

# VISUALIZING CONNECTIVITY COLAB SUMMARY

*BEYOND SAFE PASSAGE: BUILDING BRIDGES FOR LANDSCAPE CONNECTIVITY*

*IN PARTNERSHIP WITH YELLOWSTONE TO YUKON CONSERVATION INITIATIVE, ECOLOGICAL DESIGN LAB & ARC SOLUTIONS*



ECO/  
LOGICAL  
DESIGN  
LAB



ARC  
NEW THINKING • NEW METHODS  
NEW MATERIALS • NEW SOLUTIONS





**TO:** Yellowstone to Yukon Conservation Initiative

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**RE:** Beyond Safe Passage: Building Bridges for Landscape Connectivity – Visualizing Connectivity CoLab

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# COLAB ATTENDEES

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21 participants were divided into 3 working teams, balanced in the range of expertise represented on each team, including, but not limited to: communications, engineering, ecology, planning policy, landscape architecture, road ecology and community engagement. The organizations represented included:

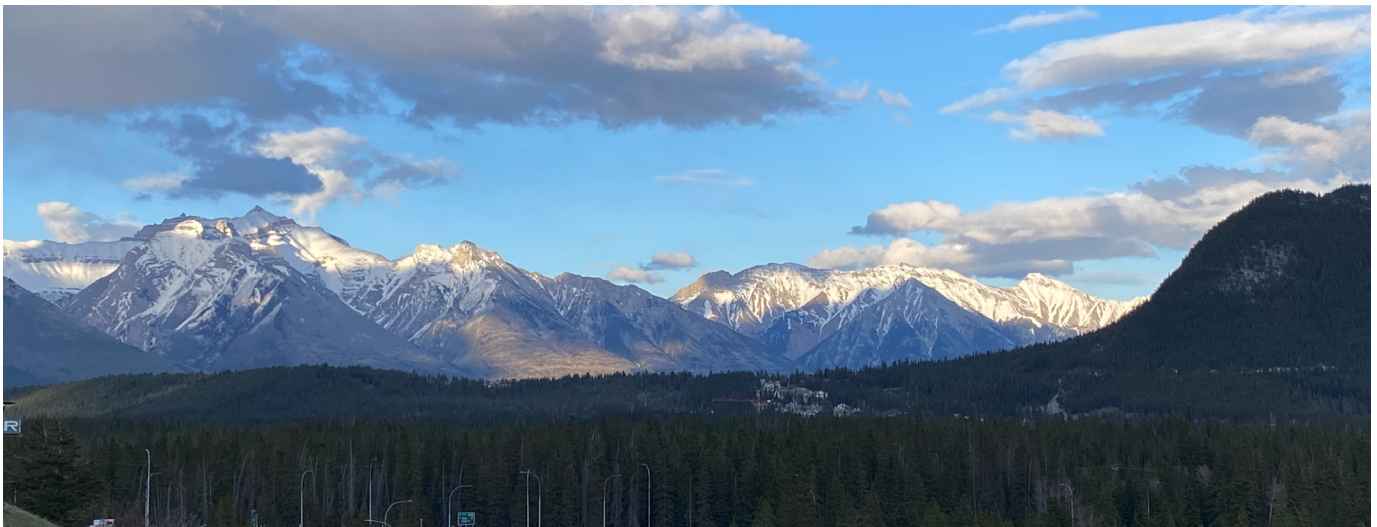
- » Ecological Design Lab @ *Toronto Metropolitan University*
- » Yellowstone to Yukon (Y2Y) (regional agency)
- » ARC Solutions
- » Harvard Graduate School of Design
- » Miistakis Institute (regional agency)
- » Montana State University - WTI
- » Parks Canada
- » Puente Strategies
- » Nature Conservancy of Canada (NCC)
- » Wildsight

The range of expertise included:

- » Communications specialists
- » Landscape architects and designers
- » Civil engineers and architects
- » Planning and policy experts
- » Conservation organizations and wildlife management agencies
- » Construction and industry representatives









# PURPOSE

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Connectivity is a complex social and ecological challenge. We know that engaging new allies and audiences in reconnecting our landscapes for wildlife, people and ecosystems is essential to short-term wins and long-term success. From planning to design to governance, we need new materials, new methods and new thinking to bridge gaps, crossroads and reconnect habitats. This begins with a compelling story, that takes us from science to design to implementation and action. So how do we tell effective, engaging, and compelling stories of connectivity — from the site to the landscape of Yellowstone to Yukon (Y2Y), from crossing structures to political will, from scientists to publics? During the CoLab, participants were asked to brainstorm, blue sky, dive in, and do it!

## Objectives

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- » Highlight wildlife infrastructure as a critical strategy for connecting protected areas supporting and meeting biodiversity conservation goals
- » Develop communications materials that support federal investment in the implementation of green infrastructure projects

## Priority Geographies

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Strategic locations were selected to amplify cross-border partnership and coordination on safe wildlife passage, and position Y2Y and partners as global leaders in this field to decision-makers using case studies and stories from Highways 1, 3, 93 and I-90. The map on the following page shows the strategic locations in the context of the larger Y2Y region.





# Yellowstone to Yukon Conservation Initiative

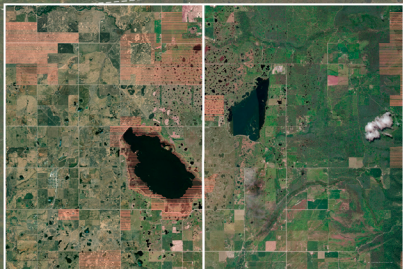
## CoLaboratory Focus Areas



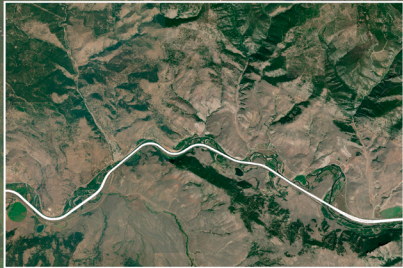
Hwy 1, Canmore/Bow Valley, Alberta



Hwy 3, Elk Valley, British Columbia



Hwy 93, Flathead Reservation, Montana



Hwy 90, Bearmouth, Montana



**Legend**

- Focus Highway
- Highway
- Protected Areas
- Urban Areas

**Project Status**

- Outreach
- Research
- Agreement
- Implementation
- Monitoring





## Guiding Questions

Participants were asked to consider the following guiding questions during the CoLab:

- » How do we make a **stronger case for safe passage** in the Y2Y region with policymakers?
- » What message or **visual elements** would position the Y2Y vision as the leading factor in improving wildlife connectivity?
- » What message and visuals convey a **compelling story** to government decision-makers on the connection of infrastructure and large landscape conservation?
- » What **species movement** could we focus on to capitalize on people's attention?
- » What is the best way to **showcase the projects** of the Y2Y region to decision-makers and prompt additional crossing structures?
- » What **communications materials/media** could best present the opportunity to work **across borders** to improve wildlife connectivity and human safety?
- » What **visual elements** would prompt a stronger commitment to infrastructure projects to take wildlife connectivity into account?

Groups spent the first day discussing the key considerations for visualization and communication strategies. Participants were encouraged to put pen to paper through sketching, drawing and visualizing ideas that emerged through discussion. The following section details these key considerations grouped by overarching themes.

While each group had a priority geography to focus on, communications and visualizations could focus around any scale that aligned with the narratives developed.

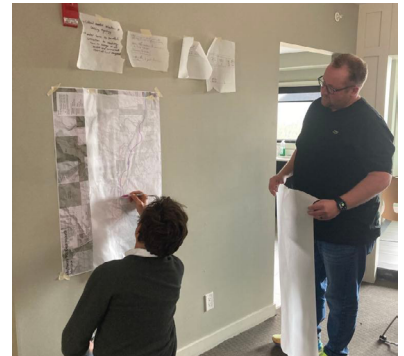
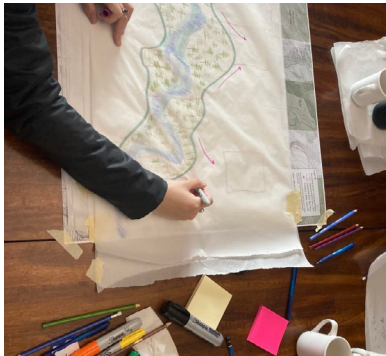






Figure 1 - The workshop took place in Banff National Park in Alberta, Canada. The park is home to a wide range of well studied wildlife crossing infrastructure.



# KEY CONSIDERATIONS & THEMES

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## Leading with Shared Values & Common Ground (people-to-people)

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How and why do we get people to care? Oftentimes, we focus on the problem and the barriers that separate us as people. Building relationships requires leading the conversation with what we value on a basic human level, and finding common socioecological denominators to build strategies around. For example, no one wants to see wildlife or their loved ones dead, no one wants to kill an animal, and we want to see healthy wildlife population.

Y2Y recently completed a poll that shows over 80%+ of Albertans support wildlife crossing infrastructure. However, the problem comes in translating this broad support into action. Based on this widespread support, wildlife crossings can be positioned as a unifying policy choice within a partisan political landscape. What messaging, visualization, or types of communication might translate this support into action? What is the role of the media, especially when it comes to communicating something as complex as “connectivity”?

The use of asset framing can serve as a useful basis to develop common values. This can mean leading with common values and solutions, rather than focusing solely on the problem.

Respectful engagement can create mutual respect amongst stakeholders, as well as build responsibility for what we collectively value. This may include a focus on health and wellness, as well as personalizing the message of “we need nature”. For example, framing nature as a “playground” – has negative connotations in that it is dismissive and offensive to sacred land that sustains us. This could be reframed as access to nature – equity, limitations, new audiences – and creating care for the land responsibly and respectfully.

Using clear and accessible language is central in working across publics, professionals, and decision makers. We know that heavy fact-driven reports do not work, why isn’t media used more effectively then? How do we communicate “connectivity?” What does it mean? Does the audience know? It is important to think about the political components to the language we are using (e.g., connectivity, biodiversity, climate change) and how this language needs to be scaled and customized for the selected audience.

## Different ways of knowing (people-to-people-to-species)

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We know that storytelling is important in engaging meaningfully with stakeholders, and groups explored how we can adopt different types of storytelling in our practice. The use of storytelling also requires us to consider, whose stories should be told versus those that are being told?

The use of charismatic and compelling stories of certain species can be used to build support and call for action, but how can we make legible the storylines of these species? For example, species pairs in the ecosystem can be used to communicate an intertwined and dependent system.

There are a multitude of voices, people, and species who experience the landscape through different lenses (different species, different people, colonial and Indigenous people). Participants explored what it could mean to bridge these diverse experiences. Some ideas included the use of a multisensorial approach (e.g., using soundscape or photovoice<sup>1</sup>) to show others how different species experience the landscape; or letting the viewer live through the experience of a different species and at the end, revealing whose point of view it was taken from (e.g., a bear).

Other questions that were explored included: What are the stories of the continental divide, and how can these stories be told? How do the stories challenge the ideas of what we consider to be “wild?”

<sup>1</sup> Photovoice is a flexible process that combines photography and storytelling, particularly in the context of marginalized communities.



## Increasing Visibility, Access to Nature and Anthropogenic Influences

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Groups discussed the tensions present between increasing the visibility of landscape connectivity infrastructure with the pressure of anthropogenic influences on wildlife. Thinking of wildlife crossing infrastructure, we explored whether increasing public access, visibility from the road, and opportunities for learning may help people feel connected with nature. However, mitigation would be required to ensure the safety of both humans and wildlife with any access or learning opportunities near crossing structures. For example, wildlife may use the crossing at certain times of day or year and the crossing may accommodate human use at other times, visual barriers may be used to separate species, and different scales/designs of crossings can be used to target certain species over others. In the absence of physical access to wildlife crossings, there could be opportunities to use virtual reality, webcams and clips of animals crossing to generate an audience (similar to bear webcams in Alaska).

Human access to wildlife corridors poses unique challenges. Bringing people closer to nature can foster a deeper connection but wildlife corridors typically discourage human access to reduce the impact on wildlife movement. There is an inherent paradox of intensity of use between people and wildlife. Groups looked to places like Los Angeles—where the movement to conserve open space for wildlife is parallel to movement of increased equitable access to nature. Oftentimes, especially in the Canadian context, wildlife corridors and crossings are spoken in terms of motor-safety for people, not for the safety of wildlife.

Increasing visibility of crossings can draw attention to infrastructure, however this must be balanced with traffic safety and the ecological function of the crossings. Distinctive and clearly displayed names may be able to develop a sense of identity, such as a bright red name on the crossing. Red can be used in these scenarios as it is less visible to certain species of animals, but is visible to humans. As well, prominent naming of infrastructure could entice private donors (similar to the Wallis-Annenberg crossing)?

Framing crossings (e.g. the crossing outside of Canmore that is under construction) as a gateway to the region's crossings could promote visibility, and centre animal welfare along the journey. For example, signage along the highway builds up and heightens attention on the crossings as one moves through the region. However, visual messaging must zoom out to fully observe the extent of human impact on animal movements. The human footprint (i.e. private lands, towns immediately adjacent to the highway, mining, topography) as well as natural "bottlenecks" create barriers for wildlife movement, traffic, recreation. For example, Elk Valley connects protected areas between Banff National Park and Glacier-Waterton International Peace Park, to "Reconnecting the Rockies" and provide an important passageway for wildlife. However, Highway 3 acts as an aggressive slice through the connected landscape.

## Engaging with Publics + Stakeholders

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There are many different audiences that have a vested interest in connecting landscapes and increasing road safety, and each group may respond to messaging differently. Groups identified that research shows the true roadblock is bureaucracy. The relationship policymakers have to wildlife and conservation at the state and federal levels often acts as a barrier to taking meaningful action on these fronts. Resistance also comes from senior-level civil servants, and these are key stakeholders who must be engaged. At the same time, it was acknowledged that stronger public support would make convincing these civil servants easier. Tools, such as technical standards for engineering, can be developed since these new infrastructures are not present in current manuals used by civil servants and consultants. Expanding the view of stakeholders and publics can be done through political activity mapping.

The range of stakeholders and publics identified included:

- » First Nations Chiefs & Band councils, traditional/community government
- » Federal, provincial, and municipal governments/politicians
- » Senior-level civil servants, including engineers, planners, ecologists, project managers, transportation professionals, and finance departments
- » Professional Associations and Conferences
- » Insurance companies
- » Organizations that produce professional standards and guidelines (e.g. Transportation Association of Canada (TAC))
- » ATV, mountain biking, hiking, hunting, and other outdoors activity clubs or associations
- » Conservationists, naturalists, environmental activists
- » Children and students, ranging from youth to post-secondary students
- » Indigenous people



## Indigenous Leadership

Groups acknowledged and discussed the importance of leadership, partnership, and relationship building with Indigenous communities is important in developing both landscape connectivity initiatives, as well as communication and visualization techniques. Groups explored how increasing visibility of connectivity initiatives through naming and identity work in tandem with the ongoing process of Reconciliation with Canada's Indigenous peoples? Could the crossings visually express Reconciliation in some way?

We looked to *The People's Way* as an example of Indigenous led advocacy for and activation of this infrastructure. Significant wildlife crossings are integrated through reserve land as part of Phase 2 of this project.

## Arguments & Strategies

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Strategies may include:

- » **Personalizing the problem:** (e.g., wildlife family trying to get home, just as we as humans do) to engage people in solutions
- » **Road safety:** Reduced collisions and less roadkill
- » **Economic argument:** It can cost less to address the problem now than to defer it to future generations (costs of collisions, ecosystem services, etc)
- » **Adaptability to climate change:** Species have more options as the climate changes to adapt to short and long term changes in weather/climate
- » **Species health:** Increases genetic diversity and longevity of some target species

## Species and Animal Stories

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The Bear has often been used as charismatic creature, and can tell the story of infrastructure. The Bison is also an enigmatic creature (higher human/Indigenous connection), which may speak more to a story of policy. This story includes a complex history of stolen treaty lands, returned lands of bison range, regulation of bison as livestock, overpopulation of Yellowstone bison populations. There is a potential to connect bison habitat and tribal lands as a form of conservation and reconciliation.

# Visualizing Movement

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Visualizing movement depends on the species and types of movement. The categories below include considerations for the various movements that can be visualized within landscape connectivity communications.

## *Animal*

- » **Wandering movement:** Movement in swaths or wandering lines rather than linear
- » **Elevation:** Wider swaths of corridors (for hooved animals traveling in herds, for example) are more possible as underpasses than overpasses
- » **Scale:** Bison range represents a much larger scale contraction over time and cannot be discussed isolated from indigenous people's land contraction, as their migration patterns are not as reliant on "wildlife corridors," but the character of the bison could be more of a cultural pull for an audience
- » **Range:** Animal ranges have responded to human presence and climate change by shrinking and moving into unconventional habitats (ex: grizzlies pushed out of prairie habitat)

## *Human*

- » **Linear Movement:** Humans use more linear movement and "cutting" or "scarring" the landscape than animal movement (If human movement/infrastructure is "Step 1", how can we create a new layer of cuts/scars/fractures of wildlife corridors in the landscape that are chosen to fracture human infrastructure, as "Step 2"?)
- » **Patchwork:** Agriculture and recreation become more patchy movements
- » **Worldview:** Indigenous people and western colonizers have different concepts of land, stewardship and ownership

## *Infrastructure*

- » **Intersections:** There are many intersections with juxtaposed landscapes, for example wetlands, fences, roads and railway.
- » **Alignment:** Do wildlife corridors have to be linear/have to either run directly beside or cut perpendicularly through infrastructure? How can this alignment be reimaged?
- » **Relationships:** What are the relationships between water landscapes in this area (pothole wetlands, rivers and creeks) and immediately adjacent linear infrastructure?



### ***“Natural” features***

- » **Movement of Water:** Perhaps the crossings should be ephemeral and oscillate in the same way that waterways and wetlands have oscillated throughout history or how they alter throughout the year, acknowledging that crossing infrastructure must be able to adapt to these changing landscapes
- » **Active River Area:** Scientists call the area where the river change its course over time the Active River Area. This is a sensitive area for conservation since natural process of erosion create key habitats for all kind of wildlife (spawning grounds, nesting grounds for bank swallow and other ground dwelling species of vertebrates and invertebrates). The idea of a highway standing (perched) over an Active River Area rather than a single bridge over a watercourse is a fantastic way to engineer future roads and preventing washed out ... greater risk of storm weather with global climate change
  - » Consider changing water levels across a single year; across 50 years

### ***Animal Eye’s View***

- » **Scale:** The ideal crossing may look different across different scales and for different species:
  - » Single grizzly bear mindset
  - » Herd bison mindset
  - » Lingenpolter’s year long attempt to cross highway I-90 to reach the mountains
- » **Landscape Features:** What landscape features attract animals to cross?
  - » Mountains
  - » Water

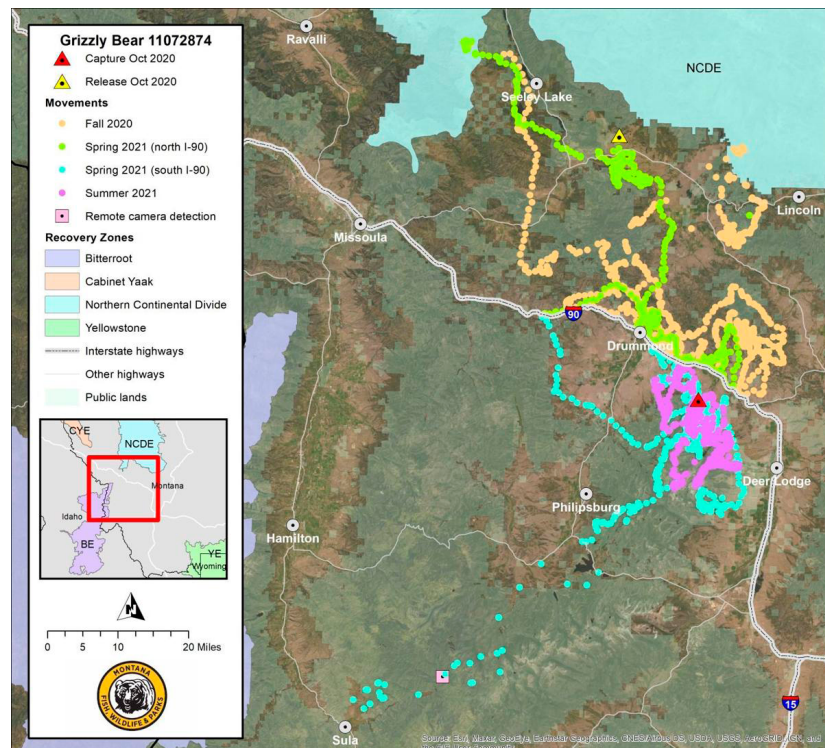


Figure 2 - The movements of Grizzly Bear 11072874 (Ligenpolter) as they attempt to cross Highway I-90

# STRATEGIES FOR PRIORITY GEOGRAPHIES

## Highway 1 // Trans Canada Highway

**Group Members:** Grant Pearsell, Joel Bonin, Kevin Robishaw, Matt Bell, Sarah Palmer, Trevor Kinley, Victoria Blake

The “Highway 1” CoLab working group focused on developing strategies for increasing public, professional, and political support for - and meaningful action toward more - animal road crossings in the Yellowstone-to-Yukon Conservation Initiative region. In particular, the group focused on ideas for more effective communication and visualization for road crossings in the Canmore/Bow Valley region of Alberta, just east of Banff National Park and where construction of a new road crossing just broke ground.

The team focused on two target audiences, with the discussion coalescing around: 1) recommendations for improving support and implementation of road crossings within professional (i.e. senior civil servants, engineers, planners, transportation professionals, etc) and political circles; and 2) increasing support among the general public (with the idea that increased support among the general public would, in turn, increase support for and action toward road crossings within professional/political circles). We aimed to emphasize the journey to all audiences as a unifying message and shared experience. The journey from urban centers to more “wild” areas (i.e. Banff NP), the journey of animals across landscapes and highways. How can we use the journey as a shared experience within calls to action amongst the public, professionals and policymakers?

The presentation to the full group centered on these themes and is summarized in the following pages.

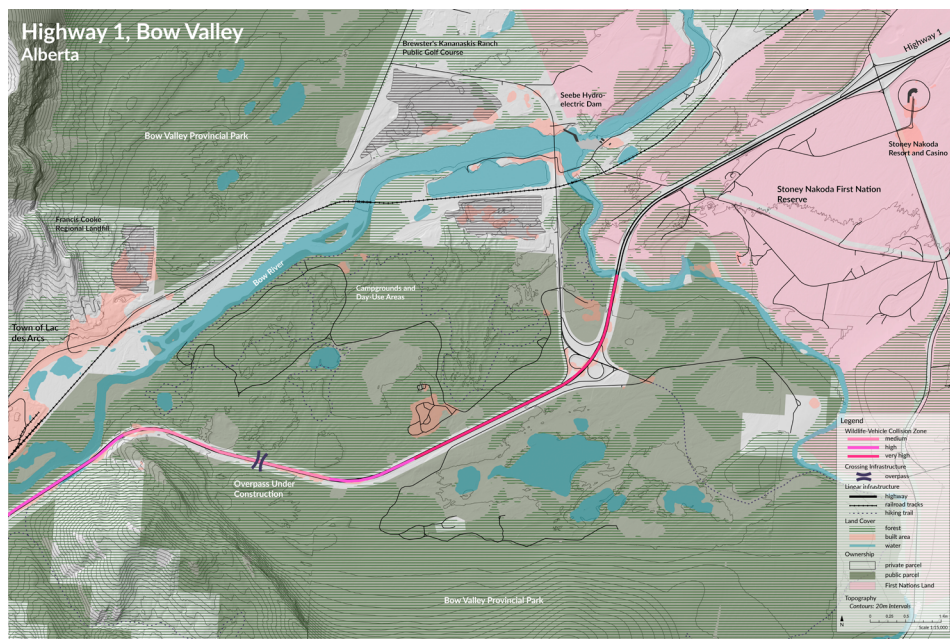


Figure 3 - The priority geography selected along Highway 1 is located in the Bow Valley near Canmore, Alberta.

## Professional + Political

The messaging toward professional and political leaders framed the implementation of wildlife crossings as a journey, with Y2Y and their partner organizations acting as a key companions on the journey alongside professional and political stakeholders/decision-makers. With Y2Y as a companion, they can ensure feedback between all moving parts, relationship building, and facilitate collaboration to ultimately expedite the implementation of wildlife crossing infrastructure.

For complex implementation such as landscape connectivity, there needs to be a balance between strategic and tactical thinking and between degrees of leadership. This is a delicate balance that leaders and companions must monitor carefully on a deliberate and ongoing basis.

The journey begins with strategy development and continues through the development of concepts, the design of specific infrastructure, and through to the building and construction and operation.

### Strategy - Concept - Design - Build - Operate

The group identified key activities to help speed up the process, reduce snags, and help decision-makers move quickly when funding becomes available

**Broad:** a guiding vision with priority geographies that can enact the most change

**Technical:** decision support tools, technical guidelines and standards. Ultimately aiming to help professionals develop designs and strategies that draw from credible manuals/standards to minimize personal/professional liability concerns.

At each step along the journey, achievements should be celebrated to build momentum, emphasize pride in work, and create further awareness of exemplary projects and tools

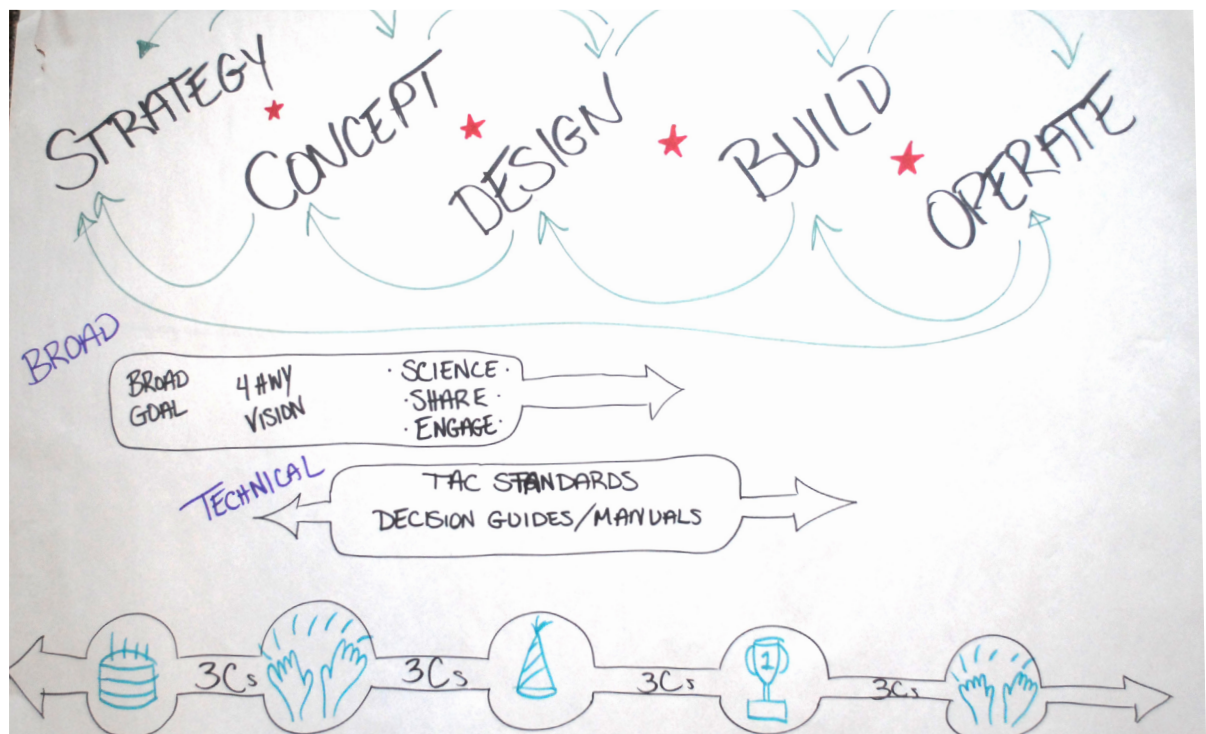


Figure 4 - Messaging to professional and political leaders focuses on the role of Y2Y in advancing support for wildlife crossing infrastructure. Y2Y can maintain momentum and provide resources to move projects from strategy to operation, while considering the larger context of the landscape.



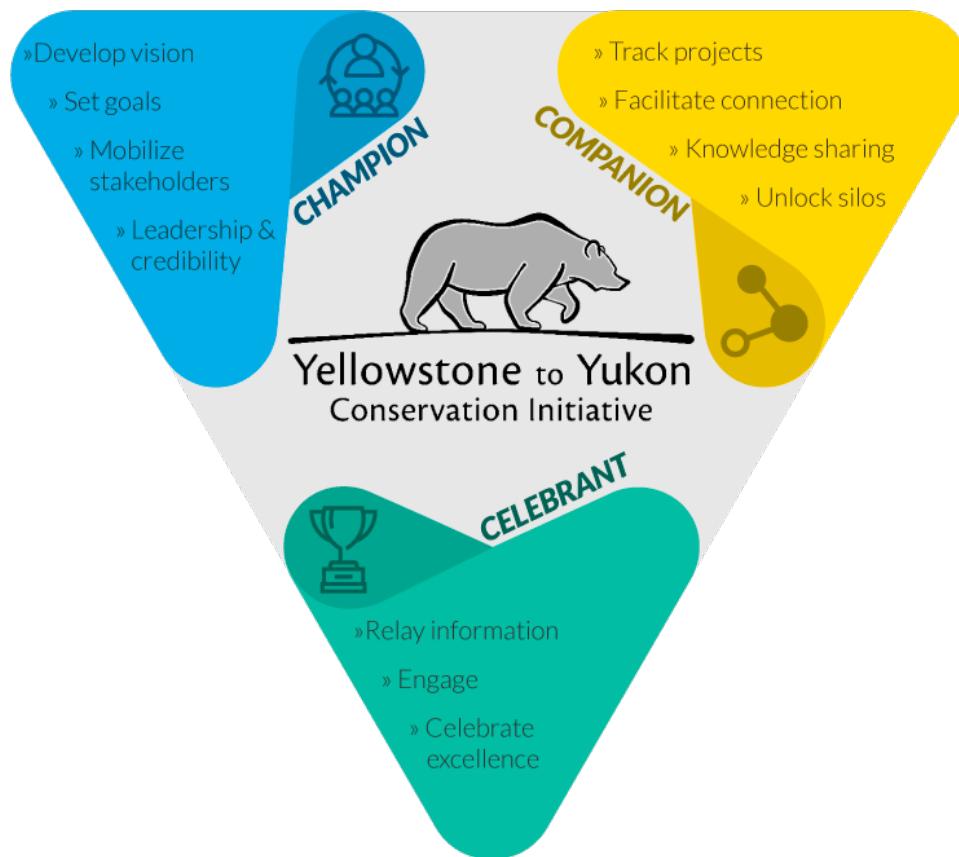


Figure 5 - Y2Y is envisioned as acting as a Companion, Champion and Celebrant. Clearly positioning the role of the organization to professional and political leaders can assist in cultivating new relationships across silos.

The Y2Y team, along with their partner organizations, has three roles: Companion, Champion, and Celebrant.

- » As a **Companion**, Y2Y can share knowledge across silos, track progress, and build relationships across boundaries
- » As a **Champion**, Y2Y can set a coordinated vision, mobilize stakeholders and provide leadership and credibility
- » As a **Celebrant**, Y2Y can build momentum through engaging and celebrating key stakeholders, promoting excellence within strategies, concepts, designs, projects and operations, and relaying key information between stakeholders.



## Public

The presentation also focused on how to increase public support for wildlife crossing infrastructure. This portion of the presentation was presented as a journey, moving from Calgary (used as an example of the urban population centers in the Y2Y region more broadly) to the new crossing currently under construction in the Canmore/Bow Valley area.

### Pre-Trip:

This “journey” starts before the trip begins. Proposed “Pre-Trip” activities included:

- » Social media
  - » Using web pages, Tik-Tok, Instagram, etc, to showcase webcams of animal movement, bridge construction process, etc.
  - » Wildlife-Vehicle Collision stats (count, hotspots)
  - » Stories of wildlife connectivity
  - » Individual animal/species stories
  - » Leave-no-trace and wilderness ethics
- » In urban parks
  - » Small wildlife crossings or a crossing-themed playground could build knowledge of crossings linked in terms of graphics, form, etc. to the crossings in Banff NP.
  - » A map showing the connections with crossings in the broader region.
  - » Interactive/guided tours, info on animal behavior
- » Education
  - » Animal road crossings incorporated into official school curriculum, similarly to how wetlands have been
  - » Teachers might regularly show students online dashboards or webcams with live updates on animals moving through or over the crossing infrastructure
  - » Barrier effect education (genetic diversity, mutations)
  - » Fields trips
- » Engagement with novel audiences/through novel means
  - » Car insurance bills for people within a certain region might include a note indicating money saved thanks to crossings (and also indicate the insurance companies support for wildlife)
  - » Engagement with truckers who drive Hwy 1 (perhaps through citizen science)
  - » Print info on bus or shuttle passes.



Figure 6 - Visualizations showing the barrier effect of the highway and the benefits to wildlife when mitigation measures are in place can work to communicate the value of crossing infrastructure.

## During Trip:

Ideas for “During Trip” activities - i.e. messaging along the Trans-Canada Highway - include:

- » Some form of gateway to the Y2Y region
  - » Map showing all that is in region
  - » Guided tour
- » Billboards (or some type of road signage)
  - » Contain simple communication of key info
  - » Contain animal facts and journey
  - » Take advantage of allowance for billboards in Alberta outside of park
- » Interactive media
  - » Audio guide (CD/mp3/QR code) or radio channel that travelers can listen to as they approach and pass under the crossings
- » Signage on crossing structures themselves
  - » Such signage might build off First Nations Reconciliation efforts and stand in visual contrast to the crossing itself to draw attention to the infrastructure
- » Pull-outs by crossings
  - » To encourage stopping, pull-outs could contain restrooms and “free wifi” signs (though “free wifi” actually stands for “Free Wildlife Information for Individuals;” actual wifi could also be provided)
  - » Info at pull-outs might include:
    - » What, where, why, and how crossings are built
    - » Info intended for different age levels
    - » Info on Wildlife-Vehicle Collisions and safety
    - » Info on connectivity and barrier effects (genetic diversity and mutations)



Figure 7 - Visually connecting the large wildlife crossing infrastructure along highways to small urban parks can bring folks closer to nature and act as an accessible educational resource.

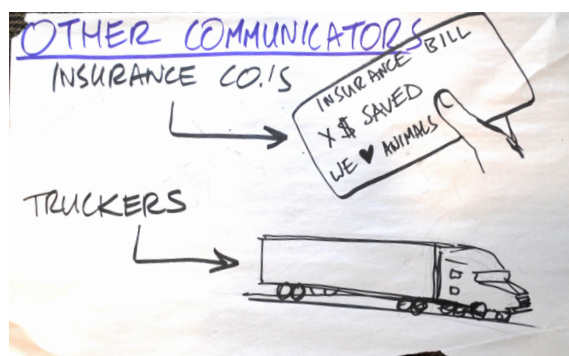


Figure 8 - Translating the monetary value of wildlife crossing infrastructure directly to citizens can build awareness and support for investments.



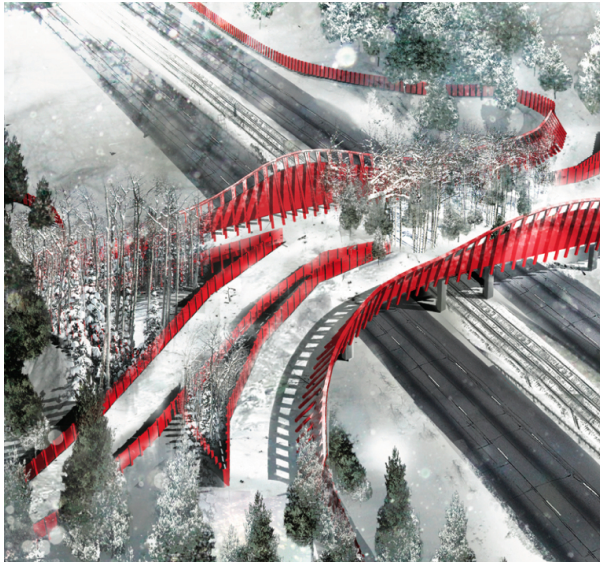


Figure 9 - Using red to highlight crossing structures can attract visual attention from road users, while not disturbing wildlife using the structures. (Image Credit: Janet Rosenberg & Studio Inc.)



Figure 10 - Providing opportunities to feature prominent donors may encourage financial support from non-governmental avenues. (Image Credit: Living Habitats LLC / National Wildlife Federation)

Additional ideas presented in the Pin-Up included:

- » Additional mitigation efforts around the wildlife crossing currently under construction in the Lac des Arcs/Canmore region (i.e. additional crossing infrastructure of various sizes)
- » The **“Lonely Bachelor” narrative** was identified as a type of narrative that might be particularly effective in generating support for crossings.
  - » This narrative entails highlighting the determined efforts of a particular individual animal to find a mate and the way that that animal’s concerted efforts are frustrated by road barriers. The story/visualization of the bear Lingenpolter trying to cross I-90 some 40+ times is an example.
  - » This narrative is effective, because it shows that crossing attempts are not just random events driven by chance or curiosity; they are instead intentional, concerted efforts essential for survival. People can perhaps relate to this drive for a partner.
- » **Creating the Story:** How might we create a story which might be picked up by the media? Ideas included:
  - » Creating opportunities to follow along with crossing construction
  - » Tapping into seasonal behavior of wildlife (e.g. elk rutting around the new crossing in the Fall).
- » **Telling/ visualizing broader story of connectivity.** Ideas included:
  - » Visual showing zoom out from individual or group of animals (e.g. bears) on a single overpass crossing to a landscape-scale image of that animal’s larger movements through the landscape.
  - » Ability to follow the journey of a particular individual animal through an online app to show that crossings mean large-scale connectivity.



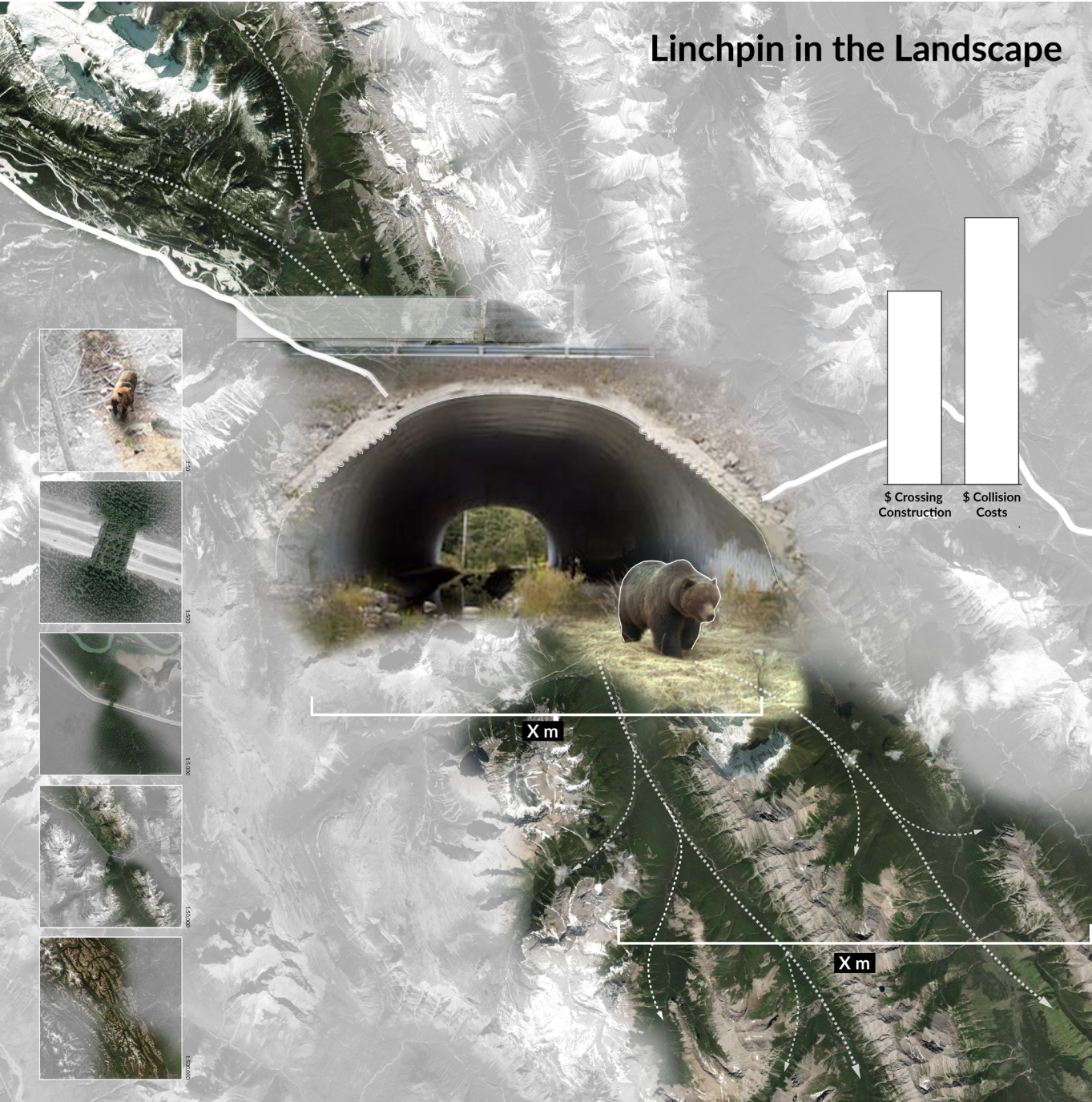


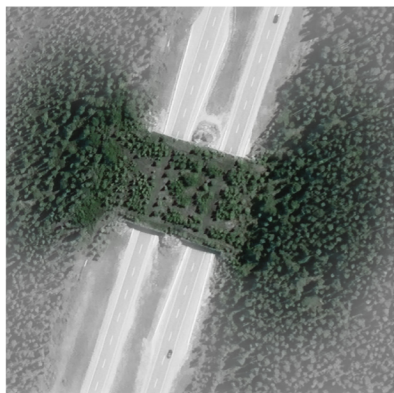
Figure 11 - Using a narrative of a compelling and charismatic animal, such as a bear, can leverage shared experiences between humans and nature. The “Lonely Bachelor” is one such narrative that highlights the determined efforts of a particular animal (such as Grizzly Bear 11072874 a.k.a. Ligenpolter) trying to find a mate, while having to overcome road barriers (top). The magnitude of the scale of the barriers (bottom) further emphasizes the need for crossing infrastructure.



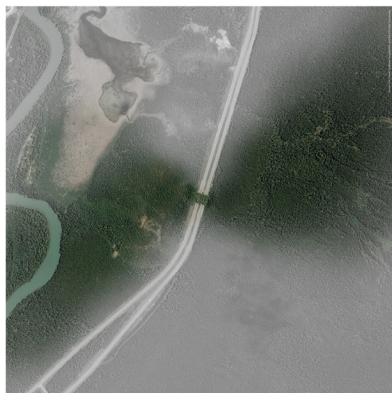
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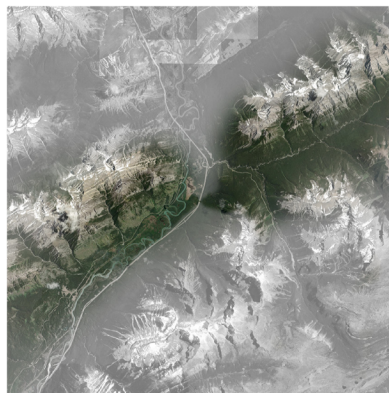
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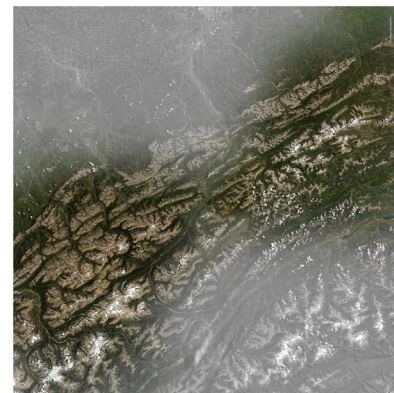


Figure 12 - The visualization considers different scales, inspired by the Eames fim, "Power of 10". The series shows images at varying scales, from a single animal, to a single overpass crossing, to a landscape-scale image of an animal's larger movements through the landscape

# STRATEGIES FOR PRIORITY GEOGRAPHIES

## Highways I-90 and I-93 // USA

**Group Members:** Aylise Cooke, Bailey Repp, Jenna Wu, Jeremy Guth, Marta Brocki, Robert Petty, Robert Rock

The US Highways groups discussed one charismatic and one enigmatic creature in relation to I-90 and I-93, the grizzly bear and the bison. The grizzly bear population's gene flow in this region rely on wandering males that must cross both highways at multiple points. The bison's range is much more heavily tied to the Blackfoot Indian Reservation land in Montana, a cultural icon of the Blackfeet Nation itself and of a landscape that has been cut into smaller and smaller pieces, in some places directly by I-90 infrastructure. This group focused on vision planning and illustrative "landscape possibility" as the primary communication tool, using perspective, plan, and section to visualize potential products of policy change and increased connectivity.

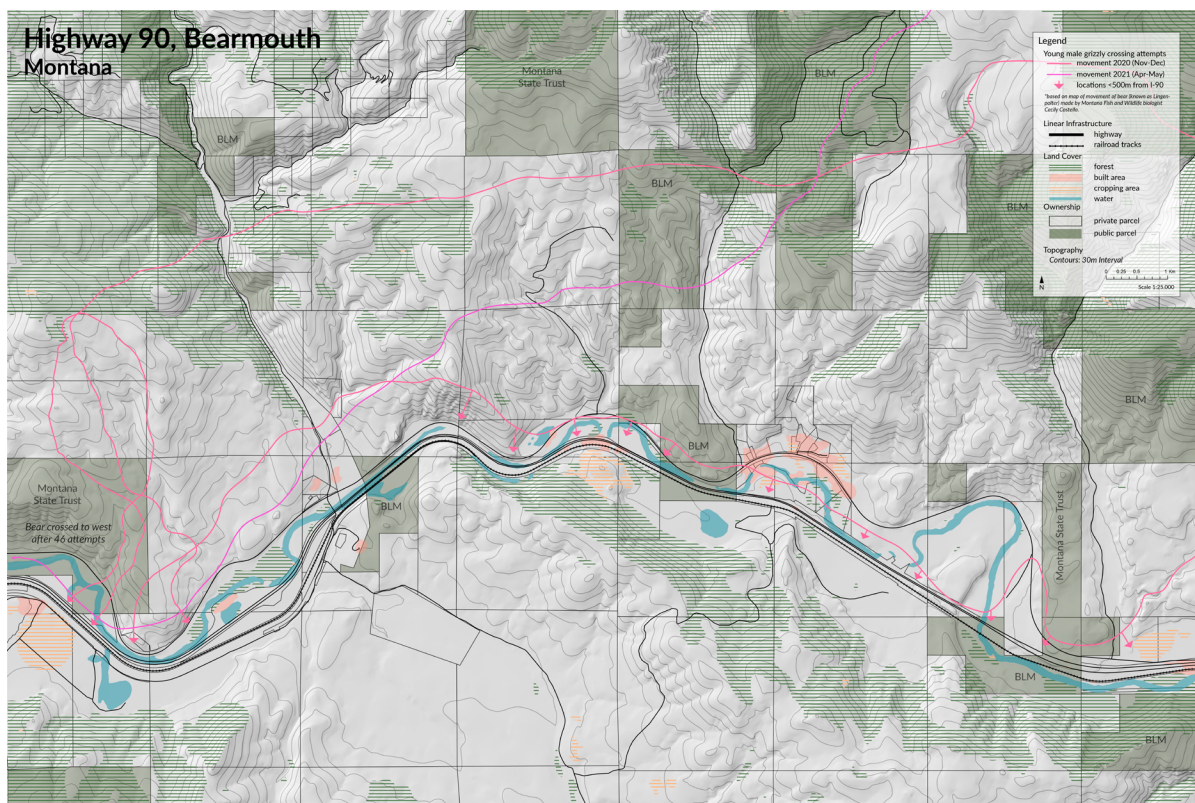


Figure 13 - The I-90 priority geography was considered by this group. This site was identified by Y2Y team as a significant barrier to wildlife connectivity across the Y2Y region.



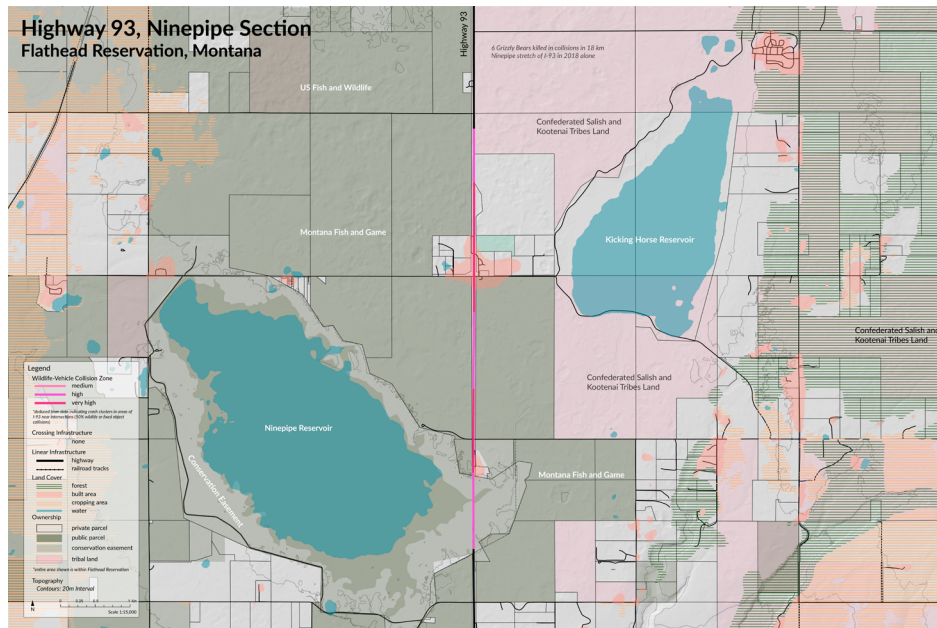


Figure 14 - The I-93 priority geography was considered by this group. This site was identified by Y2Y team as a significant barrier to wildlife connectivity across the Y2Y region and has the unique terrain of pothole wetlands.

### Storyboard: Vision Design Proposal

**1. Evolution:** Drawings of landscape/land ownership evolution

(river paths, pothole wetlands, Blackfeet Indian Reservation, highways)

**2. Communication:** Signage indicating charismatic/enigmatic creatures, story of water as natural highway

**3. Vision:** Layers upon layers of plan drawings

Discussion on the physically landed patches and “mosaics” that occur on the map as a result of “natural” and human features

- » More specifically, as water relates to highways I-90 and I-93
- » Rivers have carved the path in landscape to accommodate highway infrastructure
- » Parallel nature of hydrological features and highways

Vision Master Plan Focus Points:

- » Healing infrastructure for reconnecting the Y2Y landscape
- » Compelling story to government decision makers
- » Reimagining the potential of the highway as an opportunity for connectivity rather than a barrier to it
- » Grizzly Crossing / Bison Underpass / People’s Way highway signs

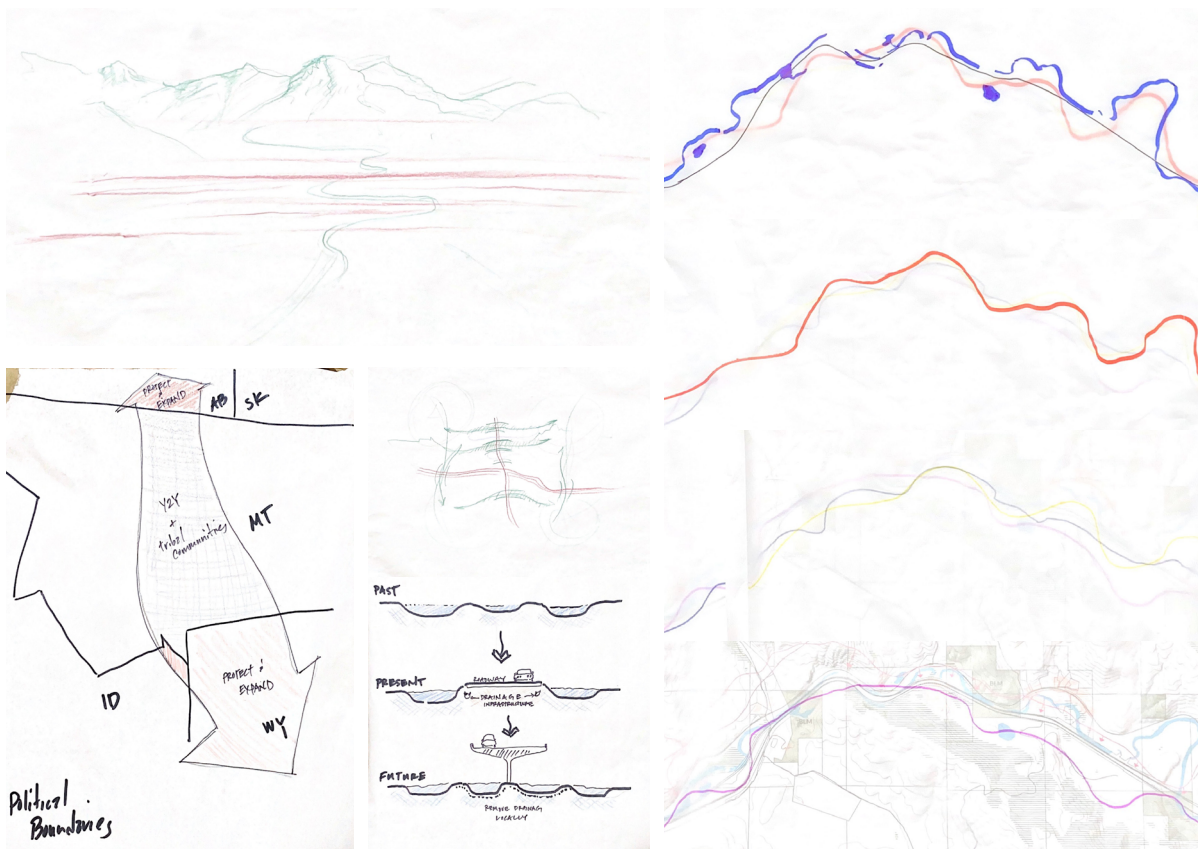


Figure 15 - Outcomes of the design sprint the group engaged with the consider the various lenses, contexts and stakeholders to barriers to movement (left). Visualization exercise on the dynamic nature of aquatic ecosystems and the relationship of the river to the highway (right). These traces communicate the role of the river as a natural highway for wildlife in this region and how it is restricted by the hard infrastructure of the road.



## 1. People's Way (Highway I-93)

- » Water as life force / organizing principle
- » As much about cultural reconciliation as ecological connectivity & environmental restoration
- » Bison as enigmatic species & culturally significant
- » Considering the power of reconnecting pothole wetlands and existing riparian corridors to the southwest
- » Illustrating a flip book of past wetland to current highway cut with drainage infrastructure to future removal of local drainage/reconnecting wetlands/ lifting the highway over the wetland completely

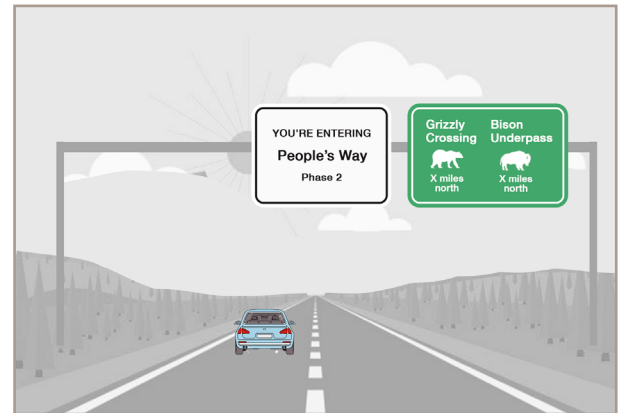


Figure 16 - Draft design of the "Peoples Way" signage designed by Bailey Repp, representative of an opportunity to reimagine the road as infrastructure of wildlife connection rather than a barrier to movement.

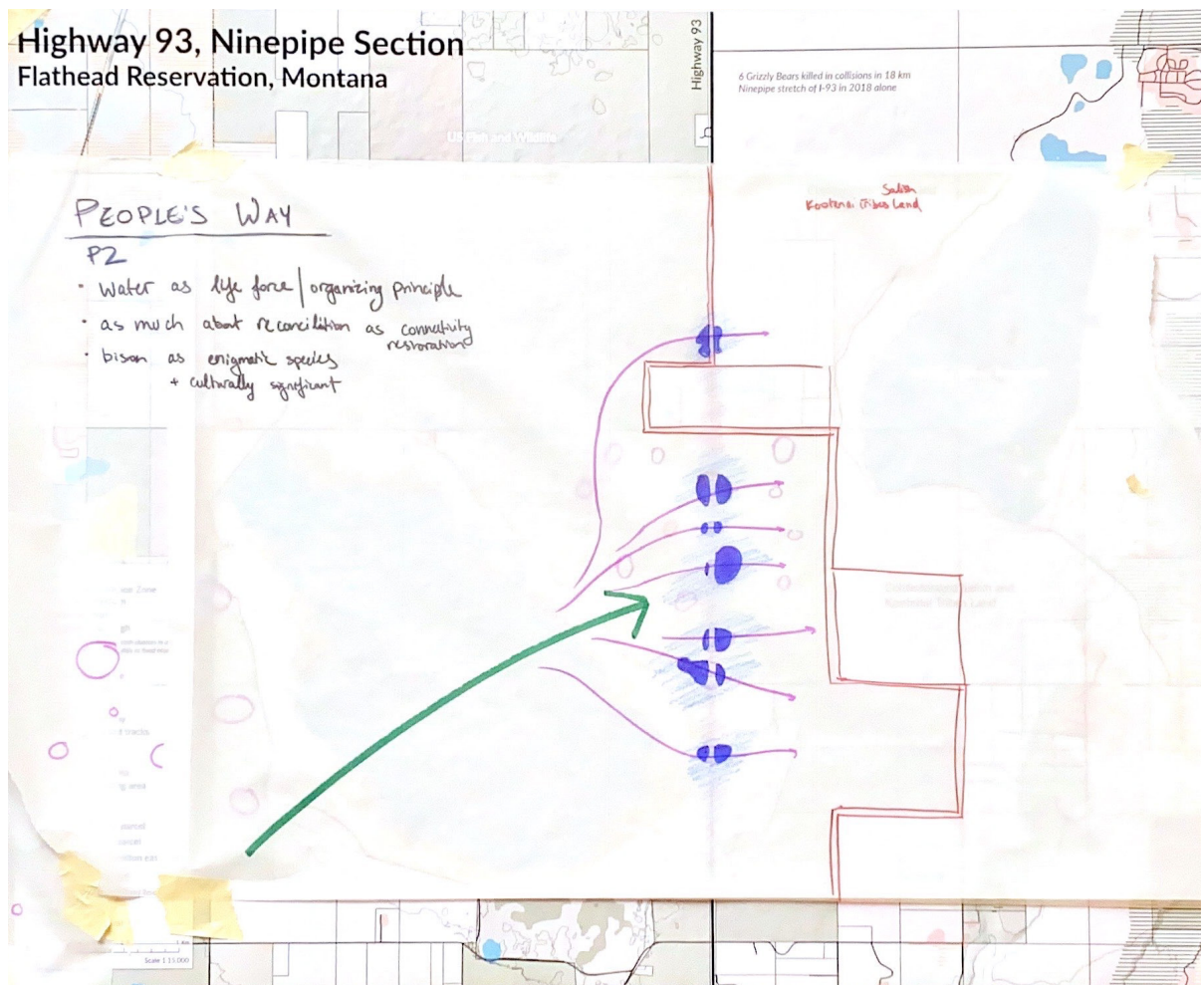


Figure 17 - Visualization of movement of bison across the specified geography of I-93 and the potential to heal the landscape with innovative infrastructure to reconnect where the road had severed pothole lakes and wetlands.



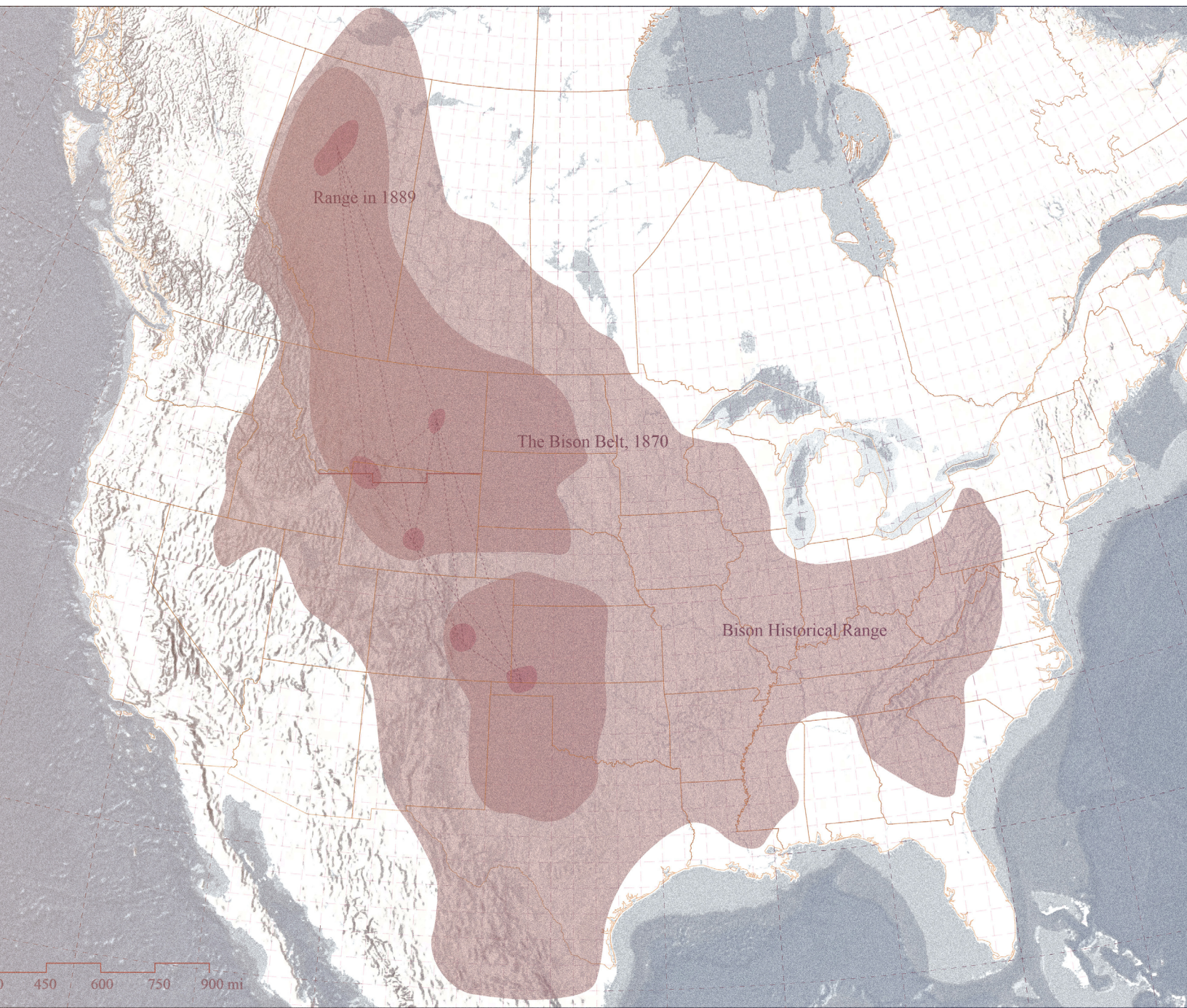


Figure 18 - The Bison Story - Landscape & Tribal Land Contraction



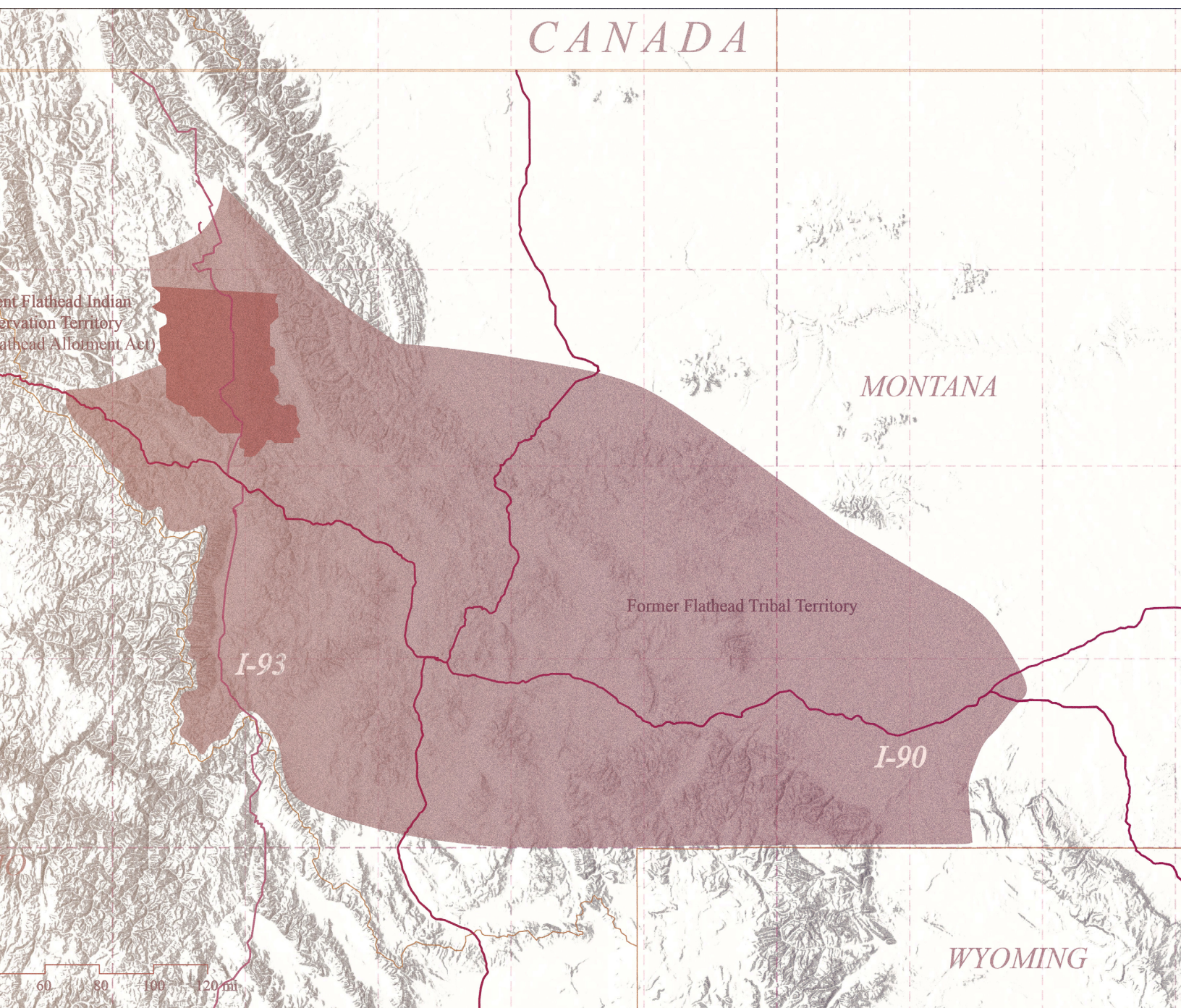


Figure 19 - The Bison Story - Landscape & Tribal Land Contraction

## 2. Bearmouth Scenic Wildway (Highway I-90)

At its core, the idea of designating a segment of roadway passing through an ecologically rich area as a "Wildway" is a strategy that aims to embed an ethos of coexistence in our collective understanding of transportation corridors. In much the same spirit as the FHWA's America's Scenic Byways, where "... Byways are gateways to adventures where no two experiences are the same..." these Wildway corridors aim to go beyond episodic signage and individual crossing structures instead encompassing a broader series of connectivity measures and embracing a unique experiential quality defined by the natural environment the traveler is a visitor to. The Wildway includes a range of context-specific communications and infrastructural elements including (1) signage, (2) wildlife crossing infrastructure, and (3) design measures that prioritize the named Wildway Corridor over the individual roadway or the surrounding landscape.

Signage may indicate upcoming wildlife crossing infrastructure, the presence of wildlife in the area, and create a sense of place /identity along a corridor. Wildlife crossing infrastructure creates functional connections across the roadway to prevent wildlife-vehicle collisions and facilitate the movement of wildlife through habitats fragmented by roads. The additional design measures aim at restoring key natural areas adjacent to the roadway and begin to thread the tapestry of individual infrastructure with critical habitat areas. Taken as a whole, the named Wildway Corridor has the potential to integrate the roadway as an element within a successful corridor and not an impediment to it.

- » Presenting an overarching vision & communication tool via greenway drawing proposals
- » Strategic planning that's scalable/visual
- » Roadmap for protection/acquisition
  - » Template for both aquatic & terrestrial habitat restoration, even though driven by present river-highway intersection (i.e. driven by water)
- » Master plan for strategic connections & infrastructure planning & refurbishment
- » Source point for connective threads beyond the wildway/greenway
- » Vision plan provides a tangible platform for research & feedback

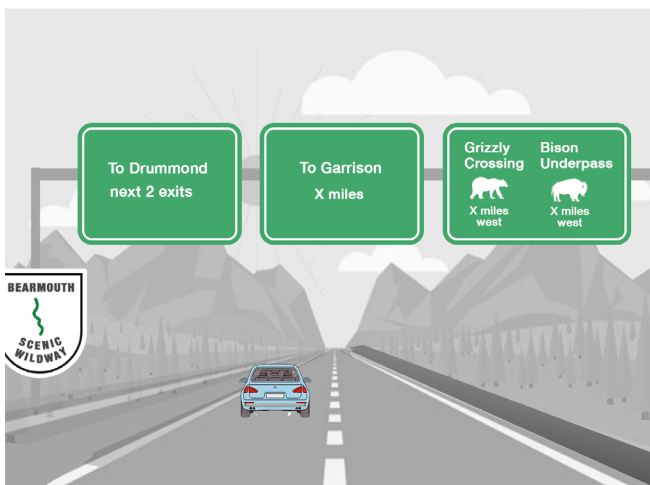


Figure 20 - Design of the Peoples Way signage designed by Bailey Repp, representative of an opportunity to reimagine the road as infrastructure of wildlife connection rather than a barrier to movement.

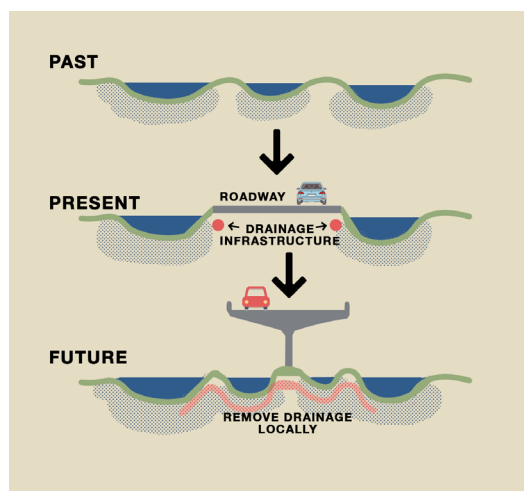


Figure 21 - Designs to reconnect pothole lakes through healing infrastructure that would prioritize limited disruption of the geographies draining and movement corridors.



## BEARMOUTH SCENIC WILDWAY

- overarching vision + communication tool
- strategic planning that's scalable
- roadmap for protection/acquisition
- template for aquatic + terrestrial habitat restoration
- master plan for strategic connections + infrastructure planning + refurbishment
- save point for connection threads beyond wildway
- platform for research + feedback



Figure 22 - Bearmouth Scenic Wildway represents an overarching vision and communication tool that offers a roadmap to protection and a template for aquatic and terrestrial habitat restoration.

# STRATEGIES FOR PRIORITY GEOGRAPHIES

## Highway 3

**Group Members:** Chris Reed, Kelly Zenkewich, Nadia Gonzalez, Nina-Marie Lister, Renee Callahan, Sabrina Careri, Tracy Lee

The Elk Valley connects protected areas between Banff National Park and Glacier-Waterton International Peace Park, providing an important passageway for wildlife. However, Highway 3 acts as an aggressive separator through this connected landscape. The Highway 3 Team focused primarily on different forms of storytelling about Highway 3, through visualization. This was guided by an exploration and analysis of considering *whose and/or which stories are and/or should be told?* In their exploration, the team developed a series of working guiding principles toward future visualization:

- » Common ground
- » Accessible language
- » Respectful engagement
- » The inclusion of multiple voices

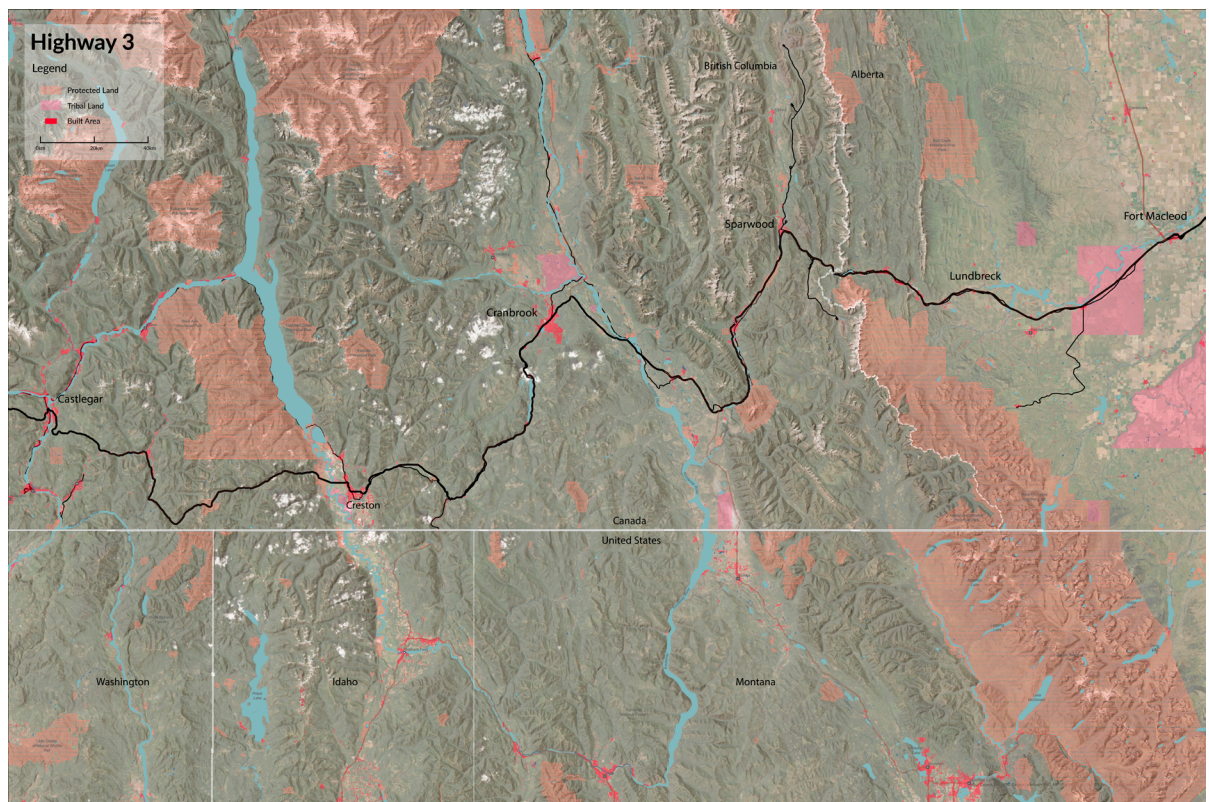


Figure 23 - The priority geography along Highway 3 in the Elk Valley was considered by this group. This site was identified by Y2Y team as a significant barrier to wildlife connectivity across the Y2Y region.





Leading conversation with shared values and common ground between people as a principle, was developed out of ideas surrounding the question, how and why do we get people to care? To which the team decided, was through focusing on what we value on a more basic human-level. Often-times, people tend to focus on barriers that separate us from each other, especially when engaging with communities that have been “traditionally disadvantaged.” Instead, the group suggested that future visualization should utilize common socio-economic denominators (e.g., no one wants to see their loved ones dead, no one wants to kill an animal, everyone wants to see a healthy wild-life population). In this form of “Asset Framing,” the conversation surrounding wildlife connectivity instead leads with common values and the solution - wildlife crossings - rather than leading with a focus on the problem.

Utilizing accessible language was developed out of ideas of personalizing the message of “we all need nature.” Here, the team considered what the role of media would be, especially in communicating something as complex as “connectivity.” As a group, the team realized that there are always political components to the language we are using (e.g., connectivity, biodiversity, climate change, etc.). This language needs to be scaled and customized to the selected audience. We cannot assume that the audience will always know what is meant by “connectivity.”

Maintaining respectful engagement is closely tied to the former key principles in that it concerns creating mutual respect and responsibility for what we value. Once more, through Asset Framing, visualization and conversations surrounding wildlife connectivity should villainize the problem. For example, a wildlife family trying to get home, just as we, as humans, do everyday.

The inclusion of multiple voices goes beyond human-to-human relations, and includes experiencing the landscape through different lenses, especially for those whose stories are often neglected. This may include, but is not limited to, stories from a Native or Indigenous point of view, others who identify as part of the BIPOC community, or even from the perspective of a different species. Especially in the case of the latter, the team pondered how to make the storylines of species legible, and how to adopt different types of storytelling in practice.

In the case of the Highway 3 team, there was focus on investigating the stories of the continental divide, and with that, whose / which stories should be told versus those that are being told. This part of the discussion focused primarily on the realization of Indigenous name-placing and political active mapping, and how each of these stories may challenge the ideas of what we consider to be “wild.”

## Storyboard: Design Proposal

The Highway 3 team chose to portray a visual and multi-sensorial experience for the final pin-up, in hopes of bringing attention to two important perspectives that are not frequently represented in media and/or in other forms of communication around wildlife corridors - that of the eagle and the grizzly bear. The team began with a 'fly-through' via Google Earth, above the clouds of Highway 3, and transitioned to the ground, exploring the surrounding landscape of the highway, which is both beautiful and 'wild', but also highly impacted by anthropogenic forces. The group's portrayal was based on the four aforementioned guiding principles.

This powerful form of story-telling acts as an example of how to proceed with engaging the key audience, in this case those who fund from far outside the region. The aim is to attract interest for funding, by developing an emotional draw through the replication of on-the-ground experiences as part of a much needed set of continentally-significant wildlife corridors. This choice of representation was also supported by the group's finding that wildlife corridors and crossings, especially in a Canadian context, are spoken in terms of motor-safety for people, not for the safety and movement of wildlife.



*"We all want to get where we are going safely. So do animals. Governments are not prioritizing safety on highways, for people or wildlife. More wildlife crossing structures would help keep people and wildlife safe. Our families will be safer on the road, and animal families can stay connected. Get your family home safely and allow wildlife to do the same."*

*Kelly Zenkewich (Y2Y Initiative)*





(1)



(2)



(3)



(4)



(5)



(6)

### **Fly over, The Eagle Story**

The viewer is introduced to Highway 3 and the surrounding landscape from a birds-eye-view. They can hear the sound of the wind passing through the eagle's wings and the beautiful sounds of other bird songs. They can imagine the sweet, sharp and refreshing smell of the air, passing through the grove of conifer trees. As the sound of rushing water heightens, the eagle can now spot some salmon traveling along the river. It is not long before a mama grizzly bear and her cubs show up to catch their favorite meal. Swooping and swimming down, the eagle is able to grasp some salmon between its toes. The eagle and grizzly bear represent an unlikely species kinship.

Although many salmon & trout species were introduced since 1900, the ecosystem has come to rely heavily on fish, river ways and greenways over the last century in the Banff region, perhaps even more so now that elk populations are curbed by the introduction of railways & human encroachment.



(7)



(8)



(9)



(10)



(11)



(12)

### **The Bear Story**

From landing the eagle, the story transitions to the perspective of the grizzly bear. As the viewer is taken through an on-the-ground view of the forest, they can imagine smells of damp moss, rain, and wet tree trunks. They can hear the sounds of crushing leaves beneath their feet, and the branches swaying in the wind, as other wildlife pass through. As the viewer enjoys elk calls and the beautiful sounds of other species, they are harshly disrupted by the steadily increasing chugging noise of the railway and roadway congestion. The grizzly bear family is left stuck on one side of the road, unable to return to their home on the other side of Highway 3. Animal crossings are the hopeful solution, which can get the mama bear and her cubs, as well as countless other wildlife families home safely





*The visual and multi-sensorial experience aims to portray two important perspectives that are not frequently represented in media and/or in other forms of communication around wildlife corridors - that of the eagle and the grizzly bear.*

## Additional Points of Discussion

### *Wildlife Connectivity in the Anthropocene*

Anthropogenic influences were also largely discussed. Specifically, human access to wildlife corridors, and how it presents a very interesting complex where we actively try to bring people closer to nature in practice. However, places such as wildlife corridors often discourage human access. The Highway 3 team noted this as an inherent paradox of intensity of use between people and wildlife. The team further considered possible ways in which we can take lessons from places, such as Los Angeles, where the movement to conserve open space for wildlife is parallel to the movement of increased equitable access to nature. The team also considered the result of these physical barriers, including access to private lands, the towns immediately adjacent to Highway 3, mining, topography / natural “bottlenecks” to wildlife movement, traffic, recreation, etc.

Future visual messaging must zoom out to really see the extent of human impact. As such the team also discussed the following as possible future ideas for visualization on Highway 3, or other similar areas of interest:

- » Soundscape / Sound mapping: distance from road, towns, cars, corridors
- » Sensorial mapping / in other visual forms: for people to experience “as animals,” through the lens of animals
- » Smellscape / Smell mapping: may include conifers, exhaust, rain, snow
- » Story mapping: From the perspective of different species with a family, or as traveling companions
- » 3D fly-over to depict the barrier effect of roads: We (traffic) are creating a wall (invisible) / essentially impenetrable to wildlife. This may start with a natural landscape with the later additions of human-made barriers
- » Adjacent landscapes
- » Transboundary flows of wildlife
- » Overlay success stories – work of partners (LA, Y2Y)
- » Intensity of use: Shown in a similar way to a heat map to show human activity (noise, pollution, stress, versus quietness, “cool zones” with bird song, etc)
- » Topographic relief









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