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**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MONTANA
MISSOULA DIVISION**

DEFENDERS OF WILDLIFE, et al.,)	Case No. cv-09-77-M-DWM (Lead)
)	cv-09-82-M-DWM
Plaintiffs,)	(consolidated cases)
)	
v.)	DECLARATION OF MARK
)	HEBBLEWHITE
KEN SALAZAR, et al.,)	
)	
Defendants.)	
_____)	
)	
GREATER YELLOWSTONE)	
COALITION,)	
)	
Plaintiff,)	
)	
v.)	
)	
KEN SALAZAR, et al.,)	
)	
Defendants.)	
_____)	

Monday, August 24, 2009

I, Mark Hebblewhite, Assistant Professor of Wildlife Biology at the University of Montana, hereby declare as follows:

Academic background

1. I received my B.Sc. in Pure & Applied Ecology with Honors at the University of Guelph in 1995, my Masters in Wildlife Biology at the University of Montana in 2000, and my Ph.D. at the University of Alberta in Ecology in 2005. I held a post-doctoral research fellowship funded by the National Sciences and Engineering Research Council at the University of British Columbia in 2006 before starting my tenure track position here at the University of Montana in August of 2006.

2. I have studied wolves and their large ungulate prey since 1994 in: Algonquin Provincial Park, Ontario; Banff, Jasper, Yoho, and Kootenay National Parks, Alberta and British Columbia; the provincial lands of Alberta and British Columbia; Montana, Idaho, Wyoming, Washington, and Oregon; and the countries of Slovakia, Poland, and Mongolia. As I point out below in my declaration, I have a wide array of experience studying wolves outside of the US under much weaker harvest regulations than proposed by the states of Montana and Idaho. Through this field research experience with wolves, I personally have caught and

radiocollared over 75 wolves and been the main principle investigator in the capture and radiocollaring of over 200 wolves in Canada, tracking their fates, causes of mortality, and survival. I also have been responsible for the capture and study of over 1,000 large ungulate prey including elk, deer, moose, and woodland caribou.

3. I conduct research on the population and habitat ecology of large carnivores and their large ungulate prey, predator-prey dynamics, endangered species management, national park management, and quantitative ecology. I presently have six graduate students and two post-doctoral research associates, and together we are studying a wide variety of carnivores including wolves, mountain lions, bears, and the Amur tiger, as well as ungulate species including woodland caribou, moose, white-tailed deer, endangered sierra Nevada bighorn sheep, mule deer, and elk.

4. I teach quantitative ecology classes at the graduate level in wildlife habitat modeling and wildlife survival modeling, and at the undergraduate level in wildlife habitat conservation and management.

5. I am a member in good standing of four professional organizations including; the Ecological Society of America, the Society for Conservation Biology, the British Ecological Society, and the Wildlife Society. Since 2006, I have served as an Associate Editor for the Journal of Applied Ecology.

6. I have published numerous studies of wolf population dynamics over time in Banff (protected) and adjacent hunted areas in Alberta, studies of the population spread of reintroduced wolf populations from Yellowstone National Park, and studies on the ecosystem effects of wolves that provide insight into the question of whether delisting may cause irreparable harm to wolves.

7. I have attached my professional curriculum vitae for the record to this declaration.

8. The purpose of this declaration is to respond to the plaintiffs' allegations of irreparable injury in their Memorandum in Support of Motion for Preliminary Injunction against the April 2, 2009 wolf delisting rule for wolves in the Northern Rocky Mountains, filed on August 20th, 2009. I address the three main points raised by the plaintiffs that wolf delisting will irreparably harm individual wolf packs, the wolf population, and the ability to see wild wolves. I also address whether the published wolf harvest seasons by the states of Montana and Idaho will cause irreparable harm. I have also twice served as a scientific reviewer for the delisting rule published in the Federal Register in the last three years, and in both times have come to the scientific conclusion that wolf delisting is warranted and management authority should be relegated to the appropriate state-level management agencies. Wolf restoration has been a clear scientific success story.

Discussion

9. I scientifically disagree with the plaintiff's arguments that wolf delisting will cause irreparable harm to the Northern Rockies wolf population at the present time. It is obvious that the killing of individual wolves is harmful to individual wolves, but from a scientific perspective, the objectives for delisting were and should be considered at the population level. At this population level, there is, in my scientific opinion, no risk whatsoever to the wolf population given the states of Montana and Idahos' wolf management plans which include hunting harvest.

10. After reviewing the current population estimates by Montana and Idaho, the harvest regulations, and the spatial zoning of wolf harvest in Idaho and Montana, as well as the in press scientific publication lead by Doug Smith et al. that summarizes 10+ years of wolf survival data across the Northern Rockies (in press in Wildlife Monographs), I have come to the firm scientific conclusion that while the harvest will certainly kill individual wolves, it will not irreparably harm the wolf populations in either Montana, Idaho or Wyoming. The wolf harvest plans developed by Idaho and Montana are quite conservative and will retain a sufficient number of wolves in both states such that total mortality will be less than 30%, the threshold identified for stable wolf populations across North America. Even if the wolf harvests were capable of increasing wolf mortality to a level greater than this sustainable threshold, both state agencies have in place in their

wolf management plans that could be enacted to reverse the high harvest, and increase wolf population growth rate – exactly the same as any other large mammal currently managed by state agencies for multiple societal objectives. Therefore, the argument that the planned MT and ID hunting seasons for wolves will cause irreparable harm to the northern rockies wolf population is simply not scientifically defensible.

11. It is well established through the wolf literature on almost every continent and population that has been studied that wolves can sustain relatively high harvests and still be considered viable from this population perspective. Across populations and studies, it has been determined that the sustainable thresholds of mortality is approximately 30% - so long as mortality is below 30%, wolf populations can be expected to be sustainable. Wolves are even robust to short-term harvests greater than this 30%, upwards to 50% for one to two years, and can recover from these higher levels quickly. Combined with the conservative harvests proposed by Montana and Idaho, it is hard to come to the scientific conclusion that these harvests will result in declining wolf populations or irreparable harm.

12. I argue that the plaintiffs have no formal or direct experience with wolf management systems in other countries where wolf harvest is much more liberal than the hunting regulations proposed by the states of Montana and Idaho. Their

ignorance of international wolf management experience leads to a major flaw in their argument. In the countries of Canada, Mongolia, and Slovakia, the harvest of wolves is far less regulated than proposed by Montana and Idaho, and wolf populations are not at risk of extirpation in many populations in these countries. After reviewing the Montana and Idaho harvest plans, I consider them extremely conservative and risk-averse, with extremely low chances of overharvesting wolves to the point of irreparable harm. Moreover, compared to other countries, both states' harvest plans do not include trapping, which in my experiences in Canada, is the more important source of mortality for wolf populations.

13. In the absence of human-caused wolf mortality, such as in completely protected wolf populations, the main source of mortality is from other wolves in adjacent wolf packs. From an evolutionary perspective, over the last tens of thousands of years, wolves evolved with high levels of mortality from themselves, other predators, and indeed, from humans. So, the plaintiff's arguments that wolf mortality causes irreparable harm from a pack and population level make no sense in the light of evolutionary biology of wolves, a species that is capable of rapid population growth and recovery from high mortality. This is in stark contrast to grizzly bears and Amur tigers that have low reproductive rates and have experienced low levels of human caused mortality over evolutionary time. Thus,

the plaintiff's arguments that wolf harvest will cause irreparable harm to wolves are inconsistent with the scientific understanding of wolf evolutionary biology.

14. The argument that wolf mortality can cause irreparable harm to the wolf pack is not borne out by scientific studies. I interpret irreparable harm to mean that mortality of one wolf within a wolf pack would lead to death of all wolves within the wolf pack. However, even the most recent studies show a short term and transient effect of wolf mortality within a wolf pack that might reduce population growth rate for one or two years of the individual wolf pack. Yet numerous simulation studies show that, even with high levels of breeder loss within a wolf pack, wolf population growth rate is determined more by the number of wolf packs, not size of individual wolf packs. Therefore, even if conclusive evidence of irreparable harm to a wolf pack from harvest could be shown, it would not negatively influence wolf population growth at the population level. Moreover, from a conservation perspective, it is the population, not the individual or even pack, that is of management or conservation concern.

15. The argument also does not agree with experience of active wolf controls in parts of Canada and Alaska that confirm that wolf populations can tolerate extremely high levels of harvest and still recover. For example, in the best scientifically conducted wolf control in the scientific literature, Hayes et al. (2004) removed 80% of a wolf population from a 20,000 km² area over the course of 2-

years by helicopter shooting, removing over 200 wolves. Within two years post-harvest, the wolf population had recovered to pre-control levels, confirming an annual growth rate of approximately 40% per year. It's worth noting that the authors concluded that wolf control by aerial means was the most effective way to kill wolves, and that local harvest through hunters or trappers was ineffective. Yet, even with the extreme actions of helicopter wolf control, the authors concluded that this was not a long-term solution to wolf-prey management because of its high expense.

16. Finally, the argument that wolf delisting will irreparably harm the plaintiff's ability to see and enjoy wolves in the wild is also scientifically weak. By far the best place to see and enjoy wolves in the wild is and will be in the future in National Parks like Yellowstone National Park. In my 15 years studying wolves in the wilds of Canada, Europe and Asia, I have seen wolves in the wild only a dozen times without aid of research methods like radiocollaring or aerial telemetry. Given the secretive and variable nature of wolves, I think it unlikely that there could be strong scientific evidence marshaled for a significant decline in the number of wolf sightings by members of the plaintiff's organizations. I see this argument as the weakest scientific point made against delisting.

17. Therefore, in my opinion, I do not think that wolf delisting will cause irreparable harm to wolves, wolf packs, or the plaintiff's ability to see and enjoy wolves in the wild.

In accordance with 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed in __Missoula, Montana, _____ on this _24th day of August 2009.



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CURRICULUM VITAE

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CITIZENSHIP

Canadian citizen by birth, British citizen by Naturalization, United States of America
Resident Alien employer sponsored VISA (H1-B)

EDUCATION

2006. **Doctor of Philosophy** in Ecology, Department of Biological Sciences, University of Alberta. January 2006. Dissertation title: *Linking predation risk and forage to ungulate population dynamics*. Advisor, Dr. E.H. Merrill.
2000. **Masters of Science** in Wildlife Biology. University of Montana. 2000. Thesis title: *Wolf- Elk predator-prey dynamics in Banff National Park*. Advisor, Dr. D.H. Pletscher.
1995. **Bachelor of Science**, Honours, Major in Biological Science in Pure and Applied Ecology. University of Guelph. 1995. Advisor, Dr. T. Nudds.

ACADEMIC POSITIONS

2006. **Assistant Professor in Ungulate Habitat Ecology**. Wildlife Biology Program, Department of Ecosystem and Conservation Sciences, University of Montana, Missoula, MT, USA. August 1, 2006 to present.
2006. **NSERC Post-Doctoral Fellow**. Department of Zoology, University of British Columbia, Vancouver, B.C. *Migratory ungulate population dynamics*. Advisor, Dr. A.R.E. Sinclair. February 2006 – July 2006.

ACADEMIC AWARDS AND SCHOLARSHIPS

- Canadian Society of Zoologists T.W.M. Cameron Outstanding PhD Thesis Awardee** for 2006, National level award for best PhD thesis.
- NSERC Dissertation Prize** award nominee for the University of Alberta, 2006.
- Martha Piper Graduate Award for Excellence in Scientific Communication**, University of Alberta, 2006.
- National Science and Engineering Research Council (NSERC) Post-Doctoral Fellowship**, (\$80,000), 2005.
- Parks Canada National Ecological Integrity Merit Award**, Restoration of Ecosystems. In

recognition of contribution to ecosystem management, Banff National Park, 2005.

Andrew Stewart Memorial Prize, University of Alberta (\$5,000), 2005.

Canon National Parks Science Scholars Program, Baja Retreat (\$2,500 USD), 2005.

Canon National Parks Science Scholars Program, Vieques, Puerto Rico, Retreat (\$3,000 USD), 2003.

Bill Shostak Wildlife Award, University of Alberta, (\$10,000), 2003.

Canon National Parks Science Scholars Program for the Americas Scholarship, 3 years full stipend and research funding (\$78,000 USD), 2002.

Poster Presentation Award at the Alberta Chapter of the Wildlife Society, 2003.

Graduate Research Assistantship Scholarship (GRA), 2002-03.

Graduate Teaching Assistantship, University of Alberta (GTA), 2001-02.

George Bright Graduate Excellence Scholarship, University of Montana, 1999.

Graduate Teaching Assistantship, University of Montana, 1998, 1999.

Les Pengelly Memorial Graduate Excellence Scholarship, University of Montana, 1998.

EDUCATIONAL ACTIVITIES

Teaching Experience

Fall 2008	Course Instructor for WBIO 595 Wildlife Survival Modeling, a graduate level course (3 credits) to 7 PhD students on recent advances in analysis of wildlife survival data, focusing on the Cox-proportional hazards model. Teaching evaluation 4.1/5.
Spring 2008	Course Instructor for WBIO 495 Canadian Rockies Wildlife Conservation graduate level course (1 credit) to international students from Pakistan and Bhutan on National park management and wildlife conservation, organized field trip to Banff and Jasper National Parks for spring break.
Fall 2007	Course Instructor for WBIO 595 Wildlife Habitat Modelling graduate level course (3 credits) to 15 graduate students. Designed lectures and GIS and statistical software based labs. Overall teaching evaluation 4.2/5
Spring 2007, 2008, 2009	Course Instructor for WBIO 370 Wildlife Habitat Conservation and Management (3 credit hours) to ~25 students. Designed syllabus, lectures, and labs. Overall teaching evaluation 3.8/5 (2 years)
	Course Instructor for FOR 275 Wildlife Conservation (2 credit hours) to 55-60 students. Designed syllabus, lectures, and maintained class websites. Overall teaching evaluation 4.3/5 (2 years)

Winter 2003	Co-Instructor (co-taught with Dr. Stan Boutin) for BIOL 633, Graduate student course on predator-prey dynamics, University of Alberta.
2001 & 2002	Graduate Teaching Assistant for two semesters of BIOL 430, experimental ecology, a 4 th year biostatistics course, University of Alberta.
2001	University Teaching Services , attended University of Alberta graduate teaching assistant training courses, 20-hours instruction.
2000	Graduate Teaching Assistant for 1 semester of WBIO 370 Wildlife Techniques, and 2 semesters of WBIO 180 Introduction to Natural Resources, University of Montana.

Mentoring & Training***POST-DOCTORAL FELLOWS***

Name	Year	Thesis topic
Dr. Hugh Robinson	2-year appointment	Spatial dynamics between fire, caribou, and elk in Jasper National Park
Dr. Kathleen Griffin	1-year appointment	Spatial meta-analyses of elk calf survival data across the Pacific Northwest.

GRADUATE STUDENTS

Student	Degree & Year	Thesis topic
Nick DeCesare	PhD, in progress	Spatial population viability of caribou in west-central Alberta
Shawn Cleveland	MS, in progress	Elk ecology and management in the wildland-urban-interface
Lacey Greene	MS, in progress	Restoring critical habitat for endangered Sierra Nevada Bighorn sheep
Jean Polfus	MS, in progress	Comparing traditional ecological knowledge and resource selection functions for Northern Mountain Caribou
Wibke Peters	MS, in progress	Evaluating moose habitat relationships for caribou recovery

UNDERGRADUATE THESIS STUDENTS

Student	Year	Thesis topic
Michel Kohl	2008	Elk-weed dynamics in the wildland urban interface (MILES internship recipient, Fall 2008).
Scott Eggeman	2007/ 2008	Influences of climate and density on fluctuating asymmetry in elk in the Greater Yellowstone Ecosystem (MILES

		Fellowship winter for 2007/08)
Brynn Nelson	2008	Spatial epidemiology of wolves in the Canadian Rockies.
Joshua Goldberg	2009	Mathematical modelling of wolf and elk source sink dynamics in the Bow Valley of Banff National Park.

PROFESSIONAL SERVICE

Professional Appointments

2008, July - September	Independent Reviewer for Alberta Wolf Sterilization Management Proposal , Alberta Fish and Wildlife Division.
2007 to present	Scientific Member of the Alberta Caribou Recovery Team – Research and Monitoring Subcommittee <ul style="list-style-type: none"> • Lead development of scientific recommendations to the Alberta Caribou recovery team’s governance board.
2007 to present	Scientific Advisory Group Member for the Critical Habitat Review for the Boreal Caribou Recovery Plan , Environment Canada, chaired by Dr. Fiona Schmiegelow. <ul style="list-style-type: none"> • Participated in science review of critical habitat for boreal caribou • Population viability analysis (PVA) team member • Environmental niche modeling (ENM) team member • Report released April 9, 2009. See media coverage and technical reports below.
2006 August	Associate Editor , Journal of Applied Ecology, British Ecological Society. 3-year appointment.
2001, summer	Volunteer Consultant , Altai-Sayan Ecoregion Project, World Wildlife Fund, Mongolia. <ul style="list-style-type: none"> • Assisted in design & collection of wildlife data and conducted herder interviews in Western Mongolia.
1997 to 2002	Invited Board Member of the Banff National Park (BNP) citizens and scientific committees of the Elk management board. <ul style="list-style-type: none"> • Participated in annual citizens and scientific board meetings reviewing elk management in BNP. • Led development of an elk population model used to guide park management for a 5-year period.
1997 to 2005	Invited Board Member of the BNP scientific review committee. <ul style="list-style-type: none"> • Participated in annual Parks planning forums reviewing scientific basis for park management.

PROFESSIONAL ACTIVITIES***University Committees***

- Wildlife Biology Program seminar committee chair, responsible for organizing and scheduling departmental seminar series.
- Wildlife Biology Program website committee chair.
- College of Forestry & Conservation (CFC) Undergraduate Committee, since Fall 2006
- Wildlife Biology Program Undergraduate Committee, since Fall 2006.
- College of Forestry and Conservation Lubrecht Experimental Forest Planning committee, since Fall 2006.
- Service on 29 graduate student committee's at the MS and PhD level at the University of Montana and the University of Calgary since 2006.

Professional Memberships

- Ecological Society of America member since 2005.
- Society for Conservation Biology member since 1995, University of Montana Student Chapter member 1997-2000.
- Wildlife Society member since 1996, Alberta Chapter member since 1998.
- Member of the British Ecological Society since 2006.
- Canadian Parks and Wilderness Association member since 1994.

Grant Review Activities

- Invited reviewer for NSERC-Canada Discovery grants 2006, 2007, 2008.
- Invited reviewer for NSF Ecology division, 2007 & 2008
- Invited board member of the Montana Rocky Mountain Elk Foundation Project Advisory Committee, 2006 to present. Reviewed 50-60 proposals/year allocating ~\$350,000 for wildlife conservation.

Conference, Symposia and Workshop Organization

- Workshop organizer for the Changbaishan tiger conservation landscape planning workshop in Changchun, China May 25 - June 1, 2009, World Wildlife Fund and Wildlife Conservation Society.
- Symposium co-organizer (with Cliff White and Evelyn Merrill) for the Wildlife-fire session at the International Association of Wildland Fire 2008 conference, The 88' fires: Yellowstone and beyond.
- Organized and chaired a symposium on "Synthesizing recent advances in ungulate population dynamics" at the Wildlife Society Conference, Calgary, Alberta, 2004.

Professional Services

Conducted ~25 peer reviews/year for international scientific journals including:

Nature, Journal of Animal Ecology, Ecology, Ecological Applications, Journal of Applied Ecology, Journal of Wildlife Management, Canadian Journal of Zoology, Wildlife Biology, Alces, Biological Conservation, Rangifer, Proceedings of the Royal Society – Biological Sciences, Proceedings of the National Academy of Sciences, Ecoscience, and the Journal of Mammalogy.

Collaborated with Parks Canada caribou recovery team in the development of prescribed fire management guidelines for promoting caribou recovery, 2006.

Reviewed Alberta Fish and Wildlife ungulate and wolf helicopter capture standard operating procedures and protocols, 2004.

Reviewed Alberta Ministry of Sustainable Resource Development- Southern Alberta sustainability strategy: wildlife and biodiversity modelling component, 2004.

Annual presentations on research and wildlife conservation to the Student chapter of the Wildlife Society, University of Alberta, 2003/2004.

Organized an interagency LANDSAT landcover mapping meeting for a 50,000 km² area surrounding Canadian Rocky Mountain National Parks, partners, 2003.

Scientific reviewer for Canadian Parks and Wilderness Society's "What's happening in our mountain parks" publication, 1999.

Reviewed 10 endangered species recovery plans for Society for Conservation Biology see <http://www.nceas.ucsb.edu/recovery/index.html>, 1999.

RESEARCH ACTIVITIES

Research Funding

- 2009, Mohammed bin Zayed Species Conservation Fund, Amur Tiger predator-prey conservation, \$25,000 (Co-PI with Dr. Dale Miquelle, WCS)
- 2009, Sierra Nevada Bighorn Sheep Habitat modeling, California Fish and Game, \$89,000 (PI)
- 2008, Modeling Amur Tiger and Leopard habitat, Russian Far East – Wildlife Conservation Society, \$15,000. (PI)
- 2008, Alberta Conservation Association, Moose-caribou-forestry dynamics, \$38,000 (PI)
- 2008, Alberta Conservation Association, Ya Ha Tinda long-term elk monitoring, \$34,000 (Co-PI with Dr. E. Merrill, U of Alberta)
- 2008, Meta-analysis of Mule Deer Fawn Survival, Idaho Department of Fish and Game, \$13,000.
- 2008, Taku River Tlingit First Nation (TRTFN) Atlin Caribou Habitat and Traditional Ecological Knowledge, Round River Conservation Studies and TRTFN, \$37,378 (PI)
- 2008, Endangered Species Recovery Fund (ESRF), Environment Canada & WWF, Moose-caribou relationships & caribou recovery, \$15,000 (PI)
- 2008, Rocky Mountain Elk Foundation – USA, North Hills wildland-urban interface elk management, \$20,000 (PI)
- 2008, Rocky Mountain Elk Foundation – USA, Calf survival meta-analysis in the Pacific Northwest, \$34,000 (PI)
- 2008, Shell Corporation – Canada, Wolf-caribou dynamics and energy development in the Narraway and Red Willow ranges, \$72,000 (Co-PI with Dr. M. Musiani, U of Calgary)
- 2008, Parks Canada, Wolf-fire-caribou-beetle dynamics and caribou conservation, \$160,000 (Co-PI with Dr. M. Musiani, U of Calgary)
- 2007, United States Forest Service, Forest-wildlife modeling project, \$42,000 (PI)
- 2007, Sierra Nevada Bighorn Sheep Recovery Project, California Fish and Game, \$495,000 (PI)
- 2007, North Hills Urban Elk Project, Rocky Mountain Elk Foundation, \$20,000 (PI)
- 2006, Linear features, forestry, wolves and caribou dynamics project, Petroleum Technology Alliance of Canada (PTAC), \$665,000 (PI, Co-PI Dr. Marco Musiani, U of Calgary)
- 2006, Woodland caribou population persistence modeling, Parks Canada, \$7,000 (PI)
- 2005, Effects of fire and cutblocks on ungulate habitat potential, Alberta Conservation Association (ACA), \$12,500 (PI)
- 2004, Ya Ha Tinda elk herd population dynamics, Foundation for North American Wild Sheep (FNAWS), \$2,500 (Co-PI with Dr. E. Merrill, U of Alberta)

- 2004, Ya Ha Tinda elk and wolf project, Rocky Mountain Elk Foundation-Canada (RMEFC), \$29,860 (Co-PI)
- 2004, Ya Ha Tinda elk herd population dynamics, Alberta Conservation Association (ACA), \$30,000 (Co-PI)
- 2003, GPS elk collar equipment grant, Alberta Cooperative Conservation Research Unit (ACCRU) \$40,000 (Co-PI)
- 2003, Human effects on wolves and elk, Mountain Equipment Co-op (MEC) Environment Fund, \$9,200 (Co-PI)
- 2003, Ya Ha Tinda elk herd population dynamics, Alberta Conservation Association (ACA), \$11,500 (Co-PI)
- 2003, Ya Ha Tinda elk and wolf project, Rocky Mountain Elk Foundation-Canada (RMEFC), \$20,500 (Co-PI)
- 2003, Human impacts on ungulate forage species diversity in the eastern slopes of Alberta. Biodiversity Challenge Grant – ACA partnership, \$13,005 (Co-PI)
- 2002, Training on the job program funding for two research assistants, Alberta Enhanced Career Development, \$14,000 (Co-PI)
- 2002, Effects of the Dogrib fire and post-harvest logging on elk population dynamics, Foothills Model Forest, \$34,000 (Co-PI)
- 2002, Elk trapping grant, Rocky Mountain Elk Foundation-Canada, \$10,000 (Co-PI)
- 2002, Research equipment and field clothing equipment grant, Patagonia Environmental Grants Program, \$3,000 (PI)
- 2001, Elk and wolf GPS collar grant, Canadian Foundation for Innovation (via Dr. Merrill), \$65,000
- 2001-2005, Wolf and elk population dynamics at the Ya Ha Tinda, Parks Canada- Banff National Park, Memorandum of Understanding, \$350,000 over 4-years (Co-PI)
- 1998, Training on the job program funding for three research assistants, Alberta Enhanced Career Development, \$27,000 (Co-PI)
- 1998, Equipment grant for Garmin GPS units. Garmin GPS Ltd, Kansas, USA. \$2,000 (PI)
- 1998, Research equipment and field clothing equipment grant, Patagonia Environmental Grants Program, \$ 6,000 (PI)
- 1997, Wolf and elk population dynamics near the Town of Banff, Canadian – Pacific Foundation Research Grant, \$15,000 (Co-PI)
- 1997, Training on the job program funding for four research assistants, Alberta Enhanced Career Development, \$35,000 (Co-PI)
- 1997, Wolf-prey ecology in the Bow Valley of Banff National Park, Parks Canada- Banff National Park research contract, \$175,000 (PI)

Publications

In Review

1. Hebblewhite, M., & Merrill. 2009. Fitness balancing in a partially migratory elk population through forage-predation trade-offs. *Journal of Animal Ecology*, *In Review*, July 2009.
2. DeCesare, N.J., Hebblewhite, M., Robinson, H., Musiani, M. 2009. Endangered, apparently: the role of apparent competition in endangered species management. Invited review, *Animal Conservation*, *In Revision*, June 2009.

Peer Reviewed Publications

3. Hebblewhite, M., White, C.A., & Musiani, M. 2009. Acceptability of letting mountain caribou go extinct in Banff National Park (Canada). *Conservation Biology*, *In Press*, June 2009.
4. Eggeman, S., Hebblewhite, M., Cunningham, J., & Hamlin, K. 2009. Fluctuating asymmetry in elk antlers is unrelated to environmental conditions in the Greater Yellowstone Ecosystem. *Wildlife Biology*, *In Press*, April, 2009. (undergraduate thesis project)
5. Post, E., Brodie, J., Wilmers, C.C., **Hebblewhite, M.**, & Anders, A.D. 2009. Global population dynamics and hotspots of climate change. *Bioscience*, 59: 489-499.
6. **Hebblewhite, M.**, & Merrill, E.H. 2009. Trade-offs between wolf predation risk and forage at multiple spatial scales in a partially migratory ungulate. *Ecology*, *In Press*, March 2009.
7. McDevitt, A., Mariani, S., **Hebblewhite, M.**, DeCesare, N., Morgantini, L., Seip, D., Weckworth, B., Musiani, M. 2009. Survival in the Rockies of an endangered hybrid swarm from diverged caribou (*Rangifer tarandus*) lineages. *Molecular Ecology* 18, 665-679.
8. **Hebblewhite, M.**, Munro, R.H., & Merrill, E.H. 2009. Trophic consequences of post-fire logging in a wolf-ungulate system. *Forest ecology and management*, 257: 1053-1062.
9. Webb, N., **Hebblewhite, M.**, & Merrill. 2008. Statistical methods for identifying wolf kill sites from GPS locations. *Journal of Wildlife Management*, 72, 798-806.
10. **Hebblewhite, M.**, & Merrill, E.H. 2008. A multi-scale test of the intermediate forage maturation hypothesis in a partially migratory montane elk herd. *Ecological Monographs*, *In Press*, May, 2008.
11. **Hebblewhite, M.**, & Merrill, E.H. 2008. Modeling wildlife-human relationships for social species using mixed-effects models. *Journal of Applied Ecology*. 45: 834-844.

12. **Hebblewhite, M.**, Whittington, J., Bradley, M., Skinner, G., Dibb, A., White, C.A. 2007. Conditions for caribou persistence in the wolf-elk-caribou systems of the Canadian Rockies. *Rangifer*, 17: 85-97.
13. **Hebblewhite, M.** 2007. Predator-prey management in the national park context: lessons from a transboundary wolf-elk, moose and caribou system. *Transactions of the 72nd North American Wildlife Conference*, Portland. 348 - 365.
14. **Hebblewhite, M.**, & Merrill, E.H. 2007. Multi-scale wolf predation risk for elk: does migration reduce risk? *Oecologia* 152: 377 – 387.
15. **Hebblewhite, M.**, Percy, M., & Merrill, E.H. 2007. Are all GPS collars created equal? Correcting habitat-induced bias using three brands in the Central Canadian Rockies. *Journal of Wildlife Management* 71: 2026-2033.
16. Hurford, A., **Hebblewhite, M.**, & Lewis, M.A. 2006. A spatially explicit model for the Allee effect: why wolves recolonize so slowly in Greater Yellowstone. *Theoretical Population Biology* 70: 244-254.
17. Gillies, C.S., **Hebblewhite, M.**, Nielsen, S.E., Krawchuk, M.A., Aldridge, C.L., Frair, J.L., Saher, D.J., Stevens, & C.E., Jerde. 2005. Application of random effects to the study of resource selection by animals. *Journal of Animal Ecology* 75: 885 – 898.
18. **Hebblewhite, M.**, Merrill, E. H., Morgantini, L. E., White, C. A., Allen, J. R., Bruns, E., Thurston, L. & Hurd, T. E. 2006, Is the migratory behavior of montane elk herds in peril? The case of Alberta's Ya Ha Tinda elk herd. *Wildlife Society Bulletin*, 134: 1280-1295.
19. **Hebblewhite, M.**, Merrill, E.H., & McDonald, T.E. 2005. Spatial decomposition of predation risk using resource selection functions: an example in a wolf-elk predator-prey system. *Oikos* 111:101-111.
20. **Hebblewhite, M.**, White, C. A., Nietvelt, C., McKenzie, J. M., Hurd, T. E., Fryxell, J. M., Bayley, S. & Paquet, P. C. 2005 Human activity mediates a trophic cascade caused by wolves. *Ecology* 86: 2135-2144.
21. **Hebblewhite, M.** 2005. Predation by wolves interacts with the North Pacific Oscillation (NPO) on a western North American elk population. *Journal of Animal Ecology* 74: 226-233.
22. **Hebblewhite, M.**, Paquet, P.C., Pletscher, D.H., Lessard, R.J. & Callaghan, C. 2004. Development and application of a ratio-estimator to estimate wolf-killing rates and variance in a multi-prey ecosystem. *Wildlife Society Bulletin* 31: 933-945.

23. **Hebblewhite, M.**, Percy, M., & Serrouya, R. 2003. Black bear survival and demography in the Bow Valley of Banff National Park. *Biological Conservation* 112: 415-425.
24. **Hebblewhite, M.**, Pletscher, D.H., & P.C. Paquet. 2003. Elk population dynamics following wolf recolonization of the Bow Valley of Banff National Park. *Parks Canada Research Links* 11: 10-12.
25. **Hebblewhite, M.**, & Pletscher, D.H. 2002. Effects of elk herding on predation by wolves: linking anti-predator behavior to population dynamics. *Canadian Journal of Zoology* 80: 800-809.
26. **Hebblewhite, M.**, Pletscher, D.H., & P.C. Paquet. 2002. Factors affecting elk population growth rate in areas with and without predation by recolonizing wolves in Banff National Park. *Canadian Journal of Zoology* 80:789-799.

Books

27. **Hebblewhite, M.** & Smith, D. W. 2009 Wolf community ecology: ecosystem effects of recovering wolves in Banff and Yellowstone National Parks. *The world of wolves: new perspectives on ecology, behavior, and policy* (eds M. Musiani, L. Boitaini & P. C. Paquet), University of Calgary Press, Calgary, AB.
28. Duke, D., **Hebblewhite, M.**, Paquet, P.C., & Callaghan, C. 2001. Restoration of a large carnivore corridor in Banff National Park, Alberta. *In Large mammal restoration: ecological and sociological challenges in the 21st Century*, Edited by Maehr, D.S., Noss, R.F., & Larkin, J.L., Island Press.

Dissertation, Theses

29. **Hebblewhite, M.** 2006. Linking forage and predation risk to ungulate population dynamics. Dissertation, Environmental Biology and Ecology, University of Alberta, Edmonton, AB. 327pp + appendices.
30. **Hebblewhite, M.** 2000. Wolf and elk predator-prey dynamics in Banff National Park. Masters of Science Thesis. Wildlife Biology Program, School of Forestry, University of Montana, Missoula, MT. 130pp.
31. **Hebblewhite, M.** 1995. Habitat use by sympatric moose and white-tailed deer in Algonquin Provincial Park: implications for the habitat refuge hypothesis. Honors Thesis, Department of Zoology, University of Guelph, Guelph, ON. 40pp.

Technical and Management Reports

32. Zhenxin, L., Zimmerman, F., Purekhovskiy, A., Jia, L., Kalashnikova, J., Chang, L.W., Shujin, L., Zhengxiang, Z., Youde, C., Jirong, T., **Hebblewhite, M.**, Miquelle, D. A Landscape conservation plan for the recovery of tigers in the Changbaishan Ecosystem, Northeast China. World Wildlife Fund and Wildlife Conservation Society (results of May 2009

workshop in Changchun, China).

33. **Environment Canada.** 2009. Scientific Review for the Identification of Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, Ottawa: Environment Canada. 72 pp. plus 180 pp Appendices. I was a member of the 18-member Science Advisory Group that drafted the report. Report available from http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=1761
34. **Hebblewhite, M.** 2009. Linking wildlife populations with ecosystem change: state of the art satellite ecology for national park science. Park Science, In press (publication of the National Park Service, USA, Peer-edited).
35. **Hebblewhite, M.** 2008. A literature review of the effects of energy development on ungulates: implications for eastern Montana. Report prepared for the Montana Department of Fish Wildlife and Parks, Helena, MT, 114p.
36. **Hebblewhite, M.,** Munro, R. & Merrill, E. H. 2005. Effects of post-fire logging on elk habitat during the first 3 years post-fire: A Case Study of the Dogrib Creek Fire on the Eastern Slopes of Alberta. Department of Biological Sciences, University of Alberta, Edmonton, AB. Prepared for the Foothills Model Forest. 85p.
37. **Hebblewhite, M.** 2000. Environmental assessment of the effects of Carrot creek fire-guard construction on forest songbirds and amphibian populations. Prepared for Parks Canada, Banff National Park. 65pp.
38. **Hebblewhite, M.,** Duke, D., & Percy, M. 1995. Bull trout breeding habitat assessment, Bow River watershed. Prepared for Parks Canada, Banff National Park. 45pp.

Invited Presentations

1. **Hebblewhite, M.** 2009. Ten-years tracking wolves in the heart of the Canadian Rockies: conservation lessons and wilderness science. Invited guest speaker in the 2009 Wilderness Lecture Series, Wilderness Institute, University of Montana, Missoula, MT.
2. **Hebblewhite, M.** 2007. Detecting climate-predation interactions in large-scale patterns: potential research approaches with *Rangifer* and *Cervus* datasets. Invited presentation to the Department of Arctic Environment, University of Aarhus, Roskilde, Denmark, December 2007.
3. **Hebblewhite, M.** 2007. Defining Critical habitat across spatial scales for threatened woodland caribou. Invited presentation to the Science Advisory Group for the Critical Habitat Review for Boreal Woodland Caribou recovery, Environment Canada, Toronto, ON.
4. **Hebblewhite, M.** 2007. Linking elk population dynamics to bottom-up and top-down forces. Invited departmental seminar speaker, Department of Natural Resources, Washington State University, Pullman, WA, Sept 2007.
5. **Hebblewhite, M.** 2007. Linking forage dynamics and predation risk to ungulate population

- dynamics. Invited presentation to the Annual meeting of the Canadian Society of Zoologists, Montreal, QC, May 2007.
6. **Hebblewhite, M.** 2007. Predator-prey management in the National Park context: lessons from a transboundary wolf, caribou and elk system. Invited presentation to the Transactions of the North American Wildlife Conference, Portland, OR, March 2007.
 7. **Hebblewhite, M.**, Boutin, S., Schmiegelow, F., Stenhouse, G., Frair, J.L., and Gates, G.C. 2007. Postcards from the edge: a review of the effects of oil and gas development on wildlife in Alberta. Invited presentation at the Montana Chapter of the Wildlife Society meetings, Bozeman, MT, Feb 2007.
 8. **Hebblewhite, M.** and Merrill, E.H. 2006. Migratory declines in partially migratory elk populations in the Canadian Rocky Mountains: a result of transboundary management conflict. Invited paper presented in the conservation of migratory ungulates symposium, Society for Conservation Biology Annual Meeting, San Jose, CA, June 2006.

Conference and Scientific Presentations

1. **Hebblewhite, M.**, Davis, W., Newton, D., Polfus, J., & Voyles, Z. 2008. The potential effects of energy development on ungulates in Eastern Montana: a literature review. Paper presented at the Montana Chapter of the Wildlife Society Meetings, Missoula, MT, February 2008.
2. Eggeman, S., Cunningham, J., Hamlin, K., & **Hebblewhite, M.** 2008. Influence of climate and elk density on fluctuating asymmetry in antlers in Montana. Poster presentation at the Montana Chapter of the Wildlife Society Meetings, Missoula, MT, February 2008 (Undergraduate thesis student).
3. Cleveland, S., Thompson, M., & **Hebblewhite, M.** 2008. Habituation, hunting, and recreation: understanding human influences on elk behavior in the wildland-urban interface: preliminary research results. Paper presented at the Montana Chapter of the Wildlife Society Meetings, Missoula, MT, February 2008. (Masters student).
4. **Hebblewhite, M.** 2007. Wolf and elk predator prey dynamics in Banff National Park, 1985-2005. Presented at the Montana Chapter of the Wildlife Society meetings, Bozeman, MT, February 2007.
5. **Hebblewhite, M.**, & White, C. 2006. Conditions for caribou persistence in the wolf-elk-caribou systems of the Canadian Rockies. Paper presented at the 11th annual North American Caribou Workshop, Jasper National Park, Jasper, AB, April 2006.
6. Merrill, E.H., & **Hebblewhite, M.** 2005. Spatial decomposition of predation risk for elk and habitat fragmentation: effects of landscape change on risk. Oral paper presented at the INTECOL/ Ecological Society of America annual meeting, Montreal, QC, August 2005.
7. Hurford, A., **Hebblewhite, M.**, & Lewis, M.A. 2005. A spatially explicit model for the Allee effect: why wolves recolonize so slowly in the greater Yellowstone Ecosystem. Oral paper presented at the INTECOL/ Ecological Society of America annual meeting, Montreal, QC, August 2005.

8. **Hebblewhite, M.**, Merrill, E.H., Morgantini, L.M., White, C., Thurston, L., Allen, J.R., Bruns, E., & Hurd, T.E. 2005. Is the migratory behavior of montane elk herds in peril? The case of the Ya Ha Tinda elk herd. Paper presented at the Alberta Chapter of the Wildlife Society Conference, Red Deer, AB, March 2005.
9. **Hebblewhite, M.**, Munro, R.M., & Merrill, E.H. 2005. Effects of post-fire logging on elk habitat and forage in the first three-years post-burn. Oral paper presented at the Annual Foothills Model Forest Fire research initiative workshop, Edmonton, AB, March 2005.
10. Munro, R.M., **Hebblewhite, M.**, Visscher, D., Hamilton, S., & Merrill, E.H. 2005. Preliminary evaluation of elk forage dynamics after harvest and fire in the central east slopes of Alberta. Poster presentation at the Alberta Conservation Association Partners in Conservation Conference, Calgary, Alberta, March 2005.
11. White, C. A., Hurd, T. L., **Hebblewhite, M.**, & Pengelly, I. R. 2005. Mitigating Fire Suppression, Highway, and Habitat Fragmentation Effects in the Bow Valley Ecosystem: Preliminary Evaluation of a Before-After-Control-Impact (BACI) Design with Path Analysis. Paper presented at the BC Ministry of Environment Monitoring the effectiveness of biological conservation, Burnaby, British Columbia, 2005.
12. **Hebblewhite, M.**, & Merrill, E.H. 2004. Modeling trade-offs between wolf predation risk and forage biomass using resource selection functions. Oral paper presented at the annual conference of the Wildlife Society, Calgary, September 2004.
13. **Hebblewhite, M.** 2004. Synthesizing advances in predator-prey and ungulate-plant dynamics: what links are missing? Special symposium summary discussion, presented at the annual conference of the Wildlife Society, Calgary, September 2004.
14. Merrill, E.H., Haydon, D.T., Frair, J., **Hebblewhite, M.**, Visscher, D., Webb, N., & Friar, J. 2004. Landscape patterns and movement strategies alter wolf-elk encounter rates. Presented at the Calgary TWS Conference, September 2004.
15. Webb, N., **Hebblewhite, M.**, Thiessen, C., & Merrill, E.H. 2004. Determining reproductive rates of wolves using fecal hormones. Oral paper presented at the Calgary TWS Conference, September 2004.
16. Thurston, L., **Hebblewhite, M.**, Morgantini, L.E., Merrill, E.H., & White, C.E. 2004. Elk population dynamics across 25-years of wolf recolonization in Banff National Park's Northern Range: The Ya Ha Tinda. Oral presentation at the Interagency Wolf Conference, Chico Hot Springs, MT, April 2004.
17. **Hebblewhite, M.**, 2004. Model selection and inference: a review of frequentist vs. information theoretic approaches. Statistical Ecology Seminar Series, Department of Biological Sciences, University of Alberta, Edmonton, AB, March 2004.
18. **Hebblewhite, M.** Merrill, E.H., Sachro, L., Gates, G., & C. White. 2004. Fire and landscape effects on elk forage biomass and phenology in the Eastern slopes. Invited oral presentation to the BNP annual Ecosystem Science Review Workshop, January 2004.

19. **Hebblewhite, M.**, & Merrill, E.H. 2004. Overview of the Ya Ha Tinda Elk and Wolf Project: Management implications and recommendations in a transboundary management setting. Invited oral presentation to the BNP annual Ecosystem Science Review Workshop, January 2004.
20. **Hebblewhite, M. 2003.** Invited Panel discussion member on Conservation and management of the Central Rockies Wolf Population. International wolf congress, Banff, AB., Sept 2003.
21. **Hebblewhite, M.**, White, C.A., Nietvelt, C., Hurd, T.E., & McKenzie, J. 2003. Wolf recolonization triggers a trophic cascade in Banff National Park. Oral presentation at the international wolf congress, Banff, AB, September 2003.
22. Hurford, A., **Hebblewhite, M.**, & Lewis, M.A. 2003. Harvest rate and range expansion: model formulation and validation. Oral presentation at the International World Wolf Congress, Banff, AB, September 2003.
23. **Hebblewhite, M.**, & Merrill, E.H. 2003. Applying resource selection functions to modeling predator-prey dynamics. Alberta Chapter of the Wildlife Society, Red Deer, AB, March 2003.
24. **Hebblewhite, M.**, & Merrill, E.H. 2003. Poster presentation on the Ecology of the Ya Ha Tinda Elk Herd. Alberta Chapter of the Wildlife Society, Red Deer, AB, March 2003. *Won best student poster award.*
25. **Hebblewhite, M.**, Merrill, E.H., & Frair, J. 2003. Application of Resource Selection Functions to modeling predator-prey dynamics. Paper presented at the First International Conference on Resource Selection by Animals, University of Wyoming, Laramie, WY, January 2003.
26. Webb, N., **Hebblewhite, M.**, & Merrill, E.H. 2003. Dynamics of a harvested wolf population in the Central East Slopes of Alberta. Paper presented at the North American Interagency Wolf Conference, Chico Hot Springs, Montana, Month, 2003.
27. **Hebblewhite, M.** 2002. Wolf-elk population dynamics in Banff National Park. Departmental Seminar Series, Department of Biological Sciences, University of Alberta, Edmonton, AB, March 2002.
28. **Hebblewhite, M.**, Percy, M., & Serrouya, R. 2002. Black bear survival and demography in the Bow Valley of Banff National Park. Paper presented at the Alberta Chapter of the Wildlife Society meetings, Edmonton, AB, March, 2002.
29. **Hebblewhite, M.**, & Roland, J. 2003. Individual mark-recapture data and analysis of animal movement. Statistical Ecology Seminar Series, Department of Biological Sciences. University of Alberta, Edmonton, AB, Month, 2003.
30. **Hebblewhite, M.** 2002. An evaluation of the keystone role of predation by wolves in Banff National Park and implications for elk management in BNP. Invited presentation to the Banff National Park annual Ecosystem Science Review Workshop, Banff, AB, February, 2002.

31. **Hebblewhite, M.**, & Frair, J.L. 2001. Application of log-linear, poisson, and logistic models in resource selection studies. Statistical Ecology Seminar Series, Department of Biological Sciences. University of Alberta, Month, 2001.
32. **Hebblewhite, M.** 2001. Cooperative hunting carnivores: do wolves maximize consumption rates or minimize consumption rate variation? Abstract of paper presented at the American Society of Mammalogists meeting, Missoula, MT., June 2001.
33. **Hebblewhite, M.** 2001. A critical review of the science of elk management in BNP: review of population model assumptions and recommendations. Invited presentation to the Banff National Park annual Ecosystem Science Review Workshop, Banff, AB, February 2001.
34. **Hebblewhite, M.**, & Pletscher, D.H. 2001. Effects of elk herding on wolf predation: linking anti-predator behavior to population dynamics. Paper presented at the Northwest section of the Wildlife Society conference, Banff, AB, March 2001.
35. **Hebblewhite, M.**, Pletscher, D.H., & Paquet, P.C. 2001. Factors affecting elk population dynamics in areas with and without predation by recolonizing wolves in Banff National Park. Paper presented at the Northwest section of the Wildlife Society conference, Banff, AB, March 2001.
36. Duke, D., **Hebblewhite, M.**, Paquet, P.C., Percy, M., & Callaghan, C. 2000. Restoration of a large carnivore corridor in Banff National Park. Abstract in the proceedings of the Society for Conservation Biology Annual Conference, Missoula, MT, June 2000.
37. **Hebblewhite, M.**, & Pletscher, D. 2000. Effects of elk herding on predation by wolves in Banff National Park. Abstract of paper presented at the International Wolf Symposium, Duluth, MN, February 2000.
38. **Hebblewhite, M.**, Duke, D., Callaghan, C., & Paquet, P.C. 1999. Restoration of a Large Carnivore Corridor in Banff National Park, Alberta. *Plenary address* at the International Wildlife Management Conference in Godollo, Hungary, July 1999.

Communicating Science to the Public

Select Public Presentations (2001-present)

- May 2008 – Presentation to the Grant Creek community association on elk habituation, 50 people, Grant Creek Inn, Missoula, MT.
- May 2008 – Presentation to the Society of American Foresters on effects of postfire logging on wolves and elk, Missoula, MT.
- Jan 2004 – Presentation to the general public of Sundre, AB., 150 people.
- Nov 2003 – Invited presentation to the Banff National Park Superintendent's office on transboundary management issues along Banff National Parks Eastern slopes.
- Feb 2003 – Presentation to 200 people at the Annual General Meeting of the Friends of

the Eastern Slopes Association, Innisfail.

Jan 2003 – Presentation to 50 members of the Sundre Fish and Game Association

June 2002- Presentation to 50 members of the Panther River Community Association on the Ya Ha Tinda Elk and Wolf Project.

April 2002 – Presentation to 480 members of the Rocky Mountain Elk Foundation at the Annual provincial fundraising banquet on the Ya Ha Tinda Elk and Wolf Project.

March 2002 – Presentation to 120 members of the Bow Valley Naturalists on Ecology and Conservation in Western Mongolia.

May 2001 - Presentation to the Parks Canada annual public research update series on “What is Science? Science in Parks and Protected areas”.

April 2001 – Presentation on “Ecology and conservation of carnivores in the Central Canadian Rockies and implications for recreation and development” to the annual meeting of the Canadian Association of Ski Resort Presidents, Banff, Alberta.

Select Media Communication (2006 to present)

Ellis, C. 2009. Avalanche thins Banff caribou herd: ‘we’re not sure if they’ve all been wiped out’. Calgary Herald, April 10, 2009.

Ellis, C. 2009. Avalanche devastates Banff caribou herd. Rocky Mountain Outlook, April 9, 2009.

Mittelstaedt, M. 2009. Environment Canada puts off action to protect woodland caribou habitat. Globe and Mail, April 13, 2009.

Rennie, S. 2009. Half Canada’s boreal caribou herds in decline: report. Canadian Press, April 8, 2009. *(These 2 articles covered report of Scientific review of critical habitat report of which I was an author)*

Cuthbertson, R. 2009. Migratory instincts protect caribou herds: research aims to preserve species at risk. Calgary Herald, Jan 29, 2009.

Gladbow, D. Controversial caribou: research provides tools to conserve their habitat. UM VISION Magazine, Fall 2008, volume 18.

Heuer, K. 2008. Hermits of the big wild. Freedom to Roam series, Fall 2008 Patagonia catalogue. <http://www.patagonia.com/web/us/patagonia.go?assetid=33804>

Ellis, C. 2008. DNA links Alberta caribou to ice age ancestors: ‘unique’ caribou herd needs protection, researchers say. Calgary Herald, July 31, 2008.

Ellis, C. 2008. Caribou migration secrets revealed. Rocky Mountain Outlook, June 12, 2008.

Metcalf, P. Can wolf hunting help conserve the species? A predator becomes prey. New West Missoula, April 16, 2008.

http://www.newwest.net/main/article/can_wolf_hunting_help_conserve_the_species/

Robbins, J. 2007. Report: walking on the wild side of a Montana University. New York Times, article on International wildlife conservation activities in the University of Montana Wildlife Biology Program, May 6, 2007.

- Habib, L. 2007. Species theses: settling a long-standing debate. Jasper Fitzhugh, May 17, 2007. Article on caribou conservation in the Canadian Rockies.
- McMillion, S. 2007. Biologist: climate change affecting Montana. Bozeman Daily Chronicle, Feb 9 , 2007. [*Coverage of MTTWS conference presentation on energy development*].
- Backus, P. 2006. Growing issues: local herd facing an uncertain future as housing developments make an impact. Missoulian, December 3, 2006.
- Farquhar, B. 2006. Elk face steep learning curve. Casper Star-Tribune, October, 2006.

PROFESSIONAL CERTIFICATIONS

- Canadian Firearms Safety course, 1998.
- Canadian Association of Zoo and Wildlife Veterinarians (CAZVW) Wildlife Handling and Immobilization certification, 2003.
- Adventure Medic Wilderness First Aid certification (80-hours), 2003.
- Certified NAUI scuba diver, 1994.
- Completed the Alberta ATV safety institute 4x4 training course, 1995