G. Wengert

PROGRAM AND BOOK OF ABSTRACTS

DEFENDERS OF WILDLIFE PRESENTS

CARNIVORES2009

Carnivore Conservation in a Changing World

NOVEMBER 15-18, 2009

The Grand Hyatt Denver
Denver, Colorado

www.carnivoreconference.org

Conference Information

Welcome to the Grand Hyatt Denver
Carnivores 2009 activities are divided between the Hotel and the Atrium tower of the Grand Hyatt Denver. The Imperial Ballroom, Mt. Sopris Room and Maroon Peak Room are in the Hotel, and the Mt. Elbert, Mt. Evans, Grays Peak and Longs Peak rooms are in the Hyatt Conference Center on the second floor of the Atrium tower, which is connected by breezeway to the Hotel. The banquet on Tuesday is on the 38th floor of the Atrium tower. Located in the heart of the Central Business District and steps from the 16th Street Pedestrian Mall, the hotel is convenient to a huge array of dining options to suit any budget.

Ambassador Wolf Workshops
Mission:Wolf will bring ambassador wolves for six small-group programs to allow attendees an up-close look at a live wolf. Mission:Wolf is a peaceful wolf sanctuary located in the remote mountains of Colorado. The refuge supports a primitive visitor center that provides visitors and volunteers with hands-on working experience. Socialized ambassador wolves travel nationally, offering public education about wild wolves while stimulating people to care about and respect nature. The programs will provide information on basic wolf biology and behavior and offer a unique opportunity to interact one-on-one with a wolf. There is no cost for this workshop, but space is limited to the first 200 conference registrants who enroll. Tickets to an assigned session are included in your registration packet and are not transferable to any other session. No food or beverage is permitted in the sessions. For more info visit www.missionwolf.com.

Notice to Speakers and Poster Presenters
To ensure a fair time allotment for all speakers, moderators have been instructed to adhere to the schedule. Please complete your presentation in the designated time allowed so as not to shortchange other speakers or interfere with other conference activities.

Speakers who are using PowerPoint presentations must submit their presentations on a USB device (flash drive), CD or a Zip (100 or 250) disk at the registration desk at least three hours prior to their session. Speakers should report to their assigned rooms 30 minutes before the start of their session for a final check of audiovisual materials.

Posters should be set up in the Imperial Ballroom foyer between 3:00 p.m. and 7:00 p.m. on Sunday and must be removed by 1:30 p.m. on Wednesday. Velcro and thumbtacks will be provided. All poster presenters should plan to be present for the poster session on Tuesday from 5:30 p.m. to 7:00 p.m. to discuss their work with interested attendees.

Carnivores 2009 Science Advisory Committee
Peter Brown, McGill School of the Environment
James Estes, University of California, Santa Cruz
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Rich Reading, Denver Zoo
Bill Ripple, Oregon State University
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Gerald Zuercher, University of Dubuque

Monday, November 16

8:00-9:30	Plenary (Imperial Ballroom): Ecological Consequences Of Large Predator Removal: A Comparison Of Five U.S. National Parks, Robert Beschta and William Ripple (page 1)	
	MT. ELBERT ROOM	**MT. EVANS ROOM**
10:00-NOON	**The U.S.-Mexico Border Wall: Implications for Carnivore Conservation** ..... 2 1. Challenges To Carnivore Conservation In The Mexico- U.S. Border Region, Rurik List 2. Potential Effects of the U.S.-Mexico Border Fence on Ferruginous Pygmy-owl, Matt Clark 3. Border Fence and Fragmentation Effects on Mid-sized Mammals in Arizona's National Parks, Jamie McCallum 4. Using Remote Cameras To Assess Wildlife Species, Habitat Preference, And Potential Impacts In The Mexican Sky Islands, Jennifer Yates 5. Landscape Connectivity For Black Bears In Arizona: Identifying Corridors And Determining The Impacts Of Habitat Fragmentation, Todd Atwood 6. Genetic Structure And Black Bear Habitat Connectivity Across The US-Mexico Border, Cora Varas	**Ecology and Recovery of Mesocarnivores** ..... 8 1. Wolverine Distribution In The East Greater Yellowstone Ecosystem, Jason Wilmot 2. Confirming The Identity Of Suspected Predators Of Fishers Through Molecular Techniques, Greta M. Wengert 3. Restoring Lynx, Wolverines And Fishers In The American West--What's It Gonna Take? David Gaillard 4. State-Space Modeling As A Method For Data Integration In Monitoring Carnivore Populations At Large Scales, John Melko 5. An Alternative Method For Tracking Movement In Elusive Carnivores, Danielle Ethier 6. Reconstructing the Evolution and Geographic Spread of Early Domestic Dogs, Sarah Brown
1:30-3:00	**Conservation Challenges, Priorities & Opportunities in the U.S.-Mexico Border Region** ..... 27 1. Identifying Potential Conservation Areas For Felids In The USA And Mexico: Integrating Reliable Knowledge Across An International Border, Melissa Grigione 2. Genetic Management for Borderlands Carnivores, Melanie Culver 3. A Carnivore Conservation Model In The Rio Aros Basin, Sonora, Mexico, Ron Thompson 4. A Carnivore Conservation Model In The Rio Aros Basin, Sonora, Mexico–A Perspective From Mexico, Martinez Jesus Florencio Moreno	**Climate Change** ..... 31 1. Polar Bears In The Greenhouse: Global Populations Under Stress, Bruce G. Marcot 2. Lynx and Climate Change: Cat (and Managers) on a Hot Tin Roof? Gary Koehler 3. Can Predators Reduce Atmospheric Carbon Dioxode Through Trophic Cascades? Jim Estes 4. Climate Change Adaptation and Carnivore Conservation, Aimee Delach
3:30-5:30	**Jaguars** ..... 43 1. Bio-Politics And The Path To Jaguar Recovery, Tony Povilitis 2. Jaguar Monitoring In Sonora, Mexico (1999-2009): Towards A Recovery For The Northern Populations, Carlos A. López González 3. Jaguar Population Connectivity In Northwest Mexico, Daniela Valera 4. Community Protected Areas and the Conservation of Jaguars and their Prey in the Chinantla Region of Oaxaca, Mexico, Joe Figel 5. What's On The Menu? Food Habits Of Pumas And Jaguars In The Lowland Amazon Forest Of Peru, Samia Carrillo-Percastegui 6. Jaguar Corridors In Brazil, Leandro Silveira	**New Tools for Sea Otter Research** ..... 49 1. Foraging Choices And Density Dependence In The Sea Otter: The Perspective Of Nutritional Ecology, Katherine Ralls 2. Does Variation In Sea Otter Activity-Time Budgets Reflect Population Performance? James Bodkin 3. Stable Isotopes: A Powerful Tool For Exploring Dietary Variation Within And Among Sea Otter Populations, Seth Newsome 4. Archival Time-Depth Data Reveal Seasonal Variation In Sea Otter Foraging Behavior, George Esslinger 5. Using Archival Time-Depth Recorders To Measure Within- And Between-Population Variation In Diet And Foraging Success Of Sea Otters, Martin T. Tinker 6. Diet, Behavior And Disease In Sea Otters: Implications For Conservation In A Resource Limited Coastal System, Martin T. Tinker
EVENING	**7:00 p.m. to 10:00 p.m. Carnivore Film Festival (Imperial Ballroom)** 68	

	GRAYS PEAK ROOM	LONGS PEAK ROOM
8:00-10:00	**Foxes** ..... 79 1. Population Size Of The San Clemente Island Fox, William F. Andelt 2. Reproduction And Denning Ecology Of The San Clemente Island Fox, Nicholas P. Gould 3. Analyses Of Factors Affecting Reproductive Success In Island Foxes, Cheryl Asa 4. Identifying Suitable Habitat For Endangered San Joaquin Kit Foxes: Conservation Implications, Brian Cypher 5. Phylogeography Of The North American Red Fox: Vicariance In Pleistocene Forest Refugia, Keith Aubry 6. The Origin Of Putative Nonnative Red Foxes In The Contiguous United States: Translocations Or Natural Range Expansions? Mark Statham	**Economic Tools for Predator Conservation** ..... 85 1. Ecosystem Services, Markets, And Red Wolf Habitat: Results From A Farm Operator Survey, Aaron Jenkins 2. Using The Wildlife Habitat Benefits Estimation Toolkit To Value Wildlife Habitat, John Loomis (*30-min talk*) 3. Economic Benefits Provided By Red Wolf Habitat In North Carolina, Timm Kroeger 4. Otters And Wildlife Tourism: A Recipe For Conservation Success? Sadie Stevens 5. Launching the Wolf Capital of Canada: How A Small City is Building A Wolf Industry, Volker Beckmann
10:30-NOON	**Black-footed Ferrets** ..... 98 1. Recovery Efforts for the Black-Footed Ferret, Paul Marinari 2. Reintroduction Of The Black-Footed Ferret To A Small Prairie Dog Complex, Daniel Licht 3. From The Underground Up: Habitat And Population Analysis Of Prairie Dogs To Support The Reintroduction Of Black-Footed Ferrets In Canada, Tara Stephens 4. Burrow Distributions and Resource Selection of Black-Footed Ferrets on Black-Tailed and White-Tailed Prairie Dog Colonies, David A. Eads	**Carnivores on the Hill** ..... 102 1. The Global Warming Survival Act, Robert Dewey 2. Sustaining Wildlife on Public Lands: America's Wildlife Heritage Act, Peter Nelson 3. Saving the Sea Otter: Defenders of Wildlife's Legislative Efforts in Paving the Road Back Towards Recovery, Jim Curland 4. The Truth About Cats and Dogs–Supporting International Carnivore Conservation, Nina Fascione 5. The Protect America's Wildlife Act, Robert Dewey
1:30-3:00	**Florida Panther** ..... 115 1. Florida Panther Recovery Plans: Next Steps, Chris Belden 2. Current Research Objectives And Management Of The Florida Panther, Marc Criffield 3. Evaluation Of Wildlife Underpasses Designed For The Florida Panther, Deborah Jansen 4. The Florida Panther Protection Program: A New Model For Collaboration Amongst Nongovernmental Organizations And Private Landowners, Christian Spilker 5. Florida Panther Outreach Programs, Elizabeth Fleming	**Energy Development Effects on Carnivores** ..... 120 1. Renewable Energy in the California Desert–Is it Compatible with Conservation? Jeff Aardahl 2. Assessing Impacts Of Wind Energy Development On Wildlife: Challenges And Solutions, Aimee Delach 3. Renewable Energy and Federal Lands: Structuring Decisions for Wildlife, Peter Nelson 4. The Bush Administration's Energy Legacy Impacts to Wildlife–Oil and Gas Leasing and the West-wide Energy Corridors, Nada Culver
3:30-5:30	**Mountain Lions, People and Policy Roundtable** 135 1. Overview 2. Christopher Papouchis, Wild Felid Research & Management Association 3. Tim Dunbar, Mountain Lion Foundation 4. Rick Hopkins, Live Oak Associates 5. Gary Koehler, Washington Department of Fish and Wildlife 6. Jerry Apker, Colorado Division of Wildlife 7. David Mattson, USGS Southwest Biological Science Center 8. Sharon Negri, WildFutures 9. Ron Thompson, Arizona Game and Fish Department	**Eastern Mesocarnivores** ..... 144 1. Seasonal Variation In Detections Of Forest Carnivores In Western Maryland Using Remote Cameras, Julia Smith 2. Spatial And Temporal Distribution Of Bobcat And Fisher Detections In Western Maryland, Zoe Hanley 3. Genetic Analysis Of Formerly Extirpated Carnivores In Northwestern New Jersey, Charles Kontos 4. Distribution Of Fishers Occupying Small Fragmented Forests In Eastern North Dakota, Maggie Triska 5. Distribution And Habitat Use By A Pioneering Fisher Population In Eastern North Dakota, Steve Loughry 6. A Genetic Approach To Determine River Otter Abundance And Effects On Fish Populations In Missouri, Rebecca Mowry

Wednesday, November 18

	MT. ELBERT ROOM	MT. EVANS ROOM
8:00-10:00	**Mexican Wolf** ..... 151 1. The Value Of Private Partnerships And Private Funding To Make Possible Mexican Wolf Recovery In The Wild, Patrick Valentino 2. Will Politics Or Science Govern The Future Of The Mexican Gray Wolf? Michael Robinson 3. Estimating Population Size Of Reintroduced Mexican Gray Wolves On The Fort Apache Indian Reservation, Arizona, Sarah Rinkevich 4. Mexican Wolf Recovery, Or Lack Thereof: An Assessment Of Problems And Solutions, David R. Parsons 5. Mexican Wolf Reintroduction in Northwestern Mexico, Carlos A. López González 6. The Mexican Wolf Conservation Assessment– Where Do We Go From Here? Buddy Fazio	**Attitudes, Education and Policy** ..... 157 1. From Extirpation To Coexistence: Wolves And U.S. Environmental Policy, Lynne Nemeth 2. "The Language Of Success": What Does It Mean to the Delisted Wolf? Karlyn I. Atkinson Berg 3. The Effect Of Civilization On Wolf Habitat And Wolf Populations, Tamara Gregg 4. Re-Creating Eden: Scientific Information In The Depiction Of North American Predators In Contemporary Informational Books For Young People, Debra Mitts-Smith 5. Facts And Values: The Objectivist Stance In Wildlife Management, Kirk C. Robinson 6. Conserving Urban Carnivores: Modeling Humane Treatment, John Hadidian
10:30-NOON	**Ecological Role of Wolves** ..... 175 1. Socio-Political Ecology Of Wolf-Induced Trophic Cascades, Carlos Carroll 2. Trophic Cascades Involving Humans, Wolves, Elk, And Aspen: Defining An Ecologically Effective Wolf Population, Cristina Eisenberg 3. A Cross-System Comparison Of The Ecosystem Effects Of Wolves In Banff, Isle Royale, And Yellowstone, Mark Hebblewhite 4. Do Wolves Buffer Ecological Communities From Climate Change? Christopher Wilmers	**Mountain Lions: Spatial Ecology** ..... 179 1. Cougar Habitat Use, Social Organization and Human Interactions In Washington, Brian Kertson 2. Cores And Corridors: Mountain Lions At The Edge In Southern California, Winston Vickers 3. Mountain Lion Movements And Mortality Relative To Roads And Development In A Fragmented, Urban Landscape In Southern California, Seth Riley 4. Effects Of Fire On Mountain Lion Movement And Habitat Use In Southern California, Megan Jennings
NOON	**A New Era for Wolves and People** 191	
1:30-3:00	**Role of Humans: Reciprocal Effects** ..... 192 1. Recognizing Ecological Diversity Within Wildlife Populations, Paul Paquet 2. Cascading Effects Of Humans, Through Wolves, In A Multiple Land Use Ecosystem, Tyler Muhly 3. Wolves, Grizzlies, Elk And The Ecosystem: Effects Of Human Activity In National Parks, J. Kimo Rogala 4. Level Of Social Trust In Government And Wolf Management, Carly Sponarski	**Mountain Lions: Attitudes and Management** .... 196 1. Cougar Management: What Would Darwin Do? Evolutionary and Behavioral Considerations, Gary Koehler 2. Roots of Cougar-Related Human Behaviors and Behavioral Intentions, David Mattson 3. The Discourse of Incidents: Cougars and People on Mt. Elden and in Sabino Canyon, Susan Clark 4. Urban And Rural Residents' Attitudes Toward Mountain Lions In Two Midwestern States, Clayton K. Nielsen
3:30-5:30	**Wolves & Livestock** ..... 208 1. Gray Wolves And Livestock In Montana: Solving A Puzzle One Piece At A Time, Carolyn A. Sime 2. Comparison Of Electrified Fladry To Fladry For Protecting A Food Resource From Wolves In Captivity, Stewart W. Breck 3. The Use Of Non-Lethal Tools And Best Management Practices To Reduce Conflict Between Imperiled Predators And Livestock: A Case Study In Preventing The Depredation By Wolves On Sheep In Central Idaho, Jesse Timberlake 4. Proactive Projects to Reduce Mexican Wolf and Livestock Interactions in Arizona and New Mexico: An Overview, Chris Bagnoli 5. 'Repeatable Environments': The Role Of Public Lands Grazing Practice In Relation To Wolf-Livestock Conflicts In The Rocky Mountains, Timmothy Kamminski 6. Economic Impacts Of Wolves And Livestock Montana's Approach To Resolve Conflict, George Edwards	**Diseases and Parasites of Carnivores** ..... 214 1. Modeling Animal Movement, Functional Connectivity, And Disease Transmission In Fragmented Landscapes, Jeff Tracey 2. Parasite Species Diversity Of North American Carnivores: Hotspots, Host Composition, And Specificity, Nyeema Harris 3. Mitigating The Effects Of Plague On Black-Footed Ferrets In Conata Basin, South Dakota, Travis Livieri 4. Wildlife Reintroductions: A Review Of Disease Issues And Implications, Mourad W. Gabriel 5. Occurrence Of Pathogens In Fishers Throughout Their Range, Mourad W. Gabriel 6. Collibacillosis in a Wild Dog, Avadh B. Shrivastav

MONDAY, NOVEMBER 16, 10:00 A.M.
MT. EVANS ROOM
MODERATOR: DAVID GAILLARD

2. Confirming The Identity Of Suspected Predators Of Fishers Through Molecular Techniques

Greta M. Wengert[1,2] M.W. Gabriel[1,2], J.M. Higley[3], S.M. Matthews[4,5], C.M. Thompson[6], K.L. Purcell[6], R. Green[6], R.A. Sweitzer[7], R.H. Barrett[7], J.C. Lewis[8], P.J. Happe[9], K.J. Jenkins[10], J.E. Foley[11] and B.N. Sacks[1,12]

The fisher (*Martes pennanti*) is a candidate for listing under the Endangered Species Act in the Pacific United States. Recovery of their populations requires an understanding of mortality factors, including predation. In most accounts of predation on fishers, observers have suspected potential predators based on puncture wounds, which can be misleading in determining the predator species. Furthermore, DNA evidence of predation in any wildlife community is scarce in the literature. We generated a field protocol for gathering DNA evidence of predation on fishers for several research projects in California and Washington. We have been able to identify predators of fishers through three types of samples: predator fur left at the carcass, predator saliva from matted fisher fur and predator saliva collected by swabbing the interior of bite wounds. In conjunction with necropsies performed, we were able to confirm in most cases that bite wounds from which we collected DNA were inflicted ante-mortem. To date, we have documented bobcats (*Lynx rufus*) and mountain lions (*Puma concolor*) as frequent predators of fishers, while only one fisher was killed by a coyote (*Canis latrans*). Currently, we are working on identifying the sex of the predator through its DNA, as well as the individual identity of each predator, to search for patterns in predation. This information coupled with knowledge of the trends in fisher predation, such as whether fishers of one sex sustain greater predation rates, will allow for a more thorough assessment of the impact that predation may have on fisher populations.

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MONDAY, NOVEMBER 16, 10:00 A.M.
MT. EVANS ROOM
MODERATOR: DAVID GAILLARD

3. Restoring Lynx, Wolverines And Fishers In The American West–What's It Gonna Take?

David Gaillard[1]

Many of America's wildlife restoration successes have been focused on animals that taste good. What about animals that are fanged, furry and nobody wants to eat? Our (unfinished) success restoring wolves (*Canis lupus*) and grizzly bears (*Ursus arctos horribilis*) provides hope for restoring other "non-consumptive" wildlife, but also illustrates the extensive time and resources required for the research, policies and public outreach needed. In this presentation I provide an update on the conservation status and needs of lynx (*Lynx canadensis*), wolverines (*Gulo gulo*), and fishers (*Martes pennanti*) in the Lower 48, with an emphasis on the U.S. Rocky Mountain region. The imperiled status of these species indicates that edible wildlife, wolves and bears are not the only species that have suffered the unintended consequences of overexploitation and the destruction and fragmentation of our forests. We also cannot assume that our progress restoring game species, wolves and grizzly bears is sufficient to restore the full suite of North American wildlife. These rare carnivores have survived thus far largely through neglect, but we can no longer take that for granted, especially given the dual threats of development and climate change across their last remaining habitat. Instead, we must make a conscious commitment to their recovery. At stake is the survival of the full suite of top-level carnivores in North America, and the forest ecosystems where they live.

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WEDNESDAY, NOVEMBER 18, 3:30 P.M.
MT. EVANS ROOM
MODERATOR: AIMEE DELACH

4. Wildlife Reintroductions: A Review Of Disease Issues And Implications

Mourad W. Gabriel[1], Greta M. Wengert[1] and Ben N. Sacks[1,2]

Over the past century, many attempts were made to reintroduce species to their historic ranges, with mixed success. Multiple factors can influence the outcome of reintroductions, including the health and disease status of both the translocated individuals and the established biological community at release sites. We describe several examples illustrating the importance of *a priori* and *post hoc* monitoring of pathogenic exposure in translocated individuals and discuss developing adaptive management approaches to assist in re-establishing populations. We review a series of reintroduction programs that employed a wide spectrum of pre-introduction screening and monitoring of founder animals, the biological communities, and the environment at the release site before and after reintroductions. We conclude that health and disease screening for zoonotic, domestic animal, and wildlife pathogens should be an integral part of all reintroduction programs.

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WEDNESDAY, NOVEMBER 18, 3:30 P.M.
MT. EVANS ROOM
MODERATOR: AIMEE DELACH

5. Occurrence Of Pathogens In Fishers Throughout Their Range

Mourad W. Gabriel[1,2], Richard Brown[3], Greta M.Wengert[1,2], J. Mark Higley[4], Sean M.Matthews[5], Jeff L. Larkin[6], Craig Thompson[7], Kathryn Purcell[7], Richard Sweitzer[8], Reginald Barrett[8], Janet E. Foley[9], Jeff Lewis[10], Steve Self[11], Richard Callas[12] and Benjamin N. Sacks[1,13]

The population of fishers (*Martes pennanti*) in the Pacific coastal United States was recently listed as a candidate warranting protection under the federal Endangered Species Act. Disease was noted as one of five potential threats to the west coast distinct population segment of fishers. However, there is a paucity of information on potentially population-limiting pathogens in this and other fisher populations. We collected various biological samples from over 250 individuals range-wide that allowed us to examine differences in pathogenic risk throughout the fisher's range. We used serological techniques which included Immunofluorescent Antibody (IFA) tests to evaluate exposures and polymerase chain reaction (PCR) to determine active infections. To date, we report ranges of exposure to canine distemper (0%-17%), canine parvovirus (4%-67%) and *Toxoplasma gondii* (11%-93%), and active infections of canine parvovirus (0%-18%), each of which are likely to pose risks to the survival and fitness of fishers. We discuss the pathogenic risks to fishers and their implications for the multifaceted field of carnivore conservation.

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