

**20<sup>th</sup> Annual North American Wolf Conference**  
**Chico Hot Springs, Pray Montana**

**Monday April 7<sup>th</sup>**

6:00 - 8:00      **Icebreaker Social (Denny Olson – as “Crittterman”  
Educational Presentation)**

**Tuesday April 8<sup>th</sup>**

8:00 - 8:30      **Welcome: Introductions and Announcements**

8:30 - 9:00      **Cascades of Symbolism, Policy, Science, and Management:  
Conserving and Managing Montana Wolves in 2008 and  
Beyond**  
Carolyn Sime, Gray Wolf Program Coordinator, Montana Fish,  
Wildlife & Parks

9:00 – 9:30      **Wolves, Prey and Fire in Central Idaho Wilderness**  
Jim Peek, Department of Fish and Wildlife Resources

9:30 – 10:00      **Developing a Wolf Conservation and Management Plan for  
Washington**  
Harriet Allen, WDFW, Olympia, WA

10:00 - 10:30      **~Break~**

10:30 - 11:00      **An Alternative Proposal for the “Conservation” of Mexican  
Gray Wolves**  
David Parsons, The ReWilding Institute

11:00 - 11:30      **Red Wolf Five Year Review – Status and  
Recommendations**  
Bud Fazio, Team leader, USFWS Red Wolf Recovery Program

11:30 - 12:00      **Ecological and Evolutionary Divergence Among and  
Within Wolves of Western North America, with Special  
Focus on Rainforest Wolves of Coastal British Columbia**  
Chris Darimont, (University of California, Santa Cruz), co-  
authors: Thomas Reimchen, Violeta Muñoz, Jennifer Leonard,  
Robert Wayne, and Paul C Paquet

- 12:00 - 1:00      **~Buffet Style Lunch~**
- 1:00 - 1:30      **How Many and Where: Applying Principles of Conservation Planning, Genetics, and Policy Science to Wolf Recovery Goals under the Endangered Species Act**  
Carlos Carroll, Klamath Center for Conservation Research
- 1:30 - 2:00      **What Does It Mean For A Species To Be Endangered In A “Significant Portion Of Its Range”?**  
Jeremy Bruskotter, Ohio State University, Sherry Ensler, University of Minnesota, Melanie Houston, Ohio State University
- 2:00 - 2:30      **~Break~**
- 2:30 - 4:00      **Proactive Projects Case Studies Panel**  
Lane Adamson, Jael Kampfe, Carter Niemeyer, Rick Williamson, Doug Hesse, Janelle Holden, Jesse Timberlake  
Suzanne Stone – Moderator
- 6:00 – 7:00      **Wolves of Yellowstone: Exciting Sneak Preview footage of Yellowstone wolves by world-renowned filmmaker Bob Landis.**

**Wednesday April 9th**

- 8:00 - 8:30      **Wolves in the Crosshairs: A Scientific Case against the Final Rule of the U.S. Fish and Wildlife Service Removing Northern Rocky Mountain Gray Wolves from the Endangered Species List**  
Valerie Bittner, Attorney, Seattle, WA
- 8:30 - 10:00      **Northern Rocky Mountain Wolf Delisting Panel**  
Panelists to be announced. Jamie Clark -- Moderator
- 10:00 - 10:30      **~Break~**
- 10:30 – 11:00      **Analysis of Population Structure and Gene Connectivity in the Gray Wolves (*Canis lupus*) of the Northern Rocky Mountains**  
John P. Pollinger, UCLA

- 11:00 – 11:30      **Biogeographic and Genetic Factors in Rocky Mountain Wolf Populations**  
Ken Fischman, Ph.D. (Genetics), Ancient Pathways to a Sustainable Future, Sand Point, Idaho
- 11:30 – 12:00      **Movements, Prey and Habitat Selection by Wolves**  
Andrea Morehouse, University of Alberta
- 12:00 - 1:00        ~ **Buffet Style Lunch** ~
- 1:00 - 1:30         **Tracking Wolves Post Delisting**  
David Ausband, University of Montana, Bozeman, MT
- 1:30 - 2:00         **Torrent or Trickle? Elk, Wolf, and Human Influences on Willow Determine Yellowstone's Trophic Cascade**  
Nathan Varley, M. S. Boyce, E. H. Merrill, R. L. Crabtree, University of Alberta, Edmonton, Yellowstone, Alberta, Canada and Ecological Research Center, Bozeman, MT
- 2:00 - 2:30         **Foraging Strategies of Eastern Wolves in Relation to Migratory Prey in Algonquin Provincial Park**  
Karen Loveless, Trent University
- 2:30 - 3:00         ~**Break**~
- 3:00 - 3:30         **Delisting Wolves: Are the Western Great Lake States Ready?**  
Dr Edward Fitzgerald, Wright State University, Dayton, OH
- 3:30 - 4:00         **America's Wolves Lawyer Up**  
Rob Edward and Melissa Hailey, WildEarth Guardians
- 7:00 - 9:00         **Alpha Award Banquet**  
**(Cocktail Hour sponsored by NRDC)**
- Alpha Award presented by Wolf Recovery Foundation**
- Keynote Speaker – Doug Smith, Yellowstone Wolf Update: Numbers, Population Regulation, and Age Structure**
- Live Auction (with Rick Williamson) and Silent Auction benefiting nonlethal, proactive wolf projects efforts in the Northern Rockies**

## Thursday April 10<sup>th</sup>

- 8:00 - 8:30      **Assessing Ranchers' Attitudes toward Livestock Compensation in the Southwest**  
Stacy J. Vynne, University of Oregon
- 8:30 - 9:00      **Howling Differentiation between North American Grey Wolves**  
Nicholas Bromen, Wolf Haven International, Tenino, WA
- 9:00 - 10:00     **A Prejudice Born of Fear and Ignorance - Did Wolves Kill Kenton Carnegie?**  
Paul C. Paquet, Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan
- 10:00 - 10:30    **~Break~**
- 10:30 - 11:00    **Costs of Wolves' Visits on Cattle and Elk**  
Isabelle Laporte, Master student, Faculty of Environmental Design, University of Calgary
- 11:00 - 11:30    **Aerial Survey Approach and Population Dynamics**  
Nathan Webb, University of Alberta
- 11:30 - 12:00    **Closing Comments**
- Noon              **~ Buffet Style Lunch ~**

**Thank you and see you all next year!**

## Friday April 11th

### **Yellowstone Wolf Field Trip with Doug Smith**

For those registered, the Yellowstone field trip vans will depart Chico Hot Springs main lobby at 5 am and will return before noon. Sack breakfast and sack lunches are provided. Please dress for the weather (layers are best), wear good walking shoes, and bring your own binoculars, sunscreen (hopefully needed), and water. If you have any questions, please contact Jesse Timberlake at (208) 424-9385 or email [jtimberlake@defenders.org](mailto:jtimberlake@defenders.org).

**20<sup>th</sup> Annual North American Wolf Conference**  
**Abstracts**  
**In order of Appearance**

**Tuesday 8:30 – 9:00 am**

**Cascades of Symbolism, Policy, Science, and Management: Conserving and Managing Montana Wolves in 2008 and Beyond**

Carolyn Sime, (Gray Wolf Coordinator Wildlife Division, Montana Fish, Wildlife and Parks, 1420 E. 6<sup>th</sup> Ave, Helena, MT 59620-0710, (406) 444-3242, (406) 461-0587 (Cell), [casime@mt.gov](mailto:casime@mt.gov)), Val Asher, (Turner Endangered Species Fund), Liz Bradley, Kent Laudon, and Mike Ross, (Montana Fish, Wildlife & Parks), John Steuber, Kraig Glazier, and Jim Hoover, (USDA APHIS Wildlife Services)

The year 2008 marks the 28<sup>th</sup> year that wolves have been in northwest Montana and the 13<sup>th</sup> year that wolves have been in southwest Montana. It marks the 8<sup>th</sup> year in which Montana has been officially engaged in a broad, diverse conversation about wolves. It marks the 6<sup>th</sup> year in a row in which wolves have met the biological recovery goal for the Northern Rockies. And, it marks the 4<sup>th</sup> year in which Montana Fish, Wildlife & Parks has been the lead agency for wolf conservation and management. While cascades of symbolism have ebbed and flowed and science has advanced, somewhere in between the two is the reality of what it means biologically, socially, and politically to have, live with, and manage a restored wolf population.

The Montana wolf population continues to be secure, though dynamic. Outside national parks, wolves share a landscape with people. Like other wildlife species, Montana's wolf population is subject to checks and balances, including strong reproduction in some areas, disease, vehicle strikes, and mortality due to conflicts with people. From 2006 to 2007, the minimum estimate of the Montana wolf population increased by 34%. Nineteen new wolf packs were documented in 2007. The majority of the increase was in the Northwest Montana Endangered Area and the Montana portion of the Central Idaho Experimental Population area. The minimum estimate at the end of 2007 was 422 wolves, 73 packs and 39 Breeding Pairs by the federal recovery definition. A minimum of 163 pups were documented at the end of 2007. Statewide, wolf distribution remained about the same.

Montana wolf packs routinely encounter livestock, and the average wolf pack territory consists of about 30% private land within the boundaries. About 72% of wolf mortality in 2007 resulted from conflicts with livestock, a testament to the mixed matrix of public and private lands and routine proximity of wolves and livestock. Both confirmed cattle and sheep death losses increased from 2006 to 2007. Approximately 25% of cattle losses and 30% of lethal control were attributed to three wolf packs that repeatedly killed cattle. Most sheep losses were attributed to lone, miscellaneous wolves. Lethal control has been implemented incrementally, connecting the management response closely in space and time to the damage. FWP and USDA Wildlife Services continued to seek opportunities to decrease risk of loss through proactive, non-lethal means. The agencies have participated in several collaborative projects. We also collaborated with Utah State University and conducted field trials of electrified fladry through a Conservation Innovation Grant from NRCS. Additionally, the Montana-based Livestock Loss

Reduction and Mitigation program got underway in 2007. Early in 2008, the Board met and received a grant from Defenders of Wildlife to help get the program up and running. The goals of the program are to decrease the risk of loss by assisting livestock producers with integrating proactive husbandry practices into their operations, as well as to reimburse verified losses due to wolves.

FWP's wolf staff gave a minimum of 47 formal presentations to about 2100 people in 2007. Additional outreach was accomplished through outlets. The FWP web site also presents information about Montana wolves and their management. The public can report wolf activity online, as well as download the 2007 Annual Report in its entirety. See: [www.fwp.mt.gov/wildthings/wolf](http://www.fwp.mt.gov/wildthings/wolf). This presentation will provide other updates about the Montana wolf program as well. In summary, Montana believes its commitment to open, inclusive decision-making based on sound science and inclusion of diverse perspectives will continue to provide the best model for 2008 and beyond.

**Tuesday 9:00 – 9:30 am**

**Wolves, Prey and Fire in the Central Idaho Wilderness**

James M. Peek, (Department of Fish & Wildlife Resources, University of Idaho, Moscow, ID 83844-1136, [peek@uidaho.edu](mailto:peek@uidaho.edu) )

Ten years after the reintroduction of the gray wolf into central Idaho, enough information has accumulated to postulate on the effects of the wolf on its prey, bighorn sheep, elk, and mule deer. Four Idaho Fish & Game hunting units, comprising 2.2 million acres, including the wolf reintroduction sites. Much of this area is within the Frank Church River-of-No-Return Wilderness, where prescription wildfire has burned approximately 52% of the land. At least 15 wolf packs were estimated present winter 2006-7, with over 100 individuals in these packs. Bighorn sheep are not subject to substantial predation in this area. Mule deer populations, as indexed by the known hunter harvest, are increasing. Elk are declining in one hunting unit, increasing in one unit and fluctuating with no apparent trend in two units. Wildfire, summer drought, winter severity, and predation are the major factors that influence this ecosystem. An interpretation of trends in large mammal populations depends upon knowledge of how these factors affect the system.

**Tuesday 9:30 – 10:00 am**

**Development of a Gray Wolf Conservation and Management Plan for Washington**

Harriet Allen, (Endangered & Threatened Species Section Manager, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia, WA 98501, (360) 902-2694, (360) 902-2162 fax, [allenhla@dfw.wa.gov](mailto:allenhla@dfw.wa.gov)), Gary Wiles ([wilesgjw@dfw.wa.gov](mailto:wilesgjw@dfw.wa.gov)), Rocky Beach ([beachrjb@dfw.wa.gov](mailto:beachrjb@dfw.wa.gov)), Madonna Luers ([luersmel@dfw.wa.gov](mailto:luersmel@dfw.wa.gov)), Donny Martorello ([martodam@dfw.wa.gov](mailto:martodam@dfw.wa.gov))

Wolves are listed as endangered under both state and federal law in Washington. They may be removed from protection under the federal Endangered Species Act in a portion of Washington,

and at that time will be managed by the Washington Department of Fish and Wildlife (WDFW) state as a state endangered species. In response to the anticipated dispersal of wolves into Washington from neighboring states and the eventual return to state management, the WDFW began development of a conservation and management plan for the species in 2006.

The WDFW Director appointed 18 citizens to a Wolf Working Group in January 2007. The purpose of the group is to provide recommendations to the Department in the development of a Gray Wolf Conservation and Management Plan for Washington. The 18 stakeholders hold a broad range of perspectives and are expected to bring those values to the table in the discussions. The Working Group began met for the first time in February 2007. In giving direction to the group, the Director noted that wolves are an important and valued component of a healthy ecosystem in Washington and that the return of wolves to Washington and their perpetuation will only occur if there is a fair balance between conservation needs and the needs of the public. The only two sideboards given to the group were: 1) no wolves is not an option; and 2) no wolves would be reintroduced from outside the state.

The working group has met 7 times and is working to reach consensus on three key issues: conservation targets, livestock conflicts, and big game conflicts. They are critically reviewing drafts of the plan chapters in light of biological, social, and political considerations. Seven public scoping meetings were held throughout the state in August 2007. The Working Group met in March 2008 to finalize input on a draft plan that will undergo scientific peer review this spring and summer. A 90-day public review period in fall 2008 will include public meetings throughout the state, followed by a final Working Group meeting to complete the plan. Presentation of the final plan to the Washington Fish and Wildlife Commission for approval is anticipated in early 2009. An interagency wolf group has also been formed consisting of agency and tribal representatives. They will be peer reviewing the plan and coordinating wolf management amongst agency managers and other entities.

**Tuesday 10:30 – 11:00 am**

**An Alternative Proposal for the “Conservation” of Mexican Gray Wolves**

David R. Parsons, (Carnivore Conservation Biologist, The Rewilding Institute, 8613 Horacio Place NE, Albuquerque, NM 87111, (505) 275-1944, [dbc@cybermesa.com](mailto:dbc@cybermesa.com))

Section 10(j) of the Endangered Species Act (Act) authorizes the Secretary of the Interior to release experimental populations of endangered or threatened species outside the current range of such species if the Secretary determines that such release will “further the conservation of the species.” The Act defines conservation as follows: “to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to a point at which the measures provided pursuant to this Act are no longer necessary.” On January 12, 1998, Interior Secretary Bruce Babbitt authorized the release and establishment of a nonessential experimental population of the Mexican gray wolf (*Canis lupus baileyi*) into the Apache and Gila National Forests in Arizona and New Mexico. These two national forests comprise the Blue Range Wolf Recovery Area (BRWRA). The objective of this reintroduction project was to establish a viable, self-sustaining, wild population of at least 100 Mexican wolves within the

BRWRA as recommended in the *Mexican Wolf Recovery Plan* (1982). Eleven Mexican wolves were released from onsite acclimation pens on March 29, 1998, and a total of 99 were released through 2006. A special rule promulgated under authority of Section 10(j) of the Act specifies limited circumstances for “taking” wolves from this population. The rule also authorizes the U.S. Fish and Wildlife Service (Service) to take wolves for additional reasons set forth in “Service-approved management plans or special management measures.” In 1998, the Service recognized the “conservation” mandate of Section 10(j) of the Act, and that conservation of the Mexican wolf would require limitations on taking. Thus, the Service committed in the final *Environmental Impact Statement* (page 2-16) to limiting its use of discretionary authority under the Section 10(j) rule to “mitigate the potential impacts of the proposal by providing the greatest degree of management flexibility and the least impact on private activity, “consistent with wolf recovery.” Project data confirm that the Service has authorized unsustainable levels of lethal control and permanent removal of wild Mexican wolves for the primary purpose of resolving livestock-wolf conflicts. The discretionary authority for this take derives from Standard Operating Procedure 13, formally adopted in 2005. The BRWRA population was estimated at 52 animals as of December 31, 2007. The  $\geq 100$ -wolf objective for the BRWRA reintroduction project was predicted to be attained by the end of 2006. The wild population has declined in 3 of the past 4 years and is currently lower than it was at the end of 2003. Furthermore, the number of breeding pairs at the end of 2007 was 3, compared to 6 at the end of 2006. Nine surviving pups were documented at the end of 2007, and the Service authorized the removal of 10 wild-born pups during the year. The Service has failed to “conserve” Mexican wolves under the current Section 10(j) rule. A “Conservation Alternative” for consideration by the Service in its Environmental Impact Statement for a proposed rule change is presented.

**Tuesday 11:00 – 11:30 am**

**The Red Wolf Five Year Review – Status and Recommendations**

Buddy B. Fazio, (Team Leader, USFWS Red Wolf Recovery Program, Alligator River NWR, USFWS, 708 N. Highway 64, Manteo, NC 27954, (252) 473-1131, Ext. 240, Cell (252) 305-1183, [Buddy\\_Fazio@fws.gov](mailto:Buddy_Fazio@fws.gov) )

A five-year status review document was completed by the U.S. Fish and Wildlife Service at the end of September 2007. The document describes the status of red wolves, restoration progress, and scientific data generated especially since 1998. We discuss highlights of the red wolf five year review, including status, science, setbacks and recommendations. We briefly discuss next steps in red wolf recovery. The world’s only red wolf population in North Carolina measures annual counts ranging from 100 to 130 wolves occupying more than two thirds of their federally designated 1.7 million acre experimental population area.

**Tuesday 11:30 – Noon**

**Ecological and Evolutionary Divergence Among and Within Wolves of Western North America, with Special Focus on Rainforest Wolves of Coastal British Columbia**

Chris Darimont<sup>1,2,§</sup>, ([darimont@ucsc.edu](mailto:darimont@ucsc.edu)), Thomas Reimchen<sup>1</sup>, Violeta Muñoz<sup>3</sup>, Jennifer Leonard<sup>3</sup>, Robert Wayne<sup>4</sup>, and Paul C Paquet<sup>2,5</sup> (<sup>1</sup>Department of Biology, University of Victoria, Canada, <sup>2</sup>Raincoast Conservation Foundation. Denny Island, Canada, <sup>3</sup>Department of

Evolutionary Biology. Uppsala University, Sweden, <sup>4</sup>Department of Ecology and Evolutionary Biology. University of California, Los Angeles, USA, <sup>5</sup>Faculty of Environmental Design, University of Calgary, Canada)

For any organism, a species is not an ecologically and functionally homogenous assemblage of populations, themselves constructed of indistinguishable sub-populations and individuals. Here, we use the concept of the niche to explore the diversity observed in extant wolves of Western North America. We focus on a population inhabiting a mainland and adjacent archipelago of coastal British Columbia. At the population level, we highlight their distinctive morphology, behaviour, as well as spatial and trophic niche compared with other wolves. Within this coastal population, we examine how biogeography structures their trophic niche, and show how island wolves become increasingly marine-oriented with island isolation. Within biogeographic regions, we show how marine resource availability can predict trophic niches occupied by social groups. At the finest scale, we examine among-individual variation in trophic niche in this social carnivore. Finally, we report how such a unique ecology has likely driven genetic divergence between coastal wolves and other populations in North America, and argue that coastal wolves are evolutionarily distinct. The coupling of divergent ecological and evolutionary criteria argues that coastal wolves and their increasingly rare ancient rainforest habitat warrant special protection.



**Tuesday 1:00 – 1:30 pm**

**How Many and Where: Applying Principles Of Conservation Planning, Genetics, and Policy Science To Wolf Recovery Goals Under The Endangered Species Act**

Carlos Carroll, (Klamath Center for Conservation Research, PO Box 104, Orleans, CA 95556, (530) 627-3512, [carlos@klamathconservation.org](mailto:carlos@klamathconservation.org))

Endangered species recovery is an arena where the latest research in conservation biology should be especially relevant to federal policy. However, recovery plans for U.S. endangered species,

despite their strengths, often do not incorporate recent findings in conservation planning, genetics, and policy science. Existing wolf recovery plans (e.g., the 1987 recovery plan for the northern Rocky Mountains and the 1982 recovery plan for the Mexican wolf) are currently being used as templates for federal and state wolf recovery plans in other regions of the United States, without consideration of whether the recovery goals in these plans are reflect more recent conservation research. The Society for Conservation Biology's North America section (SCB-NA) is sponsoring a workshop to develop a review summarizing and integrating insights from a variety of disciplines on what population and distributional goals constitute recovery for wolves in the contiguous United States. Availability of a document reviewing wolf recovery goals will enhance future prospects of a coordinated and effective wolf recovery effort across regions. Additionally, a clear definition of the implications of ESA language on recovery for wolves will help inform and strengthen the setting of recovery goals for other wide-ranging species. In this talk I outline the major questions addressed in the review from the perspective of genetics, population viability, ecological effectiveness, and previous interpretations of Endangered Species Act's mandate for species' recovery: how many (how demographic and genetic viability and ecological effectiveness are affected by wolf population size) and where (what level of geographic distribution constitutes recovery).

**Tuesday      1:30 – 2:00 pm**

**What Does it Mean for a Species to be Endangered in a “Significant Portion of its Range”?**

Jeremy T. Bruskotter, (School of Environment and Natural Resources, Ohio State University, 210 Kottman Hall, 2021 Coffey Road, Columbus, OH 43210, [bruskotter.9@osu.edu](mailto:bruskotter.9@osu.edu), (614) 247-2118, Fax (614) 292-7432), Sherry A. Enzler, (Department of Forest Resources, University of Minnesota, 330F Green Hall, 1530 Cleveland Ave. North, St. Paul, MN 55108, [senzler@umn.edu](mailto:senzler@umn.edu), (612) 625-2417), Melanie Houston, School of Environment and Natural Resources, Ohio State University, 210 Kottman Hall, 2021 Coffey Road, Columbus, OH 43210, [houston.88@osu.edu](mailto:houston.88@osu.edu))

How the government interprets ambiguous language in the Endangered Species Act has major implications for the conservation of threatened and endangered species in general, and wolves in particular. This principle was prominently displayed in 2007 when the Solicitor for the Department of Interior—the department's top lawyer—advocated for a new interpretation of the phrase, “a significant portion of its range,” a key component of the definition of endangered species in the ESA. Since 1997, the SPR phrase has been a source of debate both in the courts, as well as among conservation scientists, as its interpretation determines not only which species qualify for protections, but where species can be protected. Knowledge of listing and case history regarding the phrase is crucial to appreciating this controversy and its effect on endangered species conservation. We review the ongoing controversy concerning the interpretation of the SPR phrase—in particular, we focus on the recent case history regarding the SPR phrase, Solicitor's Memorandum, and recent listing actions. We then discuss implications of the Solicitor's interpretation of the SPR phrase for the continued conservation of endangered species, focusing on wolves. Finally, we offer recommendations for determining what constitutes a significant portion of a species' range that are consistent with Congressional intent and the Secretary's pre-1997 actions.

**Tuesday 2:30 – 4:00 pm**

**Proactive Projects Case Studies Panel**

Lane Adamson, Jael Kampfe, Carter Niemeyer, Rick Williamson, Doug Hesse, Janelle Holden, Jesse Timberlake, Suzanne Stone – Moderator

**Wednesday 8:00 – 8:30 am**

**Wolves in the Crosshairs: A Scientific Case Against the Final Rule of the U.S. Fish and Wildlife Service Removing Northern Rocky Mountain Gray Wolves from the Endangered Species List**

Valerie Bittner\*, (2611 N.E. 113th St., Ste. 300, Seattle, WA 98125, 425-408-2139, [vbittnerlawoffices@comcast.net](mailto:vbittnerlawoffices@comcast.net))

Foremost, this paper provides an explication of the intersection of the conspecific *life-history strategies* of Northern Rocky Mountain gray wolves and the mandates of the Endangered Species Act and the National Environmental Policy Act. Concomitantly, many science-supported positions are presented. These militate against a premature and illegal determination of recovery and delisting of the Northern Rocky Mountain gray wolf species in the absence of a demographic recovery criterion premised on the best available science and data. Primarily the illegality stems from the failure of the United States Fish and Wildlife Service to evaluate “significant new information” because of the agency’s entrenched belief in its arbitrary definition of a wolf “pack” as well as its scientifically outdated and dangerously minimal “recovery” criterion. “Significant new information” includes the genetic and ecological values stemming from knowledge of the behavioral characteristics of complex, extended, and long-lived wolf families. These values reflect path-breaking findings garnered in intersecting scientific studies in the realms of wolf pack dynamics (particularly, rare *cooperative breeding*), population genetics (particularly, *metapopulation* connectivity), conservation biology, deep ecology, and climate change, *et al.* Failure by agency leaders to evaluate and incorporate legally requisite “significant new information” in supplemental analyses before proceeding with delisting and the corresponding approval of indiscriminate eradication could lead to irrevocably lost evolutionary potential and a population crash. The latter consequence will inevitably result in emergency relisting under the Endangered Species Act – protective legislation which has long been vulnerable to reductive amendment.

\* Valerie Bittner 2008. Ms. Bittner, Esq. earned B.S. Degrees in Forest Resources Management and Conservation Social Sciences at the University of Idaho College of Natural Resources and a J.D. Degree at the Willamette University College of Law. Subsequently, she clerked for Justice James Andersen of the Washington Supreme Court and was appointed an Assistant Attorney General for the Washington AGO. She is a founder of the Washington State Bar Association (WSBA) Animal Law Section and has been an invited lecturer on animal law issues for the WSBA Continuing Legal Education Program. On numerous occasions, Ms. Bittner has acted as *amicus curiae* for the Animal Legal Defense Fund. She advises and litigates on behalf of natural resources protection organizations throughout the Pacific Northwest region.

**Wednesday 8:30 – 10:00 am**

**Northern Rocky Mountain Wolf Delisting Panel**

Ed Bangs, (Wolf Recovery Coordinator, U.S. Fish & Wildlife Service, 100 N. Park, #320, Helena, MT, [Ed\\_Bangs@fws.gov](mailto:Ed_Bangs@fws.gov)), others to be announced. Jamie Clark -- Moderator

**Wednesday 10:30 – 11:00am**

**Analysis of Population Structure and Gene Connectivity in the Gray Wolves (*Canis lupus*) of the Northern Rocky Mountains**

John P. Pollinger<sup>1</sup>, Bridgett M. vonHoldt<sup>1</sup>, Daniel R. Stahler<sup>1,2</sup>, Douglas W. Smith<sup>2</sup> Robert Wayne<sup>1</sup> (<sup>1</sup>University of California, Los Angeles; Department of Ecology and Evolutionary Biology; 621 Charles E. Young Dr. South; Los Angeles, CA 90095, [jpolling@ucla.edu](mailto:jpolling@ucla.edu). <sup>2</sup>Yellowstone Center for Resources; Yellowstone National Park, WY 82190)

The recovery of the gray wolf (*Canis lupus*) to the Northern Rocky Mountains has been a flagship for successful endangered species recovery. Now, the population has over 1000 individuals and has been proposed for delisting. Understanding how the naturally recolonized population of the northwestern Montana recovery area is genetically and spatially structured and connected relative to the two reintroduced populations of central Idaho and the Greater Yellowstone Ecosystem is important for Endangered Species delisting and sustained management and conservation of healthy populations. Here, we describe population structure, genetic diversity, and patterns of dispersal over the first 10 years of wolf recovery to the Northern Rocky Mountains, inferred by 26 microsatellite markers of over 500 wolves from the three major recovery areas (Central Idaho, Greater Yellowstone Area, Northwest Montana). We used genetic assignment tests to identify putative migrants and extensive field data to provide a record of dispersal. We observe low levels of genetic connectivity and migration between the three populations. The reintroduced Idaho and GYE populations are genetically distinct from Montana, attributed to the lack of migrants between the populations and resulting lack of gene flow. Genetic diversity, an indicator of genetic health, has remained high over the course of the first decade since reintroduction, despite the starting population bottlenecks. But predictive genetic modeling indicates that the proposed minimum required population sizes for each state in the delisting plan will result in future decreases in genetic diversity and health of the wolf populations, without significant connectivity and effective migration and between the populations.

**Wednesday 11:00 – 11:30 am**

**Biogeographic and Genetic Factors in Rocky Mountain Wolf Populations**

Ken Fischman, Ph.D. – Genetics, (Ancient Pathways to a Sustainable Future, 703 A-Street, Sandpoint, ID 83864, (208) 265-8580,) [bigfish@gotsky.com](mailto:bigfish@gotsky.com))

The US Fish and Wildlife has proposed delisting the wolf populations of Idaho, Montana, and Wyoming from the endangered population list. Recently estimated total wolf populations are

1,242, with 92 breeding pairs. Wolf population in Idaho is estimated at 672, with 42 breeding pairs. Idaho Fish and Game proposes maintaining a minimum of 100 wolves in their state, with a minimum of 15 breeding pairs. This paper examines possible consequences of the numbers of wolves projected by the US and Idaho authorities.

Small populations often show a Founder Effect, in which one or more gene variants predominate due to Random Genetic Drift. Genetic Drift has no preferred direction, and tends to sweep genetic variants out of the population. Migrating populations, such as wolf packs and their outliers, may show a Founder Effect. This is often responsible for high frequencies of genetic diseases.

The size of the breeding population is known as the Effective Population Size ( $N_e$ ). Fluctuation in the size of small populations increases the possibility of extinction, due to such factors as same sex generation ( $1/2^{n-1}$ ), and environmental effects, such as severe winters, climate change, and disease.

Anthropogenic effects, such as hunting, killing of so-called problem wolves, and illegal taking, can have similar consequences.

In a small population, related organisms are more likely to breed together, resulting in a far greater number of homozygous loci. Possible genetic consequences are increase in homozygosity and degree of Monomorphism/Polymorphism. As alleles become more common, the species becomes less fit and therefore more subject to mass die-offs

What is the Minimum Viable Population (MVP) for Canis lupus? MVP is a population size that will insure the persistence of a species for a specified time. Due to demographic stochasticity, an MVP needs to be sustained at higher rates, 1,000 to 5,000 within an ecologically connected area, such as the Rockies.

What is important to species preservation, is not total population, but the Number of Effective Breeder Pairs ( $N_e \geq 50$ ).

Some individuals are breeding and others are not, and some individuals have different degrees of reproductive success. In addition, if a small number of individuals produce most of the offspring, that reduces the genetic pool from which alleles are drawn. Such is the situation with Wolves, in which there is only one breeding pair in a typical pack of 8 -10 individuals.

The longer a population exists, the larger the  $N_e$  must be to avoid extinction. Heterozygosity is reduced when  $N_e$  is low. Low  $N_e$  reduces the genetic pool from which alleles are drawn. Inbreeding Depression will occur with an effective population size of  $N_e < 50$ .

To avoid the possibility of inbreeding, MVP should usually = 500. MVP should also be 5 – 10 times  $N_e$  For Idaho wolves, this would be 300 – 600 wolves.

### **Wednesday 11:30 – Noon**

#### **Movements, Prey and Habitat Selection by Wolves (*Canis lupus*) in Southwest Alberta**

Andrea T. Morehouse, (Department of Biological Sciences, CW 405 Biological Sciences Centre, University of Alberta, Edmonton, AB T6G-2E9, (780) 492-6267, [morehous@ualberta.ca](mailto:morehous@ualberta.ca)), Supervisor -- Mark S. Boyce, ([boyce@ualberta.ca](mailto:boyce@ualberta.ca), (780) 492-0081)

Wolves (*Canis lupus*) are a species of growing concern in southwestern Alberta and are of interest from both a conservation and management standpoint. Due to habitat loss and fragmentation the concept of corridors and connectivity has risen to the forefront. Previous studies have focused on species' use of habitat rather than how they move through it. Consequently, corridors may be improperly designated. Growing human population and industrial development has meant that wolves and people often are in close proximity, increasing the likelihood for conflicts and the need for effective management practices. Of particular importance is the interaction between wolves and prey (natural and livestock). We must understand what wolves are eating and killing, where these activities take place, and how habitat and movement influence that selection. We will use new quantitative methods to address both habitat use and movement patterns for wolves in southwestern Alberta.

The objectives of this study are: 1) Analyze wolf diets using GPS radiocollars to identify kill sites and use fecal samples to augment this information; 2) Use resource selection functions and step selection functions to examine wolf habitat use and movement; 3) Examine the relationship between wolf habitat use, movement, and prey selection, and the mechanisms driving those patterns; and 4) Use our models to evaluate wolf management practices and the design and placement of corridors. We will use the latest technology available in GPS radiocollars (Lotek 7000SU) to obtain detailed movement information.

Our work involves numerous interest groups including university researchers, Alberta Sustainable Research and Development researchers and wildlife managers, ranchers, conservation organizations, and other interested members of the public. Due to their possible threat to livestock, management and conservation of wolves often is an emotive issue. We will continue to work closely with these interest groups to gain different perspectives, which we believe is an important component to any conservation and management effort. By understanding how wolves use and move through the landscape we can develop appropriate, effective, and scientifically defensible conservation and management practices.

### **Wednesday 1:00 – 1:30 pm**

#### **Tracking Wolves Post Delisting**

David E. Ausband, (Montana Cooperative Wildlife Research Unit, 205 Natural Sciences Building, University of Montana, Missoula, MT 59812, (406) 243-4329, [david.ausband@mso.umt.edu](mailto:david.ausband@mso.umt.edu)), Michael S. Mitchell, (U. S. Geological Survey, Montana Cooperative Wildlife Research Unit, 205 Natural Sciences Building, University of Montana, Missoula, MT 59812), Curt M. Mack, (Gray Wolf Recovery Project, Nez Perce Tribe, P.O. Box 1922, McCall, ID 83638), Jim Holyan, (Gray Wolf Recovery Project, Nez Perce Tribe, P.O. Box

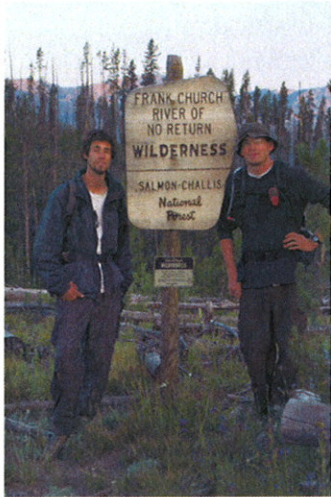
1922, McCall, ID 83638), Carolyn A. Sime, (Montana Fish, Wildlife & Parks, 1420 E. 6<sup>th</sup> Ave., Helena, MT 59620-0701, (406) 444-3242, [casime@mt.gov](mailto:casime@mt.gov)), Pete Zager, (Idaho Department of Fish and Game, 3316 16th St. Lewiston, ID 83501)

The U.S. Fish and Wildlife Service recently proposed removing Endangered Species Act protections for wolves in the Northern Rockies. As Endangered Species Act protections are removed, so too are federal monitoring dollars used to gauge overall wolf population health. States and tribes in the Northern Rockies are now faced with the task of monitoring wolf populations, specifically Breeding Pairs, to ensure their conservation with much limited budgets. Radiotelemetry has been the primary tool for monitoring wolves in the Northern Rockies, requiring intensive trapping and handling of wolves. Maintaining radiocollared wolves dispersed widely across the landscape is an expensive and logistically difficult monitoring approach and its efficacy as the sole method for monitoring will wane as federal funding declines. Recently, the Nez Perce Tribe, Idaho Fish and Game, and the Montana Cooperative Wildlife Research Unit began a research project to develop cost effective yet accurate methods for monitoring wolves in Idaho.

We used logistic regression and data collected from wolves in the Northern Rockies over the last 20 years to estimate the probability a pack of a given size contains a Breeding Pair. Our results indicate that if pack size is known then the probability that the pack contains a Breeding Pair can be accurately estimated. In addition, to test new monitoring methods we identified 4 study areas based on wolf density ranging from low to high (2 low, 2 high). We have VHF and GPS collared wolves in the study areas to determine wolf density and to allow comparisons of wolf abundance estimates from new methods to estimates obtained from radiotelemetry. In the summer of 2007, we conducted a scat survey at 480 predicted rendezvous sites and collected over 250 genetic samples to use for population estimation. We also recently surveyed 2,000 hunters in our 4 study areas to ascertain the accuracy of their wolf observations. Preliminary results show the public is largely truthful in their reporting and that public observations may be one tool for monitoring wolves in the future. For use in roadless areas, we are developing a remote sensing tool called a "howlbox" which can remotely survey an area by broadcasting a wolf howl, recording responses, and then shutting down until the next scheduled broadcast.

Our new methods show promise and all of the methods are designed to feed a statistical model that can estimate the number of wolves statewide. Trial runs with this statistical model demonstrate we can reasonably count wolves in Idaho without having to rely solely on radiotelemetry as a monitoring approach. Research will continue through November 2008 and efforts are ongoing to obtain critical funding so tests can be extended and our confidence can increase in the utility of our new methods.

Photo: Members of the 2007 Field crew surveying predicted wolf rendezvous sites in the Frank-Church Wilderness.



**Wednesday 1:30 – 2:00 pm**

### **Torrent or Trickle? Elk, Wolf, and Human Influences on Willow Determine Yellowstone's Trophic Cascade**

Nathan Varley, PhD<sup>1</sup>, (P.O. Box 769, Gardiner, Montana 59030, (406) 223-2152, [Nathan@wolftracker.com](mailto:Nathan@wolftracker.com)), M. S. Boyce<sup>1</sup>, E. H. Merrill<sup>1</sup>, and R. L. Crabtree<sup>2</sup> (<sup>1</sup> Department of Biological Sciences, University of Alberta, Edmonton, Alberta, T6G 2E9, Canada, <sup>2</sup>Yellowstone Ecological Research Center, Bozeman, Montana, 59715, USA,)

In the wolf (*Canis lupus*) -elk (*Cervus elaphus*) -willow (*Salix* spp.) food chain of Yellowstone National Park (YNP), Wyoming, USA, a cascading effect has been suggested following wolf restoration, yet the magnitude of this effect on the landscape's communities is still unclear. To benefit willow and the community that relies on it, wolves must reduce the impact of intense browsing by elk that has suppressed willow for decades in YNP. To investigate this possibility, 23 willow sites were surveyed during winter 2003-2004. At 19 sites willow growth form remained largely arrested due to a history of continued chronic browsing. We measured winter browse rates and found elk consumed up to 72% of measured willow leader length with a mean of 49%. A combination of wolf, elk, and human variables explained up to 75% of the variation in leader length removal. Values of the elk resource selection function at willow sites were the best predictors of percent of browsed stems, indicating elk used willow in proportion to the attractiveness of resources at the site. Use was mediated, in part, by predation risk from wolves and human disturbance, but the magnitude of these responses may be less than sufficient to overcome the browse-suppressed state of willow at most surveyed sites. Rather, high winter elk use and the low availability of willow across the winter range appear to be two factors that combine to contribute to continued widespread suppression of willow in YNP.

**Wednesday 2:00 – 2:30 pm**

### **Foraging Strategies of Eastern Wolves in Relation to Migratory Prey in Algonquin Provincial Park**

Karen Loveless, MSc Candidate, (Trent University, Peterborough, Ontario, (705) 755-1556, (406) 223-2355 (cell), [Karenloveless@trentu.ca](mailto:Karenloveless@trentu.ca)) and co-authors: Brent Patterson, PhD,

(Research Scientist, Ontario Ministry of Natural Resources, Wildlife Research and Development Section), Dennis Murray, PhD, (Canada Research Chair in Terrestrial Ecology, Associate Professor, Dept of Biology, Trent University), Linda Rutledge, PhD Candidate, (Natural Resources DNA Profiling and Forensic Centre, Trent University)

For predators constrained in their movements by territoriality, migration of prey can result in a critical decline in resource availability. Predators may respond to this by following prey off territory, or switching to an alternate resource within the territory. The risks of foraging off-territory include the energetic costs of travel, risk of intra-specific conflict when trespassing territories, competition and conflict in the prey wintering area and increased contact with humans. The costs of switching prey may be just as severe, including insufficient, unavailable or unmanageable alternate prey.

In Algonquin Provincial Park, Ontario, Canada, eastern wolves (*Canis lycaon*) prey on moose, white-tailed deer and beaver. The vast majority of deer leave the park in winter. Some wolf packs specialize on deer, leaving their territories to forage in the deer wintering areas, while other packs remain on territory, relying on moose and possibly beaver. This variation in prey use within a multi-prey system provides an opportunity to investigate factors influencing wolf foraging behavior.

Recent genetic research suggests that *C. lycaon* is a distinct species of wolf, closely related to red wolves (*C. rufus*), with a range limited to central Ontario and western Quebec. There is evidence of historic hybridization with *C. latrans* and recent hybridization with both *C. lupus* and *C. latrans*. The extent and mechanisms of hybridization are currently being investigated in a collaborative study. Given the variation in foraging strategies of Algonquin wolves, and evidence of hybridization with *C. lupus* and *C. latrans*, the potential influence of hybridization on prey use is being considered.

By comparing landscape, ecological, and genetic factors with the differential use of prey by wolf packs, we hope to gain further understanding of wolf foraging behavior as well as provide information for management of wolf-prey relationships. A brief overview of Algonquin wolf research will be included, and preliminary results will be discussed.

### **Wednesday 3:00 – 3:30 pm**

#### **Delisting Wolves: Are the Western Great Lake States Ready?**

Dr. Edward A. Fitzgerald, (Department of Political Science, Wright State University, Dayton, OH 45435, [Edward.fitzgerald@wright.edu](mailto:Edward.fitzgerald@wright.edu))

In February 2007, the Department of Interior (DOI) established the Western Great Lakes (WGL) distinct population segment (DPS) encompassing the wolves in the region and removed the wolves from the threatened species list. Delisting returned control of the wolves to the states in the region. Three of these states, Michigan, Minnesota, and Wisconsin, have developed wolf management plans that reflect the collaborative efforts of concerned groups and principles of conservation biology. However, the plans lack an adequate and secure source of funding.

Furthermore, there is no protection for the wolves in the regions other DPS states. These problems may jeopardize wolf recovery in the WGL region and call into question the wisdom of returning environmental and wildlife issues to the states. The paper will review the litigation surrounding the WGL wolves, the delisting regulation, and the individual state management plans, particularly their funding from federal and state sources.

**Wednesday 3:30 – 4:00 pm**

**America's Wolves Lawyer Up**

Rob Edward, (Carnivore Recovery Director, WildEarth Guardians, 1911-11th Street, Suite 103, Boulder, CO 80302, (303) 447-8655, ext. 2#, [redward@wildearthguardians.org](mailto:redward@wildearthguardians.org)) and Melissa Hailey, (Staff Attorney, WildEarth Guardians, 312 Montezuma Avenue, Santa Fe, NM 87501, (505) 988-9126 x1159, (505) 989-8623 (fax), [mhailey@wildearthguardians.org](mailto:mhailey@wildearthguardians.org), [www.wildearthguardians.org](http://www.wildearthguardians.org))

Wolf recovery in North America is at a crossroads. While the U.S. Fish & Wildlife Service has successfully removed gray wolves from the list of threatened and endangered species in the Great Lakes states, and though the agency is actively pursuing delisting in the Northern Rocky Mountains, debate swirls around claims that enough has been done to recover wolves. Moreover, efforts to recover the most endangered sub-species of gray wolf-the Mexican Gray Wolf (*C. lupus baileyi*)-now teeter on the brink of failure, threatening further losses for recovery range-wide.

Presently, wolves occupy less than five percent of their historic range in the lower forty-eight states. The U.S. Fish & Wildlife Service has not indicated any intent to initiate recovery planning for other suitable-and presently unoccupied-portions of the species range. Yet, peer-reviewed research indicates that significant swaths of such habitat does exist for wolves, most notably the Southern Rocky Mountains. Moreover, the extirpation of wolves from the Southern Rockies has produced ecological consequences that federal land managers, including those in Rocky Mountain National Park, are awkwardly trying to solve-sans wolves. Given the administration's recalcitrance regarding restoring wolves to the Southern Rocky Mountains, it appears that the next phase of wolf recovery in the region will take place in the courts. Litigation over several aspects of wolf recovery in the Southern Rockies is now in process.

If wolf recovery in the Southern Rockies is defined by governmental inaction, recovery of Mexican wolves in the American Southwest is defined by policy failure. Although launched with high hopes in 1998, the Mexican Wolf Recovery Program has withered under the weight of political compromises; those compromises have reaped a precipitous decline of breeding pairs of wild Mexican wolves. In February of 2008, the U.S. Fish & Wildlife Service announced that just four breeding pairs of Mexican wolves remain in the wild, down from a high of six breeding pairs in 2004 and 2006.

Of the 99 individual Mexican wolves the agency has released to the wild, 70 have been removed from the wild or killed for conflicts with domestic livestock-a fact that underscores the primary reason that the program now teeters on the brink of failure. In an effort to rescue the Mexican

wolf program, several conservation organizations, including WildEarth Guardians, are poised to legally challenge the Fish & Wildlife Service's implementation of the program. Moreover, WildEarth Guardians is presently challenging the U.S. Forest Service's failure to act on behalf of Mexican wolves on lands that the agency manages.

During the next decade, actions by all levels of government will determine success or failure in the effort to restore wolves to the hunting grounds of their ancestors in North America. Importantly, the actions of a handful of non-governmental organizations will have a keen influence on governmental stewardship of wolves.

## **2008 Keynote Speaker**

### **Doug Smith, Yellowstone Wolf Project**

#### **Yellowstone Wolf Update: Numbers, Population Regulation, and Age Structure**

Douglas W. Smith, (Leader Yellowstone Wolf Project, YCR, P.O. Box 168, Officer's Row, Building 27, Yellowstone National Park, WY 82190, (307) 344-2242, (307)344-2211, [doug\\_smith@nps.gov](mailto:doug_smith@nps.gov)), Daniel R. Stahler, Debra S. Guernsey, Matthew Metz, Erin Albers, Libby Williamson, Nicole Legere, Richard McIntyre, Daniel MacNulty, and Emily Almberg

The Yellowstone National Park wolf population increased in 2007 to 171 wolves in 11 packs. This was close to the population peak in 2003 of 174 wolves in 14 packs. Fewer packs this year than in 2003 meant that average pack size was larger, 14 wolves/pack, than the long term average of about 10 wolves/pack. Pack size ranged from 4-22 wolves. For the first year since reintroduction, no new packs formed. Ninety-four wolves in 5 packs plus loners and non-pack wolves lived on the northern range, while 77 wolves in 6 packs plus loners lived in the interior. Pup survival was 83% (64 born of 77 survived until early winter). One wolf was documented to have died from mange, otherwise there were no other disease related deaths.

A variety of mechanisms are hypothesized to regulate animal populations, though for most species, empirical data appropriate for evaluating competing hypotheses are lacking, especially for larger mammals like wolves. We evaluated support for two hypotheses about wolf population regulation: the biomass hypothesis (extrinsic regulation), which states that wolf density is determined by the available ungulate biomass, and the intrinsic regulation hypothesis, which states that wolf density has some upper limit imposed by social or territorial mechanisms (intrinsic regulation). Ungulate biomass available to wolves on the NR was several fold higher than reported for 32 studies across North America, and according to this hypothesis wolf numbers should have been much greater (98-150 wolves/1000 km<sup>2</sup>), suggesting some limit to high density other than biomass. Modeling an alternative hypothesis to explain the relationship between wolf density and ungulate biomass indicated that a non-linear Michaelis-Menten model did much better at explaining the NR data, suggesting an upper limit to food regulated density. We therefore suggest that at high density, wolves may be regulated by social strife.

The age structure of Yellowstone wolves has been gradually becoming older through time. More wolves are living to older ages as evidenced by pack composition and a yearly increase in the average age at death. Retention of young in packs, high survival, and increasing age has created

large packs that are comprised of wolves of many different ages. Most packs have at least one adult male and female (usually both) that are >5 years of age along with several other wolves in the 1 - 5 year age classes. The role of these older wolves is unknown but differing roles and functions of older may be a possibility. For example, both males and female wolves do not achieve maximum body size until they are between 4 and 5 years of age, and males become significantly larger than females (about 20% larger). These size differences may cause males and females to have different functions in hunting elk and bison as well as in territory defense, in addition to the already recognized differences due to pup rearing (raising pups inside of dens).

**Thursday 8:00 – 8:30 am**

**Assessing Ranchers' Attitudes Toward Livestock Compensation in the Southwest**

Stacy J. Vynne, (Candidate: MS in Environmental Studies '08 Certificate in Nonprofit Management '08, Environmental Studies Program 5223 University of Oregon Eugene, OR 97403-5223, Cell (425) 941-9132, Office (541) 346-5003, [svynne@uoregon.edu](mailto:svynne@uoregon.edu))

Negative interactions between predators and humans most commonly occur in rural areas and can result in economic loss, reduced tolerance of human communities towards predators, human injury or death. Because the wild predators involved in these interactions are typically endangered and/or rare species, building human (and specifically rural community) tolerance for these animals is critical to their survival. Livestock compensation programs are assumed to help build this tolerance by reimbursing a rancher's loss of livelihood for living alongside endangered predators. However, studies in Asia, Africa, Europe, Brazil and the United States have identified inefficiencies and ineffectiveness in compensation programs despite varying types of management. To contribute to a growing body of knowledge shaping development of future livestock compensation programs, I will present and discuss preliminary results of my survey and interview-based research on the relationship between ranchers, Mexican gray wolves, and the compensation programs in the Southwestern United States.

My research focuses on the livestock compensation program that was established for the Mexican gray wolf in Arizona and New Mexico. Despite the distribution of almost \$100,000 by Defenders of Wildlife (through 2007) to ranchers in the region, no Southwest specific assessment has reviewed whether compensation impacts rancher tolerance towards wolves or if financial reimbursement has met ranchers' needs for compensation. Ranchers living in areas where wolves were reintroduced are being surveyed and interviewed January – April, 2008. Data collected through research will help in understanding: 1) whether the current compensation program is the most effective and efficient use of conservation dollars; 2) if it is necessary to make adjustments to implementation of the program; or 3) if alternative incentive programs should be explored.

Based on early communication with government and nonprofit staff, as well as members of the ranching community, it is hypothesized that the current program does not meet the needs of ranchers in Arizona and New Mexico and should be complemented with other compensation and incentive programs. Preliminary research findings that support or contradict this hypothesis will be presented along with recommendations. The results of this research may influence implementation and management of compensation and incentive programs being developed for endangered predators around the globe.

**Thursday 8:30 – 9:00 am**

**Howling Differentiation between North American Grey Wolves**

Nicholas A. Broman, (6441 Guiren Street, Olympia, WA 98512, (360) 259-6886,

[Iginama@comcast.net](mailto:Iginama@comcast.net))

Affiliations: **Wolf Haven International**, 3111 Offut Lake Rd., Tenino, WA 98589, *contact:*

Linda Saunders (360) 264-4695 ext. 216, [LSaunders@wolfhaven.org](mailto:LSaunders@wolfhaven.org), Director of Conservation.

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Heather Heying (360)867-5535, [heying@evergreen.edu](mailto:heying@evergreen.edu), Supporting Faculty Professor

The howls of 19 mature North American grey wolves (10 male and 9 female) were examined to denote the degree of variation between individuals and provide support to the theory that each wolf has an individually distinctive howl. Recorded howls were quantified through spectrographic analysis based on duration, first noted frequency, highest degree of variation found within the mid-section, last noted frequency, mean frequency, frequency range, and the amount of harmonics produced above the fundamental.

A significant amount of variation was found in each parameter measured, and general tendencies throughout all samples recorded were examined for comparison. New information was uncovered, increasing the known range of howls for duration (from 11 sec to 14.14 sec  $\pm$  5msec) and low-end frequency ( $25 \pm 4.6$  Hz from 150 Hz). The mean frequency between all howls recorded proved to be  $371 \pm 5.32$  Hz, roughly equivalent to the fundamental key of F# at 370 Hz. Of the 156 howls recorded, 77.21% came from the females of the species.

**Thursday 9:00 – 10:00 am**

**A Prejudice Born of Fear and Ignorance - Did Wolves Kill Kenton Carnegie?**

Paul C. Paquet, (Department of Veterinary Pathology, Western College of Veterinary Medicine, University of Saskatchewan, [ppaquet@sasktel.net](mailto:ppaquet@sasktel.net) )

Twenty-two year old engineering student Kenton Carnegie was found dead near a remote camp in Northern Saskatchewan the evening of 08 November 2006. The preliminary investigation by the police (RCMP) determined his death was not the result of a homicide, but likely caused by a violent attack by a large carnivore. The only large carnivores in the region are gray wolves (*Canis lupus*) and black bears (*Ursus americanus*). Accordingly, I was asked by Saskatchewan's Chief Coroner to investigate the incident and determine, if possible, the cause of death. I carried out the investigation with forensic anthropologist (RCMP Special Investigator), Dr. Ernie Walker. Our determination was equivocal. Specifically, we concluded that Carnegie was killed by a large predator, either a wolf or a bear. The reason we were not definitive was that the substance, reliability, quality, and consistency of the physical evidence varied significantly as did the contradictory accounts of witnesses who attended the scene. At best, the evidence allowed us to speculate about probable causes but was inadequate to prove a particular theory. From our perspective, substantial evidence implicated a black bear, but was insufficient to conclude that a black bear was responsible for Carnegie's death. Likewise, considerable evidence suggested that wolves were involved, but was insufficient to confirm that wolves killed Carnegie. In other

words, a reliable determination of the cause of death could not be made. An independent report by Mark McNay and a judicial inquest disagreed with our findings, concluding that the evidence was sufficient and reliable enough to hold wolves responsible for Carnegie's death. A second independent report by Valerius Geist also concluded wolves were responsible.

I present, review, and discuss the evidence and respond to the reports by McNay and Geist, showing that both are seriously flawed, riddled with mistakes, misinterpretations, logical inconsistencies, and omissions. Both overreach with the evidence and confuse theory and assumptions with fact and proof, while consistently ignoring relevant information. The most egregious omission is the misrepresentation and distortion of the major finding/conclusion of our investigation. Overall, McNay and Geist failed to exercise prudence and caution when dealing with circumstantial evidence of questionable quality and reliability. I conclude that the cause of Carnegie's death remains unknown and that the judicial inquiry erred in its determination.

#### **Thursday 10:30 – 11:00 am**

##### **Costs of Wolves' Visits on Cattle And Elk**

Isabelle Laporte, (Master student, Faculty of Environmental Design, University of Calgary, 2500 University Dr, NW, Calgary, Alberta, Canada, T2N 1N4, (403) 220-2475, Fax – (403) 289-6205, [ilaporte@ucalgary.ca](mailto:ilaporte@ucalgary.ca)) **Authors:** Isabelle Laporte, Mark Boyce, Roger Creasey, Tyler Muhly, Carly Sponarski and Marco Musiani.

In Alberta, Canada, the costs associated with wolf depredation on domestic livestock are currently acknowledged by offering financial compensation based on the market value of the animal killed. However, there may be significant additional costs that are not covered by compensation. Specifically, cattle may respond to wolf visits by using suboptimal habitats and spending energy to avoid wolves, which can reduce cattle weight gain. Wild prey, such as elk, may be more effective in their anti-predator strategies than cattle, and provide a useful comparison when evaluating the effects of wolf presence on prey behaviour. The purpose of this research is to document, evaluate and compare elk and cattle movement patterns when wolves are present and absent and determine the potential costs of wolf presence to cattle.

The study area is located in southwest (SW) Alberta, along the eastern slopes of the Rocky Mountains. We used Global Positioning System and Argos collar tracking technology to monitor cattle, wolf and elk movements. Cattle data (up to 11 yearling steers and heifers) was collected from 2004 to 2006 within a fenced pasture of 207 km<sup>2</sup> in which the total number of animals allowed is managed by the provincial government. Wolf data (18 individuals) was collected in the same period in a larger area of 10 000 km<sup>2</sup>. Elk data (22 individuals) was collected in the area in 2007. We measured five behavioural variables for each collared cow and elk: 1) movement rate; 2) sinuosity, which is the relative complexity of each movement pathway; 3) likely grazing, reflecting the proportion of time the animal was head-down, 4) distance from nearest collared animals and 5) distance from forest cover. Behavioural variables were compared between control (wolves not detected) and treatment (wolf detected) phases similar to a Before-After Control-Impact design.

Preliminary results show that cattle significantly change behaviour, mainly their movement rate and their distance to other individuals, in the presence of wolves. However these changes are not homogenous. Some individual scatter when wolves are present while others group together. In addition, the same individuals respond differently in different wolf visits. We are testing whether elk show similar or different movement patterns from cattle. Preliminary analyses indicate that cattle respond to wolf visits by modifying their behaviour. The strategies adopted by cattle might be different in different wolf visits. Differences in behavioural changes might also be related to habitat.

The findings obtained through this project will contribute to the field of ecology by providing a better understanding of the difference in anti-predator strategies used by domestic and wild prey. Additionally, this study can contribute to wolf conservation in areas like SW Alberta, where lethal control is practiced to protect cattle. Our finding that cattle respond to wolf visits indicates additional energetic costs. Financial compensation over and above the market value of the animals lost to wolves could be offered to ranchers with the intent to increase their tolerance for wolves.



Photo credits: Joann Skilnick

**Thursday 11:00 – 11:30 am**

**Developing Wolf Monitoring Strategies for Alberta**

Nathan, Webb, (Department of Biological Sciences, University of Alberta, Edmonton, Alberta, Canada T6G 2E9, [nwebb@ualberta.ca](mailto:nwebb@ualberta.ca), (403) 845-4260, Fax (780)492-9234), and E.H. Merrill

The Management Plan for Wolves in Alberta requires regular assessments of regional wolf population trends and detailed population inventories to ensure long-viability of wolf harvest regimes and effectiveness of control programs. Use of radiotelemetry to census wolves in small areas is effective, but is prohibitively expensive to maintain over large areas or for extended time periods. We present a novel wolf survey approach that utilizes sightings of wolf tracks to estimate wolf density using an occupancy-abundance model. We used a correlated random walk movement model to create wolf travel paths during 2-day time intervals across the range in wolf densities observed in North America, and simulated a simple aerial survey approach that relies on presence-absence of wolf tracks in sampling units. Our simulations show a strongly positive relationship between wolf track occupancy in 36 km<sup>2</sup> cells and wolf density, and real wolf movement data from an area of known wolf density in west-central Alberta fits the theoretical curve. We discuss additional modeling exercises and field trials to continue the development of occupancy surveys as a new method to determine wolf density.