like to share our experiences and explore the questions we have asked ourselves as well as have been asked by others.

- Neonatal cubs
- Cubs from nuisance females
- Housing, feeding & enrichment
- Release times and locations
- Habituation and nuisance bear concerns
- Post release monitoring and survival
- Individual welfare versus species management
- Public relations
- Is rehabilitating cubs a viable management option?

STRATEGIES AND GUIDELINES FOR CAPTIVE-REARING AND RELEASING ORPHANED BEARS BACK TO THE WILD.

JOHN J. BEECHAM, *International Fund for Animal Welfare*, 7252 N. Pierce Park Ln., Boise, Idaho 83703 USA

Kati Loeffler, *International Fund for Animal Welfare*, 290 Summer Street, Yarmouth Port, MA 02675 USA

Richard Beausoleil, *Washington Department of Fish and Wildlife*, 3515 State Highway 97A, Wenatchee, WA 98801 USA

ABSTRACT: Placing orphan bears in captive-rearing facilities and releasing them back to the wild is a technique that has been used for decades with all 8 species of bears. However, the method is infrequently used by wildlife agencies because of concerns about survival of released individuals, ethical considerations and the possibility of released bears becoming involved in conflict with people. As a result, many orphaned bears are unnecessarily euthanized. The primary objectives of captive-rearing and release efforts are to use successful and defensible management techniques to liberate animals with the necessary life skills to survive in the wild, avoid conflicts with humans, and minimize disease and genetic risks to indigenous wildlife populations. Approaches to achieve these objectives vary among rehabilitators, geographic areas, local culture, political climate, and species of bears. Nonetheless, there are critical components of captive-rearing and release efforts that we promote and that can be applied across the species' range. These include developing protocols that: focus on the physical and psychological well-being of bears in captivity; enhance the probability of post-release success; and minimize concerns for human safety. Factors that appeared to increase the success of these protocols were reducing human contact with cubs after weaning, minimizing time that cubs spent in rehabilitation, and releasing cubs at relatively heavier body weights as yearlings when spring foods become more abundant. Captive-rearing and release programs have conservation implications that extend beyond obvious welfare benefits to individual animals. These include increased public support for conservation programs, maintenance of genetic diversity in small, isolated populations, and restoration of bears to previously occupied habitat. We address many of the uncertainties surrounding the fate of captive-reared bears, provide data-driven evidence that releasing orphaned bears back to the wild is a defensible management alternative, and advocate agencies utilize and implement the proposed strategies and guidelines.

WHAT TO DO WITH OFFSPRING OF CONFLICT BEARS: GENETIC INSIGHTS FROM THE GREATER YELLOWSTONE ECOSYSTEM

MARK A. HAROLDSON, *U.S. Geological Survey, Interagency Grizzly Bear Study Team*, Northern Rocky Mountain Science Center, 2327 University Way, Suite 2, Bozeman, MT 59715, USA

Craig Whitman, *U.S. Geological Survey, Interagency Grizzly Bear Study Team*, Northern Rocky Mountain Science Center, 2327 University Way, Suite 2, Bozeman, MT 59715, USA

Kerry A. Gunther, *Bear Management Office, Yellowstone Center for Resources*, Yellowstone National Park, P.O. Box 168, Yellowstone National Park, WY 82190, USA

Daniel D. Bjornlie, *Large Carnivore Section, Wyoming Game & Fish Department*, 260 Buena Vista, Lander, WY 82520, USA

Daniel J. Thompson, *Large Carnivore Section, Wyoming Game & Fish Department*, 260 Buena Vista, Lander, WY 82520, USA

Frank T. van Manen, *U.S. Geological Survey, Interagency Grizzly Bear Study Team*, Northern Rocky Mountain Science Center, 2327 University Way, Suite 2, Bozeman, MT 59715, USA

ABSTRACT: Management of human-bear conflicts is one of the greatest challenges for bear managers throughout the world. When female bears with offspring are involved in human-bear conflicts, managers face a dilemma. Translocation of offspring with the conflict mothers may increase the likelihood that nuisance behaviors are passed on to the next generation as reproductive females typically return to their established ranges with their offspring. Alternately, when management decisions involve removal of females, additional removal of dependent offspring is often not supported by the public nor may it be desirable if the conservation need is high. One option is to transport older offspring (i.e., yearlings) to new locales separately from their conflict mother. The rationale is that learning plays an important role in the development of individual foraging patterns and that separating offspring would reduce exposure to undesirable behavior. However, an important question is whether offspring separated from conflict mothers ultimately contribute to the population. We examined this question using data from grizzly bears (*Ursus arctos*) in the Greater Yellowstone Ecosystem (GYE). During the late 1960s– early 1970s, open garbage pits in Yellowstone National Park (YNP) and surrounding communities, where grizzly bears had fed for decades, were closed to reduce dependence of bears on anthropogenic foods. The immediate effect was a substantial increase in management removals and subsequent concern about population status. Early studies indicated an urgent need to reduce female mortalities. Thus, maintaining female offspring in the ecosystem was important. Researchers and managers in the GYE began separating offspring from conflict females in the early 1980s. We used individual life history information and genetic analysis of parentage to examine the fate and population contributions of 53 yearlings, 25 that were transported and released separately from their conflict mothers and 28 that were translocated with their mothers. Our findings indicate that 2 such female offspring were particularly important to the population and likely made a substantial contribution to the southern expansion of occupied range. We conclude that, under certain conservations scenarios, separating yearling bears from mothers can be a viable and successful management option.

Mark A. Haroldson U.S. Geological Survey, Interagency Grizzly Bear Study Team, Northern Rocky Mountain Science Center, 2327 University Way, Suite 2 Bozeman, MT 59715, USA

(406) 994-5042 email: mharoldson@usgs.gov

Session 3: Bear Predation on Ungulates

A LONG-TERM STUDY OF ELK-COUGAR RELATIONSHIPS IN WESTERN WASHINGTON: REMOVAL CAN RECOVER SMALL HERDS *David Vales, Muckleshoot Indian Tribe,* Auburn, WA, USA

No Abstract

USING UNGULATE BIOMASS TO ESTIMATE ABUNDANCE OF WOLVES IN BRITISH COLUMBIA *Gerry Kuzyk, Ministry of Forests, Lands and Natural Resource Operations,* BC, CANADA

No Abstract

SPATIAL INTERACTIONS AND PREDATION RISK IN MULTIPLE CARNIVORE COMMUNITIES IN THE UPPER RED DEER RIVER OF ALBERTA

ERIC SPILKER, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

Evelyn Merrill, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

Jodi Berg, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

ABSTRACT: Understanding how bears and other large carnivores individually select resources as well as interact with one another is essential for understanding how they collectively pose risk to their prey. Most research on predation risk focuses on one predator species, but prey respond to multiple predators and interactions among predators affect predator distribution. We illustrate an approach to quantifying multi-carnivore predation risk to elk in summer in and adjacent to the Ya Ha Tinda in the upper Red Deer River watershed of Alberta. In summer 2014, we collected scats of grizzly bears, black bears, wolves, coyotes, and cougars along 464-km of transects distributed throughout 48 5x5-km grid cells. We develop resource selection probability functions (RSPF) for black bears and grizzly bears based on scat locations using characteristics of landscape features and co-occurrence of scats of other carnivores. We compare black bear and grizzly bear distribution and produce maps representing the risk of predation for elk posed by ursids. Further, we compare predation risk from bears using kill sites of adult and calf elk killed by bears. Results from this study can be used in management of bears and other carnivore species and in the conservation of the Ya Ha Tinda elk herd.

FEEDING VS. FLEEING: THE FORAGING COST OF WOLF PREDATION RISK FOR DEER
Apryle Craig, *University of Washington,* Seattle, WA, USA

No Abstract

BLACK BEAR CARNIVORY OF UNGULATES: GLOBAL POSITIONING SYSTEM CLUSTER ANALYSIS AS A TOOL FOR ESTIMATION

SARAH KINDSCHUH, *New Mexico State University, Department of Fish, Wildlife, and Conservation Ecology*, Las Cruces, New Mexico 88003 USA

James W. Cain III, *U.S. Geological Survey New Mexico Cooperative Fish and Wildlife Research Unit, New Mexico State University, Department of Fish Wildlife and Conservation Ecology*, Las Cruces, New Mexico 88033 USA

ABSTRACT: GPS cluster analysis has been used to estimate predation rates and to describe prey composition of many large carnivores but has not yet been tested for American black bears (*Ursus americanus*). As omnivores, black bears exhibit different movement patterns than other large carnivores, therefore it is unclear whether this method is suitable for describing black bear carnivory. We are evaluating the use GPS cluster analysis in the Jemez Mountains of northern New Mexico to locate sites of black bear predation and scavenging of mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), and cattle. We will test a range of cluster characteristics as predictor variables in logistic regression analysis to determine whether GPS data can be used to remotely locate black bear carnivory events. We captured 25 bears between 2012 and 2014 to deploy GPS collars that transmit location data via satellite. We investigated clusters of GPS locations in the field to determine whether each site was used for feeding on ungulate prey or carrion. We visited over 775 clusters and identified 59 ungulate carnivory events, of which 39 were neonate or young of year elk. We are conducting analyses this winter with project completion expected in May 2015. If our GPS cluster analysis model proves accurate for black bear movement data, this new technique could provide researchers with an efficient tool for quantifying both the impacts black bear predation can have on ungulate populations and how ungulates as a food resource impact black bear population fitness.

Sarah Kindschuh 4214 NE 27th Ave Portland, OR 97211 (503) 501-1773

Email: skindsch@nmsu.edu


POSTERS

BLACK BEAR CONNECTIVITY MAPPING IN COMPARISON TO GRIZZLY BEAR LINKAGE AREAS IN SOUTHEAST BC AND NORTHWEST MONTANA AND IDAHO

MICHAEL PROCTOR, *Birchdale Ecological*, PO Box 606 Kaslo, BC, V0G 1M0, CANADA

Wayne Kasworm, *US Fish and Wildlife Service,* 385 Fish Hatchery Road, Libby, MT, 59923, USA

Chris Servheen, *US Fish and Wildlife Service, College of Forestry and Conservation,* 309 University Hall, University of Montana, Missoula, MT, 59812, USA

Thomas Radandt, *US Fish and Wildlife Service,* 385 Fish Hatchery Road, Libby, MT, 59923, USA

Grant MacHuthchon, *817 Mill St*. Nelson, British Columbia, V1L 4S8, CANADA

Mark Boyce, *Department of Biological Sciences, University of Alberta,* Edmonton, Alberta, T6G 2E9, CANADA

ABSTRACT: In previous research we identified grizzly bear fragmentation and linkage zones that might be managed to reverse the anthropogenic fragmentation in the Canada-US trans-border region of southeast BC and northern Montana and Idaho. We are in the process of assessing human-induced fragmentation of black bear populations by human settlement and transportation corridors, and preliminarily, it may exist. Here we use GPS telemetry data from 99 black bears to identify specific linkage habitat across 13 major highways and human settled valleys in the same region as we assessed grizzly bears. We use resource selection function and least cost modeling, and circuit theory to identify specific linkage areas for black bears. We compare our predictions to previously identified grizzly bear linkage areas. We found that 70% of all black bear highway crossings occurred in our predicted grizzly bear linkage zones. These results add another species to our efforts to build multiple-species connectivity data for region wide connectivity management.

Michael Proctor PO Box 606 Kaslo, BC, V0G 1M0, CANADA (250) 353-8082

Email: mproctor@netidea.com

KEEPING BEARS AND PEOPLE SAFE: DEFENDERS OF WILDLIFE'S BEAR-RESISTANT ELECTRIC FENCING INCENTIVE PROGRAM

ERIN EDGE, *Rockies and Plains Representative, Defenders of Wildlife*, 259 W. Front St., Suite B, Missoula, MT, 59802, USA (406) 728-8800, Email: eedge@defenders.org

ABSTRACT: Unsecured anthropogenic attractants like backyard chickens and garbage contribute to human-bear conflicts and result in considerable agency time and funding reacting to these issues. Such conflicts are frequently preventable through the application of tools such as electric fence or bear-resistant garbage storage. In 2010 Defenders of Wildlife created the Grizzly Bear Electric Fencing Incentive program to reduce human-bear conflicts. The program assists landowners with costs associated with installing a bear-resistant electric fence by reimbursing 50% of the cost of the fence, up to $500 per landowner. Our objectives are to: 1) directly prevent bear mortalities; 2) assist landowners with their ability to properly secure bear attractants; 3) improve tolerance and acceptance for bears; and 4) reduce the time agencies must spend reactively managing bear-human conflicts. Integral to the program is our full-time field technician whose job duties include assisting participants with materials lists, design ideas and hands on assistance with installation. In addition, the technician circulates information about the program and participates in outreach programs and electric fence workshops. From 2010-2011 the program reimbursed $100 to each of 18 participants in Montana and Idaho with the average cost of a small electric fence around $350-$450. Given low participation, we realized that a $100 reimbursement was still leaving prohibitive costs to potential users. In 2012 we reimbursed participants 50% of the cost of an electric fence up to a maximum of $500, targeted full page ads in local papers and distributed a new brochure. Interest in the program improved and from 2012-2014 we completed over 130 projects. Interest continues to grow and the program receives accolades from state, federal and tribal agencies as well as local residents. Measuring "success" for this type of site-based program is challenging. Defenders is conducting a survey of past participants to determine the efficacy and longevity of past projects. This will help strengthen and improve the program in future years. Future research could explore: 1) efficacy of variable electric fence designs deterring bears 2) Do programs like this reduce bear mortality in a population? 3) Does such a program improve social tolerance?

PUTTING BLACK BEARS ON THE MAP: USING HAIR SNARES TO MONITOR *Ursus americanus* IN SOUTHWESTERN ALBERTA

ANNE E. LOOSEN, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9 CANADA

Andrea T. Morehouse, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

Greg C. Hale, *Alberta Environment and Sustainable Resource Development, South Saskatchewan Region*, 12501–20 Avenue, Blairmore, AB, T0K 0E0, CANADA

Nora R. Manners, *Waterton Biosphere Reserve*, P.O. Box 7, Pincher Creek, AB, T0K 1W0, CANADA

Mark S. Boyce, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

ABSTRACT: Southwestern Alberta is an important area for maintaining connectivity with wildlife populations in British Columbia, Canada and Montana, USA. Aside from harvest and conflict records, few data exist for black bears in southwestern Alberta and provincial population estimates are 20 years old. Licensed hunters are not required to report harvest data and private landowners can harvest black bears year-round without a tag. Voluntary post-season hunter surveys indicate that 30% of the black bears in southwestern Alberta were harvested in 2013, based on the 20-year old population estimate. Despite significant harvests and a stable to decreasing human population, black bear complaints to Fish and Wildlife have been increasing. In partnership with a genetic sampling project to monitor grizzly bears, we established 899 non-invasive sampling stations to facilitate hair collection from black bears. Rub objects were visited 8 times May-November 2013-2014, sampling every 3 weeks. During 2015-2016, we will determine individual black bear identity and sex based on an analysis of nuclear DNA extracted from hair follicles. We will use these data to evaluate bear abundance, density, and distribution; how black and grizzly bears segregate habitat; and if increased hunting is correlated with reduced wildlife conflicts. We will present preliminary data on the spatial distribution of black bear detections, harvest locations, and conflict incidents.

Anne Loosen Box 176 Bellevue, Alberta T0K 0C0 CANADA (403) 627-6690

Email: loosen@ualberta.ca

USING DNA TO ESTIMATE BLACK BEAR DENSITY IN THE GREEN RIVER WATERSHED, WASHINGTON STATE, USA

MIKE T. MCDANIEL, *Michael P. Middleton, Muckleshoot Indian Tribe Wildlife Program*, Auburn, Washington, 98092. USA

ABSTRACT: We estimated the abundance and density of black bear (*Ursus americanus*) in the Green River Watershed (GMU 485) using hair trap, DNA based, mark recapture survey methods in the spring of 2013. The Green River Watershed is located in the central Cascade Mountains of western Washington and is the source of over a half million resident's water supply. Black bear density in GMU 485 was previously unknown, but is of interest to wildlife managers and commercial timber property owners alike. To estimate abundance and density of black bear in GMU 485we used 37 baited hair snags and 10 bear feeder hair snags to collect bear hair for DNA analysis. 366 hair samples were collected during our May-June 2013 trapping session. From a subset of 253 samples, 53 individual bears were detected a total of 192 times using microsatellite marker analysis. We estimated black bear abundance for the 360 km^2 study area in GMU 485 at 63 sub-adult to adult bears (95% CI =44-90) using program Density 5.0's spatially explicit models with baited hair trap data only. Our black bear density estimate for GMU 485 (17.52 bears/100km^2, 95% CI=12.22-25.07) is considerably lower than the Washington Department of Fish and Wildlife's previously estimated bear density for Western Washington habitats of 39 bears/100km^2 (WDFW 1997) and may warrant a change in management approaches that assume a much higher bear density.

GRIZZLY BEAR MONITORING: ANALYZING RUB OBJECT LOCATIONS IN RELATION TO AREAS OF HIGH QUALITY HABITAT AND RISK MORTALITY

MICHAEL S. VERHAGE, *Alberta Conservation Association*, Lethbridge, AB, T1J 0P3, CANADA

Andrew Braid, *MSc. Student, University of Alberta, University of Alberta*, Department of Renewable Resources, Applied Conservation and Ecology Lab, Edmonton, AB, T6G 2E9, CANDA

Scott Nielson, *University of Alberta, University of Alberta, Department of Renewable Resources*, Applied Conservation and Ecology Lab, Edmonton, AB, T6G 2E9, CANADA

ABSTRACT: Monitoring grizzly bear population density and distribution in southwestern Alberta (Bear Management Area 5; BMA 5) has been identified as a priority by the province's ministry of Environment and Sustainable Resource Development (AESRD). In support of this need, in 2014 the Alberta Conservation Association (ACA) began collaborating with AESRD and other project partners to establish an updated density estimate and distribution information based on the DNA material collected at rub objects. In the spring of 2014, we began this multi-year effort by establishing survey routes within the public land *recovery zone* portion of the southern half of the study area. We identified 412 naturally existing rub objects and attached short strands of barbed wire to the surface of each. At each site we recorded a number of variables that relate to rub object site characteristics, observed bear signs, presence and condition of hair. Rub objects identified in 2014 were found to be most frequently associated with lodgepole pine trees, a smooth rubbed surface and the presence of bear hair. An overlay of rub object locations onto a map of grizzly bear food resources and mortality risk found that approximately 24% of rub objects fell within moderately productive habitat quality. In 2015, we will continue to identify rub objects within the study area, focusing on an area that parallels the *recovery* zone to the east and is mainly lower elevation private land. At the same time, we will also revisit a subset of drainages within of the southern *recovery* zone in efforts to set up additional rub objects located in these areas. We plan to use grizzly bear habitat productivity and mortality risk models to guide this process. In 2016, once all rub trees have been identified and set up across BMA 5, a subset of rub objects will be selected and monitored by ACA, and ideally a network of volunteer groups. Hair samples from grizzly bears will be collected from rub objects and sent to a laboratory for DNA analysis, where they will be identified to individual, species and gender. This data will then be used to perform a mark-recapture population analysis for BMA 5 or a portion there of. Results of our rub object identification work to date has provided information on bear distribution and the proximity of rub object locations to areas of high quality grizzly bear habitat and mortality risk.

USING AVERSIVE CONDITIONING TO KEEP BEARS WARY OF TRAFFIC

LORI HOMSTOL[1], Claire Edwards[1], Carrie Hunt[2]

ABSTRACT: Aversive conditioning is often practiced as an attempt to reduce human-caused bear mortality. Roadside aversive conditioning can be used to teach bears to be wary of traffic on roadways, without requiring the animal to avoid a potentially valuable food resource. Conditioning roadside animals requires a high amount of contact projectiles, such as rubber bullets, bean bag rounds and paintballs. Paired with noise stimuli, animals easily learn to avoid traffic. We discuss how bears managers can identify the most likely candidates for successful aversive conditioning, and what they can expect when conditioning human-habituated bears. We describe, through case studies, how many aversive conditioning applications are required to make bears more wary of vehicles, and how long the process can take. After a single day, bears begin changing their response to vehicles, retreating instead of remaining in view on the right-of-way. Within a few days, bears usually will consistently avoid traffic while still utilizing resources near the road. Periodic booster work will help maintain the desired behaviour. This can reduce the likelihood of bears being fed roadside or becoming habituated to humans.

[1] Wind River Consulting Box 1623 D'Arcy, BC, V0B 1L0, CANADA

[2] Wind River Bear Institute Florence, MT, 1172, USA

ISOTOPIC HETEROGENEITY IN WHITEBARK PINE (*PINUS ALBICAULIS* ENGELM.) NUTS ACROSS GEOGRAPHIC, EDAPHIC AND CLIMATIC GRADIENTS IN THE NORTHERN ROCKIES (USA)

MARY F. MAHALOVICH, *USDA Forest Service, Northern, Rocky Mountain, Southwestern, and Intermountain Regions*, Forestry Sciences Lab, 1221 S. Main St., Moscow, ID 83843-1134, USA mmahalovich@fs.fed.us, (208) 883–2350.

Mark J. Kimsey, *Intermountain Forest Tree Nutrition Cooperative*, University of Idaho P.O. Box 441133, University of Idaho, Moscow, ID, 83844-1133 USA mkimsey@uidaho.edu

Jennifer K. Fortin-Noreus, *US Geological Survey, Alaska Science Center*, 4210 University Dr., Anchorage, AK 99508-4626 USA jfortin-noreus@usgs.gov

Charles T. Robbins, *School of the Environment and School of Biological Sciences*, P.O. Box 644236, Washington State University, Pullman, WA 99164-4236, USA ctrobbins@wsu.edu

ABSTRACT: The overall health and persistence of whitebark pine is of international concern. Extensive tree mortality and loss of vigor from the non-native pathogen white pine blister rust (*Cronartium ribicola* A.Dietr.*)*, mountain pine beetle (*Dendroctonus ponderosae* Hopkins), altered fire regimes, and climate change endanger the existence of whitebark pine as a species and as an important food source (pine nuts) for several niche wildlife species. Prior stable isotope analysis of whitebark pine revealed diversity in intrinsic water-use efficiency and nutritional status; however, small sample sizes prohibited the identification of geo-climatic effects on those isotopes. Identification of whitebark pine isotopes as a function of geography, soil parent material and climate would allow geneticists the opportunity to select individuals better suited to optimize survival, vigor and cone production. Matching genetic resources to sites projected to support whitebark pine in future climates would ensure species persistence, while safeguarding an important wildlife food source and wildlife habitat. We summarize the natural abundance of three isotopes ($\delta^{13}C$, $\delta^{15}N$, and $\delta^{34}S$) and carbon-isotope discrimination ($\Delta^{13}C$), a proxy for drought tolerance, in whitebark pine nuts in the Northern Rockies. Spatial differences in all isotopes and $\Delta^{13}C$ were broad with relatively flat geographic and climatic clines and low to moderate R^2-values. Variability in geographic source pools, soil parent material and climate contributed to the low to moderate spatial resolution in selected models (R^2-values ranged from 0.25 to 0.60). Exploring the underlying factors contributing to spatial heterogeneity revealed previously unknown edaphic variation in whitebark pine. From a wildlife perspective, whitebark pine nuts retained a unique $\delta^{34}S$ signature relative to other dietary foods; however, future applications to determine the proportion of pine nuts in assimilated wildlife diets will need to accommodate spatial heterogeneity in whitebark pine nuts, animal tissue turnover rates, nutrient concentrations, and seasonal availability of other foods. Suitable wildlife habitat for projected warmer, drier climates was characterized as $\Delta^{13}C$-depleted sources in the southeastern portion of the Northern Rockies.

IDENTIFICATION AND MODELING OF BLACK BEAR (*URSUS AMERICANUS*)-VEHICLE COLLISIONS ZONES IN YOSEMITE NATIONAL PARK, CA, USA

KATIE E. RODRIGUEZ, *San Jose State University, Biological Sciences Dept*., San Jose, CA, 95192, USA

Shannon Brose-Seemann, *San Jose State University, Biological Sciences Dept*., San Jose, CA, 95192, USA

ABSTRACT: Black bear- vehicle collisions are an example of increasing problems associated with wildlife-vehicle collisions in North America. The purpose of this study is to identify road and habitat characteristics associated with black bear-vehicle collisions and suggest proper mitigations to reduce the occurrence of black bear-vehicle collisions within Yosemite National Park. Black bear-vehicle collision data collected by Yosemite National Park Service for 1995-2011 was used to identify factors associated with collisions. Spatial pattern analysis and GIS hot spot analysis were used, respectively, to determine if high frequency collision sites existed and their locations. Road and bear habitat related characteristics were measured in high, moderate, low and zero collision frequency 1km road segments. Variables measured through driving surveys and GIS data were proportions of road segments with: possible crossing areas, minimum stopping distance, understory vegetation, downhill slope, drainages, speed limit, road straightness index, distance to human development, distance to meadows, and distance to trails. Logistic regression analyses showed that several factors were related to bear-vehicle collisions. Bears are more likely to be hit by vehicles in areas where there were more crossing sites available, more understory vegetation, higher curve index, closer proximity to meadows, and small outbound shoulder slope. High frequency of collisions are more likely in areas where there was a lack of visibility, smaller areas to cross the road, high understory cover, high inbound shoulder slope, close proximity to human development and meadows, and high outbound shoulder slope. The results of qualitative analysis suggested several demographic and temporal patterns. Cubs appeared to be affected and females were involved in slightly more collisions than males. Collisions were more likely to occur in dusk hours (15:00- 21:00) during months of high park visitation (June-September). A synthesis of the results indicated several potential mitigation strategies. Increasing visibility for drivers and black bears approaching roads could reduce frequency of collisions. Installing bear crossing signs, decreasing speed limits, and increasing law enforcement patrolling of high frequency collision zones could aid in altering driver behavior and reduce the likelihood of a collision. Additionally, constructing wildlife crossing structures or enhancing existing culverts could reduce both the likelihood of collisions and collision frequency.

Katie Rodriguez, M.S. (Cand.) San Jose State University- Biology Dept. 1894 Montford Ct. San Jose, CA, 95132, USA (408)806-5448 Email: kerodriguez8@gmail.com

AN EVALUATION OF LITERATURE-BASED VERSUS EMPIRICAL BLACK BEAR DENSITY ESTIMATION IN WASHINGTON

LINDSAY S. WELFELT, *Large Carnivore Conservation Lab, Washington State University*, Pullman, Washington, 99164, USA

Richard A. Beausoleil, *Washington Department of Fish and Wildlife*, 3515 State Highway 97A, Wenatchee ,WA, 98802, USA

Benjamin T. Maletzke, *Washington Department of Fish and Wildlife*, PO Box 238, South Cle Elum, WA, 98943, USA

ABSTRACT: Washington Department of Fish and Wildlife estimates the black bear (*Ursus americanus*) population in Washington State between 25,000 and 30,000. This abundance estimate was calculated in 1997 by extrapolating home range and overlap data from scientific literature and applying standardized densities to eastern and western WA of 18 and 39 bears/100km^2, respectively. Since that time however, no rigorous population assessments have been conducted to evaluate the accuracy of these results. Recent research using GPS radiocollars suggests home ranges in Washington may be larger than originally expected, resulting in potentially lower abundance and densities, thus conceivably higher harvest rates which may be of management concern. To evaluate density, we conducted research between 2013-2014 on 2-500km^2 study areas in the Cascade Mountains (eastern vs. western slope). We used a combination of hair collection via barbed-wire enclosures and physical capture to identify over 350 individuals using microsatellite DNA analysis; 82 of these bears were GPS collared. Hair collection and physical capture efforts were systematically distributed on a 16km^2 grid with alternating study area schedules (and bait types) to lower bias during sampling; this resulted in six mark-recapture sampling sessions each year. To account for lack of geographic closure, we analyzed data with 'density using telemetry' models in Program MARK and spatially explicit capture-recapture. These two methods of density estimation will be compared and results will be presented at the workshop. We intend to use results to provide the agency with empirical density estimates and an updated statewide black bear population estimate. We also plan to develop and recommend a statewide agency bear monitoring protocol that district biologists can efficiently implement to monitor population trends by simulating reductions in our spatial distribution and sampling intensity to assess minimum effort needed to produce similar precision in results.

AN AGENT-BASED MODEL OF BLACK BEAR MOVEMENT AND HUMAN-BEAR INTERACTIONS

JESSA MARLEY, *University of British Columbia Okanagan, The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services* (BRAES), Kelowna, BC, V1V 2A3, CANADA

Joseph Salkeld, *University of British Columbia Okanagan, The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services* (BRAES), Kelowna, BC, V1Y 8P4, CANADA

Lael Parrott, *University of British Columbia Okanagan, The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services* (BRAES), Kelowna, BC, V1V 1V7, CANDA

Sue Senger, St'át'imc *Government Services Environmental Program*, Lillooet, BC, V0K 1V0, CANADA

Rebecca Tyson, *University of British Columbia Okanagan, The Okanagan Institute for Biodiversity, Resilience, and Ecosystem Services* (BRAES), Kelowna, BC, V1V 1V7, CANADA

ABSTRACT: As human communities expands into previously uninhabited areas, interactions with wild animals increase in frequency. The nature of these interactions can be detrimental to humans and animals alike. We focus on the relationship between urban areas and black bears, and the human-bear conflicts that can result from a bear's dietary choices. Using an agent-based model we investigated the effects of education programs like Bear Aware on the number of conflict bears in an urban area. Variables tested included the size of the urban community as a proportion of human population educated and the method of teaching. The results indicate that education does have a negative impact on the number of human-bear conflicts, and that the focus of the education (increasing vigilance or decreasing attractants) as well as the spatial arrangement of educated neighborhoods have an impact on the number of conflict bears that develop. It appears that education is a useful way to reducing the number of bears exterminated each year.

Jessa Marley, Unit 1517 1875 Country Club Drive, Kelowna, BC, V1V 2A3, CANADA
(250) 801-1836 Email jessa.marley@alumni.ubc.ca

PATTERNS OF GRIZZLY BEAR CONFLICT IN SOUTHWESTERN ALBERTA

ANDREA T. MOREHOUSE, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

Greg Hale, *Alberta Environment and Sustainable Resource Development*, Blairmore, AB, T0K 0E0, CANADA

Mark S. Boyce, *University of Alberta, CW405 Department of Biological Sciences*, Edmonton, AB, T6G 2E9, CANADA

ABSTRACT: Facilitating coexistence between people and carnivores in multi-use landscapes is a fundamental challenge of contemporary conservation. Documenting the type and distribution of conflicts is a first step to any effort to reduce conflicts because it ensures that future work is appropriately targeted. In Alberta**,** conflicts between people and grizzly bears are common in the southwestern corner of the province. In this region, agriculture is the predominant human land use, and human-populated lands overlap considerably with the geographical ranges of grizzly bears. Successful mitigation programs are likely to be those that relate to the species' life history and behaviour, identify how to mitigate carnivore-human conflicts, and communicate methods that are palatable to local communities. We have categorized conflicts for grizzly bears using enforcement occurrence records of Alberta Environment and Sustainable Resource Development (AESRD) from 1999 (earliest records in electronic occurrence database) through 2014. We used the following terms to classify each occurrence as either: 1) *Sighting:* carnivore seemingly unaware of the person, no observable stress-related response during the interaction; 2) *Incident:* carnivore caused property damage, obtained anthropogenic food, killed or attempted to kill livestock or pets, or was involved in a vehicle collision; or 3) *Human Conflict:* carnivore made physical contact with person or was intentionally harmed or killed by the person. We focus on incidents and human conflicts as opposed to sightings because they represent actual interactions between people and carnivores. When possible we evaluated the sex ratio of animals involved in conflicts. Dominance hierarchies predict that subordinate individuals (i.e. females and young males) should occur more frequently in conflict records. Alternatively, if older males dominate conflict records that would suggest that either agricultural lands might represent high-quality habitats or that food shortage is occurring in remote areas. We review temporal and spatial patterns of grizzly bear conflict, discuss potential explanations for the observed patterns, and present potential mitigation measures to deal with conflict.

PHYLOGEOGRAPHIC ANALYSES OF AMERICAN BLACK BEARS SUGGEST THREE GENETIC LINEAGES EXPANDING FROM FOUR GLACIAL REFUGIA WITH COMPLEX PATTERNS OF POST-GLACIAL ADMIXTURE

EMILY E. PUCKETT, *University of Missouri, Division of Biological Sciences*, Columbia, MO, USA, 65211, USA

Lori S. Eggert, *University of Missouri, Division of Biological Sciences*, Columbia, MO, USA, 65211, USA

ABSTRACT: Previous phylogeographic studies of the American black bear (*Ursus americanus*) identified two mitochondrial clades where the B (or Coastal) clade was geographically restricted to the Pacific Northwest and the A (or Continental) clade was distributed across the remainder of the range. We identified nuclear and mitochondrial lineages across the range by genotyping 94 bears at 22k SNP loci and sequencing mitochondrial haplotypes of 387 bears, spanning eight of the sixteen subspecies ranges. We identified three broadly distributed lineages and nine nuclear genetic clusters within those lineages, including: Alaskan (Alaska-East), eastern (Central Interior Highlands, Great Lakes, Northeast, Southeast), and western (Alaska-West, West, Pacific Coast, Southwest). We also identified three mitochondrial clades (A-east, A-west, and B). Despite there being three nuclear and three mitochondrial lineages, the geographic distribution and temporal divergence time between the lineages were not congruent indicating mito-nuclear discordance. We combined estimates of the timing of lineage divergence with hindcast species distribution models to infer glacial refugia for the species in Beringia, Pacific Northwest, Southwest, and Southeast. Our results show complex patterns of admixture due to expansion out of multiple refugia. Specifically, the West cluster was formed from admixture between the western and Alaskan lineages. While the Great Lakes and Northeast clusters were predominately formed from range expansion of the eastern lineage, long distance expansion of the Alaskan lineage also contributes to their genomes. Additionally, our inference of post-glacial range expansion routes provides insight into the distribution of genetic diversity across the range. Finally, black bear biologist should consider reevaluating subspecies designations based on genetics and morphology as our three lineages did not align with subspecies ranges.

RETENTION AND CREATION OF DEN STRUCTURES FOR BLACK BEARS IN COASTAL BRITISH COLUMBIA

HELEN DAVIS, *Artemis Wildlife Consultants*, Victoria, BC, V9A 4P7, CANADA

ABSTRACT: American black bears (*Ursus americanus*) require suitable winter den sites to provide security and cover to successfully survive the critical winter denning period. Dens are reused intermittently over decades, if not longer, and may be used by successive bears (Davis et al. 2012). On Vancouver Island, winter dens used by black bears have been found in or beneath large diameter (mean = 143 cm) trees or wooden structures derived from trees (i.e., logs, root boles and stumps; Davis 1996). It is likely that black bears do not use structures other than wooden ones in coastal BC because of the cool and wet climate during the denning period.

Current and historic land management activities in coastal forests have affected the supply of these critical element-level features. Most prominently, forest harvesting has removed many large trees that are needed to form these den structures. Furthermore, these large structures are not replaced during forest rotations because the new crops of trees are not allowed to grow to sufficient size for replacement dens to develop. Further negative impacts to the den supply come from harvesting of second growth, which may damage the few residual structures remaining from old growth harvesting. Despite the knowledge that these habitat features are critical to the over-winter survival of black bears, no regulatory protection is in place for these critical structures in BC.

The objectives of this project are two-fold. First, this project aims to mitigate losses of denning opportunities by enhancing natural structures by creating entrances to cavities in existing old growth trees or large legacy stumps that have hollow centres. Second, this project has installed and is evaluating the efficacy of artificial den structures. Ten dens (7 in natural structures, 3 artificial) were created in 2014 and up to 10 more are planned for 2015. Goals of the project include 1) increased awareness by forest companies of the need for retention of bear den structures and possibilities for den creation in coastal BC, especially during second growth harvesting, and, 2) increased awareness by government policy makers of the need for regulation to protect these critical forest elements.

Helen Davis
Artemis Wildlife Consultants
1064 Colville Road
Victoria, BC V9A 4P7
Phone (25)388-5515
Email hdavis@artemiswildlife.com

USING AN INTERDISCIPLINARY APPROACH TO ADDRESS BEAR MANAGEMENT IN ROCKY MOUNTAIN PROTECTED AREAS

SARAH ELMELIGI, *PhD Candidate, Central Queensland University*, 200-186 Kananaskis Way, Canmore, AB, CANADA, T1W 0A2 (summer address), Cell: +1 403-688-8641 sarah.elmeligi@cqumail.com

Professor Owen T Nevin PhD, Primary Supervisor, Vice Chancellor Gladstone Campus, *Central Queensland University Gladstone*, Leo Zussino Building, Bryan Jordan Drive, Gladstone QLD, AUSTRALIA, 4680. Cell: +61 4 2895 6613. o.nevin@cqu.edu.au

ABSTRACT: Banff, Jasper, Kootenay, and Yoho National Parks are visited by over 5 million people each year and home to approximately 300 bears (both grizzly and black bears). Appropriately managing human use in bear habitat is essential to ensure bears have adequate access to habitat resources, and that people have adequate access to safe and high quality recreation experiences. Through an interdisciplinary approach, we are holistically examining ecological and sociological aspects to improve understanding of bear and human-use management. While this research effort has focused on grizzly bears, the methodological approach may be useful to increase our understanding of human dimensions associated with black bear management. By quantifying grizzly bear habitat use spatially and temporally in and around hiking trails in the Rocky Mountain National Parks while simultaneously quantifying visitor support for management options, we will provide a comprehensive series of interdisciplinary management recommendations designed to maximize grizzly bear habitat security and minimize impacts to the visitor experience. Remote cameras and GPS units have been used to quantify grizzly bear and human use of trails in the National Parks. A visitor survey measured trail user support for various management actions pertaining to grizzly bear activity adjacent to hiking trails. Remote cameras show an abundance of human use on most trails; people and bears are sharing hiking trails spatially and temporally regularly throughout the days and seasons. Grizzly bear trail use appears dependent on human trail use, but also on the density of hiking trails in the bear's home range. Overall, trail users were supportive of restrictive management options, such as closing the trail and not allowing dogs on the trail; even more so when a female grizzly with cubs was in the area. Trail users consistently opposed aversively conditioning or relocating the bear. Understanding what kinds of management options trail users are most supportive of helps managers make decisions they know will have a large base of public support.

GRIZZLY BEAR COEXISTENCE SOLUTIONS

GILLIAN SANDERS, *Meadow Creek Bear Education and Management Project*, Meadow Creek BC, V0G 1N0, CANADA

ABSTRACT: Environmental Education is becoming increasingly important as human populations expand into wildlife habitat, often resulting in human-wildlife conflict that contributes to conservation challenges. Meadow Creek, an isolated rural community in southeast BC, has experienced a long history of conflicts with grizzly and black bears that resulted in significant bear mortalities and likely became an attractant sink between the Central Selkirk and Purcell grizzly populations. The Meadow Creek Bear Education and Management Project combines education, research, and bear conflict management to improve a community's ability to coexist with bears in prime habitat. The local Meadow Creek Kokanee Spawning Channel (MCSC) attracts bears and visitors who wish to view and photograph bears, resulting in increased need to prevent food conditioning and habituation in the community. I applied improved attractant management, community education, and community involvement in a study about what works to improve human-grizzly bear coexistence. Twenty eight resident participants with diverse values contributed to in-depth interviews and focus group that revealed perceived barriers and potential solutions to coexistence. Results showed increased attitudes of tolerance since mid-2000s but that on-going adaptive support is needed. The most important contributions to coexistence are electric fencing to protect livestock, providing options for attractant management without giving unsolicited advice about private property management, and demonstrating that these options work. Since 2007, I installed 29 electric fences in Meadow Creek and controlled the attractants of 80% of the residents who needed better attractant management. We have seen a significant increase of tolerance in human behaviours toward bears, resulting in reduced bear conflicts and number of bears killed as a result of conflicts. DNA results show 21 grizzly bears frequented MCSC and/or the nearby rich low elevation spring habitat at least once in 2011-2013 without conflicts with humans. The success of this work has let to expansion of educational effort throughout the rural but socially diverse Kootenay Region of BC, with 55 electric fences installed regionally in 2012-2014. This work may be a useful study for communities in linkage areas between core populations of wildlife, areas of high human-bear conflicts, and people living with recovering bear populations.

INDIVIDUAL-BASED MODELLING OF CONFLICT BEAR FORAGING IN WHISTLER, BC: AN ASSESSMENT OF THE EFFECTIVENESS OF MANAGEMENT STRATEGIES IN REDUCING HUMAN-BEAR INTERACTIONS

JOE SALKELD, *University of British Columbia Okanagan, BRAES Institute,* Kelowna, BC, V1Y 8P4, CANADA

Tony Hamilton, *BC Ministry of Environment, Conservation Sciences Section,* Victoria, BC, V8W 9M1, CANADA

Jessa Marley, *University of British Columbia Okanagan, BRAES Institute,* Kelowna, BC, V1V 2A3, CANADA

Rebecca Tyson, *University of British Columbia Okanagan, BRAES Institute,* Kelowna, BC, V1V 1V7, CANADA

Lael Parrott, *University of British Columbia Okanagan, BRAES Institute,* Kelowna, BC, V1V 1V7, CANADA

ABSTRACT: The killing of known conflict animals is not a sustainable solution to existing human-black bear conflicts. Decisions about which, among many proactive measures are most effective and of highest priority for an area can be based on animal response and resources. We developed an individual-based model using NetLogo to simulate the seasonal movement of black bears in a highly modified landscape that includes urban core at the Resort Municipality of Whistler (RMOW). The model simulates the movement of individual bears as they forage on the landscape over a single growing season (early spring to late summer as determined by ripening of local berries). The bear movement in the model depends on the current and remembered food quality (in terms of bear preference) of the landscape, which was calibrated using data from collared conflict bears in the RMOW. Food quality values were spatially generated from relative ratings of bear habitat types derived from an ecological land classification and map (Terrestrial Ecosystem Mapping (TEM) data), in combination with assumed vegetative food plant phenology and biomass. The modeled landscape also included human food sources within urban areas that attracted bears, and thus lead to bear habituation towards humans. The model was used to predict the location and frequency of human-bear interactions while proactive measures were implemented. The simulation results give us insight into the relative effectiveness of different management strategies, such as selective elimination of urban access points, and spatial configurations of human education to reduce bear attractants and increase aversive conditioning.

Joe Salkeld 1395 Kelglen Crs Kelowna B.C. V1Y 8P4, CANADA (778) 821-1159
Email: Joe.salkeld@alumni.ubc.ca

BEAR / HUMAN MANAGEMENT –THE ART OF COMMUNICATING IN SOCIAL MARKETING, "THE CONFLICT OF CONFLICT"

STEPHANNE DENNIS, *Human-Wildlife Dynamics, Department of Fisheries and Wildlife*, Oregon State University, Corvallis, OR 97331, USA. Ph: (423) 413-1460.
E-mail: sdennis@twrf.net

DARYL RATAJCZAK, *Chief of Wildlife and Forestry*, *Division of Wildlife*, Tennessee Wildlife Resources Agency, Nashville, TN 37204, USA. Ph: (615) 293-7597.
E-mail: daryl.ratajczak@tn.gov

WILLIAM H. STIVER, *Supervisory Wildlife Biologist, Great Smoky Mountains National Park*, National Park Service, Gatlinburg, TN 37338, USA. Ph: (865) 436-1251.
E-mail: bstiver@nps.gov

ABSTRACT: As wildlife science professionals we are aligned to the same goals for human-wildlife coexistence: mutually beneficial cohabitation and peaceable coexistence between humans and wildlife. As such, managing human behaviors comprises a large part of wildlife management with substantial public responsibility regarding black bear (Ursus americanus). Public perceptions on species often influence the management of the species. These opinions are often influenced directly by the language used (i.e., attack, conflict, interaction, encounter, etc.) and the style used to deliver the message (Olson 2009). Communications, especially communications with the public, require proficiency with engaging, direct dialogue and consideration given to science-related terms to recognize potential ulterior implications. State and federal wildlife agencies often frame black bear management strategies in context of "conflict resolution," possibly generating unintended or antithetical consequences. Other terms in wildlife sciences are equally misleading or misunderstood by the general public and fellow wildlife professionals, many of these working directly against the meanings we seek to imbue. Furthermore, efficacy of existing bear education programs remains relatively unknown exacerbating the need for human dimension considerations when developing and initiating social marketing projects (Baruch-Mordo 2009). In some regions, the majority of people (57%) cannot identify the agency responsible for managing the wildlife within their state (Duda 2012). The failure of wildlife agencies to utilize communication-specialists to "speak the language" of the general public when developing educational and outreach materials may contribute to these dubious statistics. These concerns must prompt a "need to develop more efficient resources and people management but also to change some of our attitudes and expectations" (Herrero 2002). As we strive and learn to become better wildlife managers, we must accept that "scientists need artists" (Olson 2009); they need specialists with the talent and skill to motivate and educate the public because only with resounding public support can black bears truly be managed.

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BLACK BEAR
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CANMORE, ALBERTA 2015