



NORTHERN ROCKIES
CONSERVATION
COOPERATIVE

CELEBRATING 30 YEARS

of Conservation for the Common Good

2017 YEAR IN REVIEW



“Given the complexity of the challenges we face, NRCC’s work to inject fresh thinking, independent research, and new approaches has never been more important.”

As we celebrate our 30th anniversary, we’re also celebrating the ongoing NRCC projects and people that continue to forge improvements in conservation and human-wildlife coexistence. The timeline of our organization on pages 6-9 offers a glimpse of the many ways we’ve pioneered new approaches to research, education, and leadership. When you read about our current citizen science and education projects, or eagle, swan, and beaver restoration projects – to name a few – you’ll see how we’re mobilizing people toward more effective ways of coexisting with wildlife and native plant communities.

We’ve highlighted a few current projects that are characteristic of NRCC’s inventive, big-picture work (see pages 6-9). You’ll also find updates from some of our Research Associates (see pages 10-12) and an invitation to collaborate on a futures scenario project introduced by NRCC Board of Advisors member Gary Kofinas (see page 3).

Please take the time to read about new Board and Board of Advisors members Avana Andrade, Beedee Ladd, and Karla Pendexter; new Research Associates Erin Muths and Mike Tercek; and new Project Affiliate Trevor Bloom. These outstanding individuals share our commitment to conservation for the common good; we are so grateful for their involvement and support.

We appreciate the many organizations and individuals who contribute to and partner with NRCC. Given the complexity of the challenges we face, NRCC’s work to inject fresh thinking, independent research, and new approaches has never been more important. Please consider making a gift today to help us accomplish even more leading-edge conservation work in 2018.

Sincerely,

Peyton Curlee Griffin, Board President

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NRCC welcomes new advisors, researchers

NRCC is pleased to welcome **AVANA ANDRADE** to the Board of Directors, **BEEDEE LADD** and **KARLA PENDEXTER** to the Board of Advisors, **ERIN MUTHS** and **MIKE TERCEK** as Research Associates, and **TREVOR BLOOM** as a Project Affiliate. Avana, Beedee, Karla, Erin, Mike, and Trevor bring valuable leadership, research, policy, organizational and communication skills to NRCC.



AVANA has been a Research Associate with NRCC since 2015. She has conducted policy and historical research in Greater Yellowstone, the intermountain west, the southwest, and west coast, as well as Europe. Avana's work has focused on ranching practices, grassland conservation, land trusts, greenways,

urban revitalization, ethnohistory, and climate change. She is Sustainability Coordinator for San Mateo County working on climate change assessment and mitigation, transportation facilitation, food waste reduction, and outreach to businesses and residences. Avana earned a BA from Colorado State University and a MA from Yale University School of Forestry and Environmental Studies.



BEEDEE has participated in NRCC activities and programs since the 1990s. She has been involved in leadership roles with numerous local, regional, and national nonprofits. Beedee serves on the board of directors of the Wyoming Outdoor Council and is a member of the Open Space

Council of the Jackson Hole Land Trust. She is on the board of the Rose Kennedy Greenway Conservancy and is a member of the Board of Overseers for the Massachusetts Horticultural Society. She is a Massachusetts Advisory Board Member of the Trust for Public Land, as well as co-chair of the Advisory Board of the Charles River Watershed Association.



KARLA has focused for decades on the welfare of children and animals. She developed a child protection team in Connecticut and served as the team coordinator for ten years. She was the chairperson for a statewide group of team coordinators, which acted as a support

group for members and as an education source for teaching social service providers and the public about child abuse and neglect. In Wyoming, she has served as the Chair of the Board of the Jackson Hole Conservation Alliance and currently is a Pet Partner, visiting hospitalized patients with her dog, Rufus.



ERIN has worked on amphibian decline and conservation in the Rocky Mountains for over 20 years. Her research through NRCC includes amphibian monitoring projects in Yellowstone National Park and Grand Teton National Park, in

cooperation with the US Geological Survey, where she is a zoologist. She earned a BS from the University of Wisconsin, an MS from Kansas State University, and a PhD from the University of Queensland (Australia).



MIKE has been a project affiliate with NRCC since 2014. He is the creator of the open access website ClimateAnalyzer.org, administered by NRCC and supported by the Greater Yellowstone Network of the National Park Service (see page 4). Mike specializes in data analysis and computer programming to assist

decision makers, researchers, and the public. ClimateAnalyzer.org provides real-time and historical data for more than 60 parks and assists in understanding how temperature, snow pack, and hydrologic balances are linked to fire danger, habitat availability, and numerous human and ecological conditions. Mike earned a BA from Kent State, a PhD from Tulane, and conducted post-doctoral research at Colorado State University and Montana State University.



TREVOR was raised in Jackson, WY and has worked as a biologist in the Greater Yellowstone Ecosystem (GYE) and internationally for the past 8 years. His work has included botanical phylogenetics, biogeographical modeling, and assessments of wildfire and climate change on plant

communities. He earned a BA from Lewis and Clark and a MS from Western Washington University. He is currently working with NRCC Research Associate Corinna Riginos to build on the work of Frank C. Craighead Jr. included in the formative book, *For Everything There Is a Season: The Sequence of Natural Events in the Grand Teton – Yellowstone Area*. Along with collaborators, including the NPS and USGS, Trevor and Corinna are investigating the local impacts of climate change on the plants and wildlife of Jackson Hole.

We also extend our heartfelt thanks

to **LYNN MAGUIRE** and **BILL BARMORE**, who completed their service on our Board of Advisors this year.

We are grateful for their years of engagement with NRCC and wish them the best in their retirement.

NRCC Celebrates 30 Years of Conservation

On July 24, 2017 NRCC friends, staff, board, board of advisors and associates celebrated 30 years of conservation successes with a reception at the National Museum of Wildlife Art. Todd Wilkinson (NRCC's Writer in Residence) led a discussion with Susan Clark (Founder and Emeritus Board Member), Franz Camenzind (founding Research Associate and current Board of Advisors), and Avana Andrade (Board of Directors).

Franz and Todd described Susan's critical work identifying the last remnant population of black footed ferrets and her subsequent realization that ecological field work is only one element necessary for successful conservation. Susan talked about her love of being in the field and how she treasured the friendships she formed with ranchers, researchers, conservationists, and managers.

Franz and Todd identified the critical role NRCC plays as one of the few organizations that melds ecological and social science approaches. Susan emphasized NRCC's outstanding project leaders and partners who have made first-of-their-kind

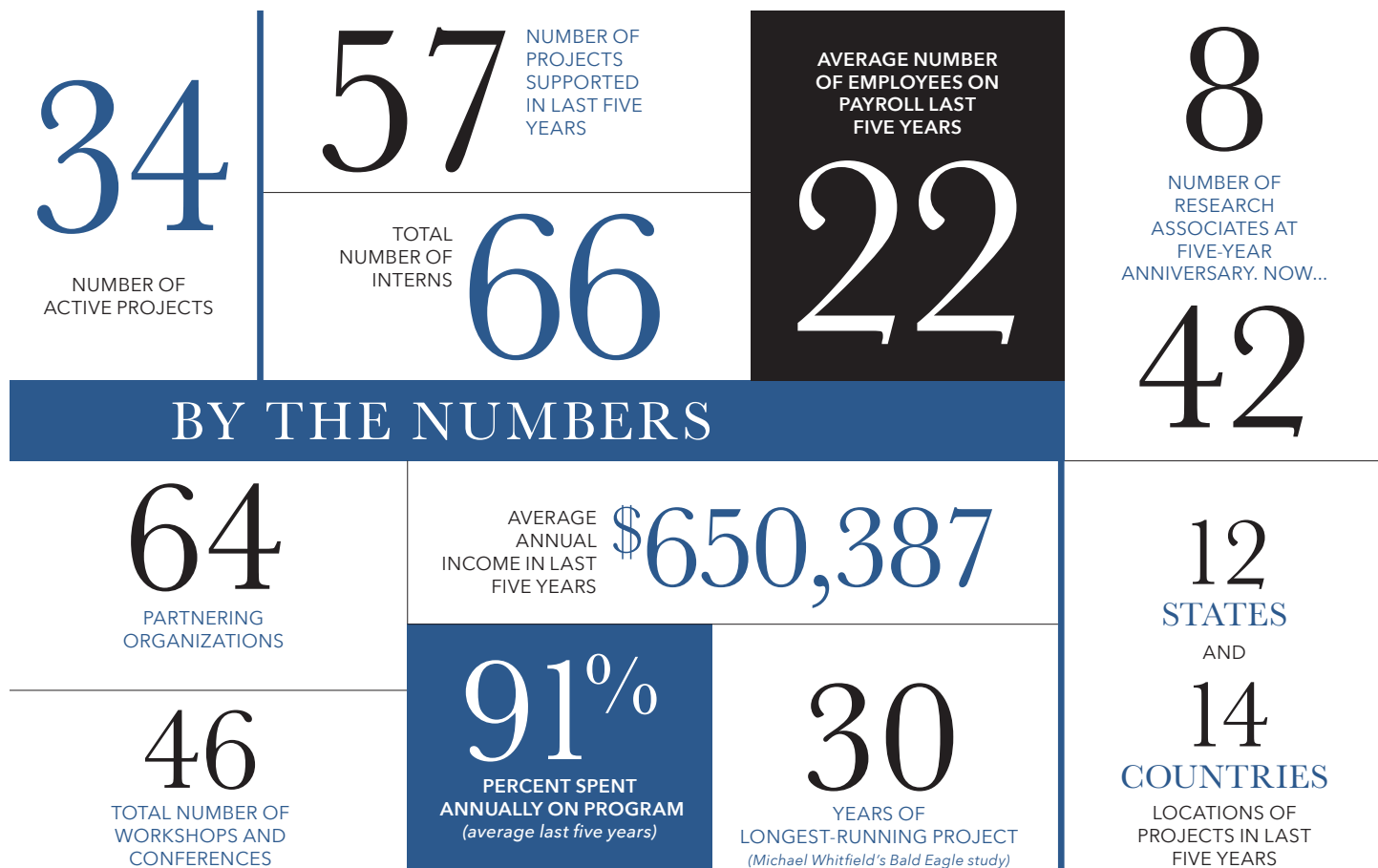


Photo by R.J. Walter

Members of the NRCC Advisory Board gather at the 30th Anniversary Celebration. From left to right, front row: Franz Camenzind, Beedee Ladd, Matthew Hall, Sue Lurie, Sandy Shuptrine, Don Streubel, Todd Wilkinson (Writer in Residence). Back row, left to right: Steve Unfried, Jonathan Schechter, Bruce S. Thompson, Len Carlman, Gary Kofinas.

contributions to research, education, and leadership (see pages 6-9 for examples).

Avana spoke about her excitement in joining NRCC because she feels like the organization can make a real difference for people and conservation. Peyton Griffin (President of the Board) closed the program by thanking the many individuals and organizations who have partnered with NRCC in the last 30 years and continue to support NRCC's instrumental work.



The Year is 2057:

EXPLORING TETON SCENARIOS

by Gary Kofinas, NRCC Board of Advisors and University of Alaska Fairbanks Professor

Imagine. It's the year 2057 in the Teton Region. What do you see? What do you anticipate? What do you fear? What do you hope for?

Now reflect on the process of imagining the future. What are the “known knowns,” “known unknowns,” and “unknown unknowns?” What decisions will shape the trajectories of change and which ones will insure that our “system,” both its ecological and social dimensions, retain the qualities we desire? Can exploring possible futures in a well-structured process help prepare us for the changes and inevitable surprises we may face?

PARTICIPATORY SCENARIO ANALYSIS is the process of examining plausible, likely, and desirable futures through active engagement of citizens, leaders, managers, and scientists in conditions of great uncertainty. Possible futures are generated through human imagination, computer simulation models, and visualization technologies. With its roots in “Future Studies,” scenario analysis is today a common and proven practice used by large corporations to anticipate and prepare for changing economies. In the world of Resilience Science, concerned with local-to-global sustainability, scenario analysis seeks to enhance our capacity to adapt by integrating multiple sources of knowledge, employing innovative forms of public involvement, and taking a “social-ecological systems” perspective.

For many academics, scenario analysis is an uncomfortable workspace, as most are trained in conventional scientific methodologies that are well suited for explaining the past, but limited when talking about the future. To meet the challenges of our world of rapid directional change, we now need creative, proactive and reflexive approaches that assume non-linearity and uncertainty, consider the implications of crossing thresholds that result in dramatic “regime shifts” (such as a dramatic change in ecosystems), evaluate tradeoffs of decisions, and prepare us for novel conditions. Human values on what we perceive as desirable futures are central to such a process, as is identifying the areas where we need to build

resilience and where we need to work towards transformation.

In the Teton Region there are currently multiple, interacting forces for change. Economic and population growth continue to increase. The human footprint is expanding, encroaching on areas critical to wildlife. The effects of climate change are dramatically affecting the hydrological system; the distribution and composition of plant communities, fish, and wildlife; the frequency of wildfires; air quality; and the invasion of new species. The interaction of all these forces adds to the complexity, creating even more uncertainties and raising many more questions.

We do know, however, that sustaining a healthy ecosystem with an array of premier wildlife species, and having local human communities with a high quality of life are two highly desirable features that Teton residents value and wish to retain. We also find there are many efforts currently underway that are examining possible futures in our region – the Yellowstone Ecological Research Center, the Lincoln Institute of Land Policy, Teton County WY Planning, Headwaters Economics, Institute on Ecosystems at Montana State, the Charture Institute, Jackson Hole Conservation Alliance, SHIFT, and NRCC, to name a few. In some cases, however, efforts are working within silos of specific disciplines or topic areas, and not addressing possible futures holistically.

Can a TETON SCENARIOS PROJECT draw on these efforts to enhance our ability to adapt and transform in a rapidly changing world? Can the region benefit from a multi-organizational effort, employing state-of-the-art scenario analysis methods to engage stakeholders, promote dialogue, raise questions, and inform governance? Can a Teton Scenarios Project serve as a model for other mountain communities of the West? In the coming months, NRCC, along with other organizations, will be convening small groups to discuss the idea of a Teton Scenarios Project. I invite you to share your thoughts and suggestions on the project idea and explore the possibilities with me.

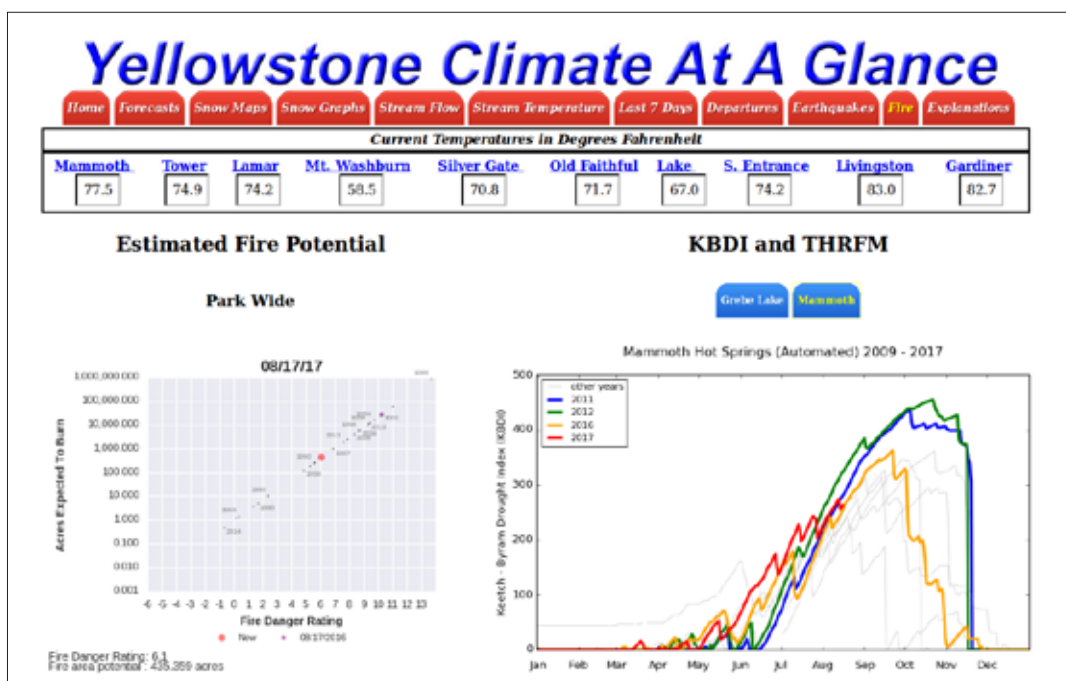


Figure 1.
Screenshot of the Yellowstone
Climate Dashboard
(www.climateanalyzer.org).

ClimateAnalyzer.org

by Mike Tercek, NRCC Research Associate and Walking Shadow Ecology

Weather station data is usually hard to understand. If you download it from one of the official sources, like the National Weather Service, it often looks like computer code rather than a weather summary. Even if it does arrive in a simple table, it isn't easy to look at long-term trends, calculate averages, or extract drought information.

I created ClimateAnalyzer.org (a NRCC – National Park Service collaboration) to make obtaining and analyzing weather station data from National Parks easy. There are two different interfaces to the web site. The first, popular science interface is a “climate dashboard.” It provides the most popular and relevant “real time,” up-to-the-minute graphs and tables for a national park like Yellowstone with just a few mouse clicks. The dashboard for Yellowstone National Park is located at www.ClimateAnalyzer.org/y_dash (Figure 1).

The second interface, which is available from the front page of the web site (www.climateanalyzer.org), allows people to make detailed data queries and advanced graphs. Do you want to know what the high temperature was on January 1, 1897? Maybe you'd rather calculate the average length of “dry spells” (number of days between rain events) during every year since 1900 at Mammoth or Old Faithful? Or look at long-term trends in peak snowpack? Or compare the average hydrographs from a stream gauge during two time periods? There are hundreds of possibilities available with just a few mouse clicks. It's easy to find interesting patterns like the one shown in Figure 2.

There are currently 20 data sources included on the web site. These include NWS COOP stations, RAWS, USGS stream gauges, Canadian Weather stations, SNOTEL, HADS, USBR

lake gauges, USGS earth quake data, SNODAS satellite imagery, Drought Monitor, marine buoys, NWS Forecasts, and a variety of other rain gauges, and NPS constructed collection platforms. Data from all these sources are updated at least every 24 hours. Some datasets are updated hourly or even every 15 minutes.

The interactive long-term and real-time data on ClimateAnalyzer.org is invaluable for understanding and planning for human needs and vegetative and wildlife conservation. We encourage you to share how you are using the data and if you have ideas about how we can improve the site.

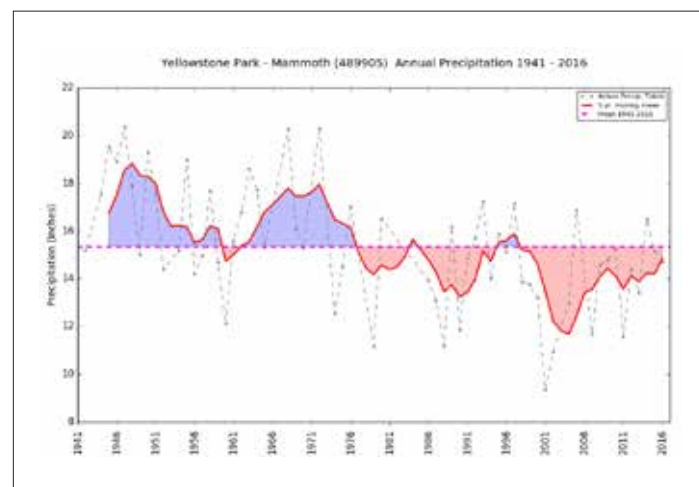


Figure 2. Annual precipitation in Yellowstone National Park 1941 – 2016. Red-shaded areas show years where the 5-year moving average is below the 1941 – 2016 average. Blue areas show years with the moving average above the long-term mean. Graph generated with a few mouse clicks on ClimateAnalyzer.org.

Human Wildlife Co-existence:

NRCC HOSTS 6TH JACKSON HOLE WILDLIFE SYMPOSIUM

On March 10, 2017, NRCC hosted the 6th Jackson Hole Wildlife Symposium at the Center for the Arts in downtown Jackson. The symposium's primary goal was to foster thoughtful discussion of the need to reframe our work, perspectives, and actions on the relationship of humans and wildlife. This reframing and grounding seeks to shift us from an emphasis on reactive conflict management to forward-thinking practical strategies for co-existence.

Bozeman-based journalist Todd Wilkinson started the morning with a staggering look at development trends in the GYE juxtaposed against the need to sustain wildlife habitat and greater ecological integrity throughout the region. Subsequent speakers provided practical ways forward to address these challenges.

Twenty-one local and regional researchers and conservationists gave "quick talks" in the afternoon on topics ranging from reducing the impacts of roads on wildlife and managing invasive species to long-term changes in the raptor community.

A highlight of the social hour was the presentation of the Craighead Conservation Award to Panthera's Mark Ellbroch and the Raynes Citizen Conservation Award to Jackson Hole conservation leaders Frances Clark and Bernie McHugh.

The evening featured a keynote presentation by National Geographic Society Explorer and NRCC Research Associate Gao Yufang, who spoke about his work on three cases of integrative conservation on the Tibetan Plateau, a region with similarities to the GYE's ecological and human-wildlife conflicts. Gao's three cases illustrated the vast array of values at play in conservation and underscored the need for a reframing from a reactive focus on conflict mitigation to a forward-looking focus on human-wildlife coexistence.

NRCC is grateful for the support of our event sponsors. Stay tuned for a save the date for the 7th JHWS – we hope you can attend!



Photo by R.J. Walter

Indy Burke, Richard L. Wallace, and Susan Clark (left to right) speak at the Jackson Hole Wildlife Symposium in March.

"This is a very valuable chance for people to get together and share information."

– 2017 JHWS participant

Jackson Hole Wildlife Symposium Sponsors

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Y2 Consultants

Mexican Wolves in Northern Mexico:

A SUCCESSFUL COLLABORATIVE REINTRODUCTION PROJECT

by Carlos A. Lopez Gonzalez, NRCC Research Associate and Universidad Autonoma de Queretaro Research Professor

We have been collaborating to reestablish a Mexican wolf population in Northern Mexico since 2012.

This collaboration is remarkable in that it is a binational effort of academic, non-profit, and governmental institutions.

Mexican wolves (*Canis lupus baileyi*) used to roam from Arizona and New Mexico in the southwestern US to the temperate ecosystems of southern Mexico. About 40 years ago, the species was extirpated from the wild and a captive program kept the subspecies from becoming extinct. After many years of planning, the Mexican National Commission of Natural Protected Areas (CONANP) coordinated the first attempts to release Mexican wolves into northern Mexico.

The restoration of a large carnivore includes many biological and social aspects, and reestablishing the Mexican wolf in the countryside of Mexico has not been an easy task. One of the main challenges is the land tenure system, which is dominated by a mixture of privately owned ranches and communally owned properties (named Ejidos), and almost no federally owned land. This is very different than areas where wolves have been restored in the US. The current population of Mexican wolves is 31 individuals, 20 of whom have been born in the wild. We have documented a total of five litters ranging from 4 to 6 pups.

The project is also grappling with some of the issues that originally brought Mexican wolves to the brink of extinction. The tolerance of livestock producers is especially important for recovery. We are using a suite of coexistence techniques such as fladry, stroboscopic lights, range riders and Radio-Activated Guard boxes to deter not only wolves but pumas (*Puma concolor*), black bears (*Ursus americanus*), coyotes (*Canis latrans*), and even

jaguars (*Panthera onca*) from attempting predation on livestock. Additionally, Mexico has livestock depredation insurance that will cover any depredation event by predators, which is funded by the Ministry of Agriculture and livestock producers. These tools have allowed us to cultivate a dialogue with producers that favors tolerating wolf presence in the area.

A combination of a hard-working field team, the implementation of coexistence techniques, and the livestock depredation insurance are allowing a slow but steady growth of the Mexican wolf population in Northern Mexico. Current funding is being provided by an array of cooperators (Arizona Game and Fish Department, CONANP, NRCC, Defenders of Wildlife, UAQ). The project will need an increase in funding to maintain the current levels of wolf population growth and the probable increases in livestock predation that will accompany a larger number of wolves in the region.



Photo Courtesy Carlos Lopez Gonzalez

30 YEARS ON THE LEADING EDGE OF CONSERVATION FOR THE COMMON GOOD

A few of our accomplishments....

1987

NRCC Founded



1988

NRCC Pioneers Greater Ecosystem Concept in Yellowstone



NRCC Sponsors The Wolf Fund Initiative



1989

Rare, Sensitive and Threatened Species of Greater Yellowstone Ecosystem

1990

Conserving Greater Yellowstone: A Teacher's Guide



1992

Management of the Greater Yellowstone Ecosystem: An Annotated Bibliography



Assessing Educational Efforts

ACROSS THE GREATER YELLOWSTONE ECOSYSTEM (GYE)

by Richard L. Wallace, NRCC Educator in Residence and Ursinus College Professor

Education is ubiquitous in the GYE, where dozens of organizations operate hundreds of individual programs throughout the year. These programs take all forms, from a year-long graduate program to a week-long field program for undergraduates, to the many short formal and informal ranger-led programs and guided expeditions in Yellowstone and Grand Teton National Parks. This “educational landscape” represents a massive growth in programming in recent years, involving educators and people served, occurring hand-in-hand with skyrocketing visitation in the GYE.

Despite the number and breadth of educational programs in the GYE, little has been done to assess their cumulative impact, or the methods and content they represent. I am undertaking a broad review of GYE educational programs, through interviews, visits, and a literature review, building on NRCC’s previous work that produced the 1990 report “Conserving Greater Yellowstone: A Teacher’s Guide.”

Preliminary findings of my work are that education in the GYE is roughly divided into three areas:

1. A focus on ecology, biology, geology, and other natural history, aesthetic appreciation, and the entertainment values of parks and wildlife.
2. A deeper exploration of human experience, with the ecosystem serving as a window on the world beyond its borders and on the inner meaning we bring to it.



Photo by Susan G. Clark

3. Problem-oriented learning designed to mitigate and adapt to social and ecological crises, including ecological degradation, endangered species, and other human overuse of the region’s fragile ecosystems.

My work explores where among these areas of focus the most effort is placed, and to what effect. Are we fully utilizing the unique educational capacity of the GYE, one of the last intact ecosystems in North America? This work will culminate in a NRCC report on education in the GYE, expected late in 2018. Among the next steps being discussed are holding a workshop for educators to build community and capacity throughout the GYE.

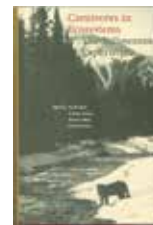


1994 -1996

Biodiversity Conference and Buffalo Jubilee

1997-1998

Elk Management Working Group, Workshop, and Monograph



1999

Carnivores in Ecosystems: The Yellowstone Experience

2002

The Policy Process: A Practical Guide for Natural Resource Professionals



Human Wildlife Co-existence:

SOLUTIONS FROM AFRICA

by Christine Paige, NRCC Research Associate and Ravenworks Ecology

Can humans coexist with wildlife? I'm interested in stories of communities that are finding ways to coexist with challenging species. I'm researching promising coexistence efforts for a project and book I'm working on through NRCC. I spent the month of July in Botswana, where people are deeply proud of their wildlife heritage and many communities depend heavily on wildlife tourism. Yet farmers can lose a year's crops in a single night to elephants, and often lose livestock to cheetahs, wild dogs, and lions. The "solution" to these conflicts is often found through poison or a gun.



Photo by Christine Paige

I visited with Ecoexist, an NGO working with villagers in the eastern panhandle of the Okavango, where 15,000 people compete with 18,000 elephants for land and water. Ecoexist works to reduce elephant conflicts through research, land use planning, and farming innovations, and by building skills and economic opportunities in the villages.

The Ecoexist team gets down in the dirt to help farmers reduce crop damage by installing solar electric fences, deploying chili powder in several ways as a deterrent, and testing alternative value-added crops. Beyond hands-on technical solutions, they also work with village and government leaders to address land use policy and broaden economic opportunities. Notably, Ecoexist is boosting local pride in elephants by hosting annual cultural fairs that celebrate "Life with Elephants" through dance, music, drama, and craft competitions. They established a basket-weavers' cooperative to market fine baskets with elephant themes, and are helping the villages promote tourism to this remote region based on their life with elephants. Ecoexist is hitting all the right notes to encourage long-term coexistence.

I was also able to briefly investigate other wildlife conflict issues in the country. Cheetah Conservation Botswana, which works to reduce cheetah depredation on livestock, is training village dogs as livestock guardian dogs – adapting rescued litters of puppies to the task – and finding them hardier and far more successful than breeds introduced from Europe. Rich Reading, an NRCC Research Associate who is working in Botswana on a Fulbright, brought me up to speed on Raptors Botswana, which is working to reduce the poisoning of vultures. Ingeniously, Raptors Botswana sponsors a youth rugby team and uses the games as a venue for education outreach. I also returned to the Botswana Predator Conservation Trust research camp, where I worked in 2002, to learn more about their current research on predator deterrents using scent and sound.

The world over, scientists and communities are seeking practical and sustaining solutions for wildlife conflicts that will promote conservation. I hope to explore the successes and challenges of a number of these case studies in a general interest book, to highlight the possibilities of wildlife coexistence.



2003
1st Jackson Hole Wildlife Symposium

2004
NRCC Facilitates Trapper's Point Collaborative Working Group



2005
State of Our Community Conference

2006
Banff Grizzly Bear Workshops

2007
NRCC Publishes Greater Yellowstone Directory



Signals from the Future:

A COMPREHENSIVE LOOK AT THE FUTURE OF GREATER YELLOWSTONE

by Susan G. Clark, NRCC Founder, Board Emeritus, and Yale University School of Forestry and Environmental Studies Professor

We have repeatedly reconfirmed the value of the Greater Yellowstone Ecosystem (GYE) to the American people, and people throughout the world. This book is about greater Yellowstone, its plants and animals and people, and the harmful changes that are underway there because of our actions. It is also about what we can do about those diverse, growing problems.

Today GYE is used and managed as though it were a collection of jurisdictions and pieces. Although there has been some movement towards unity and coherence, it remains largely a symbolic movement, with little overall real integrated science, management, and policy for sustainability. The evolving story is really a competition over worldviews about our relationship with nature, and it is always controversial. We can't forget that we are the authors of our stories of meaning, however our stories turn out. It is time to move the old story along from people vs. nature to people in nature.

We have created worldviews, organizations, and hierarchies within ourselves that have straightjacketed us and our potential to respond to the growing crises. Because of our mechanistic, fragmenting, and self-protecting system of thought we just throw more and more experts at each problem. In GYE we throw vets at bison and elk management, wildlife biologists at grizzly bear management, and administrators at management problems. These are necessary, but not sufficient.

We miss seeing how thought participates in our perceptions. The



Photo by Kim Zierlein

big outcome of this blindness is that, without noticing it, we “see what we want to see” and “hear what we want to hear.” However, as I call for throughout this book, we can learn to see ourselves and our thinking anew. It requires us to break away from our old cultural stories of frontier, conquest, rugged individualism, and unlimited growth.

The dominant story today and the resource use it perpetuates are causing fragmentation, degradation, and incoherence. If that trend continues, it will have dire consequences for Yellowstone, its life, and our future. Against that situation, other people are creating stories seeking unity and coherence. These people tend to see Yellowstone as a great cultural monument reflecting our potential to live in harmony with nature sustainably. The solution to our dilemma is, first, to see the GYE and beyond as one whole system, including ourselves – a unity.

To get to where we need to be requires that each of us be a better companion with one another and with Nature. We need to share pragmatic hope about our collective future. This hope is different than just being optimistic or utopian. It is about daring, work, and pragmatism. We can bring about change through responsible science (a new kind of integrative science and transformative education), skilled, high-order leadership, and culturally adaptive and flexible stories of meaning making.

Today in greater Yellowstone, there are many people working to do just that. They point the direction and offer a model for the rest of us. With this book, I aim to elevate public recognition of their important work.



2008

Ensuring Greater Yellowstone's Future



2009

Mule Deer and Development: Making Science Relevant to Planning



2014

Large Scale Conservation in the Common Interest and Large Carnivore Conservation in the North American West

2010

NRCC Hosts Wolverine Night



2015

Experts in Residence Program Launched

2017

30th Anniversary



NORTHERN ROCKIES
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The Research Associate (RA) program at NRCC lies at the heart of our work. It continues to grow each year, expanding our ability to increase understanding of ecological and social processes around the globe. We hope you enjoy reading about a few of our current, active projects in this issue. For more information on all NRCC RAs, please visit nrccooperative.org.



MIMI KESSLER

This May, I organized a conference that brought together researchers from across Asia to share information and develop recommendations for the conservation of the Great Bustard, the world's heaviest bird capable of flight. As a group, we developed recommendations for a "Proposal for Concerted Action" on the Great Bustard, intended to improve coordination of conservation across the Great Bustard's international migratory pathway. The Proposal was submitted by the Government of Mongolia to the Convention on Migratory Species (CMS), and will be voted on by signatory countries at the CMS Conference of Parties. Conference participants agreed that combatting poaching is crucial to the survival of this incredible species. Other major threats include poisoning for meat, loss of habitat on wintering grounds, and low reproductive rates due to incompatible agricultural practices. In October, I will attend the Conference of Parties to lobby for the passage of this proposal. I will also edit conference proceedings, so that information about this wary and vulnerable species is accessible to policy makers across its range.

RUTH SHEA

This year, my research goal was to determine the survival of the breeding segment of Greater Yellowstone's Trumpeter Swans during the very harsh winter of 2016-17. More than 30 years ago state and federal swan managers launched a controversial and difficult program to reduce the extreme vulnerability of GYE swans to high mortality during harsh winters. The effort included terminating winter feeding at Red Rock Lakes National Wildlife Refuge, Montana, and translocating over 2,000 swans to new nesting and wintering areas to expand their distribution and increase their resiliency. This year, we conducted aerial and ground surveys and coordinated agency and volunteer observers to compare the number of GYE nesting pairs in 2017 to the number documented in 2016. We found no evidence of unusual loss of nesting pairs despite the extreme winter. We concluded that 30+ years of range expansion and habitat management have made the swans much less vulnerable to overwinter mortality.



GAO YUFANG

This March I was honored to be invited by NRCC to give a keynote presentation at the 2017 Jackson Hole Wildlife Symposium where I shared my previous conservation adventures in Tibet. In May, I returned to China's Sanjiangyuan National Park, which is the source of the Yellow, Yangtze, and Mekong rivers, to conduct my pre-dissertation fieldwork. I visited a number of local and national conservation organizations to understand their perspectives on human-wildlife coexistence. I also worked with the Tibetan monk conservationists of the Nyanpo Yuzee Conservation Association to engage local herders in monitoring large carnivore occurrence and human-wildlife conflicts. In addition, I completed an intensive summer Tibetan Language Studies Program at the University of Wisconsin-Madison. I also organized a weekly online seminar where a dozen passionate young Chinese conservationists read about the interdisciplinary policy sciences framework and discussed its use in the field of wildlife conservation in China.



TREVOR BLOOM

Raised in the Tetons at the foot of shrinking glaciers and with increased wildfires, I understand that climate change is real, therefore scientific research and public outreach matter. I grew up here in Jackson attending Teton County public schools, and have grown from my roots into a professional biologist and passionate conservationist. Now I work alongside Dr. Corinna Riginos and the Northern Rockies Conservation Cooperative in an effort to study and raise awareness on the impacts of climate change on the plants and wildlife of Grand Teton National Park.

Our research builds on the observations of local biologist and writer Dr. Frank Craighead Jr. In the 1970's, he intimately studied the timing of natural events outside his home in Moose, WY, and used his observations to write the amazing book *For Everything There is a Season: The Sequence of Natural Events in the Teton-Yellowstone Region*. Nearly fifty years later, I am following in Craighead's footsteps. Warm spring temperatures have shifted the flowering and fruiting of many plants up to a month earlier than in the 1970's. However, the behavior of many migrating animals (based on day-length rather than climatic cues) has remained the same. This can cause tremendous ecological timing mismatches. How will bears react when berries peak in the summer, rather than in the fall, when they need them as a food source before hibernation? How will hummingbirds feed nectar to their young when the flowers bloom weeks too early? These are questions we seek to answer, and plan conservation efforts for, in collaboration with Grand Teton National Park, the United States Geologic Survey, and YOU!

We are working with local community members, volunteers, schools, and other conservation organizations to build a team of citizen scientists who are empowered to do important field work and collect valuable long-term data. We plan to continue our work for at least the next 5-10 years to build observations comparable to the Craighead data, thus better informing climate adaptation strategies.

SETH WILSON

I am pleased to return to Slovenia this fall to continue my international wildlife conservation work. After a successful year in Slovenia from 2015-2016, I was asked by the Slovenian Forest Service to help prevent the extinction of the Eurasian lynx.

To jump start this new effort, four Slovenians travelled to the US in late May and spent two weeks on a study exchange tour sponsored by the Trust for Mutual Understanding.

I organized and led the tour that highlighted examples of local, collaborative efforts to reduce conflicts with large carnivores in Montana and Alberta. The goal of the tour was to provide best practice examples of how communities have learned to live with large carnivores so that lynx reintroduction efforts in Slovenia will be successful.

I will return to Slovenia with my family this September for another year-long immersion. My focus will be to provide expertise and guidance necessary for involving local communities in the lynx reintroduction effort.



Photo by R.J. Walter

CORINNA RIGINOS

For the past four years, I have been working on several research projects relating to the impacts of roads on migratory ungulates in Wyoming. This year, building on this research, I have begun working towards collaborative action. In November 2016, I joined several partners from Wyoming Game and Fish Department, Wyoming Department of Transportation, Wyoming Migration Initiative, and

The Nature Conservancy in defining steps necessary to promote action on roads. This group evolved into the Wyoming Wildlife and Roadways Initiative, and in April 2017 we held the first Wyoming Wildlife and Roadways Summit. This meeting was attended by ~150 representatives of WYDOT, WGFD, 22 NGOs, citizens, elected officials, and others. The energy and spirit of collaboration in the room was thrilling! Capitalizing on this momentum, our initiative is moving ahead to identify top priority areas for road-wildlife mitigations in Wyoming and pursue funding to implement these mitigations.



ERIC ATKINSON

Over the past 5 years, 17 Northwest College undergraduate researchers and I have assessed circulating West Nile virus in 471 samples

represented by 23 avian families, across 6 orders (Coraciiformes, Charadriiformes, Strigiformes, Falconiformes, Piciformes, and Passeriformes). We are finding interesting patterns in both time (elevated virus titers before the prime vectors, *Culex* mosquitos, are active), space (highest viral loads at mid elevations), and taxonomy (House Finches, Common Grackles, American Robins, and House Sparrows showing relatively high viral titers). Furthermore, students are now looking into avian malaria and WNV co-occurrence among species and across the landscape to determine important factors delimiting disease in the face of climate and habitat change. Students are gaining skills that are preparing them for transfer to universities and graduate schools and they have the opportunity to present their work at scientific conferences such as the 2017 American Ornithological Society Conference and the Western IDeA Conference. Winter work will entail investigating various malaria lineages present in the birds while also looking into immune status and the fecal microbiome. So, stay tuned!

DREW REED

It has been a busy season on the beaver front for relocation, education, habitat improvement projects, and mitigation work.

I have already relocated 13 beavers this season, but fall will likely add to that number significantly as beavers begin their preparations for winter. Nine of these beavers were in Wyoming and four were captured in Victor, Idaho as part of our continued collaboration with the Idaho Fish and Game, Caribou-Targhee National Forest and other partners to bolster beaver populations on the forest in SE Idaho. Most of the beavers I have relocated this year were mature pairs. This is desirable because it increases the chances that the beavers will take to an area rather than moving on.

The Northern Rockies Trumpeter Swan Stewards (NRTSS) and Wyoming Untrapped (WU) are working closely with Bridger Teton National Forest (BTNF) to identify areas of the forest where beavers are needed for wetland restoration. We are also identifying locations where Beaver Dam Analogs (BDA) can be installed in the fall to help improve habitat and provide a “starter” dam to increase the likelihood that relocated beavers will be successful at establishing in a particular location. NRTSS, WU, and Friends of Pathways were also able to work with BTNF to install a “beaver baffle” (a hog panel cage) at the culvert on Crater Lake to prevent beavers from clogging the culvert. This is preventing the beavers from causing Crater Lake to overflow and potentially damage the Old Pass Road.

NRTSS and WU are also working together to provide educational opportunities for school groups and adult groups. Some of these opportunities will include field trips to beaver-created wetlands, habitat improvement projects, and field trips for beaver releases around the valley.



Photo by R.J. Walter

MICHAEL WHITFIELD

Idaho/GYE Bald Eagle Research Project Update: Female 22 first flew from her natal nest in 1987 when there were only 21 known bald eagle breeding pairs in the Idaho portion of the GYE. She traveled thousands of miles as she matured, but since 1994 she and her mate have stayed put in a new breeding area just 66 miles west of her birth place. She has now successfully raised at least 25 young, and some of those young have established new breeding areas in the GYE and perhaps beyond.

Today we are aware of 97 bald eagle breeding pairs in the Idaho/GYE. Female 22's history is one of a few we know from our years of banding nestlings, but now we have the opportunity to learn much more about GYE's bald eagle population and it's spectacular recovery from endangered status. In partnership with Teton Raptor Center and geneticists from Oklahoma State University, we are exploring the genetics of GYE bald eagles and

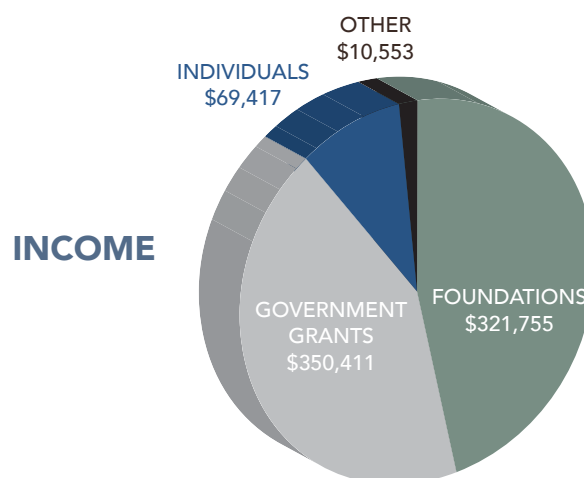
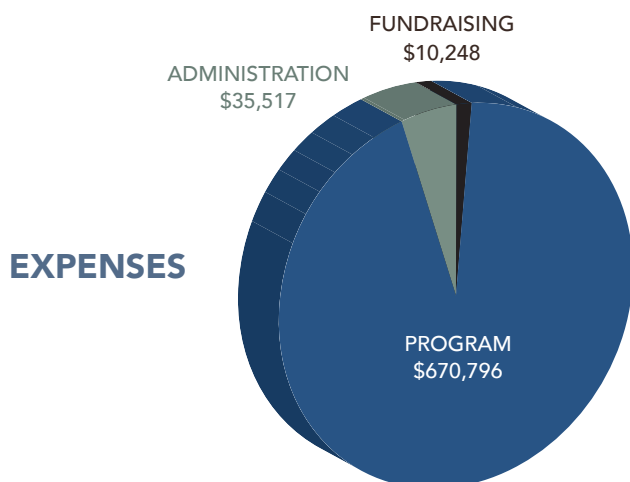
newly re-established populations immediately outside the ecosystem. This year and next we will be collecting all the bald eagle genetic samples that we can to compare with samples we collected in the past. Through super-computer powered pair-wise relationship comparisons of DNA samples taken from eagles throughout our region, we will soon have a clearer understanding of how recovery took place. It will tell us about the importance of long-lived adults like female 22 and the protected source area from which she originated, including GYE's influence on recovery within the broader region, and all kinds of population measure. We have learned a lot in 35 years of GYE bald eagle study, and new technology is about to teach us a whole lot more.

2016 Financial Report

NRCC is a 501(c)3 non-profit organization, headquartered in Jackson, Wyoming.

Our revenue comes from a wide variety of sources including foundations, government agencies, and individuals.

In 2016, 94% of all revenue directly supported conservation projects.



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