northern rockies conservation cooperative

NRCC News

bridging science and policy to advance conservation

annual newsletter fall 2014

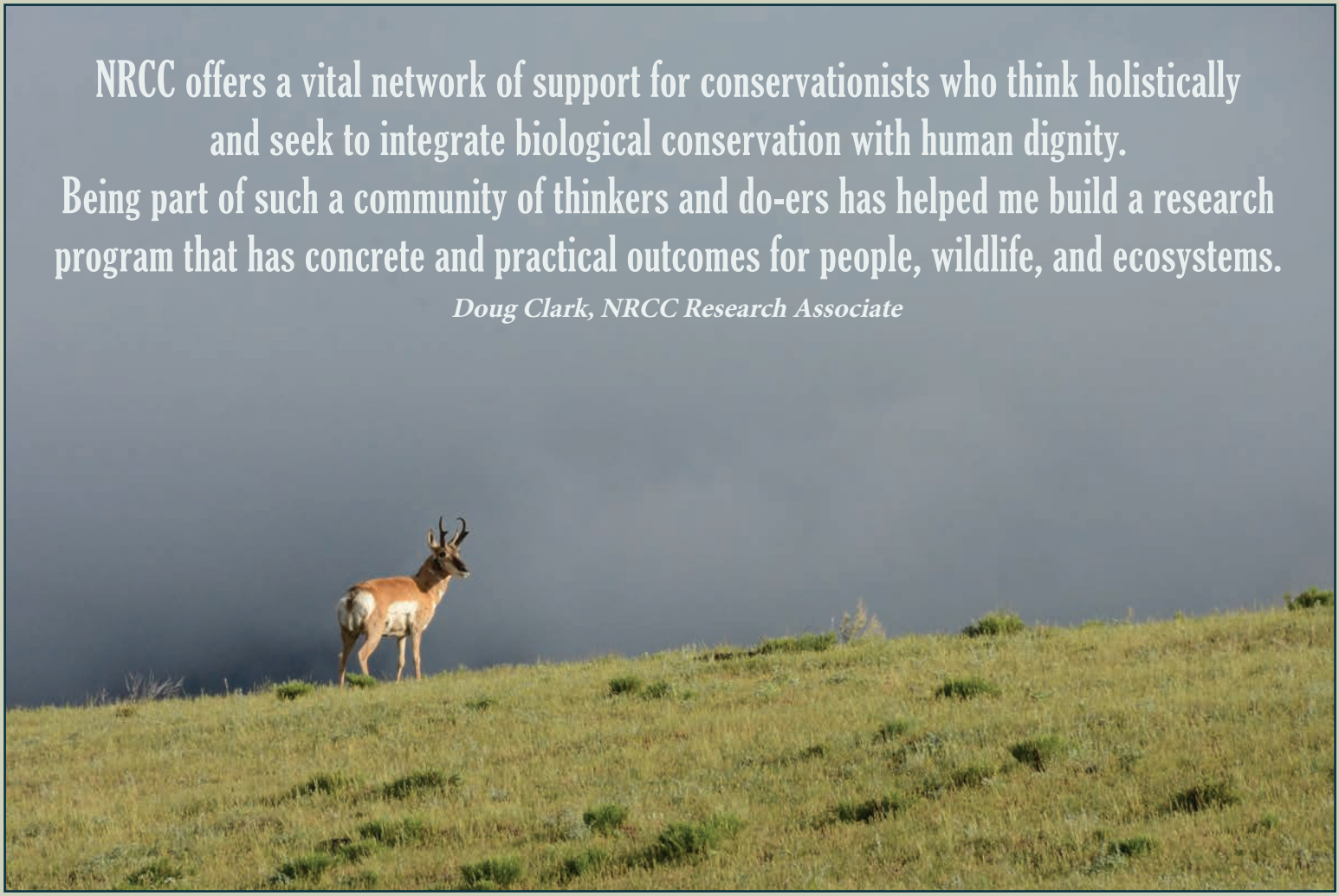


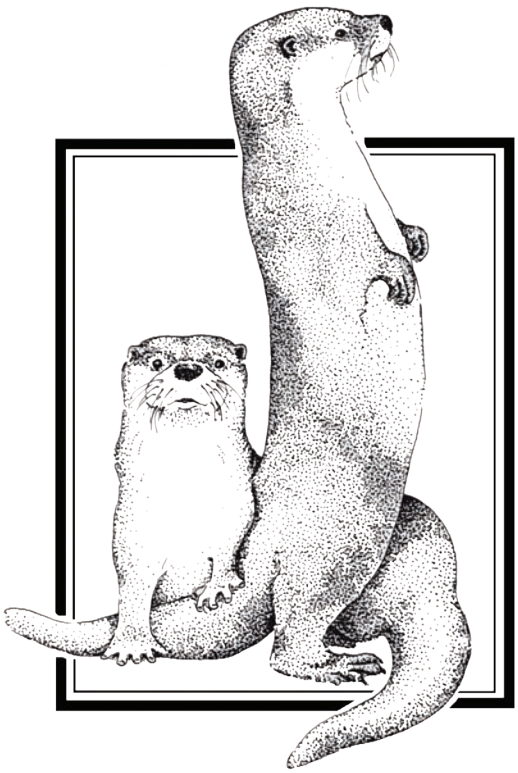
Photo: Danielle Lehle

From the Board President

Peyton Griffin, NRCC Board President

Our partnership with NRCC ensures we have a strong and robust program because we're bringing in state-of-the-art people.

Cathie Jean, Management Assistant for the Greater Yellowstone Network (GRYN)



This fall the Associated Press ran a story about boreal toads at Jackson Lake and interviewed NRCC research associate Deb Patla, who has been studying toads, frogs, and salamanders around Greater Yellowstone for years. Deb and her crew spend summer nights wading through wetlands in search of these animals, who thrive or falter depending on weather, water management, road traffic, suburban development, and diseases like chitrid fungus.

Other NRCC RAs are equally vigilant sentinels: Mike Whitfield and his assistants spend chilly spring days floating the Snake River keeping an eye on hard-won gains in bald eagle populations. Taza Schaming sets out each season to see where Clark's nutcrackers are holding on and dispersing conifer seeds in Yellowstone forests. And Rebecca Watters snowshoes the Mongolian backcountry in search of wolverines and other high elevation species that depend on snow pack and refuge from human development. These researchers are carrying on in the footsteps of Adolph, Olaus, Louise, and Mardy Murie as they observe and telegraph important news from the wild.

Research associates Steve Primm and Seth Wilson continue to work with local ranchers, hunters, and recreationists to help humans, bears, and wolves coexist. Hauling livestock carcasses to the dump and dragging bear poles in to the hills is not glamorous, but these efforts keep humans and carnivores out of harm's way.

Professional learning remains another high priority at NRCC. Administrative director Maggie Schilling is working with the Teton Science Schools' Teton Research Institute to bring back the Jackson Hole Wildlife Symposium so researchers around the ecosystem can continue to learn from one another and forge new collaborations. Research associate Murray Rutherford and emeritus director Susan Clark have edited a new book on large carnivore conservation, and Susan and three co-editors produced another on large-scale conservation. In addition, Susan received a lifetime achievement award from the Association for Environmental Studies and Sciences.

Joining us in these endeavors, we welcome Gary Kofinas and Lindsey Larson as new members of our board of advisors. All of the projects highlighted in this newsletter would not be possible without the contributions of many donors and collaborators.

Thank you for helping us with this important work!

Peyton Curlee Griffin
Board President

What's New at NRCC?

I couldn't have asked for a better first year at NRCC. Our research associates (RAs), board, and advisory board are all top-notch—a stellar group of individuals truly dedicated to making the world a better place by improving the way we do conservation.

In addition to supporting our RAs, the home office helped host 8 graduate students from the Yale School of Forestry and Environmental Studies during their visit to Jackson Hole in March. The students gained a first-hand understanding of the realities of working in conservation and management in a complex ecosystem such as the Greater Yellowstone. We were also pleased to host a gathering of RAs in Missoula, MT, during the Society for Conservation Biology conference in July, furthering our mission to encourage new partnerships for conservation and create learning networks for practitioners.

Last but certainly not least, we are thrilled to partner with the Teton Research Institute of Teton Science Schools once again to co-host the Jackson Hole Wildlife Symposium later this year. Mark your calendars for Thursday, December 4, 2014! The theme of the symposium is "Toward a Resilient Future." This exciting event is for managers, scientists, conservation professionals, public officials, and community members, and will provide a space and place to focus on challenges facing wildlife and the environment in Jackson Hole and the Greater Yellowstone Ecosystem. The overarching idea is to integrate what we know, to "connect the dots," so to speak, or "see the larger picture." We hope you will attend!

Maggie Schilling
maggie@nrccooperative.org

Two New Advisory Board Members

We are so grateful to our two newest Advisory Board members for agreeing to share their time & talents with NRCC.

Gary Kofinas is currently a professor of natural resource policy and management at the University of Alaska Fairbanks, where he works with graduate students and does research on community sustainability, adaptive co-management, and resilience. Gary is an investigator on several National Science Foundation grants focused on northern subsistence-based communities and their adaptation to environmental change. He has considerable experience teaching interdisciplinary field studies in diverse environments across the world. When he is not in Alaska, he is usually found in Wilson, Wyoming, where he serves as the founder and president of the Teewinot Institute, a nonprofit focused on issues of sustainability.

Lindsey Larson brings a wealth of nonprofit management, marketing, and fundraising experience to NRCC. She currently serves on the board of the Nature Conservancy (Connecticut Chapter) and is completing her MBA at the Yale School of Management. She completed her master's degree in environmental management at the Yale School of Forestry and Environmental Studies last year. Lindsey has worked as a fellow at Rare (an international nonprofit dedicated to supporting locally-led conservation efforts), in the Conservation Science Program at the World Wildlife Fund, and in marketing at National Geographic. She enjoys hiking, classical music, and international travel.

Migrations & Predations: A Report from Two Continents

Arthur Middleton, NRCC Research Associate

I work primarily on predator-prey interactions and migration of large mammals, with field projects in the northern Rockies and the southern Andes. In Greater Yellowstone I study how large carnivores, drought, and people affect elk populations.

More recently I began to focus on major elk migrations, which have been studied individually but almost never collectively. Six species of ungulates migrate seasonally in the Greater Yellowstone Ecosystem (GYE), but elk are the most important of these. Every spring up to 20,000 elk migrate in 7–9 populations between 25–85 miles from outlying winter ranges to high-elevation summer ranges. These migrations feed a lot of things we care about, from carnivores and diverse scavengers to local economies, via the hunting and tourism industries. I am collaborating with a number of university, federal, state, and NGO partners to pull together what we know about the basic movement ecology as well as population trends of these migratory herds. Ultimately, we will use the resulting database of GPS information—spanning more than 250 individual elk and 3 million GPS locations—to investigate the influence of spring and summer climate on elk migration timing, which in turn affects predator-prey interactions, hunter harvest, and disease transmission risk.

In Argentina I am studying puma predation on vicuñas and condors in the San Guillermo Biosphere Reserve. San Guillermo is remarkable in southern South America because of its intact large mammal food web. It offers an important ecological reference area for future conservation and restoration efforts in the region. I collaborate with rangers in the Argentinean Parks Administration and researchers from Argentina's national research council (CONICET), the University of Wisconsin, and Pennsylvania State University.

On both projects, I devote about half my time to public outreach and communication. At 11,000 feet in the Andes, San Guillermo is so remote that it receives fewer than 100 visitors per year. I realized we would have to go beyond conventional research to help give San Guillermo a place in the broader human imagination. I began working with Joe Riis, a wildlife photojournalist, to document the ecological interactions and landscape of San Guillermo. Our work has caused me to think more about popular conceptions of the GYE. Even though more than 3.5 million tourists visit Yellowstone National Park (YNP) each year, almost none of them know how important the migrations of elk and other ungulates are to that place: that migration means YNP depends heavily on lands and people far outside its boundaries. Again working with Joe, I developed an outreach component of the GYE elk migration work. Together, we were awarded the 2013 Camp Monaco Prize by Prince Albert II of Monaco, the Buffalo Bill Center of the West's Draper Museum of Natural History, and the University of Wyoming's Biodiversity Institute. Joe, a visual artist, and I are working to develop a traveling museum exhibit about the migratory animals of the GYE.

Top: Arthur Middleton surveys the spectacular landscape of San Guillermo Biosphere Reserve, Argentina.
Bottom: Arthur prepares to head out into the remote reaches of the Reserve. Photos by Joe Riis.

Camera Trapping in Mongolia: Carnivore Conservation Across Continents and Cultures

Rebecca Watters, NRCC Research Associate

On a high ridge near the Mongolian-Russian border, we picked up faint tracks through the scree. Something had been here before us, and it wasn't human. The path through the scree, marked by the pale streak of disturbed stones and the slight depression where hooves—or paws?—had knocked them aside, was probably made by ibex, but where there were ibex, there were also, most likely, the things that ate them. Wolverines, of course, and wolves, and maybe, if we were very lucky, the big cat we had come up here to try to find—a snow leopard. Along this faint track at nearly 10,000 feet, I decided, we'd set up our first camera station.

Over the course of five years of work in the Darhad Valley, I'd heard from herder after herder that snow leopards lived in the surrounding mountains, but despite intensive surveys by international organizations and the protected area rangers, the last time anyone had been able to confirm snow leopard presence was in the 1960s. Panthera, the big cat conservation organization, had loaned me 12 cameras, and the Snow Leopard Network had funded me with a small grant to see if I could catch the cat or cats on camera.

A golden eagle surveys the Mongolian landscape. Photo: Rebecca Watters

The project involved close work with the administration of the Ulaan Taiga Protected Areas, a network of three protected areas that cover more than a million acres in the northernmost region of Mongolia. During the six weeks that our cameras were deployed in the remote mountain passes, I worked closely with rangers and park specialists in the town of Ulaan Uul on tasks as varied as data management, GIS training, and basic English lessons. BioRegions International, a Bozeman-based non-profit, assisted with expenses and facilitated a three-day capacity-building workshop in early May, with the participation of two US Park Service employees and Lance Craighead, director of the Craighead Institute and NRCC board member, to share ideas about research, monitoring, and management of parks and protected areas in Mongolia and the US.

In late July a park ranger and I rode back up into the mountains to collect our cameras. Once retrieved, the cameras yielded a beautiful array of photos—numerous bird species, a spectacular golden eagle, ermine, pikas, a wary sable, curious ibex investigating the cameras, elk ambling through the talus, and a few human hunters. Sadly, however, there were no snow leopards and no wolverines.

Despite the disappointment of our snow leopard hopes, the summer was successful as we built collaborative ties with and between agencies, non-profits, and communities in the US and Mongolia. We were able to use a contained scientific research activity—camera-trapping for snow leopards—as an entry point for a longer and more complex discussion of wildlife research and management and the needs of newly formed protected areas and their staff. We will share the results of our exchange at the biennial Yellowstone Scientific Conference on October 6 to generate further discussion about how we can share successes and learn from failures in park management and carnivore conservation across countries and cultures.

Michael Whitfield: Bald Eagles

In late May 2014 I photographed the adult female shown here from a nesting pair on the Snake River in Idaho, a pair that was seen actively nesting in their snag nest in March. This female is an old friend, banded as a nestling in Wyoming in 1987 and nesting in the same Idaho tree since 1994. Sadly, this nest tree blew down mid-nesting season this year, but the adults will likely build a new nest nearby this fall. In 1987 when this eagle first took wing, there were 21 known bald eagle breeding areas in the Idaho portion of Greater Yellowstone. Today, 90 pairs nest in the same area. The adult pictured is a valuable member of this growing population; she has produced 23 advanced young in her 21 years of nesting. I and my agency partners work to ensure that productive habitat remains to sustain this recovered bald eagle population.

Female bald eagle, nesting in the same tree since 1994. Photo: Michael Whitfield.

Debra Patla: Amphibian Monitoring in National Parks

The Yellowstone-Grand Teton Amphibian Monitoring Project investigates trends in amphibian populations and their wetland breeding habitat across the two national parks. Our work since 2005 indicates that amphibians respond strongly to annual variations in moisture and temperature. This summer we initiated a new environmental DNA sampling method, in collaboration with the University of Washington, that should allow us to determine the presence of rare species. While wet years such as 2014 bolster populations by providing good breeding conditions, amphibians are vulnerable to wetland loss resulting from climate shifts in this region. Our monitoring can reveal which aspects of climate change most directly influence wetland loss and amphibian declines. Conservation implications include public recognition that climate change can harm even small and common wildlife species and an invigorated management focus on protecting and restoring wetlands. Projects that degrade wetlands become ever more consequential in a context of ongoing loss from climate change.

Amphibian survey crews at work, Grand Teton National Park. Photo: Debra Patla.

Erin Muths & Team: Amphibian Monitoring & Mitigation

In concert with the U.S. Forest Service and the Wyoming Department of Transportation, we are tracking populations of amphibians to understand host-pathogen dynamics and assess potential shifts in occupancy across the landscape. We also track habitat changes such as the composition of invertebrates that prey on juvenile amphibians and provide food for adult frogs and salamanders. These data can help us determine if roadside mitigation efforts at Blackrock Ranger Station are effective. They also contribute to amphibian conservation by providing detailed information about an assemblage of amphibians in their natural habitat. The USGS research team of Erin Muths, Blake Hossack, and David Pilliod has been joined by Leah Swartz, a master's student at the University of Montana supervised by Winsor Lowe. Steve Corn has retired from USGS but will remain involved in the project as an emeritus scientist.

Boreal toad, Grand Teton National Park. Photo: Erin Muths.

Clipping vegetation at Jones Ecological Research Center in Newton, Georgia. Photo: Ben Chemel.

Benjamin Chemel: Ecosystem Productivity

I am continuing my efforts to develop and implement methods to quantify terrestrial ecosystems in collaboration with the National Ecological Observatory Network (NEON). This year's efforts, which took place at NEON sites in Florida and Georgia, focused on techniques for collecting plant material, from tree canopies to ground cover, to provide estimates of ecosystem productivity and understanding of biogeochemical processes. Along with a host of other concurrent studies, these designs will be used at NEON sites throughout the country, including the Greater Yellowstone Ecosystem, to generate unprecedented amounts of integrated, open source ecological data for the next three decades. We hope that these continental-scale efforts will empower sound, science-based solutions to meet the challenges of climate change, invasive species, and land use change.

Nina Chambers in the Beartooth Mountains, MT.

Nina Chambers: Science Communication

As a science writer and editor, working primarily with the National Park Service Inventory and Monitoring Program, my goal is to produce engaging, clear, and compelling communication. I strive to make science accessible to the public and useful to decision makers. I find that although we are inundated with information in our daily lives, finding the right information (that is, based on sound science with practical application) is perhaps more important than ever. Conservation issues require an understanding of how multiple components interact together within a larger geographic, ecological, and social context. Conveying that meaning so that people are inspired to act, in whatever capacity they can, is one way I can contribute to conservation in the Northern Rockies and the West.

Taza Schaming radio tracking in Grand Teton National Park. Photo: Pocholo Martinez.

Taza Schaming: Clark's Nutcrackers & Whitebark Pine

To understand processes underlying forest decline and the potential for recovery, I am evaluating whether Clark's nutcrackers can persist as critical seed dispersers in Greater Yellowstone in the face of habitat decline. Since 2009, I have determined that nutcrackers did not breed (population-wide) during two years in which whitebark pine cone crops were low in the previous autumn and snowpack was high in early spring. During nonbreeding years nutcrackers were in much worse physical condition, which potentially prevented them from breeding. Another possible explanation is that the environmental cues available to the birds, that is, low availability of cached seeds, may have led the birds to decide to skip breeding. Climate change, resulting in declines in whitebark pine, which in turn leads to more nonbreeding years for nutcrackers, could have serious population-level and ecosystem-wide consequences.

The value of Long-term Monitoring: An Interview with Cathie Jean of the Greater Yellowstone Network

NRCC Board President Peyton Griffin talked with Cathie during the summer of 2014.

Q: Tell us a little bit about yourself and the National Park Service's Greater Yellowstone Network (GRYN) Inventory and Monitoring Program.

I grew up in southern Utah and have lived in western states my entire life. I am really at heart a plant person. I've worked as a botanist, plant ecologist, and program leader for the USFS and the Montana Natural Heritage Program. In 2002 I began working with the National Park Service Inventory and Monitoring Program.

Q: Are there different units of the National Park Service Inventory and Monitoring Program and what is their focus?

Yes, there are 32 networks. Each network is assigned 3–16 parks for the purpose of increasing scientific research. The program is focused on basic inventory as well as long-term monitoring. We study and communicate the status and trends of park resources as the basis for making good science decisions.

Q: How are these networks structured and funded?

The program benefits from permanent funding, unlike many other past and current monitoring programs. GRYN is implementing protocols for whitebark pine, amphibians, sagebrush steppe, juniper woodlands, water quality and quantity, as well as climate. The subject matter expertise needed requires that GRYN work with partners like NRCC. The partnership with NRCC ensures we have a strong and robust program because we're bringing in state-of-the-art people.

Q: What projects are carried out collaboratively between NRCC and GRYN?

We have two main projects. One is NRCC research associate Deb Patla's work on amphibian monitoring in Greater Yellowstone. The second is focused on science communication with NRCC research associate Nina Chambers. Science communication helps us get science to the right people at the right time. A third project that NRCC collaborates with is through partner Mike Tercek's work with Yellowstone and GRYN staff, who developed a climate analyzer website, making climate data for multiple inventory & monitoring networks available to park managers and the public. Mike is at the forefront of taking climate data gathered by a number of federal agencies and putting it in a single location where we can ask investigative questions.

Mike, Nina, and Deb are residents of the GYE and have the expertise needed by the NPS to carry out its science programs. GRYN is able to bring fiscal resources through our agreement with NRCC so that these people can do outstanding and necessary work.

"This is really breaking new ground with applicability to many other species throughout the world."

Top: Cathie Jean of the Greater Yellowstone Network. Photo: Deborah Frederick. Right: Mike Tercek in the Bighorn Canyon National Recreation Area. Photo: National Park Service.

Mike, Cathie, and the vegetation monitoring team in Grand Teton National Park. Photo: National Park Service.

Q: Can you talk about how NRCC and GRYN's work is connected to other NPS networks?

The NPS inventory and monitoring program shares the science, planning, and protocols so others can use them for their work. The amphibian protocol is benefiting not just Grand Teton and Yellowstone National Parks, but the data set is compatible with efforts extending from Glacier National Park through Greater Yellowstone and into the southern Rockies of Colorado. Because there are similar protocols throughout this region, data can be combined to ask broader questions like "How are amphibians doing in the Rocky Mountains?"

Q: Why is it important to have long-term ecological monitoring?

Long-term data sets are essential for understanding species change and ecosystem and habitat change. An example is the long-term amphibian monitoring protocol. After almost 10 years this data set shows a lot of variability in amphibian occupancy. This underscores the importance of multi-year monitoring in making inferences about amphibian species. For instance, if you were just there a couple years and they happened to be dry years, you'd underrepresent the number of wetlands where amphibians are breeding, and, likewise, if you were only there in wet years you might be fooled into thinking everything is dandy.

Our amphibian data set has both spatial and temporal components. This allows some innovative advancements in occupancy statistics. There hasn't been much occupancy work at such a large scale. The statistician Dr. Bill Gould, who also does some other work with NRCC, and his biometrics working group have devised some novel methods related to occupancy modeling. Deb and he published a paper in 2010 about spatial scale. This is really breaking new ground with applicability to many other species throughout the world. He's working right now on adding the temporal element. This biometric work is outstanding nationally and internationally.

Q: Why do you think long-term monitoring is coming together more effectively now?

The NPS realized from the onset that they would need long-term data to help managers. and this would require an emphasis on data management and accountability. In the past, data was being collected by many parties that was never being analyzed or was not fully documented so it could not be used for analysis. GRYN and similar networks are committing to a long-term, multi-decade effort. Who knows what advancements will be developed to analyze the data in the future, but we need to think in terms of future generations and how they can pick up our notes and understand what we were doing so they can use the data appropriately.

Q: How do these projects bridge science and policy to advance conservation?

This is the hardest question. Natural resource management is complex and challenging. Our job is to enhance decision makers' understanding of ecosystem health. Park managers take a lot of things into consideration when making decisions, including sound science, and public opinion is really important. The public has an important role in making their voices heard through letters, meetings, and voting. The public is an important part of the bridge.

Deb Patla monitoring amphibians in Yellowstone National Park. Photo: National Park Service.

Grizzly Bears & Bear Spray: Practice, Practice, Practice

Steve Primm, NRCC Research Associate

In the last 20 years Greater Yellowstone's grizzly bear population has grown dramatically and greatly expanded its range. The population has roughly tripled, depending on which estimates are used, to nearly 700 adult bears. More grizzlies in more places means greater odds of conflict.

Fortunately, one of the factors behind this increase is that people have gotten way better at preventing conflicts with grizzlies. Better ways of storing garbage, camp food, and other unnatural attractants have cut the rate of bear conflicts substantially. Ranchers and conservationists are finding promising techniques to reduce predation on cattle and sheep, such as secure disposal of livestock carcasses and protection of vulnerable young calves and lambs with powerful electric fences.

Also in the last 20 years, bear pepper spray has become widely available and proven effective. Coupled with increased awareness and understanding, bear spray has been a major safety improvement for people in grizzly country.

One major challenge remains: hunting safely in grizzly country. For hunters to have a chance at big game animals, it means they're going to be moving quietly through the woods. It may also mean concealment or even efforts to sound or smell like an elk in order to draw the quarry in closer. Hunters readily admit that most of these activities are directly contrary to the bear safety practices that non-hunters follow in grizzly country, such as making noise and letting bears (and all other wildlife!) know that they're coming. So hunters tend to have run-ins with grizzlies, often with dangerous results for both species.

While bear pepper spray is a promising tool for hunters and non-hunters alike, hunters typically face a few complications in using bear spray. First, they are often carrying their rifles in their hands. We have spoken with hunters who had bear spray as well as a rifle in encounters; many said the charge happened so quickly that they had no time to react with either spray or firearm. Others said they reflexively used the firearm, despite conscious intentions to use bear spray instead.

Second, hunters are often wearing layers of clothing and carrying lots of gear such as binoculars, rangefinders, and firearms. Pack belts and coats may interfere with bear spray carried on the hip; binoculars and other gear may interfere with a chest holster.

To use bear spray:

- Remove safety clip.
- Aim slightly down and toward the approaching bear. Adjust angle for wind direction.
- Spray a brief shot when the bear is roughly 30 feet away.
- Spray again if the bear continues to approach.
- Once the animal has retreated or is busy cleaning itself, leave the area as quickly as possible, but do not run. Alternately, go to an area of safety, such as a car.

Steve Primm demonstrates proper bear spray procedures at an outreach event in Ennis, MT.

REMEMBER: Bear pepper spray should be used as a deterrent only in an aggressive or attacking confrontation with a bear.

To deal with these challenges, we have been working with hunters, equipment manufacturers, law enforcement, and other specialists to improve both the way we carry bear spray and the mindset of those who use it, hunters and non-hunters alike. We are experimenting with improved placement of the bear spray holster so that it doesn't get covered up by a coat, binoculars, or some other piece of gear. Whether they choose a firearm or bear pepper spray, it is imperative to practice, practice, practice.

Practice until you develop "muscle memory" and can put your hand on your defensive system in a fraction of a second. This also means that your bear spray must be in the same place on your person every time. We routinely see people carrying it in unreachable locations on their backpacks. Don't do that!

Elk Hunting in Grand Teton National Park: Analysis of a Controversial Conservation Problem

Marian Vernon

The contentious elk hunt in Grand Teton National Park, which has been a source of conflict and criticism in Jackson Hole since it was legislated in 1950, is just one of many seemingly irresolvable conflicts pertaining to the management of the Jackson Hole elk herd. I am interested in examining the institutional, social, and governance dimensions surrounding controversial and persistent conservation problems in the American West, like this elk hunt. My research (for a Master of Environmental Science degree at Yale's School of Forestry and Environmental Studies) focuses on understanding the social and decision-making processes surrounding elk hunting in GTNP.

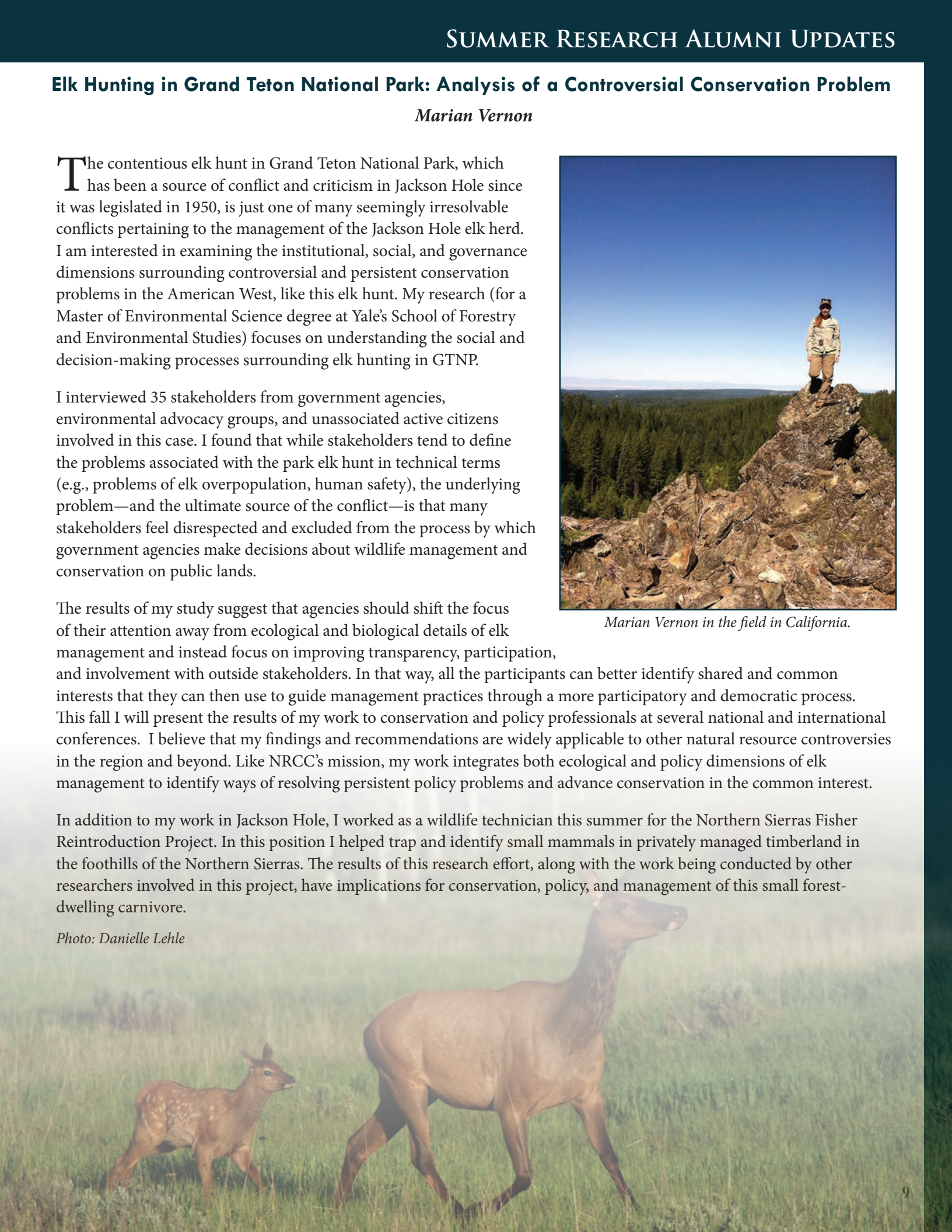
Marian Vernon in the field in California.

I interviewed 35 stakeholders from government agencies, environmental advocacy groups, and unassociated active citizens involved in this case. I found that while stakeholders tend to define the problems associated with the park elk hunt in technical terms (e.g., problems of elk overpopulation, human safety), the underlying problem—and the ultimate source of the conflict—is that many stakeholders feel disrespected and excluded from the process by which government agencies make decisions about wildlife management and conservation on public lands.

The results of my study suggest that agencies should shift the focus of their attention away from ecological and biological details of elk management and instead focus on improving transparency, participation, and involvement with outside stakeholders. In that way, all the participants can better identify shared and common interests that they can then use to guide management practices through a more participatory and democratic process. This fall I will present the results of my work to conservation and policy professionals at several national and international conferences. I believe that my findings and recommendations are widely applicable to other natural resource controversies in the region and beyond. Like NRCC's mission, my work integrates both ecological and policy dimensions of elk management to identify ways of resolving persistent policy problems and advance conservation in the common interest.

In addition to my work in Jackson Hole, I worked as a wildlife technician this summer for the Northern Sierras Fisher Reintroduction Project. In this position I helped trap and identify small mammals in privately managed timberland in the foothills of the Northern Sierras. The results of this research effort, along with the work being conducted by other researchers involved in this project, have implications for conservation, policy, and management of this small forest-dwelling carnivore.

Photo: Danielle Lehle



Undaunted Stewardship: A Model of Collaborative Conservation

Alice Buckley

I spent this summer in Montana working for a sustainability-focused marketing firm on several projects related to large-scale land conservation and agricultural production. One particularly exciting project was Undaunted Stewardship, a program that strives to preserve the cultural and environmental integrity of Montana's privately-owned working spaces by economically "incentivizing" ranchers to promote public access to historic landscapes and encouraging preservation of these lands. The most exciting aspect of this program is its uniquely collaborative nature: prior to losing funding, it was cooperatively directed and funded by federal and state agencies and private historic, conservation, and agricultural groups. My work focused on re-establishing partnerships with the Montana Stockholders Association, Montana State University, the BLM, and other organizations. The collaborative nature of Undaunted Stewardship fits well into the mission and goals of NRCC as we work to integrate and leverage the interests of species, ecosystems, and human communities for a resilient American West.

Former NRCC Intern Alice Buckley.

Meat Feasibility & One Montana

Evi Steyer

This summer I worked for One Montana, a nonprofit based in Bozeman. Their mission is to bridge the rural-urban cultural divide that exists in the state, and they take on the issue through a variety of projects, from urban/rural high school exchange programs to forums on water use. I worked on their Meat Feasibility Study, an ongoing project examining the potential for a mid-level meat processing plant that would serve ranchers across the state. It would cater particularly to alternative meat producers, many of whose grazing practices are structured to improve grassland habitat and minimize carnivore conflicts. I was researching by-product management, with the goal of minimizing waste and generating a wider array of products and revenue streams. If this proposed processing plant is built, it will have a positive impact on alternative meat production in the state, job creation, and urban/rural collaboration.

Evi Steyer converses with cattle in MT.

Human Dimensions of Wildlife Conservation

Lily Sweikert

I just started a doctorate program in wildlife and fisheries at South Dakota State University in Brookings. I will study the human dimensions of wildlife conservation in the plains and prairie pothole regions, in particular, the participation of private landowners in state and federal conservation programs. I graduated in May from Yale's School of Forestry and Environmental Studies with a master's degree in environmental science, after completing my thesis research on motivating factors for prairie dog conservation in eastern Colorado. My thesis field work was carried out last summer as a NRCC intern.

Former NRCC Intern Lily Sweikert.

Large Carnivore Conservation: Integrating Science & Policy in the North American West

Murray Rutherford, NRCC Research Associate

Photo © Thomas D. Mangelsen

We wrote this book because we are deeply concerned about the current state of governance in large carnivore conservation. Over the last two centuries, the primary objectives of carnivore management have evolved from managing abundant animals in accordance with the narrow value demands of a small number of people to managing and conserving scarce animals under pressure from the diverse and conflicting value demands of a wide variety of people. Governance problems in carnivore conservation have become more messy, or "wicked"—compounded by conflicting societal goals, uncertainty, nonlinearities, thresholds, and other challenges arising from the complexity of modern socioecological systems. Approaches to governance that worked reasonably well in the past in dealing with the technical problems of carnivore management are struggling terribly to cope with the complex problems of carnivore conservation in the present.

The book includes work by seventeen authors, all with expertise and experience in wildlife science, conservation and governance. An initial chapter introducing the problems and contexts is followed by six case studies covering mountain lions, grizzly bears, and wolves in settings ranging from Arizona to Yukon. We analyze the strengths and weaknesses of governance in each case and make practical recommendations for improvement. These case studies are followed by chapters that identify common themes, synthesize lessons, and consider carnivore conservation from a broader perspective and at higher levels of decision-making (state, provincial, national, and international). We discuss how to overcome challenges such as highly politicized settings, polarizing myths and symbolic politics, multiple levels of conflicting decision making, and unique local contexts. Our recommendations focus on improving decision-making processes, developing more civil and constructive social processes, and adaptively learning from experience.

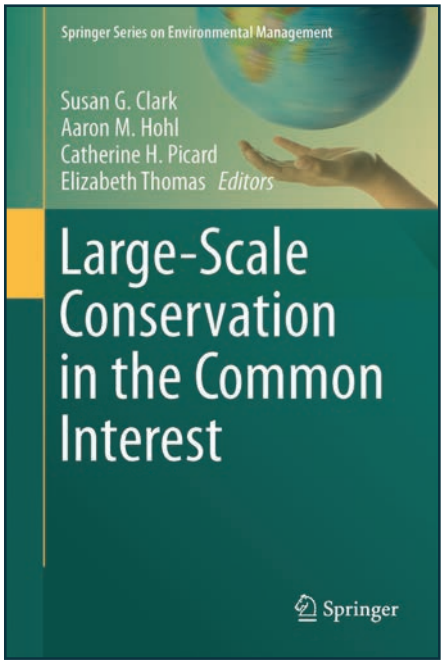
Overall, we believe that the book accomplishes three main things. First, it harvests hard-won experience and lessons from a broad selection of carnivore conservation initiatives. Second, it provides insight on fundamental societal issues concerning our institutions, decision-making practices, and cultural and constitutive makeup. And third, it offers practical recommendations about how to find enduring common-ground solutions to the diverse challenges of conserving large carnivores and other wildlife.

NRCC Research Associate Murray Rutherford.

Large-Scale Conservation in the Common Interest

A new book in the Springer Series on Environmental Management

Aaron M. Hohl is a lecturer in the Department of Forestry & Wildland Resources at Humboldt State University.



Our book uses the interdisciplinary policy sciences framework to better understand and improve the practice of large-scale conservation. As readers of *NRCC News* are undoubtedly aware, there is a growing community of resource management professionals seeking more integrative and holistic approaches to conservation. However, coming to grips with the ecological and social complexity that characterizes large-scale conservation efforts continues to be extremely challenging, and many professionals still lack the skills to address these dynamics. Using both rapid and in-depth case studies, the authors provide readers with grounded examples and analyses of efforts to upgrade the practice of large-scale conservation. The volume is intended for a broad audience, including students and professors new to the field of large-scale conservation, experienced field-based practitioners, and decision and policy makers who manage large landscapes. Those unfamiliar with the policy sciences approach will find that the book offers an accessible introduction.

The book grew out of a series of seminars at Yale University under the direction of co-editor (and long-time NRCC board member) Susan Clark. The book is divided into three sections. Part I provides an overview of large-scale conservation, the interdisciplinary method, and an extensive discussion of adaptive governance as a management approach. Part II consists of three rapid appraisals conducted by student teams using the framework. These cases—including the Connecticut River watershed that connects much of New England, the Greater Yellowstone Ecosystem, and the Last Green Valley that covers three states in New England—illustrate the practical utility of this framework for quickly understanding a new situation. Part III offers three in-depth cases, by participant observers who have been more fully embedded in the cases they describe—the Pacific Crest Trail, a transboundary wildlife corridor in Tanzania, and the Humboldt Bay Initiative in northern California.

The volume demonstrates that short-term, narrowly focused technical interventions are insufficient to address the governance and constitutive problems of managing resources. Instead, the more holistic and genuinely interdisciplinary approach of the policy sciences framework can significantly strengthen all of our efforts to implement large-scale conservation.

Lifetime Achievement Award to NRCC's Dr. Susan Clark

NRCC's Dr. Susan Clark was recently honored by the Association for Environmental Studies and Sciences (AESS) as the 2014 recipient of the Freudenburg Lifetime Achievement Award. This award is given to members of the profession who have developed innovative theories and/or pedagogical approaches, demonstrated dedication to service to their community, reached across disciplinary lines, and inspired policy makers to enact change. In her acceptance speech, Susan commented, "One of the best ways [to address environmental challenges], in my view, is to contribute through projects larger than ourselves. Education is one major way that I have chosen. It has been a rewarding career and a way that I can feel that I make a positive difference. . . . I can see positive change." Please join us in congratulating Susan on AESS's recognition of her lifetime dedicated to service, students, and constructive change.

NRCC board member Richard Wallace and emeritus board member Susan Clark celebrate Susan's award at the AESS conference in Manhattan.

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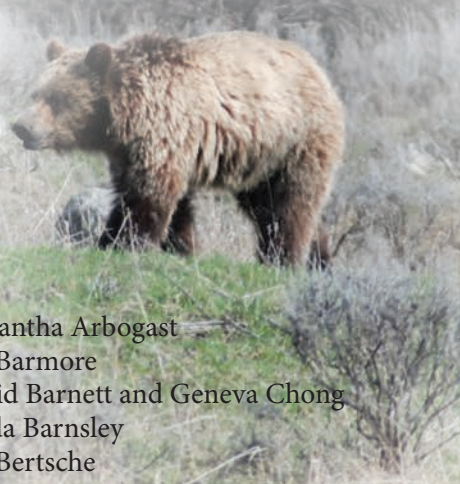

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