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BUILDING BRIDGES – HOW COLLABORATION IS ADDRESSING WILDLIFE-VEHICLE CONFLICTS IN MONTANA'S UPPER YELLOWSTONE WATERSHED

By

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Professional Paper

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TABLE OF CONTENTS

ACKNOWLEDGEMENTS 1

COUNTING LIGHTS 3

INTRODUCTION 5

PREFACE 10

INTRODUCING WILDLIFE-VEHICLE CONFLICTS 17

- HUMAN SAFETY 23
- WILDLIFE IMPACT 24
- ECONOMIC IMPACT 26

ADDRESSING THE ISSUE 29

COMMUNITY IN COLLABORATION 51

- THE RUBBER BAND THEORY OF CHANGE 56
- THE USE OF KNOWLEDGE & DATA 62
- UNDERSTANDING PRIVATE PROPERTY 65
- ADDRESSING LIVELIHOODS 66

THE LIAISON 71

- VIRTUES OF A COLLABORATIVE LEADER 75

US HIGHWAY 93 & TRIBES 77

THE ROAD AHEAD 82

APPENDICES

- A. TEMPLATE LIAISON CONTRACT 90
- B. LITERATURE REVIEW 94
- C. LANDOWNER ASSESSMENT of the UPPER YELLOWSTONE 117
- D. INTERVIEW GUIDE 127
- E. RECOMMENDATIONS 130

WORKS CITED 131

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I'd also like to acknowledge the dedicated and highly capable members of Yellowstone Safe Passages. This begins with Liz Fairbank from Center for Large Landscape Conservation, Max Hjortsberg from Park County Environmental Council, Brooke Shifrin and Blakeley Adkins from Greater Yellowstone Coalition, Dan Bailey and Kelsie Huyser from National Parks Conservation Association, and Michelle Zizian who performs the emotionally taxing work of monitoring and recording wildlife carcasses on Highway 89. Gratitude also goes out to Druska Kinkie, Whitney Tilt, and Jeff Reed, among others from the Upper

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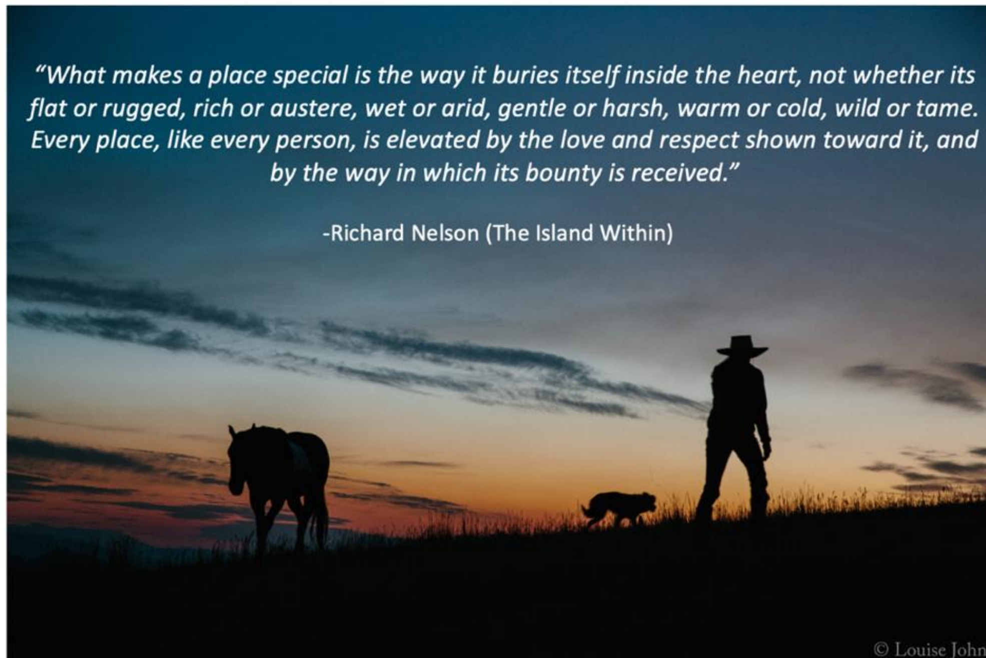
Lastly, I'd like to acknowledge the Indigenous Peoples who previously and still do regard the Upper Yellowstone as their ancestral homeland. Recent history shines a light on the Apsáalooke (Crow), Newi (Shoshone), Niitsitapi (Blackfeet), Nimi'ipuu (Nez Perce), Séliš (Salish), Ktunaxa (Kootenai) and many more tribes who seasonally lived among the high elevation mountain-scapes, rolling foothills, rich grasslands of the valley floor and meandering presence of what is now referred to as the Yellowstone River. Prior to these bands and the time of European settlement, colonization, and assimilation, homo sapiens from east Asian descent traveled the Upper Yellowstone for at least 12,000 years as the last glaciers receded up river into present day Yellowstone National Park. The lands I refer to throughout this document are also the same lands that were stolen from Indigenous people who survived thousands of years before colonial influence. Early preservationist and conservationist endeavors that set out to "protect" land were performed under a caste hierarchy that excluded many, if not all, Native individuals and cultures from these lands. Present still are threads of inequality, injustice, exclusivity, and even racism. My work, moving forward, begins by removing this veil, seeking out truth and reconciliation, and imagining new relationships to be born with my Native and non-Native brothers and sisters.

Today, I honor the Indigenous ancestral connections to this landscape, and the more than human life – some megafauna now extinct – who resided here before me. All of these beings, past and present, hold a profound connection to my heart and to my sense of place in southwest Montana.

COUNTING LIGHTS



On a late summer evening when I was eight years old, I sat with my grandfather on the tailgate of his pickup truck looking down from our family's ranch into the Paradise Valley of Southwest Montana. As the sun dropped behind the horizon, my grandfather peered into the valley below and asked me to help him count the lights flickering in the distance. "One, two, three… maybe ten or more?" Then he said, "I want you to come back in twenty years and do it again." I did.

The Upper Yellowstone – often referred to as Paradise Valley – is where I was raised. Located on the Northern border of Yellowstone National Park, the watershed displays rugged peaks covered in massive timber blankets that open to alpine meadows and sweeping hillsides of wildflower and sage. Rolling foothills provide life to aspen trees and willow lines that drink from the many springs and reservoirs trickling above and beneath the surface. The valley is known most notably for the Yellowstone River – the longest undammed river in the continental United States carrying water and life from the wild heart of Yellowstone National Park to the far reaches of the Missouri River.

The Upper Yellowstone is also a place that holds histories and disturbances similar to many other places throughout the West. It has witnessed massive environmental shifts over time, from ancient volcanic and glacial events, to flood and fire. Thousands of animals coevolved with this landscape. Bison, elk, moose, deer and many other creatures – some now extinct – moved through the valley as the seasons and years passed. Aptly named, the Apsàalooke (Crow) people have called the Yellowstone "*Iichiilikaashaashe"* (Elk River) for over 600 years (Doyle, 2019). European settler colonialism and the creation of Yellowstone National Park displaced Native people from their ancestral homelands nearly 150 years ago. Wagon trains were replaced by trains made of steel and iron, and then by automobiles that upheld the luxury of an independent American ideal. US Highway 89 between Livingston and Gardiner was constructed in 1961 as a two-lane highway connecting the then booming town of Livingston and surrounding area to the Northern entrance of Yellowstone National Park (MDT, 2021). In all of this history, some people have benefitted at the expense of others.

Today, the Upper Yellowstone is a vibrant landscape influenced by a rising tide of diverse human interests and activities that are drawn toward the allure of recreational opportunities and the area's uniquely wild character. Now I can watch from the same perch on the ranch – where both of my grandparents are buried – and count the numerous lights below. Growing up here taught me many things, but recent shifts have ignited a quiet sense of urgency for me to share an understanding of how people shape this landscape, how the landscape shapes people, and how the qualities of our interactions shape both. My grandfather's provocation rustles like leaves in the wind. What Elk River Valley will look like in another twenty years, perhaps no one knows. We can, however, have a discussion about the impact of our collective choices in the present moment. This paper attempts to ignite that discussion.

INTRODUCTION

In my first semester of graduate studies at the University of Montana – Fall, 2019 – I was given an assignment from one of my professors to research a "landscape-scale" conflict of my choosing and compose a professional memo that could be sent to key influencers or stakeholders tied to the issue. The assignment was intended to test my skills as a researcher and communicator, and gauge whether or not the issue would benefit from a collaborative process. Naturally, I directed my attention to a community I know and love, the Upper Yellowstone, and a conflict that is ubiquitous across the West: Wildlife-Vehicle Conflicts (WVCs).

By the end of 2019 I had connected with a few folks from regional NGOs and a Montana Department of Transportation regional biologist named Deb Wambach who had pressed her agency to prioritize mitigating WVCs in Montana for over two decades. In December, 2019 I requested a meeting of minds with the four NGOs I reference throughout this document. Soon thereafter a partnership was born. In the pages that follow I describe how Yellowstone Safe Passages came to be, who is involved, and the steps we have taken thus far. I also share recommendations from our experience that I hope provide insights for people in Montana who may be grappling with the same question: *How do we effectively address WVCs in our own community?*

Nearly two years has passed since I began researching wildlife-vehicle conflicts on US Highway 89, and since my founding question was presented to our core group of NGO partners. To paraphrase, that founding question went something like this: "Would a community-driven collaborative partnership be worth attempting as a means to build bridges over Highway 89?" The answer from the group, which included representatives from Greater Yellowstone Coalition (GYC), Center for Large Landscape

Conservation (CLLC), National Parks Conservation Association (NPCA), and Park County Environmental Council (PCEC) was a unanimous "Yes", followed by, "Do you want to be the person to lead it?!" And so the story unfolds. Building bridges, I've learned, has more to do with social dynamics than it does physical structures. It has more to do with how data is created and used, who is involved in generating the data, and the objectives data is intended to fulfill. It has more to do with a thoughtful and inclusive process than it does in building structures. The early partners took my interest in collaboration and personal tie to the Upper Yellowstone as a novel approach to addressing WVCs on US Highway 89. I have been both excited and humbled to work so closely with new colleagues, agency representatives, and community members who envision safer roadways in Montana. They are smart, caring, and thoughtful people who have accumulated decades of experience navigating the complex social and environmental issues that underpin wildlife-vehicle conflicts in the Upper Yellowstone and throughout the region.

I conclude this academic chapter of my life with a salaried position as liaison for Yellowstone Safe Passages, which has helped pay for a Master's Degree in Environmental Studies and a professional certificate in Natural Resources Conflict Resolution. My coursework and mentorship at the University has routinely been explored with Yellowstone Safe Passages, collaboration, and WVC mitigation in mind – resulting in a synergistic blend of academic rigor, applied knowledge, and relationship-building that I will forever be grateful for. In the following pages I reflect on this journey. I begin by introducing the broad strokes of wildlife-vehicle conflicts in the United States and Montana, touching on a handful of elements related to WVCs in the Upper Yellowstone watershed. I present the three pillars of wildlife-vehicle conflict (human safety, wildlife impact, and economic impact) in an attempt to pull the veil back on this issue, and in a manner that is digestible. Wildlife-vehicle conflicts are measurable and preventable.

The question is whether or not communities such as the Upper Yellowstone have the right people, sufficient information, and effective process put in place to come up with solutions.

Well over two decades of credible research has demonstrated the efficacy of WVC mitigation solutions such as wildlife overpasses, underpasses (large culverts), and diversion fencing that guides wildlife to the structures. Presenting solutions on the ground, and in rural communities, however, is an entirely different hurdle. It begins by bringing this information into the community, asking for feedback, inviting community members into the problem-solving circle, and raising awareness about WVCs to new heights. In "Addressing the Issue" I expand on the genesis of my role as Liaison and how Yellowstone Safe Passages dedicated ourselves to the collaborative process. The story is augmented with personal reflections and the sharing of specific activities, objectives, and milestones in our partnership's work. I also introduce a series of recommendations on how to build a collaborative culture within defined geographies or communities such as the Upper Yellowstone watershed.

Throughout the paper, and from different angles, I argue that collaboration is the key to addressing and resolving wildlife-vehicle conflicts – both in aligning diverse interests and capacities toward a shared vision and in developing a process through which cross-cultural, cross-jurisdictional, and community-wide bridge building can occur. This is what I refer to as "Community in Collaboration," which represents a pragmatic ideal to build relationships and interdependency among diverse interests (even those of competing nature). Community in Collaboration elevates a belief that conflicts of all shapes and sizes will come and go in the passage of time, but the quality of our relationships set guideposts on how we navigate those obstacles. In the context of wildlife-vehicle conflicts, I consider the potential of a subtle cultural transformation where transparency about the use of knowledge and data becomes an unspoken

mantra; where deeper understanding of the perceptions of landownership and private property rights invites compassion and empathy over that of criticism and judgement; and where framing WVCs as an impact on livelihoods enables leaders in state and federal agencies to consider that human safety is not a measure of life and death, but rather of an individual's ability to thrive.

In the following pages I also reflect on my role as liaison for Yellowstone Safe Passages and make the case for liaison positions similar to mine to be discussed, developed, and funded across the state of Montana. If state agencies, NGOs, businesses, conservationists, wildlife advocates, road ecologists, watershed groups, tribes, tourists, elected officials and Montanans at large wish to see fewer carcasses along the shoulder of our highways, there will be a need for more conversation within each community around the state. The liaison is best suited to fulfill this task.

Toward the end of the paper I discuss the role tribes might play throughout Montana, praising the efforts of the Confederated Salish and Kootenai Tribes in the renowned US Highway 93 North case study. My personal connection to Montana, and sense of place therein, has me constantly looking for lines of continuity between past, present and future human/landscape partnerships and, therefore, signifies a quiet sense of responsibility to invite our Indigenous neighbors into these conversations whenever possible. In my mind there is no limit to what can be accomplished when every stakeholder has an equitable seat at the table.

Concluding the paper, I speak to the exciting and relevant conversations taking place at this very moment. The local scene in the Upper Yellowstone is building momentum. Statewide leadership is developing plans to implement WVC mitigation projects in key areas like the Upper Yellowstone, Greater Missoula

area, and other high priority areas. Under the Biden administration new federal support will dedicate funds to states, through competitive grant cycles over the next five years, focusing specifically on WVC mitigation and habitat connectivity efforts. We are primed for great work in the years to come.

To accomplish this great work we must make space for co-created visions and culture shifts. In an attempt to support this change I provide a distillation of advice and recommendations from my experience working in the field of collaborative conservation, attempting to identify a few of the distinct threads that weave successful collaborations together – the key principles that articulate how “Community in Collaboration” can be applied in other communities, watersheds, and regions across the West.

This paper is a reflection of insights born from two years of work as a liaison, facilitator, student, and collaborative process designer. It represents a call for a greater understanding and acceptance of ethical and moral obligations related to the interface of wildlife and transportation – and toward one another and the many wild creatures who share these landscapes with us.

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PREFACE

As I reflect on my personal and professional experiences over the last two years, I am humbled by all that has been discussed and learned about wildlife and transportation issues in Montana. It will be a long time before any of us in Montana can drive our highways knowing that chances of striking an animal have been significantly, if not drastically, reduced. Perhaps with exception of the leadership that led to the US Highway 93 "Animals Bridge" and the other wildlife-vehicle conflict (WVC) mitigation treatments in the Flathead Reservation, we – Montanans at large – have our work cut out for us.

But there are conversations taking place at this very moment, where people are circling around a shared understanding that WVCs in many locations across the state are preventable. Collaborative partnerships are beginning to take hold, new relationships are being forged between varied interests, and strategies – from local to statewide – are being co-designed by thoughtful and well-intentioned people. There is hope.

I'll begin by approaching this discussion from the 50,000 foot level. There are many layers to wildlife-vehicle conflicts. They are all operating at the same time, and they all have equal value. WVCs connect to a broad stroke of interests. Those interests come from the conservation community (environmental NGOs), state and federal agencies, tribes, and local individuals, landowners, and community groups who represent or advocate for improved livelihoods of people and wildlife. The conversation about wildlife-vehicle conflict has been going for nearly two decades in Montana, as it has in many other places around the United States and Canada.

Regionally speaking Wyoming is leaps and bounds ahead of most other states in this country. Our neighbors to the south are leading the charge in addressing and resolving WVCs. Collaboration seems to

be a common theme, but Wyoming got started a little earlier than we did. One thing Wyoming is doing right (among many factors) is showing what can be accomplished when people across the socio-political and cultural spectrums begin working together. This includes landowners and environmental groups, sporting groups, philanthropists, and agencies. Let's not forget about legislators, policy makers, and state-wide decision-makers who know how to champion a collaborative culture. When I attended the second of Wyoming's Wildlife & Transportation Summit during the Spring of 2021, I heard countless times the phrase, "We're looking under every rock". This says a lot when it comes from a leading voice within an agency, a go-getter at one of the region's most trusted NGOs, and a state legislator who is a multi-generation rancher. Thanks to Wyoming we have a calibration point to aim for. Sure it hasn't been an easy road (pun intended) for Wyoming. Nor has it been for Montana. At the end of the day, fast cars driving down fast highways that cut through epic wildlife habitats will ultimately end in some form of destruction.

As a local in the Upper Yellowstone, I've bumped into people on the street who reflect on their experience hitting animals. Their reflections are always concerning. Hitting an animal on the highway is emotionally taxing, it's expensive, and it often leads to other hinderances like going to physical therapy to fix a tweaked neck, or borrowing a car from a friend while yours get a body makeover. As I have engaged more of the community members in the Upper Yellowstone, whether that be at the local café, the webinar series I moderated through the Spring of 2021, or at presentations I have given in the community, it is surprising to me the number of folks who are not familiar with the complexity of WVCs on Highway 89. Most people don't know how many animals are hit on the highway. Elk and deer are immediate assumptions. But we also have conflicts with bears, moose, bison, pronghorn, bighorn sheep and all of the other little

creatures that scurry across the highway. There are actually very few places on the continent that have as many wild animals as we do in the Upper Yellowstone, including the iconic American Bison.

From an efficacy standpoint WVC mitigation treatments are proving their worth. Those treatments include wildlife overpasses, underpasses, and diversion fencing that guides wildlife to the crossing structures. WVC mitigations treatments are working all around the United States. What's more is that the data continues to build on itself. Not only are folks beginning to see that wildlife-vehicle conflict presents a glaring issue, they also see potential for change. It's the kind of change that can alleviate tensions around human safety, economic impacts and wildlife mortality, conservation, and connectivity issues. It's the kind of change that improves local livelihoods. As our work to mitigate WVCs in the Upper Yellowstone continues, an increasing amount of local and statewide citizens not only understand the issue but proudly support the vision Yellowstone Safe Passages has cultivated through our collaborative approach, as described in our vision statement:

We envision the Upper Yellowstone to be a place where visitors and locals can travel the highway without wildlife-related accidents, and where the highway doesn't act as a barrier to annual and seasonal movement of Yellowstone's wildlife populations. The intended results will be increased public awareness, advanced partnerships between local and regional stakeholders, and reduced wildlife-vehicle conflicts.

Wildlife-vehicle conflict is complex. It's an incredibly nuanced scenario between all of the major stakeholders. The jurisdictional frameworks between county, state and federal stakeholders can be perplexing. Conversations are happening at the statewide level and they're happening at the county level, which is exciting – but they are not cohesive just yet. Groups like Montanans for Safe Wildlife Passage

and the Montana Wildlife & Transportation Steering Committee are also exploring how to facilitate change across the state while still trying to clarify their roles in relation to other leaders and working groups.

The political pendulum swings back and forth in what seems to be increasingly polarizing distances after every major election. This shifting creates tension, eats away at trust, and undermines the capacities of agencies – state and federal – to effectively support the people and landscapes of Montana. Work dedicated to reducing wildlife-vehicle conflicts can take years, if not decades, to gain fruitful results. Therefore, as the pendulum casts its way from left to right the resources needed to make change – financial or otherwise – are being dragged along in its wake. Highway 89 is also a federal highway, which means that a National Environmental Policy Act (NEPA) process that has to be taken into account for every project. NEPA is ultimately a reliable and necessary process, but the paperwork and the paper trail have a tendency to set a slow, arduous pace. Financing wildlife accommodations is another major hurdle. Whether there is a federal purse available to reach into, or if communities have the ability to leverage grassroots fundraising, there still are no easy formulas to follow. That being said, multiple funding mechanisms can be interlaced, and a growing cadre of individuals, NGO's, and agency reps are taking strides to pull them together.

The role of philanthropists is also showing tremendous potential, as is the role of lobbyists to make changes through the legislative process. We can thank our neighbors to the south and west for showing us how it can be done – they have worked effectively with entire suites of invested partners to make changes and essentially drive more attention, resources, and capacity to address challenges, barriers, and opportunities for reducing WVCs.

A critical piece I am beginning to learn is the importance of landowner engagement. I refer particularly to landowners who have land adjacent to the highway, but can easily extend that provocation to landowners at large. Wildlife have been moving and migrating across these vast swaths of land for thousands of years. Highway 89 is less than 100 years old, and it cuts right down the middle of a major gateway leading into Yellowstone National Park. It should come to no surprise that private lands play a huge role in this conversation. The way we connect to landowners, communicate with one another, cast assumptions toward one another, and attempt to work together is ultimately at the center of this issue. Basically, if we were to get federal funding to install a wildlife crossing structure on Highway 89 – with private land on one side or both sides of the highway – a portion of that private land would be required to have a conservation easement. The federal government doesn't want to drive funding toward a project that ten years down the road could have a housing development on both sides, which makes sense. Hence, our work on the ground is vital. We, as a new partnership, are realizing how valuable this is and how slow this process can be.

This work is all about cultivating and building a culture of trust. And trust, as most of you are likely aware, can take years to build. It can also take seconds to destroy. Trust-building is at the center of my work as a liaison for Yellowstone Safe Passages, and it is something I will expand on by sharing personal reflections throughout this document. I'm hopeful that by the end of this document readers might have a few new tools to use in their own personal and professional endeavors, regardless of their connection to WVC mitigation work throughout Montana.

The audience I would like to reach in this professional paper is primarily in Montana. I naturally consider the broader community of individuals, organizations, agencies, tribes, and general public to be my

overarching audience. I also aim to reach a handful of key stakeholders that I currently or expect to work with in the years to come. Those stakeholders are represented in the image on the following page. They are major influencers in the field of WVC mitigation work and all of them have past, present, and future positions that determine the integrity of our work at landscape scale. At the local scale, these stakeholders each play unique roles that will ebb and flow as the years pass. In the end, we all matter. I hope this document serves any reader – stakeholder or otherwise – who wishes to learn about the complexities of wildlife-vehicle conflicts and how collaboration is addressing the issue in Montana's Upper Yellowstone watershed.

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Figure 1. Existing and potential stakeholders associated with wildlife-vehicle conflict (WVC) mitigation efforts in Montana.

INTRODUCING WILDLIFE-VEHICLE CONFLICTS

Wildlife-vehicle conflicts (WVCs) are dangerous and costly. They are also preventable. In the United States, WVCs produce over eight billion dollars per year in expenditures from damage to property and livelihoods (Callahan et al., 2021). For people, most WVCs are a direct hit to the pocketbook through vehicle damage and rising insurance premiums. For wildlife, there is a direct mortality impact and tangential impacts that result from habitat fragmentation and impediments to wildlife movement.

Montana may boast having one of the lowest human populations per square mile compared to most states in the U.S. but it carries the less fortunate badge of placing second among all 50 states where a driver is most likely to hit an animal; 1 in 39 drivers have collisions with wildlife on Montana highways per year (State Farm Insurance, 2021). The US Highway 89 corridor in the Upper Yellowstone - serving as one of Montana's three entrances to Yellowstone National Park - has witnessed a startling number of wildlife-vehicle collisions (WVCs) in the past twenty years. The corridor's proximity to Yellowstone National Park combines diverse wildlife populations and a high volume of traffic from the area's burgeoning tourism economy. The park, alone, draws approximately one million visitors per year through the Highway 89 corridor, which doesn't count the population of individuals who live and work in the watershed (Pagemakers, 2020).

Further analysis reveals that the Greater Yellowstone Ecosystem's regional economy is "Outpacing other high-performance regions across the West" (NPCA, 2006). In a July 2020 update, Bozeman-based Headwaters Economics claimed that the coronavirus pandemic has resulted in "A real estate surge, potentially accelerating the loss of open space" (Hernandez, 2020). According to a study led by Jeff Reed of the Upper Yellowstone Watershed Group in partnership with FWP and ITRR (involving surveys,

camera traps and daily counts at access sites), “Tourism outpaced 2019 in July through October by 30% with fishing access sites overflowing onto unmanaged public and private land… In the evenings and mornings, it is not uncommon for locals to see hazard lights flashing from a car pulled to the side of the highway, and know that an animal is involved. These are signs of the times” (Reed, 2020). As highway activity increases, the capacity of agencies, municipalities, and organizations working to mitigate WVCs is seriously constrained. Whether a person lives in the watershed or is traveling through, he or she faces an elevated safety risk and potentially high collision costs with wildlife.

Image 1: US Highway 89 looking southbound toward Yellowstone National Park. Aerial Photography by Daniel Anderson.

Opportunities to fund wildlife crossing structures from state and federal budgets are also slated to be effective alongside public/private partnerships. Montana will soon be able to apply for federal funding under the new Infrastructure Investment and Jobs Act (H.R. 3684) also known as the Bipartisan Infrastructure Law. The purpose of H.R. 3684 is to encourage states to adopt wildlife vehicle collision safety countermeasures and improve habitat connectivity, and will distribute $350 million through a competitive grant cycle over the next five years. Complementary to this federal funding is Secretarial Order 3362, which "Directs appropriate bureaus within the Department of the Interior to work in close partnership with [Western States] to enhance and improve the quality of big-game winter range and migration corridor habitat on federal lands under the management jurisdiction of [the DOI] in a way that recognizes state authority to conserve and manage big-game species and respects private property rights" (DOI, 2020). Furthermore, the Order suggests that "Collectively, the appropriate bureaus within the Department have an opportunity to serve in a leadership role and take the initiative to work closely with Western States on their priorities and objectives as they relate to big-game winter range and migration corridors" (DOI, 2020). The Upper Yellowstone watershed has been identified as one such place (Fairbank & Stonecipher, 2018). Similar efforts in Wyoming, Washington, Utah, and Colorado have showcased the effectiveness of public/private partnerships, and have also been able to successfully coordinate resources and capacity-building across agencies, municipalities, environmental groups and the private sector, including private landowners (Fairbank & Stonecipher, 2018; Kintsch et al., 2021; Kintsch et al., 2011; Sawyer et al., 2012; Sawyer et al., 2016; Riginos et al., 2016; Machemer 2020).

A suite of WVC mitigation tools have been implemented on highways across the country, and have developed a growing body of research proving their efficacy. I expand on these tools throughout this document. The purposes, in all cases, are to reduce collisions with wildlife and improve habitat

connectivity. Those tools are: (1) wildlife overpasses often referred to as land bridges, (2) wildlife underpasses (large culverts), (3) diversion fencing that guides animals to the overpasses or underpasses, (4) educational signage and reduced speed limits that alert drivers to potential wildlife-vehicle conflicts at specific locations, (5) animal detection systems, and (6) outreach materials that educate drivers on the risks and opportunities in wildlife-vehicle conflicts and mitigation options, respectively.

Over the last few years, local community members, business owners, nongovernmental organizations, conservation groups, and foundations have grown eager to explore opportunities that align resources around this complex issue. The time has come to compile and share existing knowledge on wildlife movement and wildlife-vehicle conflict along the Highway 89 corridor, research existing mitigation projects from the Intermountain West, and apply a wide range of capacities toward a common mission: address and resolve WVCs along U.S. HWY 89 leading into Yellowstone National Park.

In December of 2019 a partnership was formed between the Greater Yellowstone Coalition (GYC), Center for Large Landscape Conservation (CLLC), National Parks Conservation Association (NPCA), Park County Environmental Council (PCEC), and myself, representing the Anderson Ranch and The Common Ground Project in Tom Miner Basin. Soon thereafter the Upper Yellowstone Watershed Group Recreation & Tourism Sub-Committee (UYWG) joined our partnership along with agency representatives from MDT and FWP, who frequently remain in contact with our local partners. In 2020 and 2021, we received grant funding from the Cinnabar Foundation and Arthur M. Blank Family Foundation to design and facilitate a collaborative process that builds awareness around WVCs in the watershed and creates opportunities for stakeholders from local and statewide arenas to engage.

The partnership's overarching mission is to support collaborative solutions that address and resolve wildlife-vehicle conflict on Highway 89. We call ourselves Yellowstone Safe Passages (YSP).

Image 2. The Yellowstone Safe Passages logo. Designed by Melissa DiNino (2021).

Throughout 2020, Yellowstone Safe Passages hosted a series of virtual meetings with key stakeholders from the local community, State of Montana, and Greater Yellowstone Ecosystem. I coordinated and facilitated these meetings, compiled notes, and relayed ideas back to the team members and meeting participants when it was called for. My team members contributed their expertise on specific topics, offered varying points of view toward tasks or objectives we outlined as a group, and each of their respective organizations provided monetary support for our partnership's operating budget.

We learned about the various tenets of road ecology and how wildlife crossing structures have been successfully – and not successfully – implemented in other areas. Most of the study areas we researched are located within the Greater Yellowstone Ecosystem (GYE) and the States of Wyoming, Colorado and Nevada. We learned about the various jurisdictional frameworks between County, State, and Federal

agencies, and the intersection of potential funding sources that exist for safe passage projects I also refer to as “wildlife accommodations” throughout this document. Through our own research and outreach, we learned about the nuanced social perceptions around wildlife-vehicle conflicts. Those include a spectrum of concerns ranging from impacts on human safety and livelihoods, the looming costs associated with WVCs, and the complexities of wildlife conservation, mortality, and landscape connectivity.

Since the spring of 2020 I have met with and interviewed a growing number of locals – many of them landowners – asking for opinions and feedback from individuals here in the community. I also helped coordinate and facilitate local convenings and presented to local and statewide groups when possible. Most of the local community members we’ve heard from view WVCs in the Upper Yellowstone as an important issue that has for the most part been unaddressed and is largely unresolved.

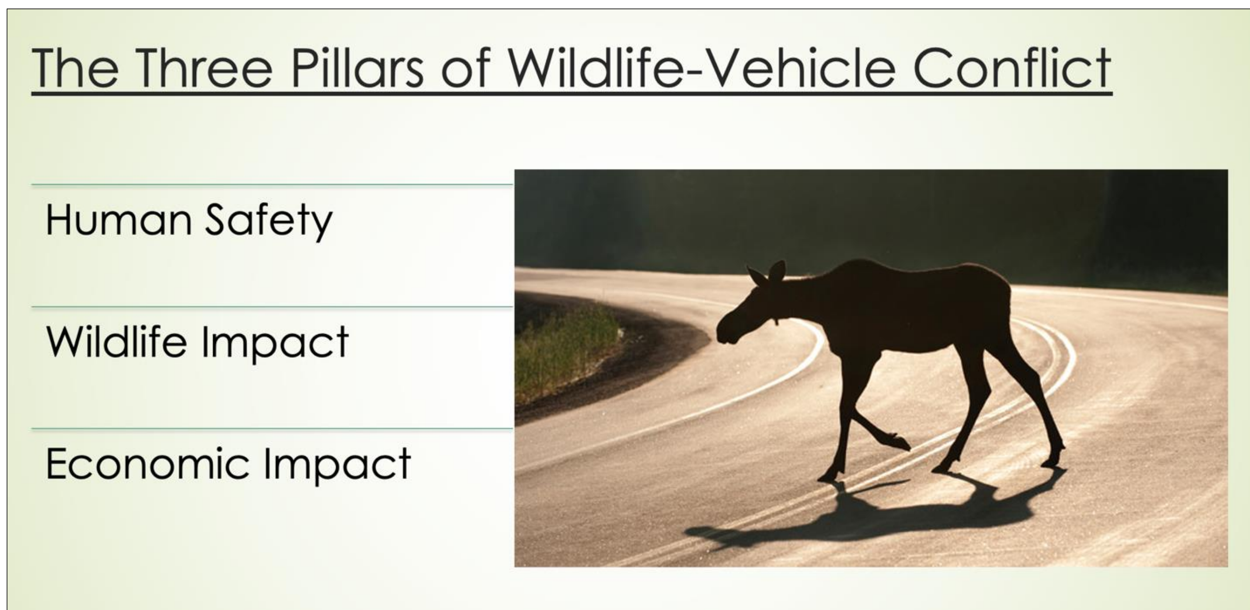

Figure 2. The three pillars of wildlife-vehicle conflict.

HUMAN SAFETY

It goes without saying that a collision with an animal like the moose pictured on the previous page is traumatizing and can be incredibly dangerous. The vast majority of collisions nationwide are with deer (Huijser et al., 2008), but Montana's uniquely wild character presents a challenge far greater than just deer. Montanans also strike elk, moose, big horn sheep, pronghorn, black bear, grizzly bear, mountain lion, bobcat, bison, wolves, and occasionally cattle (Huijser et al., 2007; Peccia, 2014). These animals are large and don't include many smaller creatures like coyote, fox, skunk and racoon, or large birds of prey that are often scavenging on carcasses left on the shoulder of the road. According to the Insurance Institute for Highway Safety (IIHS) and Highway Loss Data Institute (HLDI), nearly 6,000 deaths have been reported, nationwide, from a motor vehicle crash involving an animal since 1975. Montana reported 7 deaths from collisions with animals in 2019 and a total of 45 deaths since 2010 (IIHS & HLDI, 2021).

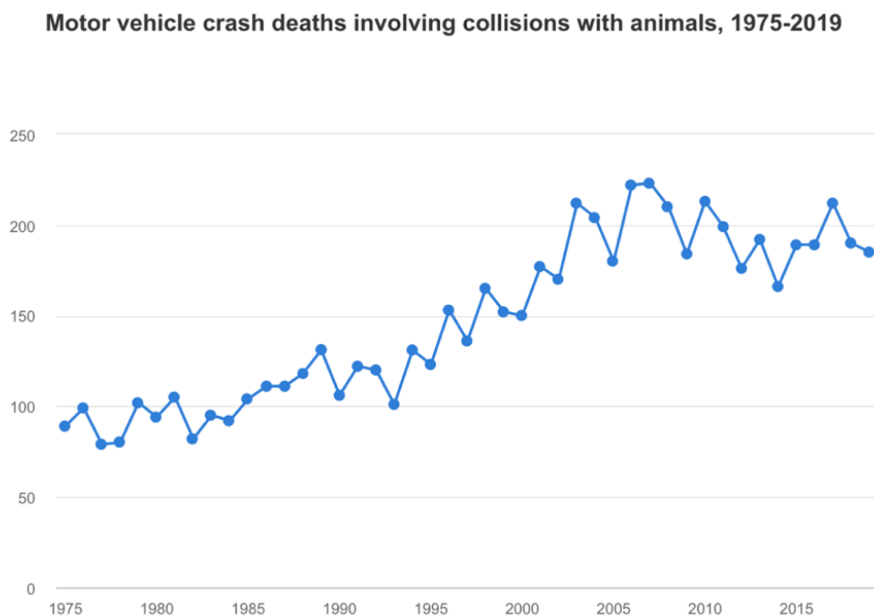

Figure 3. Deaths reported due to collisions with wildlife, national trend from 1975 - 2019.

WILDLIFE IMPACT

WVCs rarely end well for wildlife. Most, if not all, collisions with wildlife result in dead animals on the shoulder of the highway or at a short distance away from the highway. Some species, especially federally recognized species of concern and endangered species, can also face severe population impacts from high levels of mortality associated with WVCs. Migratory routes can be impacted from the fragmentation that highways impose on landscapes, also referred to as "the barrier effect" (Huijser et al., 2008). For wildlife advocates this naturally presents a glaring issue. But even for those who don't advocate for the well-being of wildlife there still exists a heightened degree of sensitivity at the thought of vehicles killing animals. When I broach the subject of dead animals on the side of the road with residents of the Upper Yellowstone, the response is consistently the same. People are left feeling discouraged, disheartened, and heartbroken. I will expand on specific responses from community members in the landowner assessment provided in this document.

More tension exists when we consider the impacts on wildlife due to habitat loss, fragmented landscapes, and mortality of endangered species or unique species of concern. Montana's state and federal roadways have in many cases cut right through the heart of critical wildlife habitat, and while deer and other popular ungulates have largely found ways to adapt to such impacts there still exists a significant and growing risk in our ability to maintain connected habitats or accommodate wildlife movement at landscape scale. Montana has fifteen federally threatened or endangered species (U.S. Fish and Wildlife Service, 2021). Of that list, Grizzly Bears and Canada Lynx are impacted by direct collision and barrier effect (Huijser et al., 2007). Barrier effect occurs when the frequency of vehicles on a stretch of highway is so high that any attempt to cross the highway is thwarted, forcing the animals to remain on one side. This can pose a serious threat to wildlife depending on the time of year and their necessity for adequate nutrients. Other,

more common species such as elk and mule deer have ancient and often far-reaching migratory routes, like the 125-mile distance elk travel between the upper end of Paradise Valley and the southern reaches of Yellowstone National Park (McKean, 2021).

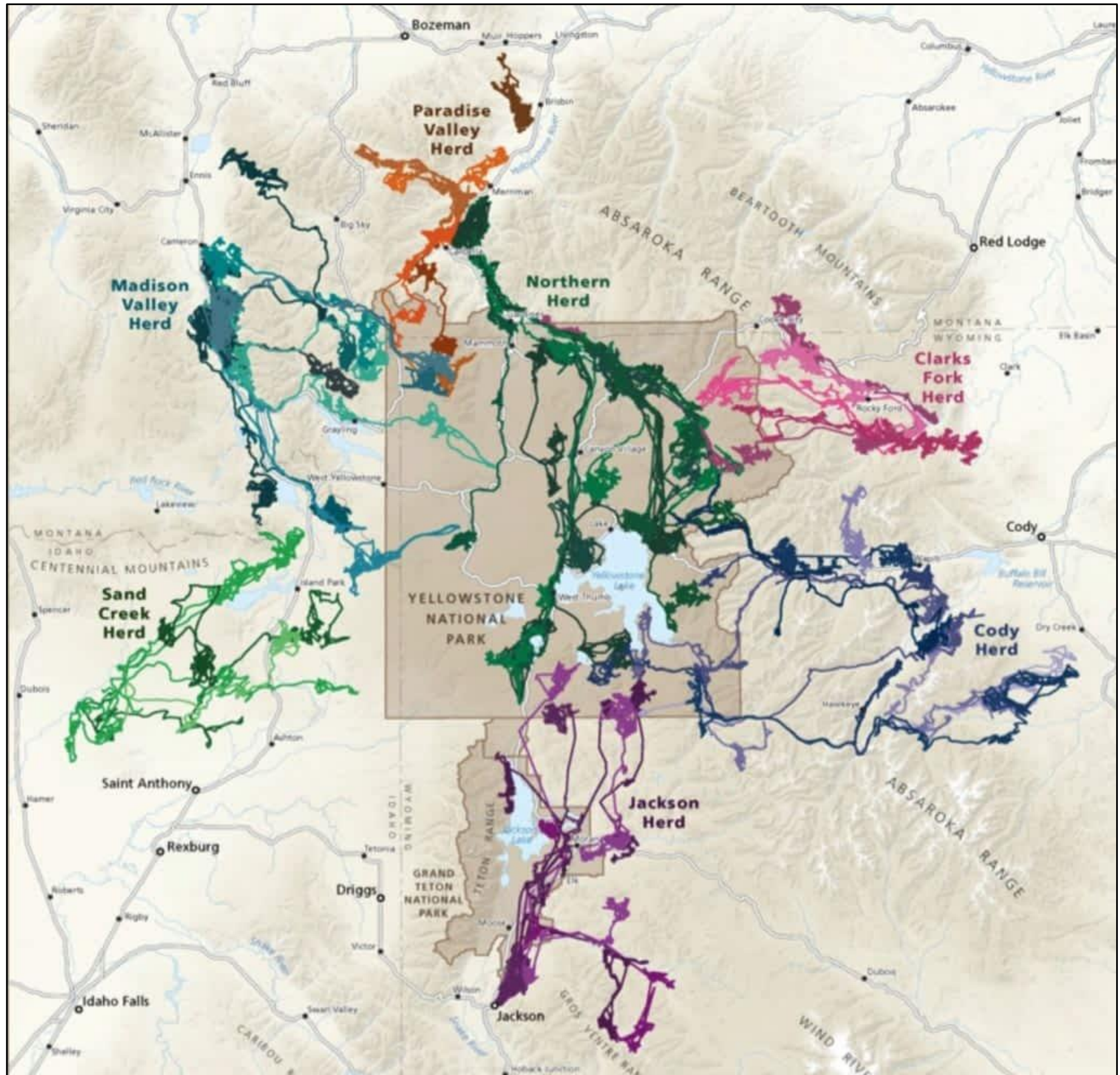

Figure 4. Elk migrations of the GYE, provided by the Greater Yellowstone Coordinating Committee (GYCC).

ECONOMIC IMPACT

Wildlife-vehicle conflicts are expensive. Research suggests that the average collision costs for deer, elk, and moose are $10,248, $22,344 and $36,568 respectively (Huijser et al., 2008, adjusted for inflation). This estimate is linked to research performed on vehicle collisions with large ungulates, which accounts solely for vehicle property damage, towing, accident attendance and investigation, carcass removal and disposal, lost hunting and recreational value of the animals, and human injuries and fatalities (Huijser et al., 2008). Researchers do not factor in other costs associated with tourism, recreation, or biodiversity conservation values of these animals (Fairbank, 2020).

Montana Department of Transportation collision reports from 2002 - 2012 show a total of 1,659 WVCs along the 55-mile stretch of highway from Livingston to Gardiner, which included black bear, elk, moose, mule deer, white tailed deer, bighorn sheep, antelope, and bison (Peccia et al., 2014).

Large Animal	Carcasses Collected	% by Species
Antelope	1	0.06%
Bighorn Sheep	6	0.36%
Bison	2	0.12%
Black Bear	1	0.06%
Elk	94	5.67%
Moose	1	0.06%
Deer (unknown species)	21	1.27%
Mule Deer	1,116	67.27%
White-tailed Deer	417	25.13%
TOTAL	1,659	100%

Figure 5. US 89 Carcass data between Livingston and Gardiner, 2002 - 2012. Source: MDT Carcass Database, Jan 01, 2002 to Dec 31, 2012.

Taking the prior collision costs at an inflation adjustment for 2007 (mid-point within the ten year period), the costs associated with each deer, elk, and moose collisions from the previous table results in $7,682, $16,750, and $27,413 respectively. Casualties aside – not including the other species listed – this accumulation of collisions resulted in a conservative estimate of over $13.5 million for the ten-year period. There have been no WVC mitigation tools implemented on Highway 89 except variable message signage which can be used seasonally and at site-specific areas. Considering the watershed's high traffic volumes, we can safely assume that the next ten-year period (2012--2022) will produce roughly $15 million in damages.

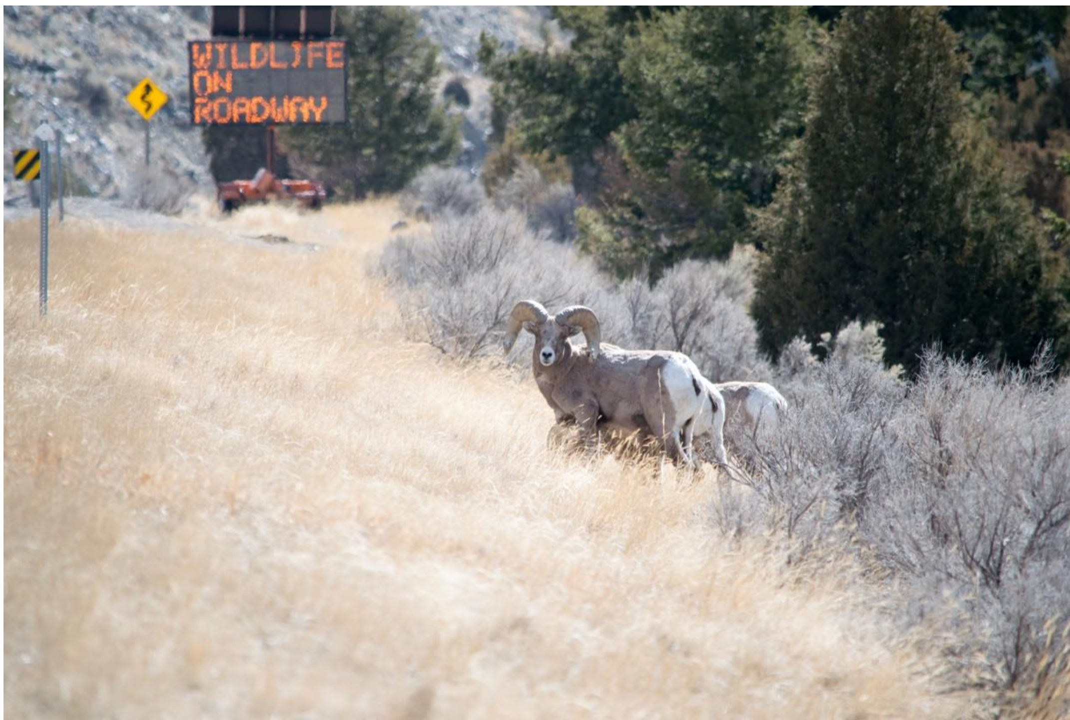

Image 3. A variable message sign located 17 miles north of Gardiner, Montana. Photo by Wes Shifrin.

These numbers translate to a conservative $1,425,000 per year in damages, which leads me to wonder how they would read if mitigation measures were thoroughly implemented. Wildlife crossing structures

and diversion fencing – when combined and properly located – can reduce collisions by up to 97% in mitigated areas (Callahan et al., 2021). Structures themselves (land bridges and large culverts) are designed and engineered to last an average of 75 years before needing significant maintenance. It isn't hard to imagine, therefore, that the accommodations would pay for themselves in far fewer than 75 years.

Wildlife crossing structures range in price, but regional benefit-cost analyses show a promising future for the Upper Yellowstone (Ament et al., 2019). The Colorado State Highway 9 project, for example, has installed two wildlife overpasses, five wildlife underpasses, nine pedestrian walk-throughs, 61 wildlife escape ramps, and 29 wildlife guards that are connected by over ten miles of eight-foot high wildlife diversion fence. Total wildlife infrastructure costs tallied to $15,755,144 (Kintsch et al., 2021). Since completion, a benefit-cost analysis indicated a payoff period of 56 years based on the comparable collision rates and costs associated therein (Kintsch et al., 2021).

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ADDRESSING THE ISSUE

How does one grapple with all of this information? Perhaps more importantly, how do people effectively address WVCs in their own community? As a child I remember quite vividly when my parents and I struck a deer on Highway 89. Headlights from oncoming traffic cast a blinding glare that blocked our visibility toward the shoulder of the road and by the time we saw the deer we had already made contact. My father quickly pulled off to the right-hand side of the road, threw the hazard lights on, and walked to the borrow pit where the deer, still barely alive, laid traumatized and broken. What I recall from that point is my dad pulling the heaviest tool he could find from the back of the car – perhaps a large lug wrench – walked to the deer laying in the grass and returned with a heavy heart, tears filling his eyes.

About ten years later my high school sweetheart and I struck a deer in her parents' mini-van no more than 15 miles from the location where I watched my father put down the deer. This time the deer was gone within seconds, but the trauma remained just as heavy. I've talked to many people in my community who share similar stories, some from years back and others from a few days back. Just recently I shared updates on our partnership's work to a group of folks at an outdoor bar patio halfway up the valley. When I asked the question, "How many of you have either hit an animal on Highway 89 or know someone who has?" all but maybe one or two people of the nearly 50 attending promptly raised their hands. Collisions happen nearly every day on the 55-mile stretch of highway between Livingston and Gardiner, Montana and it has been this way for at least a few decades.

It wasn't until I received a semester long research and engagement assignment at the University of Montana's Natural Resources Conflict Resolution (NRCR) program that I began to unlock this question. My professor, Shawn Johnson, offered the guidance necessary for me to adequately research the issue at

a localized scale, and suggested I look for key individuals and organizations who had previously worked on the issue or knew something substantial about it. I quickly learned that a handful of folks had prior discussions around WVCs in the watershed. I also learned that many people from around the state had experience addressing WVCs – a large handful being road ecologists, leading biologists, and NGO experts who were at the top of their game working on projects both in and out of the state of Montana. In December, 2018, leaders from MDT, FWP, tribal nations, NGOs, Montanans for Safe Wildlife Passage (MSWP), and Western Transportation Institute (WTI) gathered in Helena for the "Wildlife and Transportation Summit". The summit served as the first statewide attempt to explore the complexities of WVCs and set intentions for future engagement with the state's wide array of interested partners, stakeholders and the general public.

If you've driven Highway 93 north of Missoula you have witnessed the outcome of WVC mitigation tools implemented by tribal partners from the CSKT. I will expand further on tribal influence and the case of Highway 93 later in this document. For now, I'd like to emphasize that the onset of my research two years ago revealed that many folks from around the state had invested time and dedicated resources to address WVCs – even here in the Upper Yellowstone Watershed.

Previous attempts to address WVCs in the Upper Yellowstone had found little or no traction, however, so we needed to create a framework that was different. Two seminal documents, *Gateways to Yellowstone: Protecting the Wild Heart of our Region's Thriving Economy* (2006) and *Paradise Valley Corridor Planning Study – US 89 Gardiner to Livingston* (2014) helped draw a larger degree of awareness around the impacts of WVCs in the watershed and identified high-level needs and opportunities in the watershed. The authors of both dedicated a significant amount of time and resources to build the documents, and the

work indeed has a role to play in our efforts, even now. In both cases, however, years have passed and wildlife still remain dead along the side of the road at each of the 55 miles connecting Livingston and Gardiner.

The discussions and planning efforts I've had the good fortune to be a part of – in some cases to lead – have been incredibly rewarding. They also continually remind me of the complexities of this work. As I reflect on the initial discussions held by the Yellowstone Safe Passages coalition, I am grateful we dedicated time to identify the values, character traits, and approach our partnership would adhere to. I am also grateful we dedicated ample time to scope my role as "Liaison" for the partnership.

At this point in the story I'd like to tip my hat to Brooke Shifrin with the Greater Yellowstone Coalition. She knew, as did the others in our partnership, that the NGO community could not successfully lead our effort in the Upper Yellowstone. There was just enough bad blood between landowners and environmental groups in the watershed to know that any effort led by an environmental NGO – even if aligned with most of the local perspectives – would likely run up against too many roadblocks before gaining the traction needed for real work to begin. Brooke made the point clear in our first meeting and strongly suggested that each of the NGO partners provide resources and support for my work, enabling my position as liaison to take the lead. She also suggested that each of the NGO partners contribute equal and even monetary support for my part-time salary. She had the foresight to know that if I weren't being reimbursed for my time, I would almost certainly become fatigued and ultimately fail. All of the partners agreed. Thankfully my contracted position with the partnership gave just enough support (and still does) to provide the stability necessary for me to dedicate a confident and deliberate focus toward our efforts while remaining patient in what is likely to require many more years of work.

This is where I make my first recommendation for collaborative partnerships looking to drive attention to WVCs in their community. First and foremost, find a local who is willing to dedicate energy and time to lead from within the community and give this person the resources needed to thrive in the work. If an individual already exists, reach out to him or her and explore how you can build on their strengths. This could mean providing financial support and it could also mean sponsoring educational opportunities for tools and skillsets that can be immediately applied. I was fortunate to be able to lean into the academic support and expectations provided by my mentors at the University of Montana while at the same time putting those new insights and skills to use. I was also fortunate to have a community both on and off campus that made space for reflection and refinement of those new skills. For NGOs and other organizations trying to facilitate the change they'd like to see in the world, invest in the community first.

RECOMMENDATION #1

INVEST IN THE COMMUNITY.

Find a local who is willing to dedicate energy and time to lead from within the community, and give this person the resources needed to thrive in the work.

I was also given a high degree of autonomy as a person with local perspective that none of the other partners have. This immediately set the stage for each of us, myself included, to be completely transparent with our individual or organizational interests and let those interests come into alignment while we prioritized the important work of building a strong bond within our group. We explored our strengths and weaknesses as a partnership, drew up a long list of people to solicit expertise and guidance from, and began asking questions. We convened weekly, and when COVID-19 took the world by surprise in March of 2020 we immediately adapted to virtual meetings. By December of 2020 we were a cohesive unit and

had dedicated nearly a year's worth of time to "listening and learning" which soon became a cornerstone to our ethos as a collaborative partnership.

This early phase of our work is what professional facilitators call a "situation assessment", also referred to as a comprehensive stakeholder assessment. For WVC mitigation, the assessment can be framed either through watershed designations or on distinct sections of highway, and it is wise to consider what statewide or potentially cross-boundary stakeholders might be interested or already involved in the issue within either framework. Yellowstone Safe Passages, for example, met with and interviewed individuals, private landowners, business owners, non-governmental organizations, environmental groups, community groups, researchers, Park County elected officials, and representatives from state & federal agencies.

RECOMMENDATION #2

PERFORM A COMPREHENSIVE SITUATION ASSESSMENT.

Take the time needed to research as much of the issue as possible and meet with as many stakeholders as possible. A thorough situation assessment should provide your team with a holistic view of the issue.

The situation assessment is an ongoing task for Yellowstone Safe Passages, but the majority of this phase was accomplished within the first 18 months and nearly all of our attention was directed toward the Upper Yellowstone watershed from Livingston to Gardiner, including groups leading statewide discussions such as Montana Department of Transportation and Montanans for Safe Wildlife Passage.

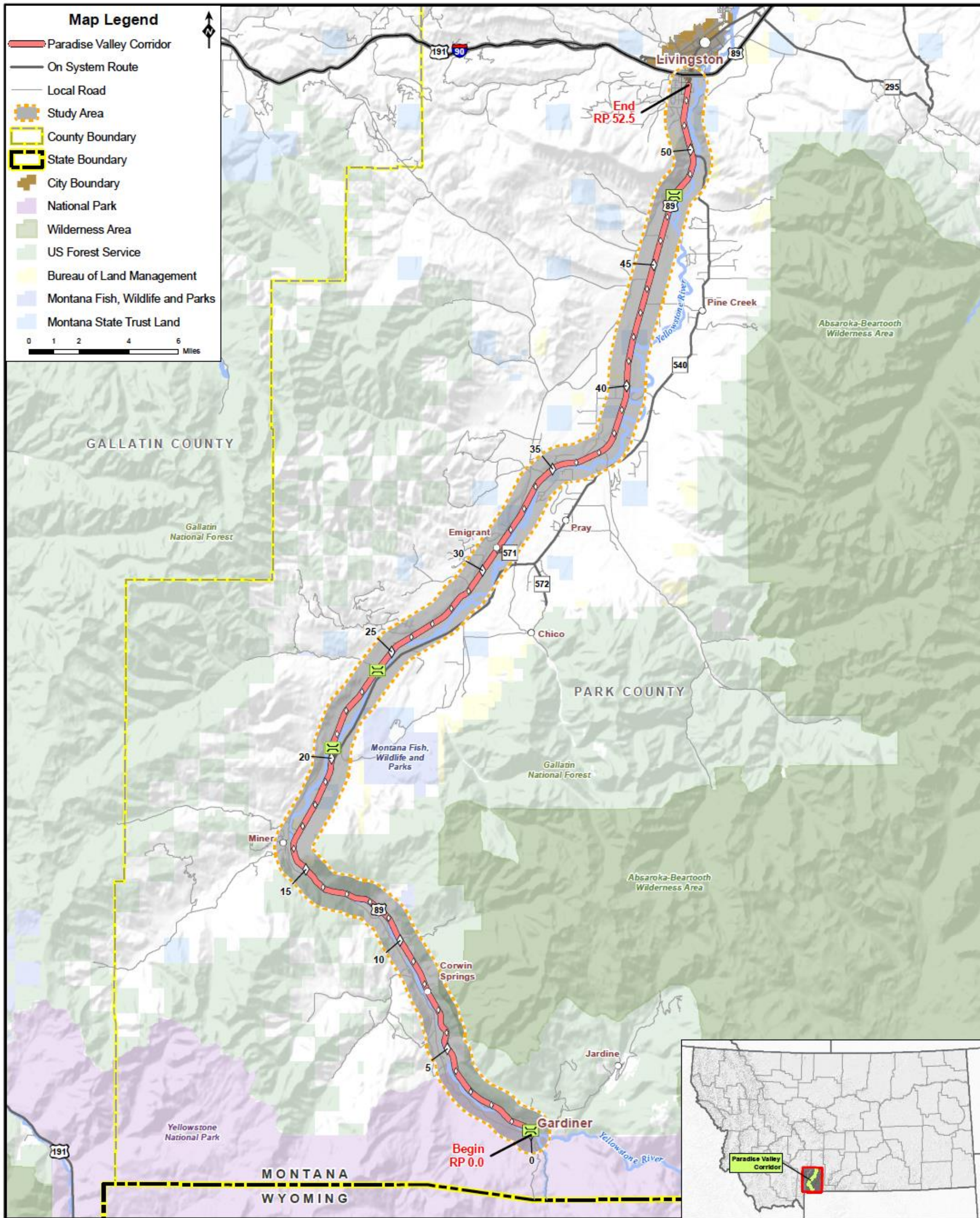


Figure 6. Vicinity Map of the Upper Yellowstone Watershed and US 89 from Livingston to Gardiner, provided by Montana Department of Transportation.

A full situation assessment can be expected to take up to a year and if done thoroughly can fulfill three critical functions for a localized partnership, its affiliates, and for the collaborative process itself:

1) It provides a clear roadmap of key players – both current and future – who either support or hinder the construction of wildlife accommodations.
2) It can cultivate new relationships between stakeholders whose historical connections have either been severed or degraded, and can strengthen those that are already functional.
3) It can provide leadership and key stakeholders an invitation to consider formal processes, such as strategic planning efforts, that facilitate movement toward collaborative partnerships.

Understanding the social and environmental terrain set the stage for YSP to move confidently into the community and begin looking for financial support. After receiving our first grant from the Cinnabar Foundation, one of their board members attended a meeting we held at a local park in Livingston. At the end of the meeting he approached me with a compliment, stating that one of the primary reasons Cinnabar felt confident in our partnership was because we embodied two things: Being diverse in perspective and well-informed. To this day we continue to ask questions and carry our "listening and learning" mindset into almost every aspect of our work. As a result, our partnership has become a new stakeholder in the issue of WVC mitigation at the local level – acting primarily as a conduit between the other partners, stakeholders and local community members who are engaged in planning discussions.

On June 4th, 2020, members of Yellowstone Safe Passages gathered at the Anderson Ranch in Tom Miner Basin. Throughout the afternoon the partnership reflected on our work to date and created a list of objectives for the remainder of the year. Prior to the meeting we each took time to reflect on what we had

learned up to that point (December, 2019 - June, 2020) and considered our strengths and weaknesses as a community-led collaborative. I primed the group with two questions, which were intended to have each of us consider our group's role and how it might evolve, adapt, and grow in context of the mission we had created to reduce wildlife-vehicle conflicts in the Upper Yellowstone:

"Where do you think we are positioned now?

And, where do you see value in our partnership as we look to the road ahead?"

Within minutes we coalesced around the fundamental and critical importance of building and supporting a culture of trust in the Upper Yellowstone community. We also complimented the character traits that our partnership had embodied over recent months. Such traits included listening and learning, joint fact-finding, and exploring local perspectives on WVCs. We acknowledged that we were still learning how to balance expectations (both our own and those of other stakeholders) and we understood that elevating awareness in the community would be a significant workload in the months ahead; a few locals recognized the impacts from WVCs along Highway 89 were not enough to gain traction for grassroots campaigning efforts, and concerns of an "Island Park Scenario" were realities we couldn't ignore. We appreciated our collaborative nature, however, and celebrated that each of us brought complementary skills, experiences, and perspectives toward a shared vision for the future of the watershed. Moreover, we clearly understood that solutions for WVCs in the Upper Yellowstone would require a collaborative framework, coordinated effort, and long-term visioning. Collaboration, as we saw it, meant bringing as many stakeholders to the table as possible, discussing barriers and opportunities embedded in WVC mitigation, and creating a shared commitment to move toward those opportunities.

RECOMMENDATION #3

SECURE FUNDING TO SUPPORT THE COLLABORATIVE PROCESS.

Process managers, collaborative leaders, facilitators, and liaisons can benefit multi-faceted landscape-scale conflicts because those individuals act as a conduit to weave all of the various stakeholders together.

People need capacity to accomplish what they've set out to do. This is a reality every individual, organization, management agency, facilitator or grassroots effort faces on a daily basis. When I attended Wyoming's virtual Wildlife and Transportation Summit during the spring of 2021 there were numerous instances when presenters from different stakeholder groups would reference the phrase, "Looking under every rock" for the resources needed to motivate diverse interests and identify projects that were designed to reduce WVCs. A large handful of categorical expenditures are tied to WVC mitigation solutions, which I won't detail here. Instead, I emphasize the opportunity for agencies, NGOs, tribes, and other key players to pool resources for the collaborative process itself. Process managers, collaborative leaders, facilitators, and liaisons can be a tremendous asset to multi-faceted landscape-scale conflicts because those individuals act as the thread that weaves all of the various stakeholders together. Research also suggests that having the right structures and processes in place can be essential in bringing diverse participants together (DuBow et al., 2018). Those structures and processes typically require the dedication of an organization or group, such as Yellowstone Safe Passages. For YSP, we committed to holding regular convenings, a high degree of accountability and presence in the community, and frequent engagement with top-level leadership among agencies and county officials.

Skilled facilitators have a unique ability to "see" the issue from various points of view and often reflect those perspectives back out to stakeholders in a way that enables diverse interests to align around a shared

goal, objective or mission. Experienced process managers and collaborative leaders can shift a stakeholder's attention – even if brief – toward the web of relationships that exists between all parties. This offers the stakeholder just enough time to release their hold on a particular position and then consider the underlying interests at play.

Funding the collaborative process can include salaried positions as needed, such as the liaison position I have held with Yellowstone Safe Passages, contracted services for professional facilitators, graphic design for digital and print applications, website design, development and maintenance, photography and film services, facility rentals for larger in-person gatherings, food, beverage, and any variety of creative elements tied to community engagement. For Yellowstone Safe Passages, our budget includes all of the aforementioned with additional line items for a part-time "Field Technician", web-based subscriptions, and display items we use at the local farmers market.

RECOMMENDATION #4

COMPILE, ORGANIZE, AND SHARE EXISTING KNOWLEDGE.

Dedicate time to organize information about stakeholders, research the issue, explore possible solutions, and implement a plan to share this knowledge with the community.

Our partners individually dedicated time to research the issue from local to regional arenas, drawing on case studies throughout the American West, and learning from similar efforts throughout the region. We then began a concerted effort to organize this information and share it with our local community. This began by creating a website, designing a logo, thinking critically about our mission and vision, detailing

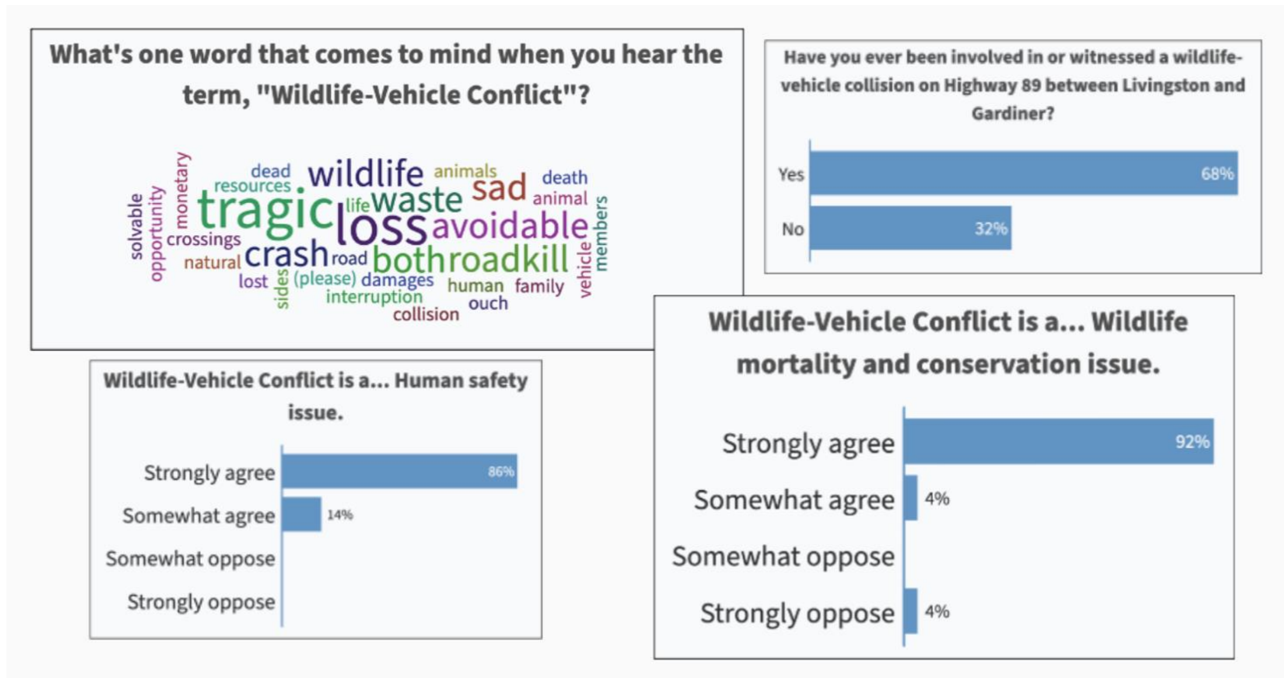
who we are and what we do, and collecting powerful imagery that relates to either our collaborative culture or the issue of WVCs in the Upper Yellowstone.

As a result of the COVID-19 pandemic, Yellowstone Safe Passages hosted a series of Zoom meetings with partners, agency stakeholders, and members of the general public. Throughout the spring and summer months of 2020, I facilitated close to twenty Zoom meetings. The meetings felt clunky at first, in part due to my awkwardness communicating to people on a screen, and also due to the virtual adaption required by nearly all of us through the onset of the COVID-19 pandemic. The time, however, proved invaluable for us to gather and organize information on all things related to wildlife-vehicle conflict. We organized this information and then designed and hosted a four-part webinar that was open to the public. The webinars were recorded and are still displayed on our website for viewers to access, organized as follows:

- Webinar #1: Introducing Yellowstone Safe Passages
- Webinar #2: Framing the Issue: Wildlife-Vehicle Conflict in the Upper Yellowstone
- Webinar #3: Agency Input: Understanding Jurisdictional Frameworks
- Webinar #4: Looking Toward Solutions

The webinars were one way to make the best of our world going virtual, and also for recording information that can be referenced for individuals who are new to the scene. Our webinars reached an impressively wide audience from locals here in the watershed to folks around Montana and even a few corners of the U.S. We were also able to poll our participants, which generated relevant data on various topics and helped our partnership identify new opportunities and roles that we could fulfill.

The following are specific examples of questions and responses we posed to the audience during our webinars:



What was the most interesting or surprising part of this webinar?

" that there is so much information on this topic "

" That was excellent. It underscored for me the need for outreach and education for the folks who live and work in the valley. "

Based on what you've heard today, what's one topic you'd like to hear more about?

" How do we get to a pilot project. What can we do once we have community support and buy-in, where do we go? "

" How do communities engage the broader public in this issue "

I'd like to highlight the polling question above, "Based on what you've heard today, what's one topic you'd like to hear more about?" The responses displayed on this page are just two of about a dozen responses we received from the community. This question performs a handful important tasks: 1) It helps individuals in the audience express voice to their curiosities, 2) It indirectly invites community members to work together to bridge knowledge gaps (also called "joint fact-finding") or begin working toward specific solutions, 3) It presents a variety of perspectives to community members who might see things

differently, 4) It helps our partnership begin developing customized "Q&A" language that can be reflected back to the community, and 5) It gives our partnership clear marching orders as we forecast our work through the next year or two.

The next three recommendations continue our pivot toward community outreach and engagement, building stronger connections between key individuals within the local watershed, generating local support, and steadily working to strengthen the ties between all of the stakeholders involved – what we refer to as building a culture of trust.

RECOMMENDATION #5

GENERATE LOCAL SUPPORT.

Without local support, the potential for installing wildlife crossing structures could be drastically stymied, if not all together permanently disregarded.

By the time we finished our four-part webinar at the end of June, 2021, Yellowstone Safe Passages had officially made a name for ourselves. We had the ear of the community, conservation groups within the region, local working groups, and agency reps from Montana Department of Transportation and Fish, Wildlife, & Parks. We had also reached a handful of individuals in the community who understood how much time might pass before wildlife crossing structures could be built. Those individuals, who we refer to as local champions, fully support our collaborative approach.

We also knew we needed to reach a bigger audience. From this vantage point we knew our role of balancing expectations would becoming increasingly important, and likely more difficult. Our work

through the remainder of the year, therefore, was and continues to be more active in the community. We participated in the Livingston Farmers Market, purchased stickers, hats, and educational print materials with our logo displayed on each, attended local events and just recently started a private Facebook group for the community to engage with.

Building awareness in the community goes hand and hand with generating local support. Without local support, the potential for installing crossing structures could be drastically stymied, if not all together permanently disregarded. Take, for example, the unfortunate chain of events that led to the State of Idaho's Transportation Department essentially avoiding all matters of discussion around WVC mitigation in Island Park. The voices of a few disgruntled local citizens played heavily on misinformation and accusations that NGOs and their affiliates were formalizing a conservation land-grab agenda with United Nations backing. A January, 2020 issue from High Country News aptly describes the polarizing scenario when it writes, "Meetings turned combative; neighbors stopped speaking; employees who supported crossings were allegedly hushed by bosses. Facts themselves — annual roadkill statistics, for instance — became objects of partisan dispute" (Goldfarb, 2020).

Another similar story, although not related to WVC mitigation, speaks to the power of misinformation when federal funding comes to rural communities in Montana. Recently, an ill-fated attempt to designate a national heritage area near Great Falls – based on the area's unique historical qualities – was completely disrupted by a small cadre of local citizens. The motivation behind their appeals was based on an unabashed fear that a national heritage designation would infringe on private property rights and perhaps has a connection to some of the looming, though unvalidated, claims about amorphous conspiracy theories such as the COVID vaccine being more dangerous that the

COVID virus itself, or the United Nations systematically scheming to take control of private land and the manage the world population. The New York Times reported on the issue saying, "The dispute has split communities, become a wedge issue in this fall's political campaigns and left proponents of the heritage area flummoxed at their collective inability to refute falsehoods once they have become accepted wisdom" (Epstein, 2021). Bob Kelly, the mayor of Great Falls, was quoted in the article, saying "Misinformation is the new playbook… You don't like something? Create alternative facts and figures as a way to undermine reality" (Epstein, 2021).

Addressing and resolving Wildlife-vehicle conflicts on U.S. HWY 89 presents a few realities our partnership has grappled with. For one, we are dealing with a federal highway under the jurisdictional constraints of the Federal Highway Administration (FHA). Federal funding will be a necessity if wildlife crossing structures play a role in the corridor's future. Another reality is simply that Park County has many rural qualities. Among those qualities are open space, agricultural livelihoods and incredible views. Our goals to install wildlife crossing structures may be challenged by local citizens who believe the structures would interfere with those qualities. There is also a risk – even if small – that misinformation campaigns composed by a few aggravated citizens could derail any ability to implement projects that address WVCs. In the worst scenario, misinformation could poison the trust we have steadily aimed to cultivate between landowners, environmental NGOs, and agencies. Accepting this strange truth has pushed us to communicate early and often with local citizens and working groups who have a strong voice in the community.

Working closely with landowners and rural community members is mandatory in communities such as the Upper Yellowstone where most of land adjacent to the highway is under private ownership. We also

have a unique and exciting opportunity to elevate the voices of landowners who often are not invited into early planning discussions.

RECOMMENDATION #6

WORK CLOSELY WITH LANDOWNERS AND RURAL COMMUNITY MEMBERS.

Communicate early and often with local landowners, rural citizens, and other local groups who have a strong voice in the community.

Landowners themselves can have invaluable perspective on seasonal wildlife behavior and movement through their lands. When invited into conversation, whether that be one-on-one time shared at a local bar or café, or at larger "Q&A" sessions held in the valley, every landowner I've met expresses sincere appreciation for the invitation. Most landowners acknowledge the severity of WVCs on the highway and hope for some reasonable resolve in the years ahead.

Starting in the fall of 2020 I helped coordinate and facilitate collaborative workshops and "Q&A" sessions with local landowners. YSP hosted two gatherings in the past year at West Creek Ranch, thanks in large part to the support from the Arthur M. Blank Family Foundation (AMB West) for the use of their facilities and for the landowners carving out the time to meet with our other partners. The first landowner gathering, on October 14th, 2020 hosted a total of 11 people; 5 from the highway partnership and 6 individuals representing three ranches located on the southern end of Paradise Valley running adjacent to the highway. The pulse of the room felt engaged with productive dialogue and a well-rounded assortment of questions raised by the ranch representatives. All participants viewed the issue of wildlife-vehicle conflict as

something that could be addressed in the future, and everyone seemed willing to accept that more time would be needed to clarify how and when wildlife accommodations might take form on Highway 89. Folks also expressed a need for updated knowledge of wildlife movement related to the highway (including local knowledge from landowners) and clearly defined expectations on how wildlife crossing structures could be funded in the future. The second landowner gathering, on October 11th, 2021 invited a total of 19 people, 8 of whom were from our partnership. Due to the year's first heavy snowfall the night before, a few landowners and two from the partnership were unable to attend, but the remainder of our participants engaged in a full day's worth of conversation. We began with a round of introductions, discussed how Yellowstone Safe Passages came to be, shared information on WVCs in the watershed and then began exploring the role that landowners could play in the future. This last part of our discussion was framed with two leading questions: *1) How can landowner knowledge influence the future of our watershed?* And, *2) How can Yellowstone Safe Passages help depict landowner knowledge through mapping and other tools?*

We also discussed the role of conservation easements, "protected lands", and potential leads on state and federal funding. From start to finish we dedicated time for Q&A and creative dialogue. We offered space to discuss other relevant topics such as brucellosis/ungulate diseases, and the role of key stakeholders (i.e., the Upper Yellowstone Watershed Group, environmental NGOs, philanthropists, MDT, FWP, etc.). The results of our October landowner meeting were invaluable and set in motion a blueprint for Yellowstone Safe Passages and landowners in the watershed to begin working more closely with one another. Most of the ideas displayed on the following page were suggestions from landowner participants, and a few require landowner assistance. This is exactly the type of engagement we set out to accomplish, which paves the way for long-term relationships as the months and years go by.

LANDOWNER IDEA EXCHANGE

Yellowstone Safe Passages 2021 Fall Gathering
West Creek Ranch

1. **Draft a "Landowner MOU" (non-binding) that displays a list of signatures from key landowners along the valley floor and others in the watershed who support the process of constructing wildlife "accommodations" designed to reduce collisions with wildlife.**

   Yellowstone Safe Passages will create a first draft MOU, and will then ask for input from landowners so all parties feel a sense of ownership in the document. From there, YSP will ask for landowner signatures before sending it to Montana Department of Transportation and other leaders at county and statewide locales. This document will prove landowners' interest in the issue, and would urge our agency partners to prioritize allocating resources towards projects with landowner input.

2. **Create a Facebook page for the community to engage with and contribute to.**

   This page will ideally bring the level of awareness to new heights within the community and might aid in YSP's data collection. YSP will request the help of one of our local partners to get the page set up and will inform landowners and other community members when it is ready to visit. YSP will call on a few friends and locals to help build momentum with the page once it's up.

3. **Add info graphics for costs and casualties of WVCs in the watershed to YSP's website.**

   Yellowstone Safe Passages already has good data and a handful of images that can be used on our website, but infographics will help locals garner a clear understanding of the impacts from WVCs and will aid in driving more attention to YSP's website.

4. **Meet one-on-one or in smaller groups at landowner homes over the next few months.**

   Ideally, a landowner host will invite a few neighbors to his or her home for "Q&A" with YSP partners. Conversations will also be looking for specific partnership ideas between YSP and landowners. For example, moving cattle across the highway is a highly stressful event. If a structure like a bridge or large tunnel could be used instead, and in a location with recorded WVCs, how can landowners help YSP communicate their need and how can YSP work with MDT to dedicate resources for a project assessment?

5. **Yellowstone Safe Passages will use existing data from MDT and our own highway monitoring data to create a first draft "map" that identifies "hot spots" where collisions are the highest.**

   YSP will bring this map to landowners for input and would ideally upload landowners' knowledge into the map. YSP will then share the map with MDT and FWP, perhaps asking for collar data from FWP if needed.

6. **Yellowstone Safe Passages will potentially run a larger digital campaign MOU for the general public, which would be built off the landowner MOU previously discussed.**

   Discussions around MOU design, intention, and how it is disseminated throughout the community are details that still need to be clarified. At the earliest, this activity would take place in the summer of 2022.

RECOMMENDATION #7

STRIVE TO BUILD A CULTURE OF TRUST.

Prioritize relationships over that of positional differences, be non-partisan, promote collaborative leadership, and look for opportunities to coordinate efforts among various stakeholders.

Building a culture of trust is no small feat, and cultures of all kinds are shaped and continuously created through networks of relationships. More often than not it's the quality of those relationships that shape our cultural impacts on the places and spaces we inhabit. In the grand timeline the Upper Yellowstone watershed has held rich cultures from past to present, but not all people who reside within this unique geography ascribe to the same values or perspectives as their neighbors. Despite our differences, the relationships we share with one another still exist. The question is whether or not those relationships are open, inclusive, adaptive, interconnected and ultimately healthy.

Amy Mickel, collaborative leader and member of the group "Collaborating Well," introduces main commonalities of effective collaborative leaders – compassion, character, courage, and commitment (Mickel, 2021). The four, combined, generate individual and cultural qualities within diverse partnerships that lead to higher quality and quantity of interconnection between stakeholders, and an increasing level of trust between them. Mickel's research on collaborative partnerships points to the interdependent nature of relationships that exist between diverse partners and stakeholders. The four Cs – compassion, character, courage, and commitment – provide an intellectual and emotional roadmap on how to add quality to those relationships.

Healthy relationships require cultivation. They require time, presence, attention, listening, seeing, and ideally, co-creating. They need mutual respect and reciprocity. Healthy relationships accept “other” ways of knowing and being, especially when different than our own. They allow for fluid, flexible, and adaptive mindsets. They support the expression of openness and vulnerability – practicing heart forward empathy and compassion. Healthy relationships also espouse humility and curiosity, two traits that I find to be less prevalent in the “wild west” cowboy culture I grew up in.

Unhealthy relationships amass the opposite. They can produce more dysfunction within the culture and often lead to a tear in our emotional fabric, whether individual or collective – a division of sorts that alienates the “I” from “We”. Unhealthy relationships lack understanding, security and safety, and in the worst of cases will sow seeds of fear and separatism toward that which is unknown. This fear and separatism is the undercurrent beneath the waves of present day misinformation campaigns and combative behavior. How do we transcend such ill-fated paradigms?

In the Upper Yellowstone it is far too easy to pinpoint damaged or degraded ties between individuals, environmental groups and agencies. Just recently I attended a meeting hosted by the Working Lands Group in Paradise Valley. Discussions around the issue of elk populations and brucellosis in the valley were the central focus. An elderly man who attended the meeting occasionally launched into short opines on the failures of the National Park Service, the Forest Service, Montana Fish, Wildlife and Parks, and environmental groups who have only one thing in mind: their agenda. Not to say this man’s assertions weren’t valid. There might indeed be factual accuracy in some of his claims. At first glance, however, this man looked angry and ready to talk about it. His narratives failed to recognize and account for larger, more encompassing histories and perspectives than his own, nor did they create a safe environment for

any type of productive dialogue. A larger, more encompassing, narrative would affirm that European settler colonialism brough brucellosis into these lands on the backs of cattle (Meagher and Meyer, 1994) that didn't evolve with the landscape as the elk, deer, bison, pronghorn, big horn sheep and predators alike did for millennia.

Whether we are agencies, NGOs, community groups, landowners, tribes, philanthropists, facilitators, or individuals of the general public, at some point in time we will face people like this disgruntled elderly man. The onus will be on us to value the relationship with him or her vs that of challenging the opine. There's a history behind people's words, and every individual is seeing their experience from a different perspective even when embedded in a dominant cultural narrative. Most importantly, at the root of every conflict is an unmet need. If we do our part to discover those unmet needs we will be one step closer to shifting the dominant cultural paradigm toward one built off of trust. My friend and mentor, Peggy Dulany (2017), writes, "Trust is the social glue that holds families, communities, organizations and societies together; without it, reaching any agreement can become a fraught negotiation." Peggy has studied for over 30 years how trust, vulnerability, authenticity and belonging have brought people together from around the world to solve complex social problems, particularly of poverty, and has created opportunities for individuals and communities to thrive amidst daunting circumstances. She speaks to trust as a cornerstone to any collaborative movement, upholding trust as "A prerequisite for people to feel safe enough with each other to dare to speak their truths openly and without fear" (Dulany, 2017).

As Yellowstone Safe Passages became a cohesive partnership, we acknowledged that we must build and promote ongoing working relationships between all stakeholders connected to the watershed and the highway. This effort is underpinned by an understanding that trust is paramount. We also anticipated that

our capacity as a neutral, non-partisan, convener would need to grow in order to support the complexities of WVC mitigation work. We are talking, after all, about landscape-scale conservation, community development, infrastructure improvements, and wildlife management. Many people are and will be involved in the process.

Thankfully our commitment to "listening and learning" has been well received and acknowledged within the community. Our ethos remains firmly planted in the fact that none of the work aimed to install wildlife crossing structures on U.S. 89 will amount to much without a strong focus on building novel and trusting relationships. The work is more process-oriented than it is outcome-oriented, which enables us to show up to meetings like the Working Lands meeting previously referenced without needing to insert a contrasting opinion or force and agenda. It's more a matter of showing up to the conversations, listening, and then doing it again.

In the following section I unpack the tenets to our partnership's theory of change and discuss a few of the tensions we have struggled with while attempting to both espouse and embody collaborative leadership. I refer to the section as "Community in Collaboration," a practice of stewardship that urges collaborative leaders to have a closer look at the social constructs residing in the periphery of our typical, day-to-day, mindset. Moreover, I suggest that collaborative leadership, when understood and implemented, provides a unique mold in which cultures of trust can begin to be shaped.

COMMUNITY IN COLLABORATION

How does one know when to compete for a position or when to collaborate? Collaboration – as much as I celebrate the act – is not always the most effective way to facilitate change within a community. Litigation and advocacy have proven their worth through the course of history as made clear with the Clean Water Act and the Wilderness Act, two worthy examples of conservation without a collaborative frame. The *Yellowstone Is More Valuable Than Gold* campaign – which I supported by playing protagonist in a documentary film – may have had the appeal of local collaboration, but it played on dualism more than anything else. Community members in Paradise Valley needed to make a stand against an opportunistic Canadian mining company, and that's what we did. We leveraged the voices of local business owners, backed by NGOs, and created a stir big enough to get politicians involved. In 2018, former Interior Secretary Ryan Zinke signed a 20-year mineral withdraw designed to protect 30,000 acres in the Upper Yellowstone from new mining claims and in March, 2019, the president signed the *John D. Dingell Jr. Conservation, Management and Recreation Act,* which included the *Yellowstone Gateway Protection Act,* permanently protecting this acreage from mining. In some cases, people need to rally and assert themselves. In other cases, people need to rally and collaborate. Mitigating wildlife-vehicle conflicts requires both.

The recent boost in Federal funding will bring a suite of WVC mitigation projects to highways around the country. This funding is necessary but can only be applied by and through state transportation departments and will be disseminated through competitive cycles over the next five years. If state transportation departments are not prepared to apply for funding, they will miss an opportunity that may not be available again once the funds are depleted. On the other hand, new habitat connectivity provisions added to federal infrastructure improvements might lead to much bigger opportunities and potentially longer timeframes

if state transportation departments and other key players develop stronger relationships in the coming years. Until recently, Montana's Department of Transportation (MDT) had not prioritized the issue of WVC mitigation at a statewide level. But in 2018, leaders from MDT, FWP, tribes and NGOs gathered in Helena for the state's first "Wildlife and Transportation Summit," which deliberated specifically on wildlife-vehicle conflicts. A course was set for collaboration. Summit attendees began formulating ideas on how to develop highway assessments, wildlife movement and migration data, community engagement, and strategic planning efforts aimed for shovel-ready WVC mitigation projects.

This is where I make the case for community in collaboration. In a rural corner of Montana, a growing consortium of community members has come to realize that WVCs in our valley occur far too often. We've built a loose partnership including Democrats and Republicans, elected officials, business owners, outfitters, anglers, recreators, landowners, and a few environmental NGOs who have an interest in the area's wild and working character.

Our group understands the severity of WVCs in the watershed and wants to do something about it. We have convened, educated ourselves on the complexity of WVCs, and know that a better way forward means improving the main highway that cuts down the middle of the watershed. We also have local leaders stepping into more active roles, we have been creative in bringing diverse partners into discussions, and we have developed our own community-driven data collection and assessment of crash and carcass data along the highway, thanks to guidance from local and regional NGOs who have expertise in these issues and financial support from philanthropic donors.

Our group has formulated a grassroots message to county and statewide leaders that wildlife-vehicle conflicts in the watershed are a danger to people and wildlife, and have a direct impact on local livelihoods. We have participated in local events, presented to other local groups in formal and informal settings, and started developing a robust grassroots campaign aimed to elevate the community's call for highway improvements. One of our objectives is to apply reasonable pressure to the people who wield authority over construction and maintenance of the highway. Our group isn't particularly acrimonious, but we are asking for and expecting change on the highway.

Another objective is to be helpful. We see knowledge gaps and breaks in trust between agencies and a few local citizens. We see financial obstacles along every major step of the way, from planning to design, construction, and maintenance of highway improvements. But our group is also prepared to work across social and political boundaries, fundraise, rally volunteers, develop educational curricula, and co-create a localized strategy that works with the highway department and alongside other statewide discussions about WVC mitigation strategies. We have resources to bring to the table – financial and otherwise – and are committed to building a mature and successful collaborative partnership.

This scenario is presently unfolding in the Upper Yellowstone watershed because of the role Yellowstone Safe Passages has played as convener and coordinator. The partnership's collaborative design has set the stage for MDT and other key players to design and implement a WVC mitigation strategy that would identify "hot spots" where WVCs have the highest occurrence between Livingston and Gardiner, developing a suite of mitigation recommendations at each location.

US Highway 89 in the Upper Yellowstone could have multiple land bridges as pictured below, along with underpasses (large culverts) and diversion fences that guide wildlife to the structures. For these projects to occur, however, a legitimate collaborative effort must be implemented with leadership from all of the stakeholders and potential partners, including local citizens.

Image 4. A wildlife overpass constructed along Highway 93 in Elko County, Nevada. Source: NDOW.

If a strategic plan cannot be created to move the work forward, will the relationships within the collaborative partnership hold? In some cases I fear they would not. But this is where the roots of collaborative leadership take hold. Since the beginning, Yellowstone Safe Passages has understood that relationship-building takes time, and that our "listening and learning" approach would become one of the most effective ways to re-establish trust between community members and other stakeholders, particularly between landowners, agencies, and environmental groups. In doing so, we are offered a position to see

the issue from angles that the stakeholders themselves cannot see in entirety. From this vantage point we can identify knowledge gaps and explore (with stakeholders) how to bridge those gaps, we can predict roadblocks that arise from a lack of financial or other critical resources, and we can create the space, quite literally, for partners, stakeholders, and community members to convene together and begin developing generative relationships that are aligned around a shared vision, grounded in a shared sense of community. We have also understood that WVC mitigation projects on US Highway 89 – from planning and assessment to design and construction – can be estimated to take up to fifteen years before completion (assuming multiple project locations are pursued along the 55-mile stretch of highway). Assessment and strategic modeling of the highway, under the most expeditious timeframe, can require a year or more depending on the availability and capacity of organizations who can be contracted for these services.

Construction design, scoping, and procurement can begin once this critical step has been completed. Proposed Highway 89 infrastructure projects would be funded from federal and state sources (among others) and thus would fall under joint state and federal jurisdiction. As a result, these projects would require environmental review for compliance with the National Environmental Policy Act (NEPA) and nearly equivalent Montana Environmental Policy Act (MEPA). Juggling these jurisdictional timeframes has been one of our partnership's greatest challenges, as it demands an ability to balance expectations held by and between the key players.

For Yellowstone Safe Passages, communication, transparency, intention-setting, listening, patience, and even more patience have revealed the early makings of strong collaborative leadership. We have also remained open-minded, curious, and engaging in conversations that might not have a direct connection to WVC mitigation – acknowledging that the human/wildlife interface within our watershed reveals complex

webs of interconnection. A person can't pull on one side of the web without influencing the rest of it, and WVCs are not the only source of tension between people and wildlife. In setting this course for ourselves we have been able to clearly define our role as a partnership and have the early makings of a community in collaboration.

THE RUBBER BAND THEORY OF CHANGE

One of the challenges Yellowstone Safe Passages has faced is the tension felt between collaboration and assertiveness. Collaboration is a quality we try to emulate, while assertiveness is, at times, necessary to gain the attention from leaders in county, state, and federal arenas. In a strategic planning session I hosted at my family's ranch this past June, the partnership discussed our group's strengths and weaknesses. We forecasted short-, mid-, and long-term objectives, and explored potential barriers we might face over the next few years. Our group reflected on how the nature of our work (primarily with agencies) alternated between collaboration and assertiveness. This back and forth dance is what I referred to during our discussion as holding tension in a rubber band.

Inspired by thought leaders such as C. Otto Scharmer, Peter Senge, Joseph Jaworski, and Betty Sue Flowers, the rubber band metaphor is one way to explain how collaboratives can influence change through long periods of time. Imagine applying tension at two points in a rubber band. One point represents the present moment, the paradigm or model that has been created through social constructs, systems, and governing frameworks. The other side of the rubber band represents a point in the future, where those same social frameworks have undergone change, evolved, grown, or transformed. When we invite our imaginations to the table, this point on the other end of the rubber band begins to crystalize into meaning, creativity, and purpose that directs attention from those in the present toward this future scenario. Too

much tension, however, and the rubber band breaks. This occurs when radical ideas or group-think becomes the dominant narrative of the future scenario, excluding circumstances within social and environmental realities that cannot be omitted without serious detriment.

On the other hand, no tension in the rubber band results in stagnancy with little or no change to the current reality. This occurs when complacency and indifference in a culture overshadow curiosity and creativity, disarming those who attempt to challenge the status quo. Alternatively, as Betty Sue Flowers recounts, "Our willingness to hold and consider different stories can free us from being isolated in our own" (Senge et al., 2004). Holding and considering different stories is precisely how communities in collaboration facilitate change. If the right amount of focus is applied to a future vision for a long enough period of time, the present reality will begin to move. This happens out of a simple understanding that tension in the rubber band inherently wants to be alleviated. Yellowstone Safe Passages's theory of change is in part shaped by this metaphor and therefore challenges us to consider how to hold just enough tension between present day realities and future concepts of structural improvements along the highway without breaking the rubber band entirely.

Collaboration is the key. The collaborative model provides a necessary structure for change that is both sustainable and resilient. The Society for Organizational Learning (SoL) has made the case for collaborative partnerships addressing systemic change all around the world, from food and water systems, energy, waste, toxicity, and more. There are hundreds, if not thousands, of successful collaborations taking place this very moment, worldwide. Why? Because "As the complexity of issues grows, people are beginning to understand that any one organization can only do so much" (Senge, 2008). When designed appropriately, collaboratives provide fertile ground for a wide array of interests to share a

common goal while bringing diverse skillsets, tools, and knowledges to a complex situation. Collaboratives guide stakeholders and invested partners to value and commit to a process over that of results-driven metrics. This shifts existing power dynamics from linear ways of knowing and being to integrated models more circular in nature, more inclusive by design. Inclusivity and diversity provide the integrity necessary for the right amount of pressure to be held by the right amount of stakeholders. Collectively this group of people can securely hold a future reality in their sights, thereby re-establishing (or establishing for the first time) alignment amidst diverse interests and avoiding a radical break in the rubber band.

Another key, however, is time. Collaborative partnerships require time to develop and sustain themselves. They require patience and a commitment to building relationships with people that may or may not see the issue at hand from the same perspective. Shawn Johnson – facilitator, professor, and collaborative leader – adds, "The challenge and the opportunity of collaborative leadership lies in our ability to create healthy relationships shaped by diverse, inclusive voices and nurtured through an effective process (Johnson, et al., 2021). When done successfully, collaborative partnerships don't just shift paradigms, they transform them.

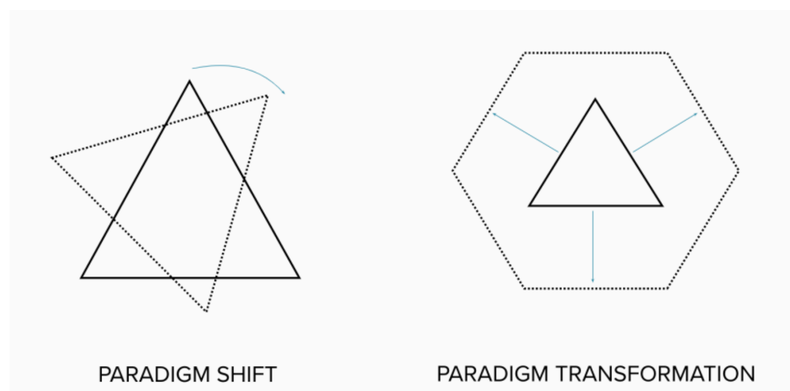


Figure 7. A visual distinction between paradigm shift and paradigm transformation.

In the best cases, collaboratives that function within state or similar jurisdictional geographies can shift land, water, and natural resource management policies from traditional top-down models to wholistic models – whereupon financial resources, capacity, research, and unique forms of expertise are complementary to the governing jurisdictional frameworks. Shawn Johnson adds that "durable, adaptable, and resilient landscape-scale outcomes can be achieved through culture change… specifically, a shift from regulatory, top-down, 'us versus them' approaches to collaborative partnership-based approaches" (Johnson et al., 2021).

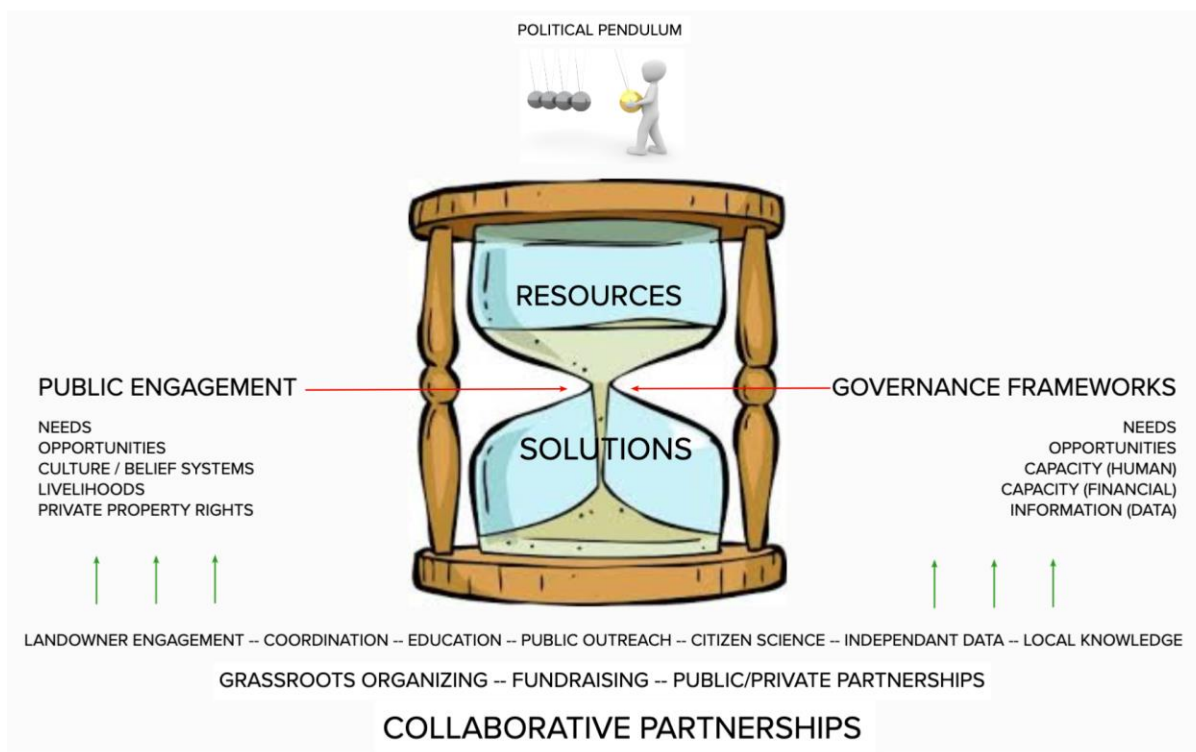


Figure 8. How collaborative partnerships support top-down natural resources and land management processes.

The figure above depicts how collaborative partnerships can support vertically integrated, top-down paradigms where resources from Federal and State governments are used to address solutions for landscape-scale conflicts. I conceptualized this image after observing the nuances of WVC mitigation

work when federal funding is applied through Montana's transportation and infrastructure budgets, and acknowledge that the image may not apply to all geographies in the U.S. or even across all watersheds in Montana. I also acknowledge that this image omits specificity at localized watersheds, and therefore hesitate to profess that it's a one-size-fits all conceptualization of the role collaborative partnerships can play.

Imagine that funding for wildlife accommodations such as overpasses, underpasses, diversion fencing, among other tools to mitigate WVCs in Montana is available in the upper chamber of the hourglass. Note, too, that this funding would not get projects to full completion but would under existing opportunities provide the majority of financial capacity necessary to identify, design, and procure on-the-ground projects. The remainder of the funding gap would then come through state budgets and other means, such a philanthropic, NGO, lobby, and local support mechanisms.

Additionally, what is not depicted is the relationship between public engagement on the left and governance frameworks on the right. These two sides interact with and influence one another; governance frameworks are often shaped by the needs, opportunities, cultural belief systems and livelihoods of the general public. The two combined – either through direct policy or indirect cultural influences – contribute to the restriction through which top-down resources can flow.

Without the presence of a strong collaborative culture a few roadblocks might prevent successful WVC mitigation work. Those are: (1) accessibility and use of knowledge and data, (2) perspectives on private property and individual rights, (3) impacts on local livelihoods, and (4) a lack of cohesive community planning. The social-environmental terrain of the Upper Yellowstone – in context of WVCs – consists of

a federal highway that is constructed and managed by MDT and connects both physically and figuratively to private and public lands, a teeming wildlife community, and wide-ranging interests from agriculture, tourism, recreation, development and conservation activities. Because of this complexity, power relationships can exist between locals, governing agencies, environmental groups, and other community members. Tension builds, conflicts persist, and relationships face chronic degradation.

By shining a light on these issues, I aspire not to pit one group against another or critique the functionality of existing stakeholder roles, but rather suggest that a novel approach to addressing conflict in the Upper Yellowstone watershed, what I refer to as "Community in Collaboration," might strengthen the integrity of our roles as stakeholders or local citizens, and renovate the human-environment relationship we share with a popular federal highway. At the end of this document, I expand on a handful of underlying principles I have observed that can help define and foster communities in collaboration. A suite of possibilities emerge when collaborative partnerships are brought to the fore. For Yellowstone Safe Passages our collaborative approach has supported grassroots organizing and campaigning. We have elevated awareness across a wider geography of community members, sustained a reasonable operating budget that enables our partners to invest time and energy into the work, and have started refining our approach alongside MDT's statewide efforts.

Collaboration has not been easy. Building a partnership that engages with and supports the local community while at the same time attempts to work alongside agencies has proven to be a delicate and, at times, difficult task. When people ask me what my liaison position is intended to do, I generally answer by saying that I am a conduit and convener; my role and our partnership's role is first providing an avenue for stakeholders to connect to one another. From here we ask questions and offer ideas that shift attention

toward generative solutions. This requires us to have a confident grasp of the complexities that reside just under the surface, and to balance expectations amidst diverse stakeholder perspectives. The scenario is indeed a conundrum, and it requires a bit of unpacking. In the next few pages, I explore how knowledge derived and managed by agencies, private property rights, and socio-environmental impacts to local livelihoods shape this conundrum and make the case for strong collaborative partnerships.

THE USE OF KNOWLEDGE & DATA

Knowledge – who creates it, how it's created, how it's disseminated, and to what effect it's use is intended – is relevant to almost every socio-environmental issue involving land management and natural resource policy, as well as broader social and sustainability issues. A two-lane federal highway that leads to the world's first national park, for example, is laden with decisive frameworks that to this day produce unevenly distributed power dynamics based on knowledge valuation. Creation of the park itself was one case among many within our nation's dark colonial underbelly; the park was designated as a public "pleasuring ground," which would be preserved "from injury or spoilation, of all timber, mineral deposits, natural curiosities, or wonders within" (Onion et al., 2021). Indigenous people that lived and hunted in the area would be forced to relocate, permanently altering their relationship to the wildlife and their ancestral connection to the landscape. To this day, their historical knowledge of wildlife migrations outside of the park is not considered or valued within larger land management discussions, and more specifically within the federal highways that link visitors and locals to the park and surrounding watersheds.

In an interview with a fourth generation landowner whose property runs adjacent to Highway 89, I discovered one of the primary reasons why some people still hold grudges toward governing agencies –

in this case the Department of Transportation. The landowner's family has been living and ranching in Paradise Valley for close to 100 years, has lost cattle to vehicle collisions on the highway and because of those collisions has carried the burden of facing a lawsuit. While rare, events such as these can be highly emotional and financially devastating. The interviewee frustratingly recalled that his grandfather "tried like hell" to get stock underpasses installed when the highway was being constructed, but apparently had no response from MDT.

The general manager at another ranch reflected with similar frustrations. When she first came to work at the ranch over twenty years ago, she sent letters to MDT expressing concern for the amount of wildlife being struck along the stretch of highway running through the ranch. Similar to the previous interviewee, she received no response from the agency. Herein lies a point of contention that can be exposed: local knowledges are rarely considered or valued in infrastructure projects funded through state or federal (or both) programs. While two personal accounts might seem anecdotal to the argument, of the 16 local landowners I've interviewed in the last year, only one was optimistic about working with the Department of Transportation on WVC mitigation strategies. In contrast, I have personally introduced this thread of tension to MDT and FWP staff that I've interfaced with in the past two years, each of whom express sincere acknowledgement of this tension. A few of those representatives wish to explore pathways for landowner knowledge to be included in decision-making processes – focusing specifically on WVC mitigation work – but acknowledge that existing bureaucratic systems and the safeguarding of local knowledge from ill-intentioned people in the general public present challenges worthy of discussion.

Wildlife management in the Upper Yellowstone watershed has for many years been considered the responsibility of Montana's Fish Wildlife & Parks (FWP). From estimating population densities to

capture, collar, and tracking activities, these data are developed for the purposes of managing wildlife toward socially constructed targets defined by ecological sciences and, at times, the general public. This can be said for almost all megafauna on the landscape, particularly those who pose a safety threat to human beings or to their livelihoods. Bears, wolves, elk, and bison have all been highly contested and at various scientific, social, and political scales (Robbins, 2004; Bidwell, 2009; Hughes et al., 2020; Tilt, 2020). Amidst this body of research are growing concerns over the state's capacities, management frameworks and unstable political pendulum. And yet, these social complexities single-handedly illuminate potential for collaborative partnerships to transform existing paradigms.

In March of 2020, MDT and FWP signed a memorandum of agreement to work together on wildlife and transportation issues, stating that they aim to "institutionalize continued communication, cooperation, and collaboration with the intent of providing for a safe, efficient, and environmentally sensitive transportation system while also stewarding the state's wildlife resources." This agreement between leading agencies charts a course for new ways to acquire and manage data, and invites other stakeholders to explore how their contributions (fundraising, education, outreach, citizen science, coordination, etc.) and professional networks can co-create new governance frameworks. Collaborative leadership, therefore, might greatly benefit the situation by exposing a wider range of perspectives through transparent and intentional communication strategies. This is surely a plausible argument in the context of mitigating wildlife-vehicle conflicts on Highway 89 and the work that Yellowstone Safe Passages has accomplished within a two-year timeframe. I argue that bridging knowledge gaps between local landowners, Indigenous historians, and governing agencies has potential to transcend the hard data and top-down discourse paradigms employed by state agencies.

UNDERSTANDING PRIVATE PROPERTY

In Paradise Valley, private landowners make up approximately 45% of the land from one end of the valley to the other, from the western ridgeline of the Gallatin Range across to the eastern Absaroka-Beartooth Mountains. Private lands adjacent to the highway undoubtedly have ties to MDT and FWP – relationships that shift over time and are subject to larger forces such as climate change, fluctuating markets, development and recreation pressures, and policy shifts. The nuances are many. Highway 89 is a federal highway, subject to federal processes when improvement projects are identified. An assessment under the National Environmental Policy Act (NEPA) is one such process, which generally would not infringe on a landowner's property or resources.

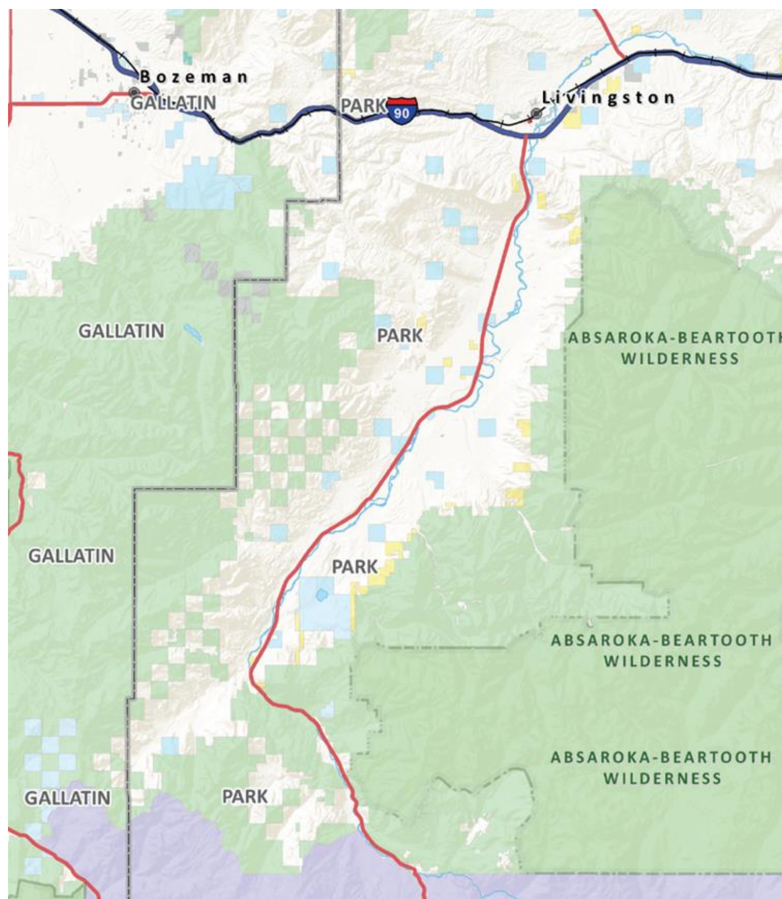


Figure 9. The Upper Yellowstone. Source: Property and Environment Resource Center

Wildlife crossing structures, however, mandate "permanent" protection of the land on both sides of the highway, requiring case-specific segments of property to be placed into easement with a qualified land trust. Requirements such as these can conflate landowners' concepts of property rights and how those rights are either supported or imposed upon. As Yung and Belsky (2007) relay from a study performed along Montana's Rocky Mountain Front, ideas about property will likely overlap with existing conceptions of landownership and landowner rights. As further stated, "Where these ideas are different and competing, they can result in conflict and tension between landowners, especially in landscapes undergoing rapid changes in ownership and land use" (Yung and Belsky, 2007).

Securing open space on both sides of a wildlife crossing structure makes sense. Structures are engineered to last up to 75 years before needing repair, so it would be short-sighted and irresponsible to fund a wildlife crossing structure if ten years later a housing development exists on either side. But if a landowner believes that conservation easements are an abdication of private property rights, the conversation may very well be at a standstill. On one hand we have a mandate system, and on the other we have a belief system. Collaborative leadership brings time, education, tools, and knowledge to the table, and ideally charts a course for stakeholders to find common ground and work from that place.

ADDRESSING LIVELIHOODS

Livelihoods are defined by the set of activities and material essentials required to sustain our everyday lives (food, water, shelter, clothing). They are influenced by environmental forces such as drought and disease, and are informed by social constructs, cultural beliefs, and other various ways of interacting with a community. Livelihoods are bound by both material and symbolic creations. They are intricately tied to economic systems and market forces, and are grounded in cosmologies, religions, and ceremony. On

one hand, livelihoods can be considered unique to an individual's lived experience. And on the other hand, livelihoods can be highly dependent on the web of relationships within a community. The World Commission on Environment and Development (1987) developed a refined definition of livelihood, shortly thereafter being popularized by Chambers and Conway (1992), which reads:

> *A livelihood comprises the capabilities, assets (including both material and social resources) and activities for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base.*

This foundational understanding of livelihoods, when refined to watershed geographies or landscape-scale natural resource conflicts, invites collaborative leaders to better understand the social complexities of the conflict at hand and create pathways for community members and stakeholders to engage in the issue. You may be reminded now of my previous recommendation to perform a comprehensive situation assessment. In my research and interviews with local community members (most of whom are landowners), I have found that "livelihood" is the single most practical and resonant topic nested within the broader WVC discussion. Impacts to livelihoods from WVCs arrive in myriad ways: Like when a rancher strikes an animal on the highway with her most valued work truck; or when a commuter nearly totals his only form of transportation. Both of these scenarios have played out too many times to count in the past few decades.

I also find it interesting how conversations with skeptical landowners – of which there have only been a few – take a quick turn when I bring up the point about impacts on local livelihoods. I've fielded many questions on the efficacy of wildlife crossing structures and whether or not tax-payer dollars are better spent elsewhere, but as soon as I expose details on the quantity and cost of collisions with deer, elk and

moose in the watershed, the person on the other side of the table tends to nod in acknowledgement. Some have even continued with stories of their own. Narrowing our focus on wildlife-vehicle conflicts provides an opportunity to showcase how collaborative leadership can leverage WVCs as a means to create solutions that improve local livelihoods and build a new, shared sense of community. That is certainly an objective of mine as liaison for Yellowstone Safe Passages and as a champion for collaborative partnerships.

On October 5th, 2020 Lee Nellis – a veteran rural land use planner of the Greater Yellowstone Ecosystem – challenged collaborative leaders in a provocative essay titled, "Has 'Collaborative Conservation' Reached Its Limits?" He begins by complimenting collaborative partnerships, stating that when they are effective, "These groups deal with *the local*, *the particular*, and *the tangible*… their success is rooted in a shared sense of community and a willingness to compromise, to move ahead only with projects that can be supported (or at least not opposed) by every stakeholder" (Nellis, 2020). But Lee asserts that collaborative conservation operates in the shadow of the "Narrative of Domination". This narrative of domination, he claims, is driven through commodification, opportunism, and power. The narrative of domination is about advocacy and victory over that of cooperation and compromise, and even our best collaborative work, "barely troubles the dominant narrative" (Nellis, 2020).

Nellis sends a provocative call for a new narrative to be written, a new guiding myth, that can replace the narrative of domination. In doing so, we will have created a myth arisen from many courageous voices transcended from individuals to heroes, measured not through what has been protected or conserved, but rather through finding purpose in a world of uncertainty. He urges us to "write, paint, compose, do whatever it takes, to create a new myth… that we replace the narrative of domination with a new story, a

story soulful enough that people will want to tell it to their children" (Nellis, 2020). He argues that collaborative conservation will not get us there on its own. I argue that collaborative conservation will given it is nurtured by qualities Amy Mickel writes about and the ideas I introduce later in this paper about the containers we create to do this work. Later, I refer to the quality of this container as SPIRIT: Space, Presence, Intention, Respect, Information, and Transparency.

I wish to reframe "Collaborative Conservation". The word "conservation" inherently presumes that something must indeed be conserved. But who defines what needs to be conserved, and from what grounds? Who defines the conservation agenda, even at localized scales? More importantly, who doesn't have a seat at the table? The word – although not intended – creates a playing field with winners and losers, where conservationists gather around maps and data in an effort to crystalize a mission that, ultimately, points to an objective. Collaborative conservation, in this case, becomes a frame no different than the dominant narrative Mr. Nellis describes, but he may have overlooked one critical detail that mature collaboratives foster: Community.

I am of the mind (and heart) that community is the very thing we all have most in common with one another, and "many courageous voices" invites qualities I have written about extensively up to this point: Inclusivity and Diversity. I argue that community in collaboration is the process through which Mr. Nellis's new myth can emerge. Community in collaboration is not so much about a mission or objective, but rather about valuing the web of relationships that define, depend on, and influence one another. Those relationships inextricably tie the human and more-than-human world together. They are indeed already tied together – it's just a matter of how. Community in collaboration might open our eyes to the possibilities surrounding us, and to the respect, humility, and decency that is illuminated when we show

up to the table, not with a map, but with the question: How can I help? What follows is an opportunity to listen. And then, an opportunity to re-imagine a better way forward. I am reminded of the teachings of Sherri Mitchell, Weh'na Ha'mu' Kwasset (She Who Brings the Light). Mitchell is an author, scholar, human rights activist, and internationally recognized Indigenous leader. In her book "Sacred Instructions: Indigenous Wisdom for Living Spirit-Based Change" (2018) she reflects on the power of listening:

"One of the best things that we can learn to do is to listen.

It enhances nearly every aspect of our lives."

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THE LIAISON

My position as liaison for Yellowstone Safe Passages emerged out of necessity as the partnership coalesced in January of 2020. Early conversations among my colleagues Dan Bailey, Brooke Shifrin, Max Hjortsberg, and Liz Fairbank (representatives from NPCA, GYC, PCEC, and CLLC, respectfully) made it clear that my reputation as a third generation local of the watershed would be best suited to lead, coordinate, administer, and facilitate our group's work. We knew that a locally-driven partnership – also deliberately collaborative – would be the only way to carry the work forward. Otherwise, we risked running up against WVC-related fits and starts that had previously failed in the watershed, and could face what might be perceived as a "green group" agenda. Those individuals invited me to lead the partnership from a place of authenticity, autonomy, and professional accountability - having faith and confidence in me as an individual, my education in Natural Resources Conflict Resolution, and in themselves as experienced, driven, and capable partners.

Prior to my work with Yellowstone Safe Passages I had never been a "Liaison" nor had I worked in a position that required such close proximity to agencies, landowners, and environmental NGOs. I was moving into a position that would immediately test new skills in facilitation and refine project management skills from my previous work experience. In short time we brought on new team members – Kelsie Huyser (NPCA), Blakeley Adkins (GYC), financial partners (Arthur M. Blank Family Foundation and Cinnabar Foundation), and developed a new "Lead Field Technician" position, filled by Michelle Zizian, tasked to build our own systematic data by monitoring the highway with ArcGIS. We were all stepping into new territory together, and have since created a highly functional partnership as well as new and meaningful friendships. I am grateful for each individual's invaluable contributions and trust that we *will* succeed in making Highway 89 safer for people and wildlife.

Figure 10. The Yellowstone Safe Passages invested partners as of June, 2021.

During those first few weeks I approached friends, family members, and locals whom I respected in the watershed and trusted would share productive feedback for me as liaison in our newly formed partnership. One of those community members, Whitney Tilt, a talented collaborator with Property and Environment Research Center (PERC) and facilitator for the Upper Yellowstone Watershed Group (UYWG), made a statement that rings true even to this day: “The messenger is just as important as the message.” It was then I realized that my role as liaison would not only be necessary, it would be critical.

In our work, liaisons create space for convening and conversation within localized communities. We help translate the complexities of science, data, and jurisdictional decision-making frameworks to those in our communities who typically don’t have the interest or time to research such matters. We help translate the ideas, concerns and even frustrations held by local community members to those who wield authority through elected positions and governing agencies – county, state, or federal. We help build on the strengths and insights of the many brilliant and dedicated people who work to enhance the resilience of Montana’s vast landscapes, whether they be wildlife biologists, road ecologists, environmental advocacy

groups, rural livelihoods advocates, community and rural development planners, ranchers, farmers, tribal representatives, or the countless individuals who deeply care about this state and its citizens, both human and wild.

Liaisons are tasked to learn about and communicate the complexities of WVC mitigation to partners who wish to invest resources – financial or otherwise – toward solutions like the suite of wildlife accommodations I've discussed intermittently throughout this document. In doing so, we can develop skills in fundraising, grant writing and reporting, public speaking and presenting, facilitating, coordinating and strategic planning. Liaisons learn and practice all these forms of communication, and therefore must learn and practice the art of listening. Listening isn't just about synthesizing and reflecting what one is hearing (while important), it is also about tuning into a deeper understanding of the social and psychological barriers that prevent growth or change in a community, and the histories that inform peoples' beliefs.

Central to this work is the art and science of facilitation. Bill Milton, a wise and soft spoken rancher from central Montana, has been a facilitator in rural settings for most of his adult life. During a retreat I hosted at my family's ranch this past summer called "Collaborative Approaches," Bill reflected on the efficacy of good facilitation and the deeper listening I refer to now. He suggested that there is always a history behind peoples' words. He added that a good facilitator must consider how to hold that karma. From this place of holding, facilitators can leverage collective wisdom – through trust and safety – to imagine the next step to be born.

I can't help but ponder the discouraging scenario that unfolded when wildlife crossing structures were once considered viable in Island Park, Idaho. The response from a relatively small group of people may at face value look like disgruntled individuals who didn't want to see change in their community. And yet, to what degree did those individuals feel vulnerable in the face of change? What role did fear and aggression play in response to that vulnerability? And what were they holding onto so tightly that their grip, alone, prevented them from seeing another's point of view? Where has curiosity and humility fallen short? Where has compassion and empathy gone? Perhaps most importantly, where has creativity been lost and where can it be found? These are the questions an effective liaison is exploring in the process of deeper listening.

Deeper listening also allows liaisons to ease our own grip as well. I have found myself, at times, holding too tightly to a mindset or objective and nearly always run into resistance, whether that be within myself or from other individuals in my community. Deeper listening has offered me the strength to let go of my grip, move toward compassion, and open myself to a larger understanding of the relationships around me. In another discussion I co-hosted at my family's ranch this past summer, an eloquent Native woman from central California proclaimed that the greatest achievements of our time will be those that move at the speed of trust, in the direction of nature, and with the flow of empathy. I couldn't agree more. The speed of trust, as I've learned, starts (and ends) with listening.

VIRTUES OF A COLLABORATIVE LEADER

I have approached nearly two years of work as a liaison for Yellowstone Safe Passages, and have come to realize that many of the qualities, skills and competencies I write about now will continue to be learned and refined. Two years in the larger scheme of things is rather insignificant, but the relationships that have been cultivated by and between the stakeholders connected to WVCs in the Upper Yellowstone are nearly too many to count. This web of interconnection, which I previously referred to as community in collaboration, will continue to develop into meaningful and productive relationships. Indeed, we have already begun.

Collaborative leadership holds firmly to the practice of being respectful toward others, inclusive, creative and committed to the process. As many of my mentors and peers have echoed through classrooms, conference halls, and even campfire circles, building "cultures of trust" is at the core of our work. Adhering to the process, no matter what form it may take, requires patience. And yet, to lead from this understanding also begs honest inquiry into the leadership qualities I see in other leaders, and those I wish to emulate in myself. Below is a diagram of virtues that have co-evolved alongside my personal and professional development throughout the course of my adult life and, more specifically throughout my engagement with the Upper Yellowstone community and all matters of importance related to wildlife-vehicle conflict.

The leader within aspires first to nurture alignment amongst diverse interests and then, when possible, inspire alchemy among them. The following page identifies six leadership qualities I've observed in others and will try to espouse in my own life, both personal and professional. It is important to note that none of these virtues are valued more than another, and all of them are interconnected.

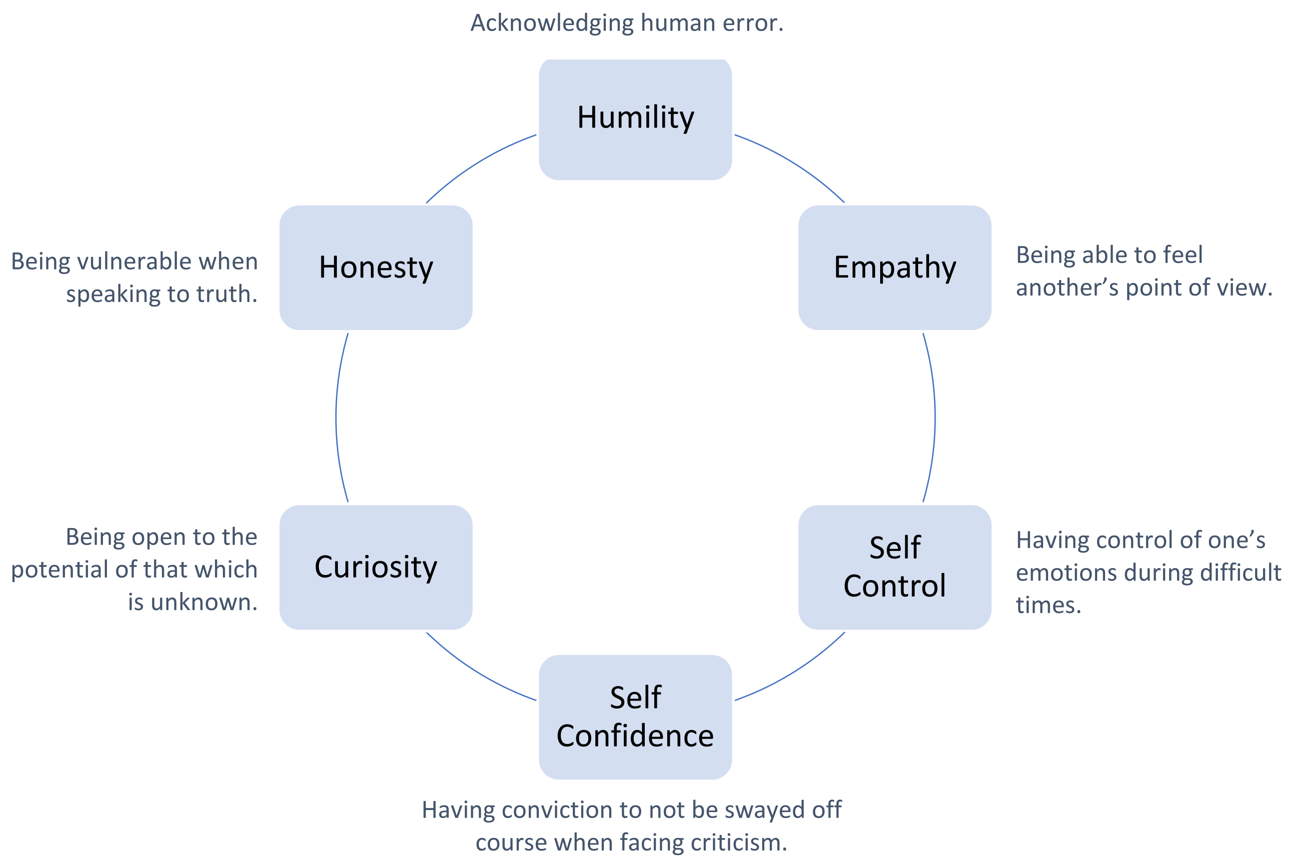


Figure 11. Virtues of a collaborative leader.

MONTANA'S HWY 93 & TRIBES

The US highway 93 North running through the Flathead Indian Reservation is considered one of the most extensive wildlife-sensitive highway construction projects in North America. It is revered as the only long-standing wildlife-vehicle conflict mitigation area in the state of Montana (Huijser et al., 2016). On 56 miles of highway between Evaro and Polson, a total of 41 aquatic and terrestrial crossing structures have been installed. Numerous studies, presentations, and graduate-level theses have developed a growing body of research championing the efficacy of such projects (Allen, 2011; Allen, 2013; Connolly-Newman, 2013; Purdum, 2013; Fairbank, 2014; Andis, 2016; Huijser et al., 2016; Andis et al., 2017). In a project summary report provided by Montana Department of Transportation, researchers concluded that nearly all measures of success were met, which were intended to enhance habitat connectivity and improve human safety by reducing wildlife-vehicle conflicts (Huijser et al., 2016).

Figure 12. Examples of different wildlife species using the crossing structures along US 93 North. Source: Montana Department of Transportation.

A unique quality of this case study is that three governments – Federal, State and Tribal – needed to develop a shared vision for the project. That vision was counseled by the Confederated Salish and Kootenai Tribes (CSKT), whose collective leadership framed the culture that each government would be required to adhere to under federal recognition of tribal sovereignty. All three governments agreed that reconstruction of US Highway 93 North would be founded on the concept that, "'The road is a visitor' and that it should respond to and be respectful of the land and the 'Spirit of the Place'" (Huijser et al., 2016). The agreement was also grounded in acknowledging and honoring wildlife species that are considered cultural resources to the Confederated Salish and Kootenai Tribes. This moved leadership in Federal and State agencies to reframe conceptions of wildlife beyond what are more commonly referred to as natural resources.

The cultural thread is what I wish to highlight. In the introductory story I shared at the beginning of this document – acknowledging that the landscape is changing – I prompted readers to consider how people shape the landscape, how the landscape shapes people and how the quality of our interactions shape both. I believe that our cultures are the forces that underpin, inform, and guide the way we show up in the world, both as individuals and as organized groups. Moreover, our cultures have a direct impact on the landscapes we inhabit and through the discourses we create to enhance and sustain our lives. And yet, the landscape of Montana has a patchwork of cultural influences that by no means reflect cohesion around or adherence to an overarching land ethic. Religious groups, sporting groups, watershed groups, conservationists, agrarians, academics, agencies, politicians, and myriad social circles conceive principles that align most effortlessly with their group's way of knowing and being. At present day, how often are those principles written, composed, mapped or discussed without humans at the focal point? How often do those principles value ancestral histories of Indigenous People? And how often do our leaders honor

the landscape's intrinsic value over the values that modern civilization has molded through the commodification of natural resources? The CSKT on the Flathead reservation cleared a novel path for State and Federal leaders by grounding collective intentions in the "Spirit of the Place." Their leadership also placed tribes in a unique position to model a more holistic perspective on how our state highways interact with the landscape, its wildlife, and the people who utilize them.

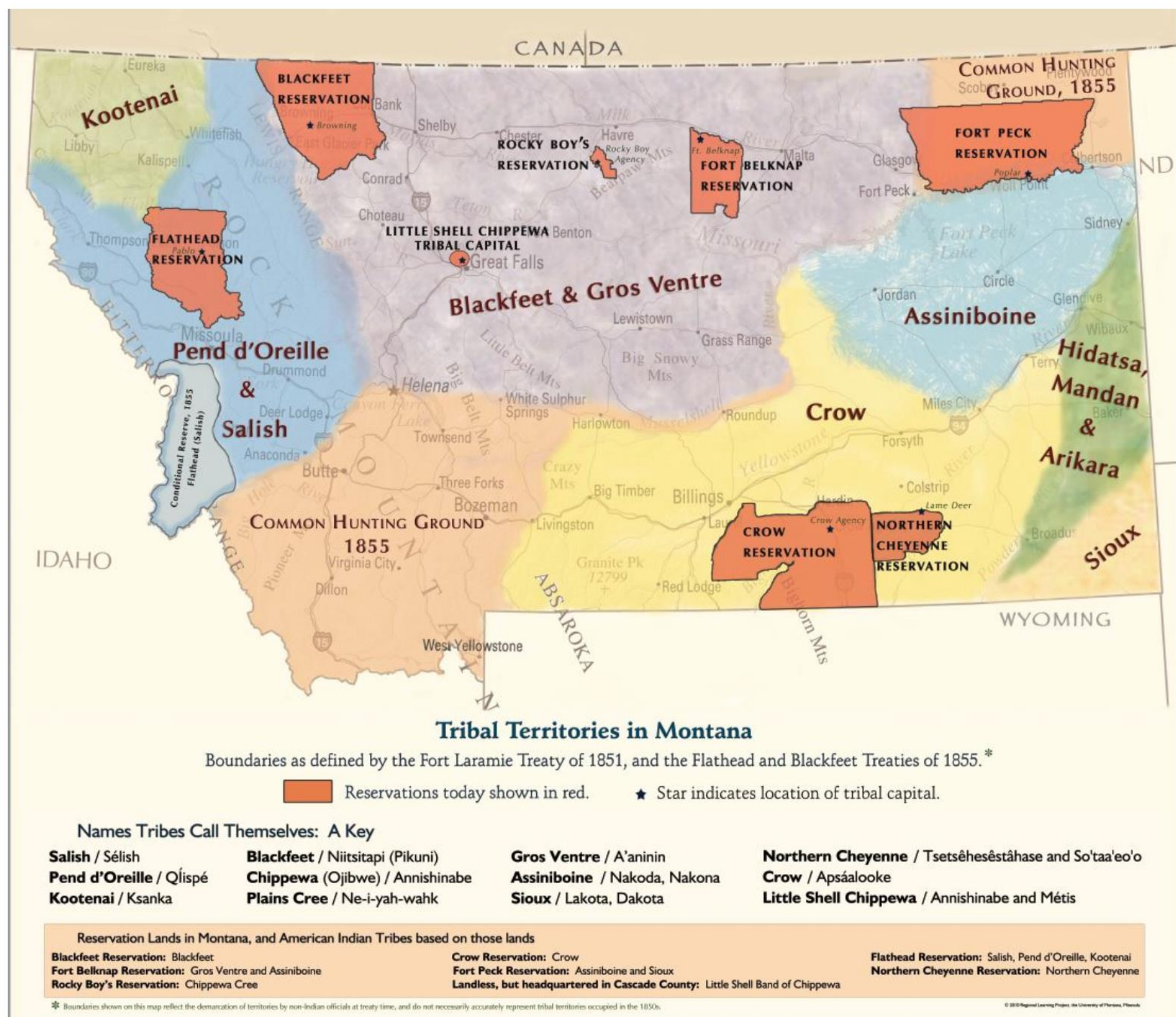


Figure 13. Tribal territories in Montana as defined by the Fort Laramie Treaty of 1851, and the Flathead and Blackfeet Treaties of 1855. Source: Montana State University, Bozeman, Montana.

Montana is the ancestral land of at least twelve tribes from recent history, and is home to eight reservations that have been reduced to the sizes shown on the previous page – these Indigenous homelands fell into private and U.S. government ownership through the 1800s and early 1900s. Only in these relatively small reservations can tribal leaders exercise sovereign rights and influence the tides of state and federal funding for highway infrastructure projects. What would discussions about wildlife and transportation include if decision-makers at all scales – from local to statewide – invited our Native neighbors to a seat at the table?

In the absence of tribal influence north of Missoula it is unlikely that there would be wildlife accommodations on US 93. WVC mitigation work on Highway 93 continues, however, thanks in large part to the values that the CSKT set in place nearly fifteen years ago and for the collective effort that blossomed from that fertile ground. For the remainder of the State, is there room for tribal influence to guide agencies, NGOs, wildlife advocates, private landowners, and all other citizens to better appreciate Indigenous worldviews and histories? Are there opportunities to weave those knowledges into modern infrastructure improvements? I'd like to believe so.

This is not a message centered on a romantic notion that all Native people were or still are in some idealistically harmonious relationship with the more-than-human world or with their human counterparts. Such a claim would be both naïve and patronizing. Nor is this a message claiming that non-Native people lack the capacity to weave spiritual cosmologies with the natural world. That would cut against the grain of my own personal identity and sense of kinship with the many creatures who inhabit the landscapes of Montana. Rather, I suggest that it is in our best interest to listen to and learn from every person who has a connection to this landscape, especially those whose ancestral roots go back thousands of years. The

process would be inclusive by design and supported by respectful integrity. The results will champion a cultural legacy of immeasurable brilliance.

Keith Basso (1940 – 2013) was an Arizona rancher and professor of anthropology at the University of New Mexico who spent years studying the cultural significance of place names in the world of the Western Apache. Basso's reverence for Western Apache people comes through in his seminal book, "Wisdom Sits in Places: Landscape and Language Among the Western Apache" (1996). Alongside reverence, however, is Basso's reminder that it is our ethical duty to listen to our Native neighbors:

> *"Cultural constructions of the environment, whether those of American Indians or of peoples elsewhere in the world, will remain largely inaccessible unless we are prepared to sit down and listen to our native consultants talk – not only about landscapes, which of course we must do, but about talking about the landscape as well" (Basso, 1996:68).*

Looking ahead, there are a small handful of us in the Upper Yellowstone considering how to design a captivating and powerful story map focused on humans, wildlife and US Highway 89. This project would include photography, videography, narration, digital mapping, graphic design, and other creative technologies. My early conversations with tribal representatives from the Crow and Shoshone Tribes were an invitation to explore how Native perspectives could be invited into this creative endeavor. Many more discussions await.

THE ROAD AHEAD

On October 18, 2021 I presented an update to Montana's Statewide Wildlife & Transportation Steering Committee on the work Yellowstone Safe Passages has accomplished in the last year. I urged committee members to consider how novel collaborative partnerships might effectively address wildlife-vehicle conflicts in Montana, and added a strong pitch for the committee to take into account the need and opportunity for WVC mitigation in the Upper Yellowstone. The Steering Committee, along with members from Montanans for Safe Wildlife Passage (MSWP), a coalition of NGO and agency representatives focusing on highways in the greater Missoula area (called "The Missoula Group"), and two of my colleagues with Yellowstone Safe Passages entered into a dialogue unlike any I'd experienced prior. I left the conversation feeling encouraged, confident in YSP's role, and excited for 2022.

Montana's Wildlife and Transportation Steering Committee includes a handful of leaders in the Department of Transportation, Fish, Wildlife & Parks, and Montanan's for Safe Wildlife Passage. The group was formed as a follow-up from the 2018 Wildlife and Transportation summit, which brought together NGO, agency, tribal and community leadership from across the state to explore high-level wildlife and transportation conflicts and begin formulating processes aimed at reducing WVCs. Since then, the Steering Committee has been periodically meeting in attempt to keep the ball rolling. The discussion I was invited to in October was the committee's first outward attempt to consider their role alongside local efforts and explore how all of our groups might work together in the years to come.

I can't stress enough how important this invitation was. It offered both groups, Yellowstone Safe Passages and The Missoula Group, an opportunity to share reflections on how and why we formed, what we have been doing to raise awareness about WVCs in our respective communities, and discuss barriers and

opportunities that lay front of us. It quickly became apparent that YSP and The Missoula Group are playing important roles that the Steering Committee cannot fulfill on its own. As my colleague Brooke Shifrin recalled, it became clear that the Steering Committee, particularly agency representatives, grasped the level of progress our partnership has made in the past two years and could see the momentum we have in the community. Liz Fairbank, another colleague from the Center for Large Landscape Conservation was struck by the response from the committee, not just through their engagement in what I consider top-notch dialogue that was open, creative, and exploratory, but also how quickly one of the members of the Steering Committee could see that their quarterly meeting schedule wouldn't keep up with YSP's and The Missoula Group's pace. After the meeting, Liz reflected by saying, "There's [historically] been so much tension about potential conflict between groups, but folks left with a mindset to work together." Our roles, at all scales, are in the process of converging.

Why this new wave of momentum and why now? I believe the recent momentum is a result of a confluence of events and emerging trends. For starts, local groups such as Yellowstone Safe Passages are proving to be effective at generating awareness and grassroots community buy-in for wildlife crossing structures and other WVC mitigation tools, which is something individual environmental NGOs or agencies almost always fall short of doing successfully on their own. We also have capacity to generate data outside of empirical models employed by agencies. Perhaps more relevant than ever before, empirical data designed to facilitate change in a community, when it doesn't invite community participation, can generate toxic fissures between the general public and governments through misinformation campaigns. Citizen science data, on the other hand, is developed by the general public. It's created through a voluntary and ideally growing consortium of community members who harvest data points alongside daily or weekly activities. Citizen science serves two critical roles: (1) It proves that communities are engaged in an issue,

and (2) fills potential knowledge gaps, ultimately complementing empirical models created by agencies. Yellowstone Safe Passages has introduced and implemented a citizen science program, which continues to grow in participation with every passing month. The figure below shows a series of data points that local citizen scientists have collected, identifying animals (dead or alive) along the side of the road north of Emigrant, Montana. These clusters of data will in the future be overlayed with MDT crash and carcass data to pin-point exact locations with the highest probability for WVCs.

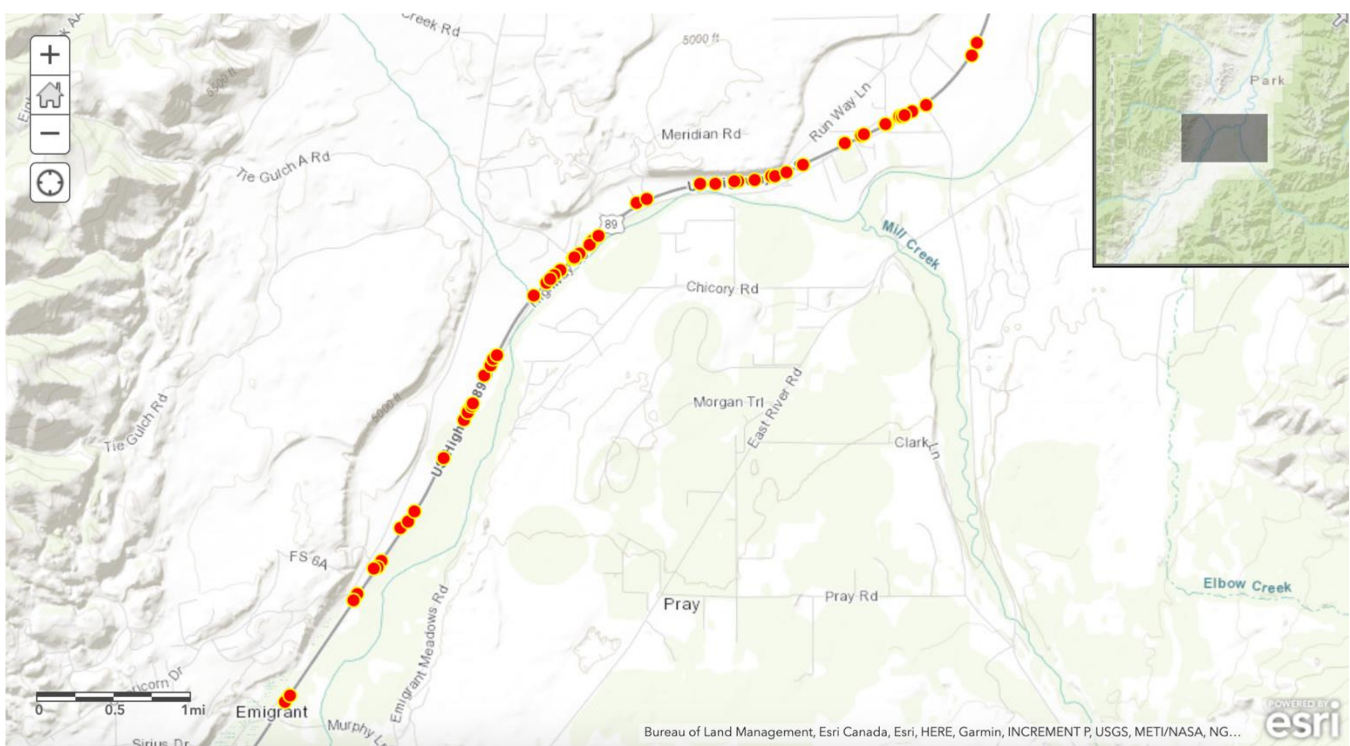


Figure 14. Citizen science data points collected by Yellowstone Safe Passages, north of Emigrant, MT. Developed through ArcGIS software.

Second, the statewide conversations have evolved over the last decade and Montana's 2018 Wildlife & Transportation Summit set a broader intention to come up with solutions for wildlife-vehicle conflicts across the state. Those early conversations served a critical role, which have led to refined planning and deliberate consideration of shovel-ready projects where local groups are generating buzz in their

community. MDT left our discussion in October stating they would be in a position to approve a stand-alone project perhaps as soon as spring of 2022. At the very least, the Steering Committee's 2021 close-out meeting will focus attention on the data and information work group product that a few experts – including my colleague Liz – have been working on. The product will identify areas of greatest need by addressing human safety, property damage, wildlife movement, habitat fragmentation and impacts that highways have on sensitive species – setting the stage for state resources to be directed toward stand-alone WVC mitigation projects. It is anticipated that the product will also assist statewide leadership to develop strategies for how the interested public can initiate projects.

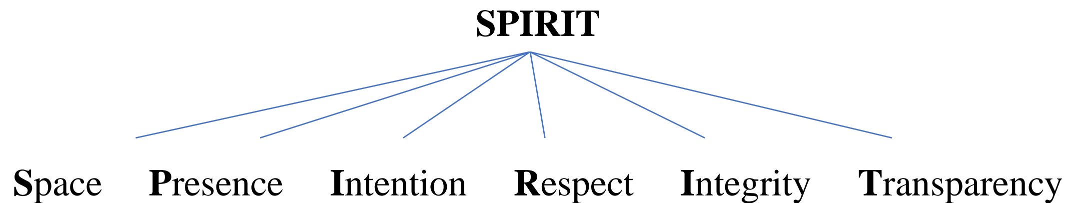
Third, Montana is also shifting its attention toward federal funding opportunities under the new Infrastructure Investment and Jobs Act (H.R. 3684) also known as the Bipartisan Infrastructure Law. The purpose of H.R. 3654 is to encourage states to adopt wildlife vehicle collision safety countermeasures, thereby distributing $350 million in funds through a competitive grant cycle over the next five years. This federal support – aimed specifically at WVC mitigation and habitat connectivity projects – will generate a new wave of momentum across the US, bringing experts and stakeholders together to address and problem-solve at localized geographies. The Upper Yellowstone is one such place.

I have made the case throughout this paper that wildlife-vehicle conflicts are measurable and preventable. I have also argued that WVCs have a direct impact on livelihoods – both human and wild – and therefore requires our collective attention. Likewise, in the many conversations I have had with community members, agency and NGO representatives, philanthropic donors, and more, I have seen threads of ethical and moral obligation adding color to this larger society-environment fabric. Every one of those individuals cares about the loss of life witnessed daily on US 89 in the Upper Yellowstone. The community at large

has indeed started to collaborate in creative and inspiring ways. But this bigger process, as I have framed "Community in Collaboration," invites each of us consider how we can show up for one another in ways that, in the end, move beyond the limitations that still exist in our social circles – our dominant, divisive, and divided narratives. Community in collaboration is not an outcome of great work done my many, it's an ethos that carries into our daily lives, manifested in myriad forms, throughout our individual and collective circles. It's community building at its finest and I believe it never ends. This type of community-building requires flexibility, adaptability, and transparency. For WVC mitigation work it requires a table big enough for all stakeholders to have a seat and listen to one another. It also requires moving toward a deeper appreciation for every aspect of the conflict at hand and stepping into a far more creative conversation than typical. This is what Otto Scharmer and Adam Kahane, two world-renowned thought leaders and facilitators, refer to "generative dialogue". Adam Kahane writes, "In generative dialogue we listen not only from within ourselves or from within others, but from the whole of the system" (Kahane, 2004).

How do we get to generative dialogue? In my rather short experience as a facilitator in the Upper Yellowstone I have witnessed a handful of elements – both tangible and intangible – emerge from the people, spaces and character of our discussions. I believe these elements can be applied to other communities attempting to navigate difficult conversations and especially those who are addressing wildlife-vehicle conflict. These elements are perhaps better conceptualized as ingredients to a robust and healthy soup. The only catch is that you cannot remove any one ingredient out without disturbing the synergistic quality of the recipe. Those ingredients create the acronym, "SPIRIT", which as you may recall has a resonance to the Confederated Salish and Kootenai Tribes' call for an honoring of the "Spirit of Place". I believe every place has spirit, just as every person and wild creature does. And I believe a

community in collaboration embodies the type of spirit that has the wisdom – through collective action – to navigate the most challenging obstacles of our time. SPIRIT is an assemblage of principles (or ingredients) that can help facilitators, organizational leaders, and individuals who wish to build communities in collaboration.



Space. Make space, both physically and emotionally, for people to gather together. The physical space, itself, matters more than one might think. Take, for example, the difference between a sterile rectangular community hall, a Zoom room, the circle around a campfire, and a gathering space in the upstairs of a restored old barn. Those are four starkly contrasting spaces and the connections made within each will be limited to the degree of connection each setting has to offer.

Presence. Rather, be present. Gathering spaces require people, and therefore it is critical that anyone who arrives to a conversation (stating the obvious that he/she/they have actually arrived) must be present in the space. This means shedding all potential distractions and disturbances before arrival. This means providing attention and dedicating time. In Zen master Thich Nhat Hanh's words, "The most precious gift we can offer others is our presence" (Takagi, 2007).

Intention. Stating an intention with formality is not a critical task in every meeting space, but it is important to, at times, give voice to that which matters most. Being clear on our intentions – individually

and in our respective organizations – allows others to gather more clarity on the various underlying interests. Exploring when and where those interests align can be the next step, which is naturally one of primary qualities of successful collaborative partnerships.

Respect. Be respectful, no matter what. People will almost always arrive to a conversation with histories behind their words. I have witnessed rooms where respect was not the redeeming quality, and in those circumstances the conversation was rarely productive. Conversations void of respect do not provide the safety and security, even if subconscious, for a group of people to connect with one another and work through difficult conversations. Respect, as I've learned, is paramount in every situation and with every person.

Integrity. When space is created, people are present, intentions and underlying interests are out in the open, and respectful dialogue can occur, this leads to an invitation to openly share information. Integrity means sharing information with a mindset to better the lives of the collective compared to that of the individual. There are copious amounts of angles one can approach wildlife-vehicle conflict mitigation – from social and cultural nuances, wildlife biology and behavior, research on the efficacy of crossing structures, financial opportunities and barriers, and more. The more information available to stakeholders, partners and decision-makers, the better informed. The better informed, the higher chance of creating sustainable and long-lasting solutions. Without consciously addressing the whole, as in holding integrity for the well-being of others, the value of information-sharing is weakened.

Transparency. Show stalwart transparency. This might mean being vulnerable at times. NGO's can be pressured by large donors and complicated boards. Agencies are made up of people, too, whom don't

always align or function cohesively. Private landowners can be weary of working with environmental groups or agencies, can feel underappreciated, scrutinized, and at the mercy of overwhelming pressures from the outside world. Tribal communities might struggle with over two centuries of trauma, intertribal conflict, colonial mindsets of past and present, and can feel largely marginalized by non-Native people and by society at large. Politicians may feel as though they are pulled in too many directions. The list goes on. Transparency is an extension of integrity, and it offers pathways for deeper understanding and empathy of the other people connected to the issue. Transparency also supports and is a pre-requisite to building trust. Without trust, the road ahead will be full of obstacles, roadblocks, and barriers. Trust is ultimately what we are striving to cultivate. And from trust, nearly anything is possible.

PARTING THOUGHTS

"Community in Collaboration" elevates a belief that conflicts of all shapes and sizes will come and go in the passage of time, but the quality of our relationships define how we navigate those obstacles. The conversations about wildlife-vehicle conflicts in the Upper Yellowstone may look and sound much different in just one year's time. Given the dedication I know will come from Yellowstone Safe Passages, that has already come from local community members, landowners, and philanthropists, and the good intentions set forth by agencies and statewide leadership, I trust we will get there.

"We are all moving as one stream of consciousness in a flowing river. We can't stop the flow or separate ourselves from it; all we can do is choose the direction of the current through our collective choices."

- Sherri Mitchell, Weh'na Ha'mu' Kwasset (She Who Brings the Light)

- - APPENDIX A - -

TEMPLATE LIAISON CONTRACT
(Yellowstone Safe Passages, 2020)

< INTRODUCTORY LANGUAGE OMITTED FOR BREVITY >

To address this issue, a partnership has been formed between the Greater Yellowstone Coalition (GYC), Center for Large Landscape Conservation (CLLC), National Parks Conservation Association (NPCA), Park County Environmental Council (PCEC) and Daniel Anderson from the Anderson Ranch and The Common Ground Project in Tom Miner Basin. The partnership's overarching mission is to address and resolve wildlife-vehicle conflicts on US Highway 89 between Livingston and Gardiner, Montana.

The Partnership's 2020 objectives are as follows:

- Perform a comprehensive stakeholder assessment related to wildlife-vehicle collisions in Paradise Valley (Livingston to Gardiner).
- Compile and share existing knowledge on wildlife-vehicle collisions along the Highway 89 corridor and research existing mitigation projects from the Intermountain West.
- Facilitate collaborative workshops and "Q&A" sessions to discuss legal boundaries for road improvements (i.e. wildlife accommodations) and corresponding funding strategies with federal, private, and other sources.
- Generate local support for potential mitigation strategies (i.e. wildlife overpasses, underpasses, fencing, etc.) that benefit people and wildlife along the Highway 89 corridor.

- Build and promote ongoing working relationships between all interested parties (agencies, NGOs, community groups, and local landowners) that foster a continually maturing culture of trust within the community.
- Secure funding for the partnership to perform its projected tasks through the calendar year of 2021

COMMUNITY LIAISON POSITION

The Community Liaison's overarching role – fulfilled by Daniel Anderson – will be to spark dialog among the residents in the Upper Yellowstone, work closely with project partners and local representatives, and foster alignment among individuals, organizations, and agencies. As a local resident of Tom Miner Basin and founding director of The Common Ground Project, Daniel's role is uniquely situated to provide valuable leadership for Yellowstone Safe Passages and community members in the Upper Yellowstone watershed. Daniel's role will be critical to achieve long-term objectives identified by the partnership and by other community stakeholders. The Common Ground Project, a registered 501(c)3 non-profit, will also serve as a vehicle to support the partnership's work through services rendered by Daniel and by acting as a neutral non-partisan convener. The organization will also serve as a vehicle to generate income for YSP's collaborative work. The position will be contracted to The Common Ground Project as an independent partner and will not consider Daniel an employee of any other funding/partner entities.

The liaison's scope of work includes, but is not limited to:

- Develop (with project partners) a detailed project plan to monitor progress.
- Perform interviews and generate conversation related to wildlife-vehicle mitigation strategies with local landowners and key stakeholders (local and statewide).

- Draft reports and report progress to project partners and other stakeholders as necessary.
- Support fundraising efforts for the project through face-to-face interaction with potential funding partners (such as AMB West, Kendeda, the Park County Community Foundation, and other private parties of interest). Fundraising support may come in the form of hosting (or co-hosting) a fundraising event at a location agreed upon by the partnership.
- Present to the Upper Yellowstone Watershed Group at intermittent times, as necessary.
- Facilitate e-meetups (via Zoom) with local and neighboring conservation groups.
- Begin developing a data-sharing Memorandum of Agreement (MOA) that can be shared between FWP, USFS, MTDOT, BLM, and Park County.
- Facilitate e-meetups (via Zoom) with the agency stakeholder group. The purpose of these meetings will be to foster alignment between agencies, and introduce the partnership's activities, requests, and other strategic visioning concepts when applicable.
- Draft grant reports with assistance from other members of the highway partnership.
- Facilitate a small in-person gatherings of key stakeholders within the local landowner community.
- Draft a "general reflection" landowner assessment, which includes a synopsis of what was discussed and what landowners' thoughts are related to the collaborative process and YSP's mission to address and resolve WVCs in the Upper Yellowstone.
- Begin outlining a long-term funding strategy that organizes the partnership's discussions around polling, website development, graphic design, photography/videography, social media opportunities, stakeholder/community engagement, camera trapping, systematic data development, citizen science data development, additional staffing, etc.
- Continue to develop mission, vision, and campaign planning language for the partnership's multi-year effort.

The liaison's work will begin on January 1st, 2020 and will continue through December 31st, 2020. The position will commit an average of 10 hours per week. The liaison will not supervise other employees. However, he/she will be responsible for coordinating activities and monitoring deliverables involving project partners and other key stakeholders. The liaison will utilize a high degree of initiative in determining project needs and priorities and facilitating the completion of project tasks, and will also possess the ability to work independently and as part of a team. It is understood that the liaison will work collaboratively with the project partners (GYC, CLLC, NPCA, & PCEC) and other stakeholders who are willing to support the program's objectives. It is also understood that unknown constraints due to COVID-19 and other factors may limit or prevent the liaison from completing all tasks in the contract term. Any tasks/deliverables not complete will be assessed by the partners and reinstated in future contracts as deemed necessary.

MEETINGS

Reporting to program partners will take place weekly or as needed via in-person meetings at the partnership's preferred location or via Zoom. Meetings are intended to update the partners on progress, review the project scope and schedule, and identify critical next steps.

COMMUNITY LIAISON REIMBURSEMENT

A grant is requested for a total of $XX,XXX for liaison services outlined in this document. The term is one year: January 1st, 2020 through December 31st, 2020. The grant covers transportation, food, beverage and administrative duties required on behalf of the liaison. Printing and supplies, facilities rentals and reservations are not included.

- - APPENDIX B - -

LITERATURE REVIEW and LANDOWNER ASSESSMENT

ABSTRACT

Landowner perspectives on the complexities of wildlife-vehicle conflicts along federal Highway 89 leading into Yellowstone National Park have been, until recently, untapped sources of knowledge. Wildlife-vehicle conflicts (WVCs) have been taking place along this 55-mile stretch of highway since the highway was constructed over half a century ago, but thoughtful consideration around the interface of highways and wildlife hasn't fully matured – in large part due to the fractured nature of this issue, both literally and figuratively. There are indeed many shareholders connected to the issue even though it can be distilled into three basic pillars that justify the conflict: Human safety, economic impacts, and wildlife mortality are all interconnected pieces that bear their own weight of impact on the larger human-environment scenario taking place every day in the Upper Yellowstone. The unabridged version of this story reveals that landowner input, whether realized or not by other stakeholders, is an invaluable contribution to the larger order of addressing wildlife-vehicle conflicts. More importantly, resolving location-specific WVCs with mitigation strategies that have been effective in other landscapes (referencing wildlife overpasses, underpasses, and diversion fencing) requires more than just input from landowners. It requires engagement. The landowners interviewed in this study speak to the nuances of living with wildlife, the challenges of co-existing with a rising tide of influences from outside social pressures and changes across the landscape. They speak to the importance of relationships, adequate understanding of conservation methodologies, and the critical need for landowners to have a seat at the table wherever these discussions may take place.

INTRODUCTION

In the pages that follow, I provide a combination of academic research and reflections from formal interviews and informal conversations with landowners in Southwest Montana's Paradise Valley, from June 2020 to the present. My focus is primarily on landowners who have property adjacent to the highway. The two overarching questions that guide my research are as follows:

1. *What are landowner perspectives on vehicle collisions with wildlife on Highway 89?*
2. *What opinions do landowners have on the installation of wildlife crossing structures?*

By shining a light on landowner perspectives, I aspire not to pit one group against another or styme the functionality of federal highway maintenance and upgrade discourses as related to WVCs, but rather suggest that novel approaches to addressing such a dynamic issue might pave the way toward renovating the integrity of human-environment relationships and the legacy of a popular federal highway. There is no clear suggestion, based on the literature integrated throughout this document, as to how individuals, organizations, agencies, and community groups might attempt doing so.

Relevant literature on WVCs throughout the region does, however, acknowledge the importance of landowner perspectives in the context of social constructs around land ownership, private property rights, and the fragility of rural livelihoods (Robbins, 2004; Yung & Belsky, 2007; Bidwell, 2009; Belsky & Barton, 2018). Within the Paradise Valley alone, private landowners make up approximately 45% of the land from one end of the valley to the other, and from ridgelines of the Gallatin Range and Absaroka-Beartooth Mountains (Tilt, 2020). This type of ownership represents varied interests and actions when it comes to development pressures from nearby townships, recreation, tourism, and wildlife. Landowners adjacent to the highway will undoubtedly be presented with unique challenges and opportunities to work more closely with governing agencies such as Montana Department of Transportation and Montana Fish,

Wildlife, and Parks. The scenario is indeed a conundrum, and it requires a bit of unpacking. Even more so, it requires thoughtful engagement with the landowner community.

A GROUNDING IN LITERATURE

The purpose of this literature review is to summarize and integrate what is known about wildlife-vehicle conflicts (WVCs) and the roles that landowners play in resolving or otherwise preventing mitigation strategies to be employed. As stated previously, Yellowstone Safe Passages, a community-driven collaborative partnership, is currently exploring the feasibility of significant structural changes to US Highway 89. Such changes include constructing highway overpasses, underpasses, and wildlife-friendly fencing projects that divert or guide wildlife to the aforementioned crossing structures. As a complement to YSP's work, the following review provides a backdrop for the complexity of this issue and unveils common themes and trends that landowner perspectives have toward the issue of WVCs. I also develop an argument that a more focused engagement with private landowners has the potential to activate collaborative partnerships and a broader scope of trust within the watershed.

Gateways to Yellowstone: Protecting the Wild Heart of Our Region's Thriving Economy

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Gateways to Yellowstone (2006) synthesizes four studies performed throughout six counties in Wyoming and Montana. All of these counties share a unique relationship with Yellowstone National Park, and make up the complex of wildlands commonly referred to as the Greater Yellowstone region, or Greater Yellowstone Ecosystem (GYE). The four studies are:

1. The Economy of the Greater Yellowstone Region: Long-Term Trends and Comparisons to Other Regions of the West. Ray Rasker, Senior Economist, Sonoran Institute, Bozeman, Montana (2006).
2. Yellowstone Wildlife and the Regional Economy: Review of Economic Study Results and Analysis. Chris Neher, Senior Economist, Bioeconomics, Missoula, Montana. John Duffield, Ph.D., Adjunct Research Professor, Department of Mathematical Sciences, The University of Montana, Missoula (2005).
3. Wildlife's Contribution to the Greater Yellowstone Regional Economy SuzAnne Miller, Biometrician, Dunrovin Research, Lolo, Montana (2006).
4. Economic Development in Environmental Economies of the Northern Greater Yellowstone Region. Jeff Graff, MPA, Montana State University, Bozeman, Montana (2006).

Combined, these four studies examined economic success and performance compared to other regions throughout the west, reviewed studies on visitor and resident perspectives related to wildlife, examined the use of wildlife-related terms for marketing and branding, and interviewed business owners and managers on their perspectives of doing business in the region. "Gateways to Yellowstone" set the stage as a landmark publication in 2006. It drew upon a wide range of professional researchers and contributors – 25 to be exact – and identified four high-level objectives looking toward the future. One such objective is protecting important wildlife habitat (Gateways, 2006):

> Whether proposing or reviewing a new subdivision or evaluating major proposals for projects on public lands, communities and government agencies should share a commitment to a common set of conservation priorities. These priorities should include protecting important habitats such as riparian areas, winter range, and migration routes, as well as aim to keep large blocks of habitat

> intact. Local governments and community groups should work with landowners to reduce the potential for wildlife conflicts through means such as proper storage of pet food and garbage, and wildlife-friendly fencing.

For the purpose of compiling this literature review, I don't dissect the methodologies employed to generate the findings of the report. Rather, I use this as an example of the emerging trends that are connected to later works as cited in this document. Those trends are commonly expressed as, "the qualities supporting this region's supercharged economic performance and its culture are increasingly at risk precisely because of their magnetic appeal. The economy is thriving, the population is booming, and amidst all that success, great care is required to protect what is most precious about this place" (Gateways, 2006). I also use this study as an opportunity to shine a light on the very thing that, up until recently, has been directly or indirectly avoided: Thoughtful inclusion and engagement with the landowner community in the Upper Yellowstone and farther reaching rural communities that make up the Greater Yellowstone Ecosystem.

Paradise Valley Corridor Planning Study: US 89 (Gardiner to Livingston)

The Paradise Valley Corridor Planning Study (2014) was the first seminal document focusing solely on the Highway 89 corridor from Gardiner to Livingston. This document was intended to act as a tool to facilitate effective planning and environmental review for future projects, including but not limited to wildlife crossing structures. The study was completed by a partnership primarily between Montana Department of Transportation and Park County, acknowledging over 40 individuals who provided guidance and support throughout the course of its development. As stated in the planning study (2014):

> The Paradise Valley Corridor Planning Study is a pre-National Environmental Policy Act (NEPA) and Montana Environmental Policy Act (MEPA) study that allows for early planning-level coordination with the public, stakeholders, environmental resource agencies, and other interested parties. The NEPA/MEPA environmental review process is an approach to balance transportation decision-making that takes into account the need for safe and efficient transportation and the impacts on the human and natural environment.

The study does not replace the NEPA/MEPA process, but the results are intended to help guide future environmental review of projects, and assist in facilitating "smooth and efficient transition from transportation planning to future project development/environmental review, if a project is moved forward" (Planning Study, 2014). Furthermore, the study outlined technical and environmental issues and set forth a list of options for "reasonable and feasible improvements to increase safety and efficiency for the traveling public" (Planning Study, 2014). Of the many transportation and environmental objectives outlined, only one acknowledged the need for an evaluation of best practice mitigation strategies designed to reduce WVCs. The study's summary of improvement options and strategies for moving forward were based on a variety of factors, almost all of which are tied to financially prohibitive actions, such as field review, engineering analysis of as-built drawings, crash data analysis, consultation with various resource agencies, and information provided by the public. This last factor – information provided by the public – remains a focal point of this literature review.

The study team developed a robust community engagement process, called the Public and Agency Involvement Plan (PIAP). This plan facilitated meetings in Gardiner and Livingston, issued newsletters and sent mailers to a predetermined selection of key stakeholders. A website was also created to provide up-to-date information and opportunities for the public to provide comments. Of the large handful of

comments received by the public, the issue of wildlife-vehicle collisions was the only concern expressed throughout the entire corridor. All other concerns were tied to site specific areas, or short sections of highway. The study organized its information through the use of charts, graphs, maps and tables, and covered a wide swath of topic areas nested within transportation and environmental concerns. Human safety and wildlife mortality were represented in the findings, but rarely associated with a clear or obvious connection to one another. The study also identifies a variety of improvement options through short-term, mid-term, and long-term timeframes. In contrast to some of the ambiguous language around addressing WVCs, the study does include a substantial amount of focus on specific options that can be used to mitigate WVCs. Within this section are detailed descriptions of each option and estimated costs of construction. Carcass data from a ten year period (2002 – 2012) was used to identify areas with concentrations of WVCs. The study leads one to think that agency partners have placed WVC's as a necessary issue to resolve, stating that they are "committed to evaluating wildlife mitigation opportunities along the US 89 corridor through the examination of best-practice, wildlife mitigation strategies" (Planning Study, 2014). They follow by forecasting a much broader set of circumstances that dictate the feasibility of WVC mitigation options (Planning Study, 2014):

> The highway corridor is only one piece of a much larger landscape puzzle. Other pieces that fit next to the highway corridor, such as adjacent land use, fencing configurations, agricultural practices, subdivision development, and conservation easements factor into planning feasible and economically viable wildlife mitigation strategies for highways.

If anything bears repeating, the trends between these two pieces of literature lead one to think that community members, environmental groups, and agencies all identify WVCs as a legitimate concern in the Upper Yellowstone. The process of aligning these interests and costs associated with resolving the

issue is amorphous at best. Furthermore, the study fails to elevate the importance of landowner perspectives and conservation easements as prerequisites to installing wildlife crossing structures. The next three pieces of literature will illuminate more of the nuances of social perception of wildlife, wildlife conservation, human safety and economic impacts as a result of WVCs.

Elk in Paradise: Conserving Migratory Wildlife & Working Lands in Montana's Paradise Valley

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Elk in Paradise (2020) is a 40 page document prepared by Whitney Tilt and commissioned by Property and Environment Research Center (PERC). This report synthesizes a multi-year effort to "better understand landowners' attitudes and challenges with wildlife in Paradise Valley" (Tilt, 2020). The document reports findings from an "extensive" landowner survey, a one-day landowner workshop hosted at a local resort, and "many hours spent in conversations with working landowners in their kitchens and at local saloons" (Tilt, 2020). The survey targeted 34 landowners, representing an estimated 90% of land use for ranching or agriculture in Paradise Valley. There was an 85-88% response rate to the survey questions. The goal of the project was "to explore market-based approaches, economic tools, and other ways that can enable elk migrations to become more of an asset, or at least less of a liability, to private landowners, thereby preserving the working landscape nature of Paradise Valley and the habitat that migratory elk rely on" (Tilt, 2020).

Terminology like "coexistence", "working lands", "fragmentation", and "development" are scattered throughout the document with varying degrees of contextual relevance. Fragmentation and development are often associated with heightened concern for the valley losing its rural character, agricultural heritage,

and abundance of wildlife. And, landowners generally want autonomy and benefits for providing wildlife habitat, not regulation and costs. The document is also supported with maps, graphs, and charts that portray the varying degrees of concern, along with a handful of recommendations, drawn up by the landowner community. Of the major trends that emerged from this study, economic resilience and sustained agricultural way of life were the two most prominent concerns among landowners. Threads of private property rights, preserving open space, and managing relationships between locals, environmental groups and agencies were also woven throughout. Interestingly enough, there is no mention of Highway 89. And while the names of study participants remain anonymous, it is a well-known fact among the landowner community that two of the three largest acreages of land holdings in the valley floor are longstanding agricultural operations that have been in place for at least four generations. Both of these ranching families have land adjacent to and on both sides of the highway.

Elk, the primary motivator of this report, move back and forth throughout most of the 55-mile stretch of highway in this study area. There are measurable degrees of human safety and economic impact risks associated with WVCs, particularly with elk on the highway, and every landowner in this study uses the highway for varying personal and professional purposes. It is the main vein for traveling purposes, and it cuts the valley almost exactly in half. Highway 89 has a relationship to these landowners and to the broader issues of land fragmentation, wildlife conservation and landowner engagement outlined in the Elk in Paradise (2020) study. The thread of consistency throughout the literature discussed thus far is, simply put, that landowner perspectives have not been attuned to wildlife movement related to Highway 89 or to proposed mitigation strategies that would reduce wildlife-vehicle conflicts – an opportunity missed within broader strokes of human-environment relationships in the Upper Yellowstone.

Public Opinion on Wildlife and Migration Corridors in Wyoming

The Wyoming Open Spaces Initiative, in partnership with the Nicholas Institute for Environmental Policy Solutions at Duke University, performed an online focus group of 20 Wyoming residents and a statewide poll of 400 Wyoming registered voters, surveying perspectives on wildlife and issues related to wildlife migration corridors. The focus of this study was uniquely tuned to the interrelated themes of wildlife, wildlife conservation, and the state's economy. Highways were a central focus, which elevated a broader understanding of the pressures that Wyoming highways place on all three of the aforementioned themes. The publication, while short in length, efficiently depicts participants' attitudes on wildlife and the issues previously discussed through the use of bar charts, pie charts, tables and graphs. The study does not detail its methodology, but it shows results to questions that are both qualitatively and quantitatively constructed. The results are consistent throughout, showcasing that the majority of study participants find wildlife to be a central component to their lives, the state's economy, and also to elevated risks to drivers on state highways. The respondents strongly supported construction of wildlife crossing structures (overpasses and underpasses) within migration corridors.

The study also revealed that the majority of participants have trusting relationships with state and federal agencies, namely the Wyoming Department of Game and Fish. This is a unique observation in comparison to other works cited in this literature review. A more common result would likely show the opposite. Another unique attribute to this study was the breakdown of male to female participants (almost a 50/50 split) and political positionality (republican, democrat, or independent) compared to their conservative, moderate, or liberal positioning. This detail of research offers an opportunity to further unmask our

assumptions on how we project each other's political stance on issues related to wildlife, wildlife conservation, and solutions to wildlife-vehicle conflicts.

Montana Online Discussion Groups Among Landowners: Key Findings Regarding Wildlife Migration

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During a three day online discussion group in September, 2020, FM3 Research and New Bridge Strategy, commissioned by The Pew Charitable Trusts, surveyed 36 registered voters throughout the state of Montana. The majority of participants self-identified as landowners. The purpose of the discussion was to explore their views on "wildlife, the value of migration corridors, and their reactions to additional information, images and videos related to this topic" (Pew, 2020). Similar to the landowner survey in Paradise Valley, most of these participants identified with agricultural roots, and had varying acreages under ownership. Also similar to Paradise Valley, a strong majority of participants made a connection between healthy populations of wildlife and Montana's state economy. The majority of participants also agreed that wildlife are essential to sustaining a healthy and balanced ecosystem. In this study, participants identified the increased likelihood of hitting animals on the highway as a downside to having healthy populations of wildlife. This point was not made as a distinction in the Elk in Paradise (2020) report, which may offer an opportunity for further study.

Another trend in comparison to Paradise Valley, is that the respondents overwhelmingly believe that Montana's government agencies (namely Fish, Wildlife, & Parks and Department of Transportation) carry the primary responsibility of managing wildlife and ensuring wildlife migrations can coexist within the broader public sphere. This information pairs commonly with the perspectives that landowners implicitly

help wildlife by providing safe haven and habitat, and that the result of such often creates headaches and economic burden on landowners. These results show consistent double-standard perspectives on wildlife. Compared to the other works cited in this review, the Pew study team unveiled the potential for opinions to shift when educational materials on the effectiveness of WVC mitigation strategies (i.e. overpasses, underpasses, and diversion fencing) were introduced to the participants. The results stated that "few have heard about actions that have been taken or are being considered to help migrating big game" (Pew, 2020). As further stated, "These Montana respondents broadly supported a wide range of actions that would benefit wildlife migration, prioritizing compensating landowners for conservation easements, over/underpasses and limiting development in migration routes" (Pew, 2020). Two key statistics that came out of the survey were (1) 77% of the participants supported the construction of wildlife overpasses and underpasses, and (2) 94% see WVCs as primarily an issue of human safety and economic impact, as opposed to concerns regarding wildlife mortality and conservation.

The results, objectives, and concerns raised in these studies show common threads that exist between landowners' perspectives on wildlife, wildlife conservation, migrations, and the issues related to wildlife-vehicle conflicts. There are holes in this body of research, however. Moving forward, I see a great deal of work that is needed to effectively bridge knowledge gaps regarding WVC mitigation strategies – within local and statewide arenas. It's both concerning and illuminating that Wyoming residents are more aware of such strategies compared to Montana residents, but this is also understandable considering the higher degree of focus Wyoming Department of Transportation and Wyoming Game and Fish have dedicated to the issue over the past two decades. Montanans, specifically landowners in the Upper Yellowstone, are primed for inquiry around wildlife-vehicle conflicts and mitigation options that have been proposed to

reduce the impacts discussed throughout this paper. As further explored, human safety, high collision costs, and wildlife mortality uphold the three pillars of this dynamic issue.

DISCUSSION

The overarching purpose of my research has been to explore what landowners see as most pressing when it comes to wildlife-vehicle conflict and the aforementioned mitigation strategies that have been proposed along Highway 89. With regard to WVCs on the highway, the majority of interviewees placed human safety and economic impact as the two most pressing concerns; Out of all 16 participants, one prioritized animal welfare over than of humans and went as far as to say, "I know they're trying to get to water, and we're impeding their travel. I don't want to hit them… If I hit one, it's on me because I wasn't paying attention" (anonymous interview #16). Wildlife conservation is a concern shared by every participant, but this pillar comes with varying degrees of baggage. Landowners who own and manage cattle typically have lower levels of tolerance toward wildlife who threaten their way of life (Pew, 2020; Tilt, 2020; Weigel et al., 2020; Gautier et al., 2019). This is true of landowners in Paradise Valley (Tilt, 2020). Generally speaking, however, my conversations revealed a wide range of concerns when it comes to wildlife conservation, management, and their impacts on landowner livelihoods.

Not everyone I interviewed has personally struck an animal on the highway (13 out of 16 have; 81.25%), but 100% had witnessed at least one prior instance of other people who had, or knew someone who had struck an animal on the highway. In comparison, I posed a similar question in an online survey to individuals who live in the area or seasonally travel the highway corridor. These respondents don't all fall under the landowner perspectives I am focusing this report on. Within 25 responses, 68% of the respondents replied that they had been involved in or witnessed a wildlife-vehicle collision and 32% had

not. These results, combined, reveal that most drivers – local, neighboring, or seasonal – face equitable risks to colliding with wildlife on Highway 89.

One participant used to maintain the rest area not far from Big Creek, and witnessed a lot of folks who had just pulled their damaged vehicle into the parking lot. He said, "I saw a lot of people sitting in that rest area, some of them crying as they were waiting for the wrecker to come" (anonymous interview #7). Asking his perspective on human safety, economic impact, and wildlife conservation, the participant responded strongly that human safety is the priority. He cares for wildlife and always feels bad seeing a dead animal on the highway but said that he almost always thinks first of the person who had to face the aftermath of the collision - both from an emotional standpoint and a financial standpoint. He expanded on this by saying, "A lot of people can't afford to hit animals. I know people who've gotten injured so bad that it affects the rest of their life" (anonymous interview #7). This reflection is worth acknowledging as a general response to change that most landowners in the Upper Yellowstone have expressed at one point or another throughout my ongoing effort to engage in conversation and develop trusting relationships. If anything, it shines a light on the delicate balance between accepting change and participating in guiding it.

The same participant also had common assumptions on how much wildlife accommodations cost to build and maintain. Fencing, for example, is something he sees as "A huge part of the cost to maintain" and a multi-million dollar expenditure for a wildlife overpass sounds like a lot of money to him. I was able to share a bit more broadly on the effectiveness of overpasses, underpasses, fencing, signage, speed limits, and educational programs when they are used as a full suite of accommodations vs that of independent options to site specific locations. He seemed surprised to hear about the percentage of effectiveness

potential, and also sounded welcoming of more conversation around these points. I asked this participant if he could see any barriers or roadblocks that Yellowstone Safe Passages might need to be aware of. He appreciated the question and said that while he can't imagine why anyone would be against a collaborative effort to install wildlife accommodations, he reminded me that it's important to remember that some people don't like to see change. He said, "A lot of people don't like change. I'm kind of that way but I don't like seeing people get hurt" (anonymous interview #7).

Not far from the rest area previously referred to is a ranch with lands adjacent to both sides of the highway. The previous owners are well known in the community and come from four generations of a ranching family in Paradise Valley. When I met with one of the previous owners, I was delightfully surprised with her knowledge of the issue and strong desire to install wildlife crossing structures. She thinks wildlife on the highway is a big issue and, ever since seeing the Highway 93 project in Montana, has wanted to see a wildlife overpass or underpass installed alongside their ranch. She also claimed to know right where to put a structure based on intimate knowledge of the landscape and wildlife movement through the property. She also commented on the collaborative potential of Yellowstone Safe Passages and reflected on her personal connection to Montana Department of Transportation. Some time ago her grandson was tragically killed at the rest area location adjacent to the property (a vehicle related accident). She and her family worked hard with MDOT to put a turn lane in at that location and she said the process went well. She has a positive outlook on the potential of working with MDOT on wildlife accommodations, and respects the fact that our partnership is focused so strongly on working with landowners and other key stakeholders. While the results of this interview are largely supportive of wildlife, safe wildlife passage across the highway, and collaborative approaches to resolving the issues at this particular location in the

valley, this interview stands out as just one of five from the landowners I interviewed who were fully supportive of the broader scope of issues and the installation of wildlife crossing structures.

During a larger group discussion hosted at West Creek Ranch, one of the current owners of the aforementioned ranch frankly asked a question of why there hadn't been any overpasses or underpasses installed along the highway in the past. She followed with a question that, to date, is one of the most basic yet profound responses to the issue, saying, "And what are the reasons not to?" This question is indeed at the heart of the issue and the work Yellowstone Safe Passages has explored over the past 15 months. Unveiling the reasons *not* to construct wildlife accommodations is equally as important as illuminating the reasons for constructing them.

QUESTIONING THE EFFICACY OF WILDLIFE CROSSING STRUCTURES

My interviews with local landowners and other members of the community have been in search of the reasons that argue against installation of highway overpasses, underpasses, diversion fencing, etc. To date, resistance comes in the form a healthy level of skepticism and constructive questioning on the efficacy of wildlife crossing structures. A manager of a ranch on the southern end of Paradise Valley, for example, presented a variety of sight-specific questions with regard to fencing and how the mitigation works at the points where fences end. When I met with her individually, she voiced concern for wildlife (namely elk) that frequently cross the highway at their ranch location, which also runs adjacent to the highway for approximately five miles. She anecdotally noted that the wildlife friendly fencing they installed along the highway seemed to reduce the number of collisions along that stretch, but by no means has solved the issue. She isn't a strong proponent of placing a larger structure at their location and stated a handful of times that she can't speak to the opinion of the ranch owner, but she was receptive to learning

more and to participating in conversations. She appreciated the invitation to join our small West Creek Ranch gathering and said she would welcome more conversation in the future.

Another landowner on the Northern side of the valley raised similar questions regarding the effectiveness of wildlife accommodations. He had seen and heard of overpasses, underpasses, and fencing, but hadn't heard anyone speak to the effectiveness of them and how they work with respect to private lands adjacent to highways. His family has been living and ranching in Paradise Valley for close to 100 years. He was receptive and curious, and reflected on his personal experience of striking wildlife and of stressful events moving cattle across the highway. His family has actually lost cattle to vehicle collisions on the highway and even carried the burden of facing a lawsuit. He frustratingly recalled that his grandfather "tried like hell" (anonymous interview #10) to get stock underpasses installed when the highway was being constructed, but apparently had no response from MDOT.

One of the first creative questions this interviewee had was whether or not a new wildlife crossing structure could be used for cattle. He said, "Starting about the first of June, we start trailing them across and it's getting tougher all the time to do that… I would love to have a place to get my cattle through without crossing over the highway" (anonymous interview #10). He considers the potential of this future scenario to be a "win-win". He also noted that nearly every day he sees a dead deer or elk along the shoulder of the road, and can think of a few potential places to put a crossing structure along their ranch. He noted, too, that he has started seeing more collisions with elk down near Mallard's rest, potentially because of the access to hay near the Mill Creek turnoff. When I asked if he'd personally show me the areas he is considering for a potential underpass, he was receptive and willing.

Conversations such as these illuminate the necessity of engaging landowners in creative dialogue and listening to their concerns. I was surprised to see that out of 16 landowners, 5 were not only receptive of installing wildlife overpasses, but were outwardly advocating for them. Everyone, to date, has questions on the efficacy of wildlife crossing structures, and fairly so. Highway 89 in the Upper Yellowstone doesn't have any such mitigation strategies installed and the nearest examples are located along Highway 93 nearly 300 miles to the Northwest.

RELATIONSHIPS MATTER

The history of relationships between agencies and landowners in Paradise Valley is fuzzy at best, and for some individuals, there is an undercurrent of mixed feelings when it comes to agencies. The general manager at a ranch on the southern end of the valley reflected with similar frustrations. When she first came to work at the ranch over twenty years ago, she sent letters to MDOT expressing concern for the amount of wildlife being struck along the stretch of highway running through the ranch. Similar to the previous landowner, she received no response from the agency. Herein lies a point of contention that Yellowstone Safe Passages can work to acknowledge and resolve in the years ahead. Among the 16 participants, all but one had hesitancy expressing confidence in the agencies. Every participant, however, acknowledged the critical role that agencies play in the process, and I received constructive input from most of them on the potential of collaborative work. As one person said, "I feel like it should be a collective thing of course with oversight from the agencies" (anonymous interview #16).

When I interviewed a local leader in the Upper Yellowstone Watershed Group (UYWG) this past summer, she commended Yellowstone Safe Passages's commitment and willingness to engage with local community members, specifically landowners, and believes that our process of "listening and learning"

has potential for long-term results. She also sees the UYWG as a diverse place to listen to opinions, and the only way to move forward on any issue is to at the very least show up to the table. She sees highway safety as a real issue, but knows that it will take time to make any tangible change. Her connection to the landowner community runs deep, thus she feels strongly that landowners need to be included in the process, adding "I think it's an important topic to be discussing, especially if landowners have a say" (anonymous interview #1). She also sees our effort as an opportunity to empower the community. She emphasized, "Whatever would empower the community is good stuff. We need to bring people together and have a discussion on how and where we can make appropriate changes in the valley" (anonymous interview #1). She also cautioned us on how we craft language around all aspects of who we are, what we're doing, and why we feel it's an important issue to address. In her opinion, human safety comes as the top priority, followed by economic impact and wildlife conservation. As a rancher, her number one concern is brucellosis transfer from elk to cattle. Of the 16 participants in this body of work, she is the only person to voice such strong concern of increased risk of brucellosis transfer from elk to cattle as a potential side effect of wildlife crossing structures. As with most issues in the valley, many of the threads are interwoven. Brucellosis happens to be one such thread that comes with a high degree of tension and anxiety for the future of agricultural livelihoods in the watershed (Tilt, 2020). Herein lies the importance of building on existing relationships, exploring new relations, and expanding the conversations in ways where trust can be rebuilt as needed, and nurtured for the long haul.

PRIVATE LANDS AND LANDOWNER RIGHTS

Highway 89 is a federal highway, subject to federal processes when improvement projects are identified. An assessment under the National Environmental Policy Act (NEPA) is one such process, which generally would not infringe on a landowner's property or resources. Wildlife crossing structures, however, require

"permanent" protection of the land on both sides of the highway, requiring case-specific segments of property to be placed into easement with a qualified land trust. Requirements such as these undoubtedly impose on landowners' concept of property rights and how those rights are either supported or imposed upon. As Yung and Belsky (2007) relay from a study performed in Montana's Rocky Mountain Front, ideas about property will likely overlap existing conceptions of landownership and landowner rights, and are also subject to shift in time. As further stated, "Where these ideas are different and competing, they can result in conflict and tension between landowners, especially in landscapes undergoing rapid changes in ownership and land use" (Yung and Belsky, 2007: 690). Elk in Paradise (2020) was the first in depth publication that unveiled the complexity of landowner issues pertaining to wildlife movement in the Upper Yellowstone (noting elk as the primary source). Of the 13 recommendations that came from that report, one suggested that landowners be considered full shareholders in wildlife management decisions. In the report, a landowner says succinctly, "I'm more the just another stakeholder; it's my land, and my livelihood" (Tilt, 2020). In a nutshell, landowners don't like being told what to do, they often express frustrations toward governing agencies, generally don't look to conservation or environmental groups for solutions, and at times consider their voices to be of the marginalized (Tilt, 2020). That being said, not all private landowners think alike, and some have indeed placed conservation easements on their property and for various purposes. My family's ranch, for example, has had an easement in place since the early 1990s for the purpose of securing open and connected habitat for wildlife. Others in the valley floor, such as the Arthur Blank Family ranches, have easements as well, and ardently support the idea of wildlife crossing structures along Highway 89. Their connection to the community and potential home of a future wildlife overpass will, alone, make a statement to the landowner community that *everyone* in the community drives the highway and all are at risk to collisions with wildlife. Being a landowner, therefore,

comes with a generous burden and unique opportunity to think and act not just for oneself, but rather for the broader community of citizens and more than human life that shares the landscape with us.

CONCLUSION

Opportunities exist to further explore the perspectives that landowners have on the development of wildlife crossing structures, how they're funded (whether through state, federal, or public/private partnerships), how the various state and federal jurisdictional frameworks operate to support or hinder these developments, and how the role of locally-led initiatives such as Yellowstone Safe Passage might productively serve the decision-making dynamics therein. Relationship-building is the key to seeing this process unfold in any productive manner that is mutually beneficial for both people and wildlife. How can research and education support this larger effort and bridge the gaps as needed? How can relationships with landowners increase understanding and garner enough of their support to begin expanding the boundaries of the existing (and restrictive) paradigm of governing agencies? How can partnerships be created to invite a much wider array of funding sources and capacities? And, how can landowner perspectives help inform and guide this process in ways that, ultimately, benefit both the landowners and the millions of visitors who travel Highway 89. Thankfully, landowners almost unanimously agreed that wildlife-vehicle collisions are detrimental to at least one of the aforementioned pillars of WVCs, and all agree that landowner input is valuable and should be a part of any process moving forward. I see this as an invitation to work together, to build bridges (pun intended) between landowners and other stakeholders and dispel the local myth that all landowners are conservative in nature and thus won't support "conservation" discourses lead by others. This simply isn't true. I've found it more common than otherwise for folks who aren't landowners to cast limiting beliefs or assumptions toward those who are.

I have yet to meet a landowner in the Upper Yellowstone who vehemently opposes the installation of wildlife overpasses.

My work with landowners in the Upper Yellowstone has revealed that the three pillars of wildlife-vehicle conflict (human safety, economic impact, and wildlife mortality) are all almost equivalent in importance. If anything, they are inextricably tied together, which shines a light on the nuances and complexity of these various conversations with stakeholders. Landowners, however, have a unique role to play. Their concerns about wildlife management and capacities of governing agencies and environmental groups being able to effectively get the work done come from decades of previous experience that hasn't all together created positive mindsets. In the first interview I conducted, the landowner spoke quite directly to the issue of trust, particularly with environmental NGOs, by saying, "Words really matter… What TU [Trout Unlimited] did in this community made it really difficult for landowners to trust agencies and other groups… made folks super suspicious." Herein lies the delicacy of navigating a complex terrain of society-nature relationships. As stated previously, relationships matter, and the landowners have and will continue to play an important role in supporting new, more functional relationships compared to those of the past.

FURTHERING THE RESEARCH

This body of research is far from complete. Two active members of the Upper Yellowstone Watershed Group (UYWG) have become local champions of Yellowstone Safe Passages' work, and will continue to support the effort in the years to come. I've had multiple in person and virtual meetings with both individuals, the purpose of which has been to direct attention toward creative problem solving and coordination with the UYWG. As advocates for the partnership's collaborative process, they see great

potential in wildlife accommodations being linked to other valley-wide efforts as they relate to wildlife, the Yellowstone River, education, public outreach, and landowner engagements. Our work, therefore, will necessitate further exploration of landowner perspectives on wildlife related accidents on Highway 89 and the proposed installation of wildlife crossing structures. It will require walking fence lines with landowners, having discussions at the local bar or café, presenting information in public settings such as those fostered through the UYWG or the local church, inviting specialists to attend webinars and other public-facing events, and indeed, interviewing more landowners. There are myths to dispel and knowledges to glean from and elevate. Most of this work, as implied, is a process fully invested in raising awareness and building a broad foundation of locals who support making changes on Highway 89.

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- - APPENDIX C - -

LANDOWNER ASSESSMENT in the UPPER YELLOWSTONE (Continued from Appendix B)

The following assessment is a first-person general reflection of formal interviews and informal conversations with landowners in the Upper Yellowstone, from June 2020 to the present. I also include information gathered at in-person meetings hosted at West Creek Ranch on October 14th, 2020 and October 11th, 2021. The meetings at West Creek Ranch have been framed as "Landowner Convenings", offering space for landowner participation, updates from the YSP team, and exploratory discussion about future partnerships between landowners, NGO's, agencies, and other local working groups. 2020's meeting held a total of eleven individuals, including myself. Six of the participants were whom I consider "landowners," defined through either the ownership or management of large landholdings (100 acres or more) and with agricultural operations typically expressed through beef, hay or cover crop production. 2021's landowner meeting held a total of 14 participants, with an additional 5 who were unable to attend due to last-minute snow storm conditions that prevented them from making the drive. While my research and engagement with local landowners continues to evolve, this existing body of work is a reflection of nearly two years of conversations with community members in the Upper Yellowstone. The data presented here reflects all of my research, which includes a large handful of interviews during the spring of 2021. I also present this data not as an academic, but instead as a member of the landowner community in Paradise Valley and, more importantly, as the liaison for Yellowstone Safe Passages.

DISCLOSURE STATEMENT

I am fully aware of any biases I have as a landowner, rancher, and wildlife advocate might be perceived as affecting the objectivity of this assignment.

Throughout 2020, Yellowstone Safe Passages hosted a series of virtual meetings with key stakeholders from the local community, state of Montana, and Greater Yellowstone Ecosystem. Our goal was to learn about the many facets of wildlife-vehicle conflict (WVC) in the Upper Yellowstone watershed and neighboring regions. I facilitated most of these meetings and compiled notes with assistance from others in the partnership. We learned about the tenets of road ecology and how safe passages have been successfully - and not successfully - implemented in other regions. We learned about the complexity of jurisdictional frameworks at play between Park County, State, and Federal agencies, and of the various funding mechanisms that exist for wildlife crossing structures. We also learned about the nuanced social perception of WVCs, which includes a spectrum of concerns ranging from human safety to economic impact, and wildlife conservation. Aside from virtual meetings, I have met with nearly 30 individuals who live and work in the Upper Yellowstone. I performed formal interviews with folks I consider "landowners" in addition to a few local business owners and genuinely curious individuals who live in the valley. Aside from those meetings with individuals or small groups, I have presented via Zoom and in person to a handful of organizations in the area. Those organizations include:

- Park County Environmental Council (Annual Gala)
- Arthur M. Blank Philanthropies – "AMB West"
- The Upper Yellowstone Watershed Group
- "September Fest" Inaugural Event @ the Old Saloon

I try conducting every meeting or interview with casual authenticity. Aside from having family ties to the Upper Yellowstone and a personal connection to an agricultural way of life, I am genuinely curious about the histories and perspectives that landowners have in our community. There's always a history behinds people's words or perspectives. Understanding that history is one step closer toward being fully

aware of the broader social terrain I am navigating. Admittedly, I also arrive to each conversation with biases, but try to be transparent about my biases and practice setting them to the side whenever possible. In one-on-one interviews, I always take 5 – 10 minutes to connect on a personal level. Once a feeling of connection is made, I begin by asking what to degree the person is familiar with wildlife-vehicle conflict. From here, the conversation generally moves toward landowner perspectives on wildlife, which can flow in many directions, offering space for the individual to share and reflect, and for me to pose specific questions, thoughts, or facts about the issue. Refer to Appendix D for a list of interview questions. By the end of the interview (most interviews ranged from 60 – 90 minutes) I try to enter into a creative space with the interviewee. This looks to the future and to what landowners can do to productively engage with wildlife-vehicle conflict. I ask for recommendations on who else to talk to, and what we (Yellowstone Safe Passages) can do to better serve the community as it relates to the issue. Lastly, I always end an interview with a statement of gratitude for the individual and his or her time, and follow with an invitation for him/her to remain a part of the broader community-wide conversation and more specifically as an active participant in YSP's growing partnership.

There were a few instances when an individual would make a claim that factually wasn't sound. When this situation happened, I would either (1) Not respond and let the conversation continue, (2) Ask how they arrived at that claim, or (3) Ask if they'd like to hear what I've learned about that particular claim. Every person was open to hearing what I had to say. People oftentimes arrive to conversations with limiting perceptions and assumptions defined by the filters through which we look. These filters can prohibit opportunities to develop healthy relationships and at times eliminate the potential for a creative conversation. Thankfully, all of my conversations were creative. Every interviewee had questions. Some had claims, and some had historical baggage when it comes to environmental groups and agencies. Most

importantly, every interviewee was interested in having the conversation and made time to consider what we – as a broad community of stakeholders – might do together to address the complex issue of wildlife-vehicle conflict on Highway 89.

Interviews were performed through Zoom and phone primarily. Two meetings were in person, which both took place at a local café. Interviewees were selected through my local knowledge of people to speak with, and also through snowball methodology. When possible, I took vigorous notes during the interviews. I also utilized participant observation at two publicly held meetings that I presented in and the meetings hosted at West Creek Ranch.

Please note that I use "wildlife accommodations" and "wildlife crossing structures" interchangeably and in lieu of wildlife overpasses, underpasses, and diversion fencing. I use "participants" and "interviewees" interchangeably. I also don't expand on every interview, but include a combination of general reflections from all of the interviews combined and specific notes from individuals who had particularly unique contributions. Every person I met with had relevant feedback. To date, all of the local community members I've heard from view wildlife-vehicle conflict as an ever-present issue that is long overdue to resolve.

The landowner community is the primary focus of my research and therefore has unique contributions to the larger body of research I will continue to develop in the coming years. I entered each interview with genuine curiosity on what these landowners perceive of wildlife-vehicle conflict and explored what they see as most pressing when it comes to the issue. I also welcomed a broader discussion on how they feel about changes in the landscape and the potential changes to Highway 89.

All of the landowners I interviewed expressed a strong connection to the Upper Yellowstone, and thus share a uniquely strong sense of place and appreciation for the landscape at large. Not everyone I met with has personally struck an animal on the highway, although a strong majority have. Every interviewee had witnessed many instances of other people who had, or at least knew someone who had struck an animal on the highway. In comparison, I posed a similar question in an online survey of individuals who live, work, or seasonally travel the highway corridor. Within 25 responses, 68% of the respondents replied that they had been involved in or witnessed a wildlife-vehicle collision and 32% had not. These results reflect my same inquiry with local landowners, revealing that all drivers – local, neighboring, or seasonal – face equitable risks to WVCs.

My conversations with landowners revealed a wide range of concerns. In broad strokes, the landowner community feels pressure from increases in housing developments, tourism & recreation, predators (grizzly bears and wolves), disease (brucellosis), environmental and conservation groups, and in some cases their neighbors. Landowners also have a common lack of trust toward government agencies, such as Montana Fish, Wildlife and Parks (FWP) and Montana Department of Transportation (MDT). Of the landowners I interviewed, almost 50% voiced skepticism toward agencies being capable partners in resolving the issues we discussed around wildlife and wildlife-vehicle conflict.

When I sharpened the focus toward wildlife-vehicle conflict on Highway 89, the majority of interviewees placed human safety and economic impact as the two most pressing concerns. Wildlife conservation is a concern shared by all, but this tenet comes with varying degrees of baggage and geographical considerations. For example, many of the landowners I interviewed expressed firm belief that the elk population on the northern end of the valley is far greater than it should be, and therefore should have

more comprehensive wildlife management actions. These same landowners followed with concern for the number of elk being killed by vehicles on the southern end of the valley, where herds are closer to Yellowstone National Park and also where the data presented by FWP and MDT shows a higher number vehicle strikes with elk. Landowners in the Upper Yellowstone who own and manage cattle typically have lower levels of tolerance toward wildlife who threaten their way of life, particularly elk.

Landowners also have common and similar assumptions on how much wildlife accommodations cost to build and maintain. Fencing, for example, is something one participants sees as "A huge part of the cost to maintain," and a multi-million dollar expenditure for a wildlife overpass sounds like a lot of money to him. I was able to share specifics and previous findings on the effectiveness of overpasses, underpasses, fencing, signage, speed limits, and educational programs when they are used as a full suite of accommodations vs that of independent options to site specific locations. He seemed surprised to hear about the percentage of effectiveness potential, and also sounded welcoming of more conversation around these points. I asked the same interviewee if he could see any barriers or roadblocks that we as a partnership might need to be aware of. He appreciated the question and said that while he can't imagine why anyone would be against a collaborative effort to install wildlife accommodations, he reminded me that it's important to remember that some people don't like to see change. He said, "A lot of people don't like change. I'm kind of that way but I don't like seeing people get hurt." This reflection is worth acknowledging as a general response to change that most landowners in the Upper Yellowstone agree with. If anything, it shines a light on the distinction between accepting change and helping to guide it.

During a larger, in person group discussion at West Creek Ranch on the southern end of the valley, one of the owners of another nearby ranch frankly asked a question, "Why hasn't there been any overpasses

or underpasses installed along the highway?" She followed with a question that, to date, is one of the most basic yet profound responses to the issue, saying, "And what are the reasons not to?" This question is indeed at the heart of the issue and the work Yellowstone Safe Passages has endeavored to uncover over the past two years. Unveiling the reasons *not* to construct wildlife accommodations is equally as important as illuminating the reasons for constructing them. Throughout my research, not a single landowner has made a strong stance against wildlife crossing structures; Specific reasons *not* to build them have yet to be revealed.

Landowners' concerns on efficacy of crossing structures and who pays for them have remained at the center of their focus, almost unanimously. That being said, I foresee tension with some landowners when the topic of conservation easements come into play. If MDT wishes to apply federal funding to engineer and construct wildlife accommodations on Highway 89, easements at the approaches of those structures will be required. It's a detail that makes sense when one considers how to make smart choices with the use of taxpayer dollars, but it breaches the ever-present issue of perceived impingement on private property rights. Assumptions are the key here, and maintaining consistent communication with landowners – early and often – will ultimately define our ability to move through points of resistance.

Another landowner commended our partnership's commitment and willingness to engage with local community members, and believes that our process of "listening and learning" has potential for long-term results. She also sees the Upper Yellowstone Watershed Group as a space to listen to the opinions of other landowners. She sees highway safety as a real issue, but knows that it will take time to make any tangible change. Her connection to the landowner community runs deep, thus she feels strongly that landowners need to be included in the process. She said, "I think it's an important topic to be discussing, especially

if landowners have a say." She also sees our effort as an opportunity to empower the community. She emphasized, "Whatever would empower the community is good stuff. We need to bring people together and have a discussion on how and where we can make appropriate changes in the valley."

She also cautioned us on how we craft language around all aspects of who we are, what we're doing, and why we feel it's an important issue to address. In her opinion, human safety comes as the top priority, followed by economic impact and wildlife conservation. As a rancher this interviewee's number one concern is brucellosis transfer from elk to cattle. YSP's work, therefore, will require further exploration on the potential that wildlife crossing structures enhance, mitigate, or don't influence the spread of brucellosis in Paradise Valley.

DISCUSSION

This preliminary assessment, to date, is a strong start to a larger and more comprehensive report that can include a wider range of perspectives from local landowners, including more of those who own land adjacent to the highway and those who might call themselves traditional ranchers. Over the last year, I focused primarily on individuals who have longstanding ranch histories in the Upper Yellowstone, are respected in the community, own or manage larger landholdings adjacent to the highway, or who have a strong connection to the Upper Yellowstone Watershed Group. I initially focused my effort on the southern end of the valley, feeling safer in my ability to connect with individuals who live or work closer to my family's ranch in Tom Miner Basin.

I also believe that I can begin directing focus on individuals, organizations and community groups who reside in the Gardiner Basin. Agriculture is less prominent in the Gardiner Basin, but a few well-known

ranchers still put up hay, raise sheep, and pasture cattle through the summer season. Perspectives from landowners, outfitters, and local businesses in the Gardiner Basin will be important to hear and understand. We can expect to hear more concern about brucellosis and new talking points around issues with bison. I assume we will face more questions regarding the efficacy of wildlife accommodations and how diversion fencing comes into play with the many private and public access points between Yankee Jim Canyon and Gardiner.

The landowner community in the Upper Yellowstone has been interviewed and researched more in the past few years than any other time in the past 15-20 years. I state this as a person who is familiar with the growing tension around conservation and land-use planning in the watershed and also as a "landowner" who has been interviewed, filmed, photographed, and asked to participate in various other conversations. Some landowners feel a growing amount of pressure from NGO's, and also an overarching feeling of pressure from all of the activities taking place in the watershed. Some have recently referred to this as "landowner fatigue". My research, for example, is another additive to this mixture.

I had also hoped to host and facilitate a focus group from members of the Upper Yellowstone Watershed Group. I was forced adjust my plans after learning that another group, Property and Environmental Research Center (PERC) was also trying to hold smaller, in person gatherings with local landowners - doing their own research not associated with Highway 89. Too many focus groups on landowners throughout the year would not cultivate what is more important than data, which is trusting relationships. I struggle with balancing the expectations embedded within a research paradigm and simply being an observant, intentional and deliberate note-taker for the community. Looking at this from the standpoint of decision-making metrics, data on landowners is actually not as relevant as the relationships that are

cultivated through the research process. Therefore, I continue to navigate this dynamic social terrain with a casual conversational approach, and have made conscious decisions to slow the process down when possible. This process of slowing down is something I take seriously. As another regional supporter of our work has emphasized in past conversations, it's incredibly important to move slowly in this work.

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- - APPENDIX D - -

PRIVATE LANDOWNER INTERVIEW GUIDE
(Upper Yellowstone Watershed)

Participant Name: ________________________________ Date:__________

Female: ________ Male: ________

Age: __________

Occupation(s): ____

The purpose of this study is to understand how landowners in the Upper Yellowstone watershed view wildlife movement as it relates to Highway 89 and mitigation strategies (i.e. wildlife accommodations) that can be employed to reduce wildlife-vehicle conflict.

INTRODUCTIONARY QUESTIONS

1) To start off, I thought we could talk just a bit about your history living here; How long have you lived in the valley?
   i) Do you have other family members who live here too?
   ii) Have you lived anywhere else?

2) What's your occupation?
   i) How long have you been doing that?
      PROBE: Can you share more about what you do?

3) Given your experience in this area, what do you like about living here?
   PROBE: What do you think about the community of people who live here too?

GETTING TO THE ISSUE

4) As you know, one of the things about living in Paradise Valley is that there are a lot of wildlife here too. In general how easy or difficult is it for you to live alongside wildlife?

    PROBE: What makes it easy? What makes it Difficult?

5) To what extent should managers try to control wildlife movement?

6) What are the primary uses you make of the road? Commute, recreation, other?

    PROBE: Tell me more about your use of the Highway: When you think about how you use of it, is it more for short trips near your place or longer trips into one of the towns?

7) What concerns do you have, if any, about wildlife movement on the highway?

    PROBE: Are there any more concerns?

8) Have you personally ever had experience where you were in a vehicle that collided with wildlife? If so, would you be willing to tell me about that? If not, have you witnessed an accident like that?

    FOLLOW UP: Did these experiences impact you, and can you expand?

9) As you may know, 1 in 2 accidents on HWY 89 are wildlife related, and we strike an animal about once every other day (on average). Actual #'s may be close to 3 to 4 times this rate based on previous studies. What concerns, if any, do you have about these accidents?

    PROBE: Do you have any other concerns?

10) What recommendations do you have for how to help reduce accidents between wildlife and vehicles?

    PROBE: Do you have any other recommendations?

11) What specific places along the highway do you think are particularly problematic, if any?

    PROBE: Any other places? NOTE: get location information and later on put on a map

12) Would you favor active strategies or infrastructure that would accommodate wildlife movement across the highway? Why or why not?

13) Would you favor active strategies or infrastructure that would accommodate wildlife movement across the highway? Why or why not?

14) Which strategies for controlling wildlife movement do you think might work and why?

15) With regard to wildlife on the highway, I've heard many people voice concerns related to human safety, economic impact, and/or wildlife conservation. Do you agree with any of these concerns? Which? And why?

16) Are there any other concerns aside from the three I just listed that you think are important to address?

GETTING TO SOLUTIONS

17) Have you ever heard of or seen wildlife overpasses, underpasses, diversion fencing etc.?

    PROBE: Do you think any of these strategies are viable options for Paradise Valley? Are there any that are not viable options?

18) Do you see barriers or roadblocks to addressing this issue with other folks in our community? Can you explain more?

19) Are there any other implications or concerns you see toward wildlife-vehicle conflict?

20) Do you have any ideas we haven't already discussed that might help mitigate the impacts of wildlife-vehicle conflict on highway 89?

21) Is there anyone else you think I should be talking to?

- - APPENDIX E - -

RECOMMENDATIONS for STATEWIDE EFFORT TO ADDRESS WVCs

#1 - INVEST IN THE COMMUNITY.

Find a local who is willing to dedicate energy and time to lead from within the community, and give this person the resources they need to thrive in the work.

#2 - PERFORM A COMPREHENSIVE SITUATION ASSESSMENT.

Take the time needed to research as much of the issue as possible, and meet with as many stakeholders as possible. A thorough situation assessment should provide your team with a holistic view of the issue.

#3 - SECURE FUNDING TO SUPPORT THE COLLABORATIVE PROCESS.

Process managers, collaborative leaders, facilitators, and liaisons can benefit multi-faceted landscape-scale conflicts because those individuals can weave all of the various stakeholders together.

#4 - COMPILE, ORGANIZE, AND SHARE EXISTING KNOWLEDGE.

Dedicate time to organize information about stakeholders, research the issue, explore possible solutions, and implement a plan to share this knowledge with the community.

#5 - GENERATE LOCAL SUPPORT.

Without local support, the potential for installing wildlife crossing structures could be drastically stymied, if not all together permanently disregarded.

#6 - WORK CLOSELY WITH LANDOWNERS AND RURAL COMMUNITY MEMBERS.

Communicate early and often with local landowners, rural citizens, and other local groups who have a strong voice in the community.

#7 - STRIVE TO BUILD A CULTURE OF TRUST.

Prioritize relationships over that of positional differences, be non-partisan, promote collaborative leadership, and look for opportunities to coordinate efforts among various stakeholders.

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