U. S. HIGHWAY 93 RECONSTRUCTION ON THE FLATHEAD INDIAN RESERVATION

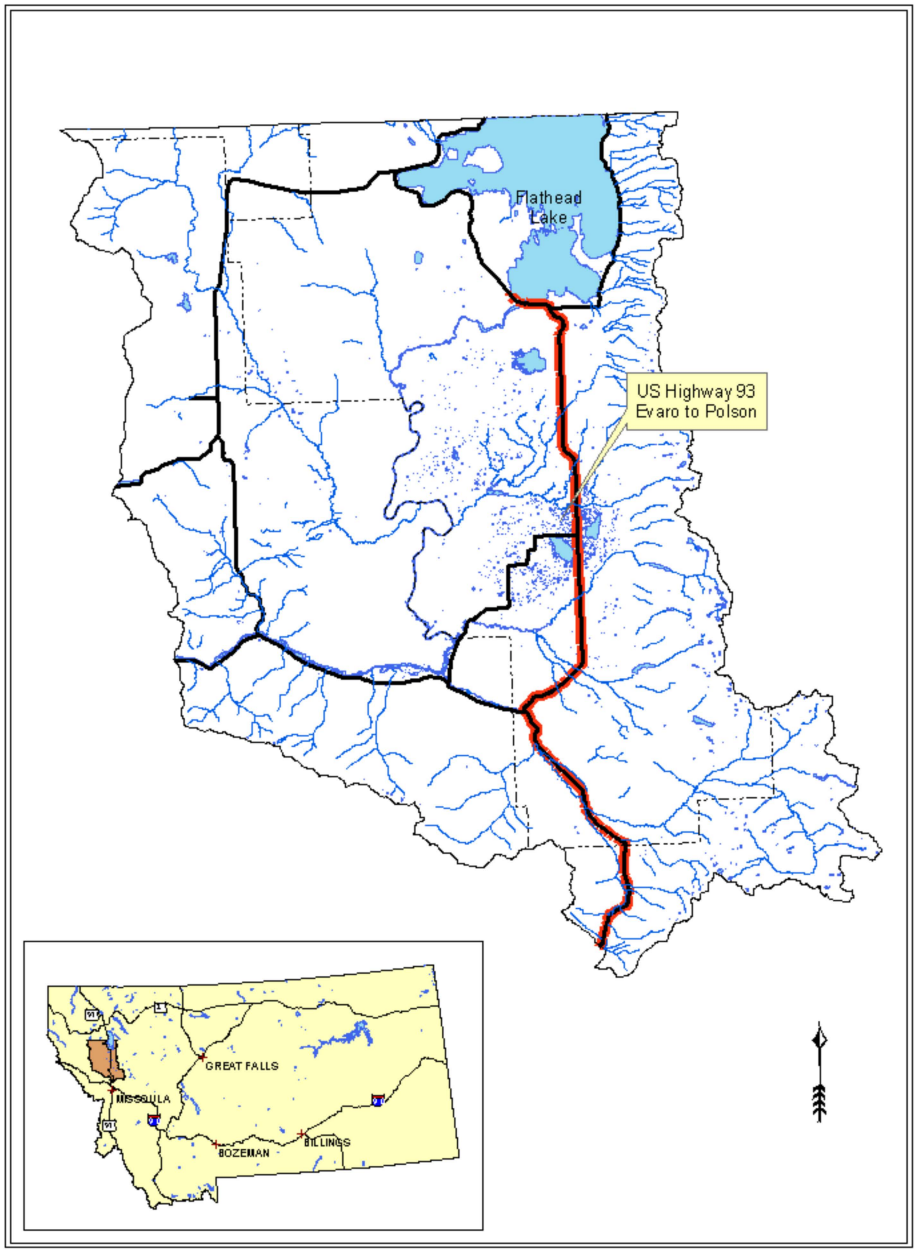
AN INNOVATIVE PARTNERSHIP IN ROAD ECOLOGY

Dale Becker, Tribal Wildlife Program Manager

Whisper Camel Means, Wildlife Biologist

Confederated Salish and Kootenai Tribes

P. O. Box 278 Pablo, Montana 58855


Flathead Lake
US Highway 93
Evaro to Polson
GREAT FALLS
MISSOULA
BOZEMAN
BILLINGS

1991 - Montana Department of Transportation (MDOT) began planning for reconstruction of U. S. Highway 93 on the Flathead Indian Reservation.





Justification:

1. Public safety

2. Increasing traffic

3. Increasing population

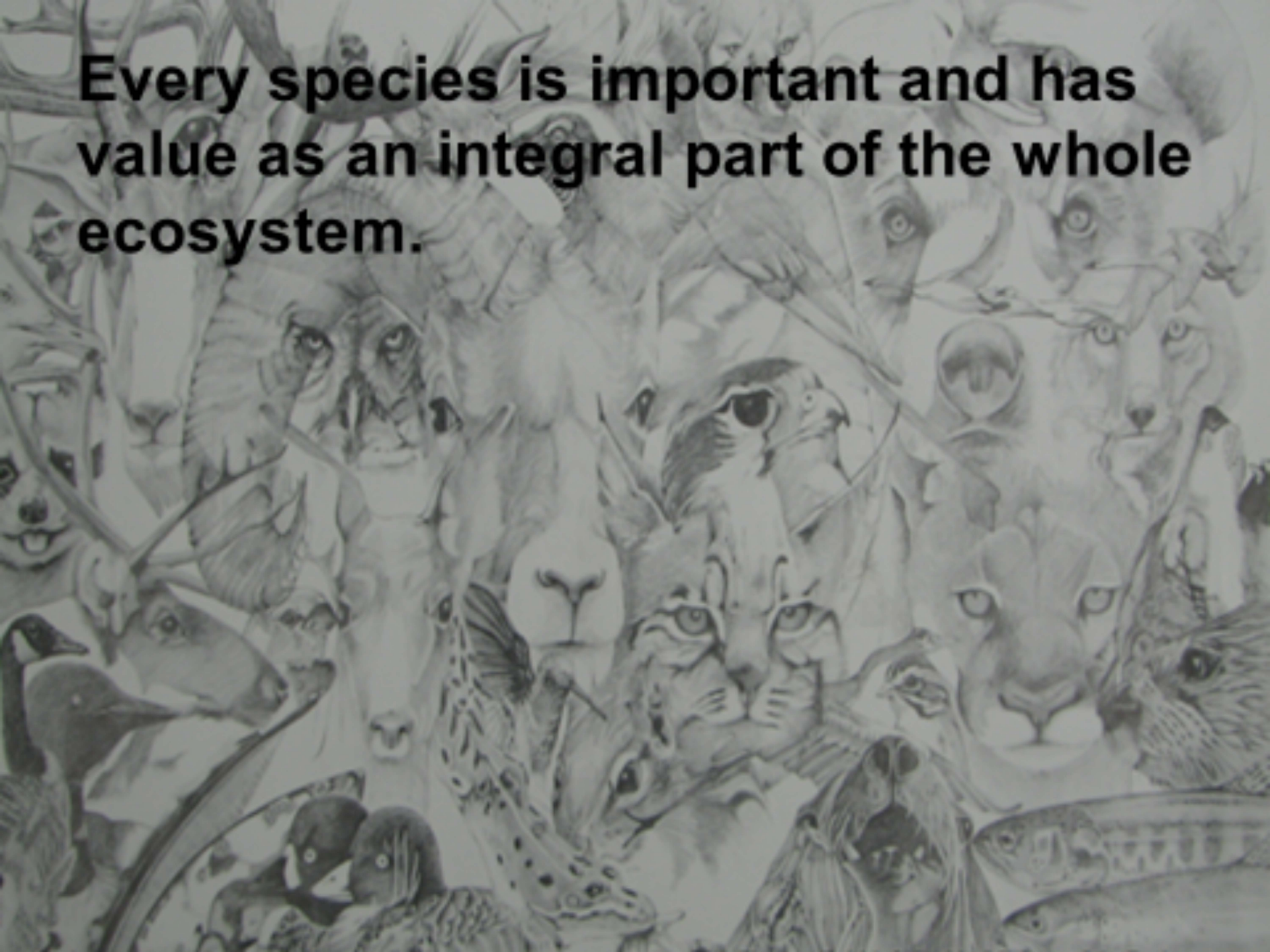
CSKT's primary concern related to further dilution of their culture.



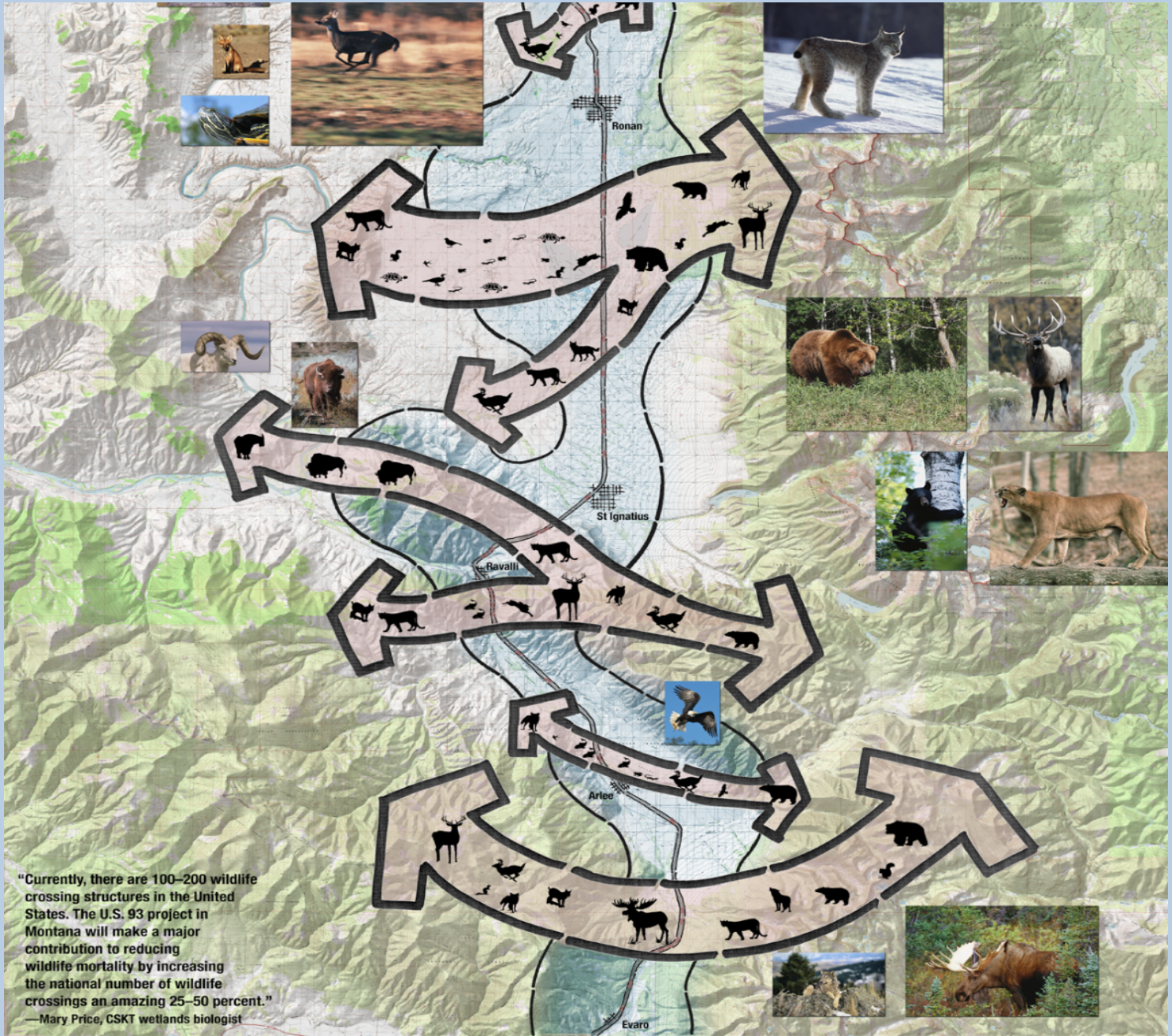







Every species is important and has value as an integral part of the whole ecosystem.

Wildlife Movement/Habitat Fragmentation



Wildlife/Vehicle Collisions

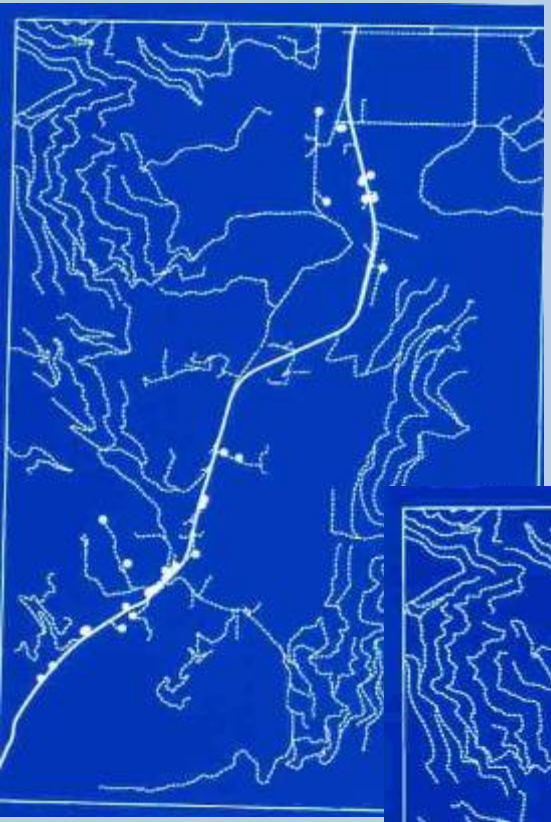




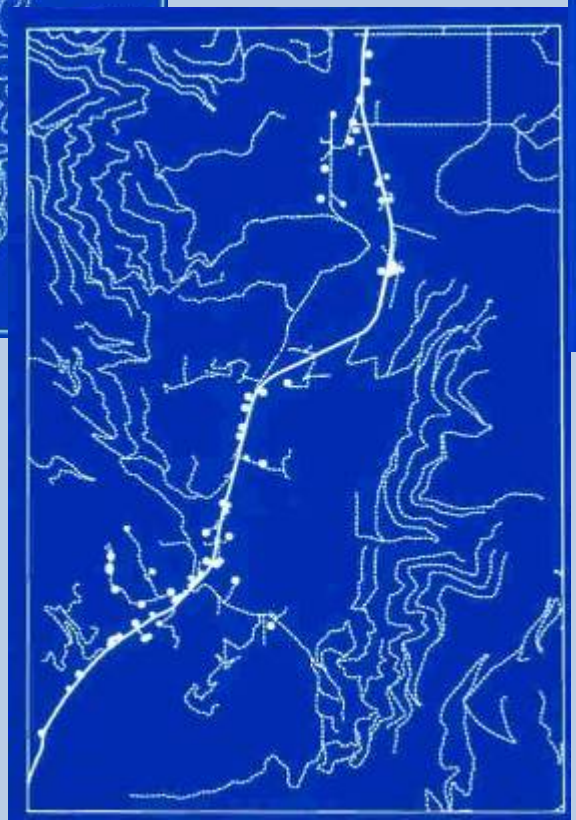




Subdivision/Habitat Fragmentation



1960



1972



1982



1992



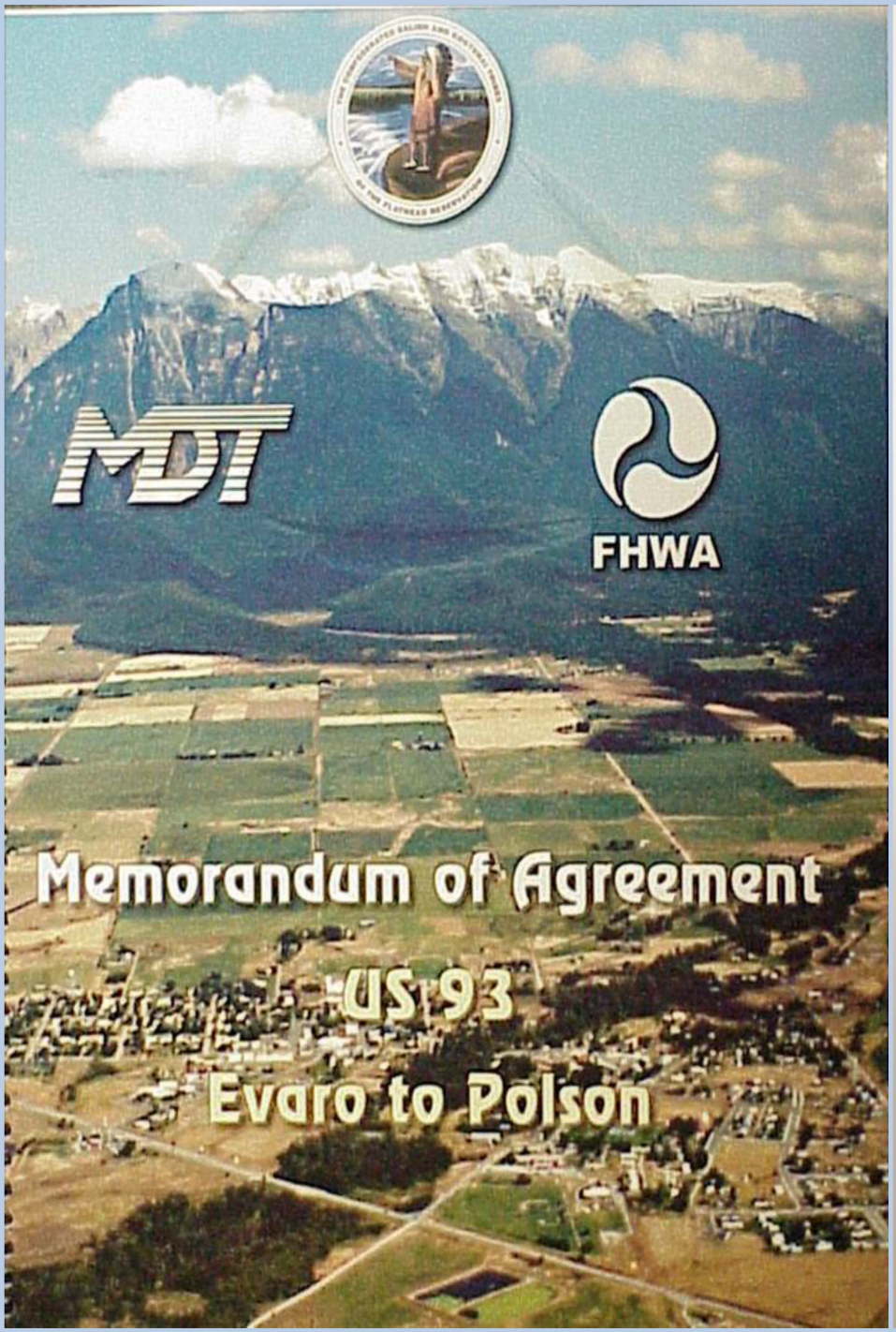
MDOT's Preferred Alternative was a divided four-lane highway.

The Confederated Salish and Kootenai Tribes disagreed and recommended an improved two-lane highway with safety improvements through their reservation.

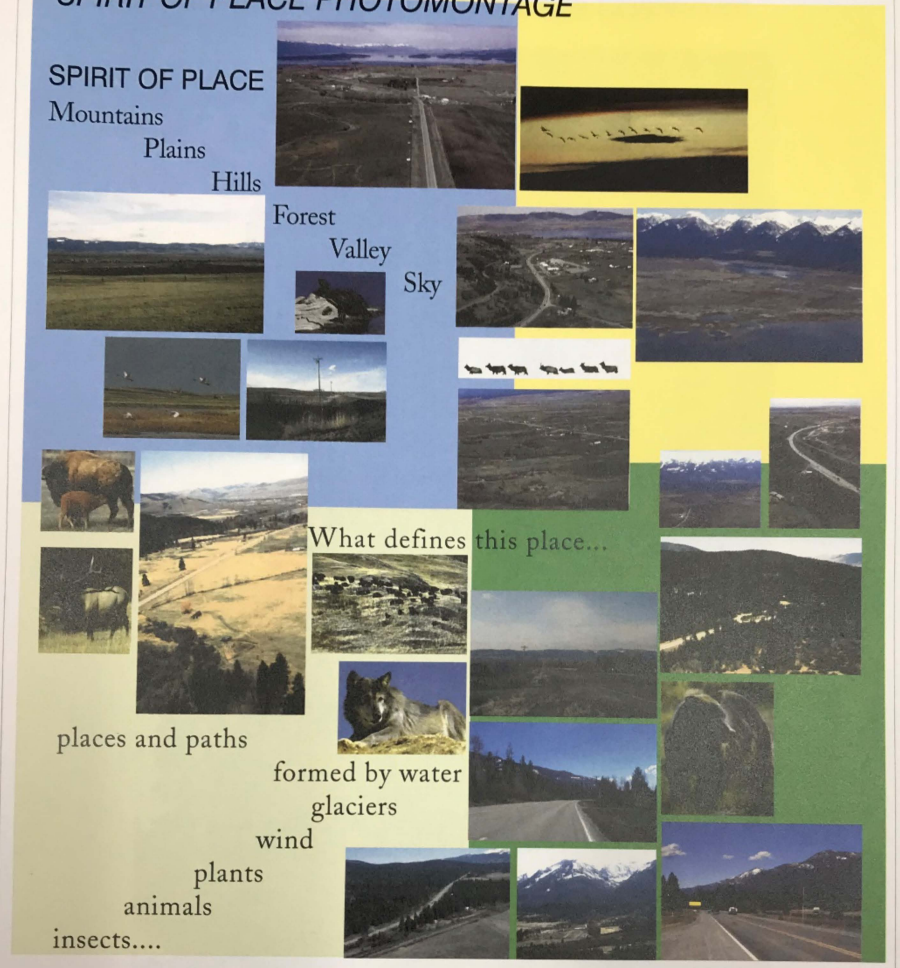
Without consensus, the Federal Highway Administration would not authorize and fund the project. Gridlock occurred.

In 1999, the three governments began negotiations to resolve their differences.

In 2000, consensus between the three governments was reached for most of the route, except for the segment including the Ninepipe area and City of Ronan.



SPIRIT OF PLACE PHOTOMONTAGE



US 93 DESIGN DISCUSSIONS

Project Committee:
Montana Department of Transportation
Federal Highway Administration
The Confederated Salish & Kootenai Tribes of the Flathead Nation
Prime Consultant: Skillings-Connolly, Inc. - Consulting Engineers

Evaro to Polson, Montana

December 20, 2000

JONES JONES
Architects & Landscape Architects

The landscape of the Flathead Indian Reservation is a dynamic collection of plants, landforms, animals, and special places. This graphic illustrates the variety of unique features on the reservation, and illustrates how US 93 currently interacts with these features. This graphic was used as a starting point in the process of creating a road that responds to and reflects the character of the landscape and people.

Problem Resolution Process

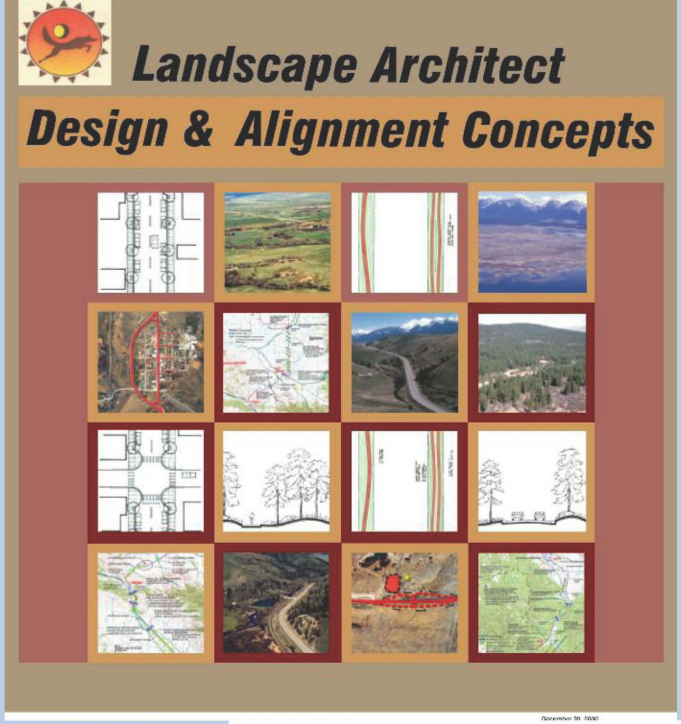
Context Sensitive Approach

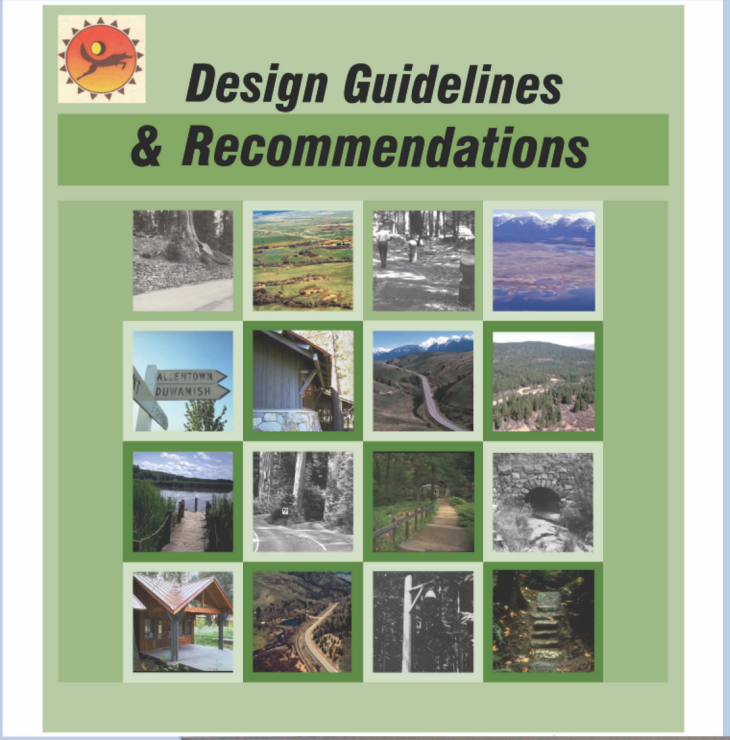
Multi-tiered process for project design

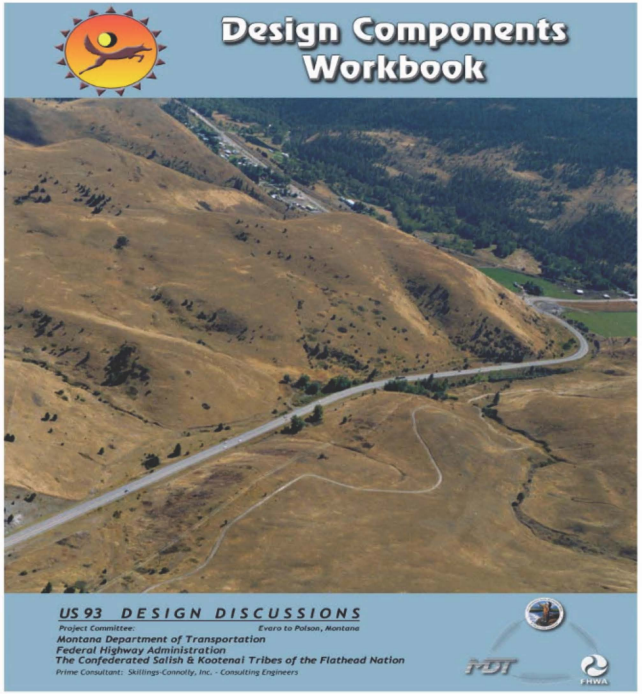
Value engineering to economize

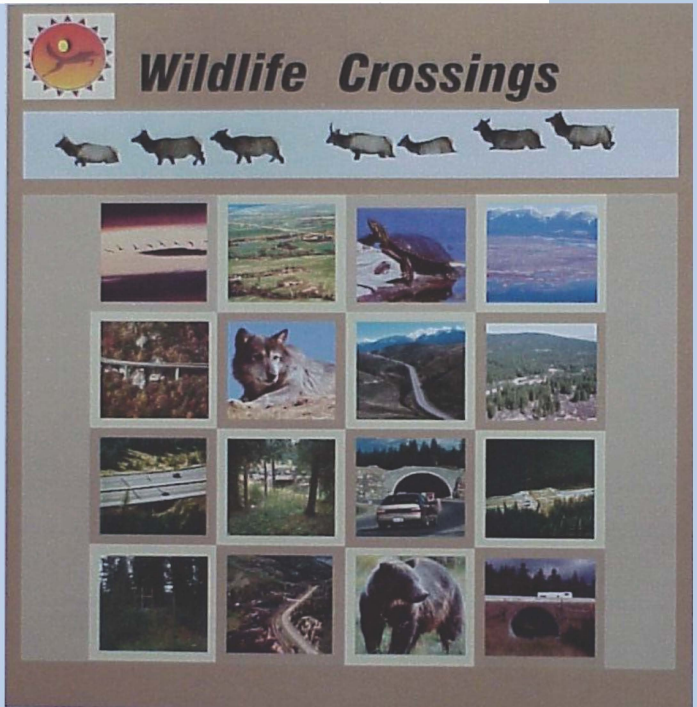
Technical Design Committee: Engineers
Design Engineers
Consultants
Ecologists
Landscape Architects

Policy Oversight Group: MDOT Administrators
FHWA Administrators
Tribal Council


Landscape Architect
Design & Alignment Concepts


Design Guidelines
& Recommendations
ALLENTOWN
DUWAMISH


Design Components
Workbook
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MDT
FHWA


Wildlife Crossings

FISH & WILDLIFE CROSSINGS—Crossing Structures #1
CONCRETE CULVERTS

Concrete Box Culvert
Location: Rasmuson Creek Okitam County, Washington - State Route 112.
Why built: Culverts had been built on a steep slope - the water velocity was too high for most fish swimming upstream.
Suitable for: Fish and amphibians.
Effectiveness: The project added nearly 7/8ths of a mile of stream habitat - post-project surveys reported salmon, trout and other fish in upstream areas where they had not been before.

Pipe Culvert (before construction)



Box Culvert (after construction)



Concrete Box Culvert
Red Earth Underpass
Location: Banff National Park, Canada - Trans-Canada Highway
Size: 3.0 M. X 2.5 M.
Why built: To facilitate safe wildlife passage across highway.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians and reptiles.
Effectiveness: Black bear, cougar, coyote, and ungulates have used the underpass (11/95-6/00).



Bear Underpass
Location: Florida - State Road 46
Size: 42' (14.9 M.) long, 24' (7.9 M.) wide and 8' (2.4 M.) high.
Why built: Bears were using similarly designed panther crossings on Interstate 75. Placement of underpass locations were based on bear kill data along the road.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians and reptiles.





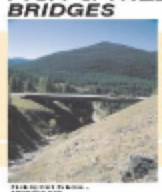
Possibilities for integrating a wildlife passage with large, newly installed culverts:
A. Over-dimensioning in combination with artificial soft banks for fauna.
B. Integrated concrete fauna ledges.
C. Integrated concrete fauna ledges with raised edges and soft cover.
D. Creation of wildlife tunnel parallel to culvert.

Prefabricated Concrete Arch Culverts
Size: Up to 10' High and 24' wide.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians and reptiles.





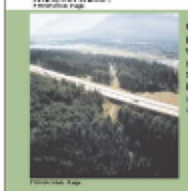
FISH & WILDLIFE CROSSINGS—Crossing Structures #2
BRIDGES



Open Span Bridge - US HWY 2
Location: Montana
Why built: To accommodate motorists. A passage underneath was built with FHWA funds to facilitate mountain goat passage (Constructed in 1990).
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians, and reptiles.
Effectiveness: 4 years after completion, all "crossing goats" in the area are now using the underpasses.



Open Span Bridges - Trans-Canada Highway
Location: Banff National Park, Canada
Why built: 5-Mile Bridge was built to accommodate motorists. All other bridges shown were built to reduce roadkill and facilitate wildlife movement.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians, and reptiles.
Effectiveness: The 22 underpasses over a 29 mile stretch of road have reduced ungulate roadkills by 96 percent (FHWA web page). Bridges that span both water and land are considered by experts to be optimal for carnivores.See individual photos for more detail.





Healy
Effectiveness: Four grizzly crossings (same bear). Frequent use by black bears, wolves, cougar, coyote, and ungulates (11/95-6/00).



Vermilion
Effectiveness: Used by black bears, wolves, cougar, coyote, and ungulates. (11/95-6/00).



Carrol Creek Bridge
Effectiveness: Two grizzly crossings. Frequent use by black bears, wolves, cougar, coyote, and ungulates. (11/95-6/00).



Duthil
Effectiveness: Two grizzly crossings. Frequent use by black bears, wolves, cougar, coyote, and ungulates. (11/95-6/00).



5 Mile Bridge
Effectiveness: This is an unconventional wildlife underpass, characterized by great breadth and openness. One of the few places large carnivores choose to cross the TCH (Clevenger, 1998).

FISH & WILDLIFE CROSSINGS—Crossing Structures #3
CULVERTS



Wall with Lip and Culvert
Location: Central Florida - US 441
Size: 35 ft. (1.1M.) concrete wall with 6" (15.2 cm) lip at the top.
Why built: To deter amphibians and reptiles from crossing over the road and funnel them to underpass culverts. (Construction began in December 1999).
Suitable for: Small mammals, reptiles and amphibians.
Effectiveness: Wall will be monitored for effectiveness.



Medium Culvert
Location: California, San Bernadino County - State Highway 58
Why built: To allow slow moving desert tortoises to safely cross the road.
Suitable for: Small mammals, reptiles and amphibians.
Effectiveness: Monitoring system confirms multiple tortoises using the culverts with frequency.







Large Elliptical Metal Culvert - Castle
Location: Banff National Park, Canada
Trans-Canada Highway
Size: 4M X 7M
Why built: To facilitate safe wildlife passage across highway.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians and reptiles.
Effectiveness: One grizzly has used the underpass as well as many black bear, wolves, coyotes, and ungulates (from 11/95-6/00).





Large Round Metal Culvert
Morrison Coulee
Location: Banff National Park, Canada
Trans-Canada Highway
Size: 4M
Why built: To facilitate safe wildlife passage across highway.
Suitable for: Carnivores, ungulates, small mammals, fish, amphibians and reptiles.
Effectiveness: Black bear, wolves, cougars, coyotes and ungulates have used the underpass. (from 11/96-6/00).

FISH & WILDLIFE CROSSINGS—Crossing Structures #4
OVERPASSES



Wildlife Overpass
Location: Florida, Marion County - Interstate 75
Size: 50.8' wide and 200' long.
Why built: Vegetated wildlife crossing. Construction is scheduled to be completed in July, 2000.
Suitable for: Ungulates, small mammals, and reptiles.
Cost: 3.4 million or $327.00 per square foot (cost includes all construction costs and landscaping of approaches, FHWA Web Page).
Effectiveness: Camera monitoring is being considered for installation.

Wildlife Overpass - Red Earth





Location: Banff National Park, Canada
Trans-Canada Highway
Size: 50 M. Wide
Suitable for: Carnivores, ungulates, small mammals and reptiles.
Cost: 2-3 million (included construction costs and landscaping of approaches, Clevenger).
Effectiveness: One grizzly, three black bear, and fifty-four coyotes crossed this structure. It is also frequently used by ungulates (11/95-6/00, Clevenger).

Wildlife Overpass - Wolverine



Location: Banff National Park, Canada
Trans-Canada Highway
Size: 50 M. Wide
Suitable for: Carnivores, ungulates, small mammals and reptiles.
Cost: 2-3 million (included construction costs and landscaping of approaches, Clevenger).
Effectiveness: Three black bear, two wolves, twelve cougars, and thirty-eight coyotes crossed this structure. It is also frequently used by ungulates. (11/95-6/00, Clevenger).

Other Examples of Wildlife Overpasses



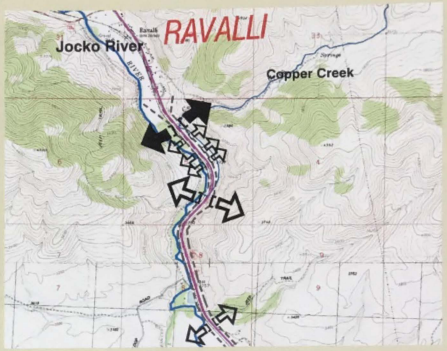


US 93 FISH AND WILDLIFE CROSSINGS

23. Copper Creek Fish & Wildlife Crossing

Arlee - Ravalli Segment

This area has great significance for fish and wildlife crossing. The Jocko River is bull trout bearing. Two tributaries in this area, Copper Creek and Spring Creek have been altered by highway fills and embankments. Restoring these water channels will greatly improve fish and wildlife habitat. Raising the road in concert with providing undercrossings, would improve motorist safety and allow wildlife to move through the canyon. Anticipated use by: black bears, grizzly bears, mountain lions, bobcats, coyotes, elk, deer, etc.



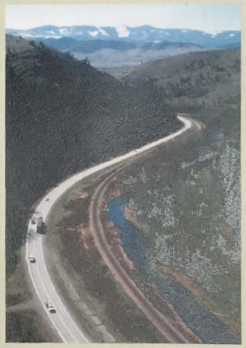
Design Recommendations

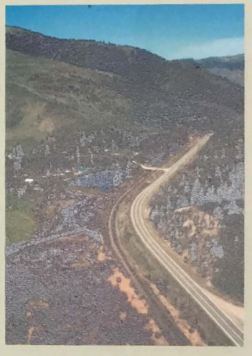
Recommended crossing type: *Open span bridge*
Approximate dimensions: *100' to 150' span, 12' min. ht.*

Notes:

End 8' page wire fencing south of Ravalli. Begin fencing south of Schall Flats #4 crossing. Fencing on west side of road to be placed below sight line. Jump-outs are desirable adjacent to bridge structure as studies have shown that animals trapped inside R.O.W. will turn back rather than cross structures.

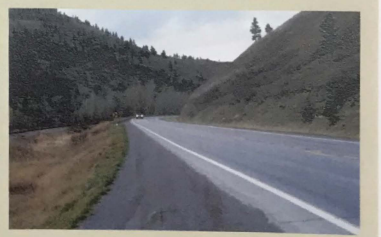
Mitigation in this area will require coordination between CSKT, MDT, and MRL to ensure appropriately sized companion crossings (across railroad) for fish, wildlife and hydrology.





Criteria for locations of crossings:

1. **Winter tracking** - NA.
2. **Summer Game Trails** - NA.
3. **Road Kill Data** - Tribal data from 1/95-10/98 combined with MDT data from 12/97-1/00 indicates an **extremely high concentration of kills in this area (31 kills)**.
4. **Habitat** - The road bisects two areas of good mountain habitat, and runs adjacent to excellent riparian habitat (the Jocko River) fed by two tributaries (Spring Creek and Copper Creek). These tributaries increase the fish and wildlife habitat value.
5. **Engineering Practicality** - The physical constraints of this canyon pose a challenge.



US 93 DESIGN DISCUSSIONS

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December 20, 2000







Wildlife Crossing Structures





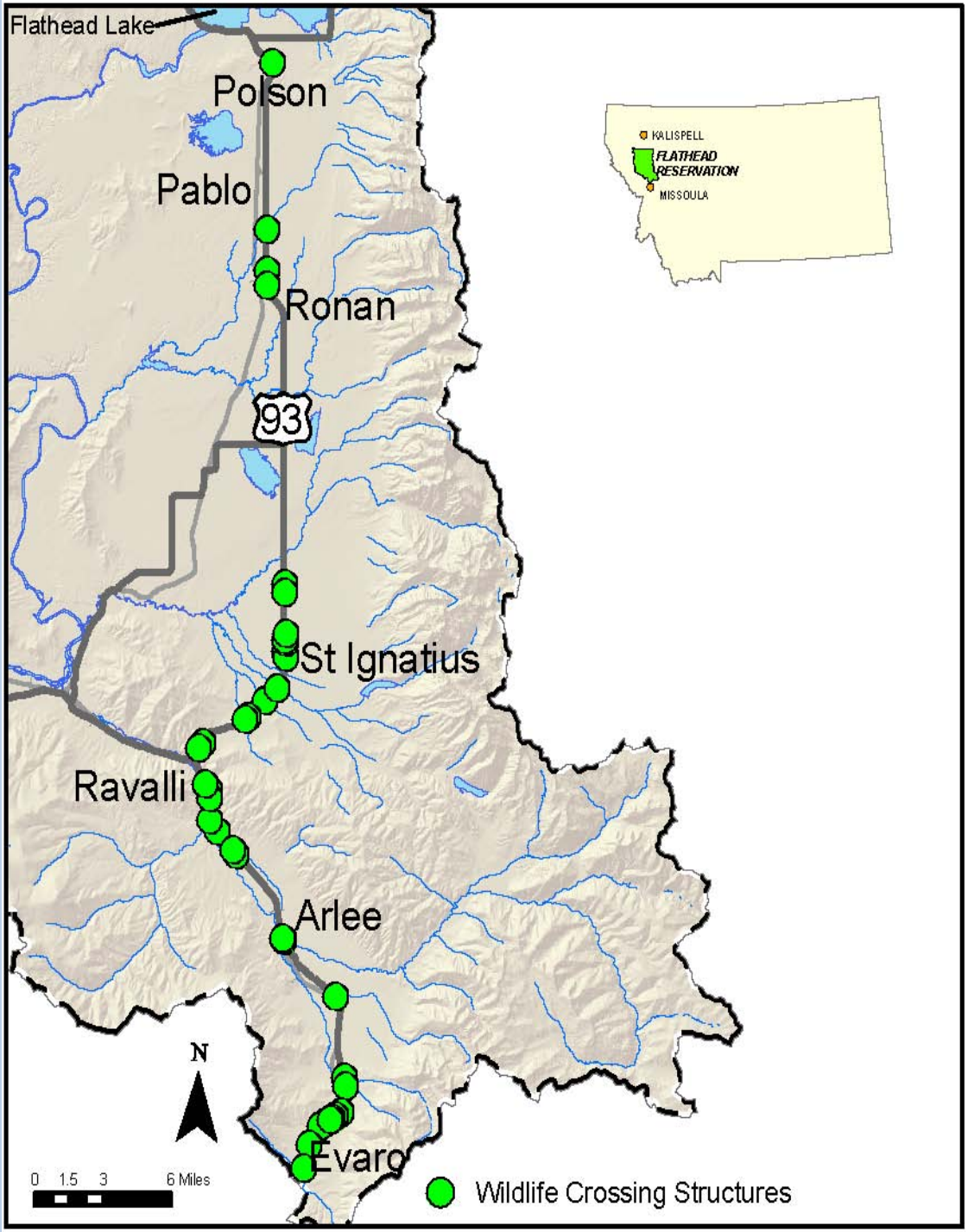






Crossing Structure Locations

Most crossing structures per mile for longest distance in U.S.

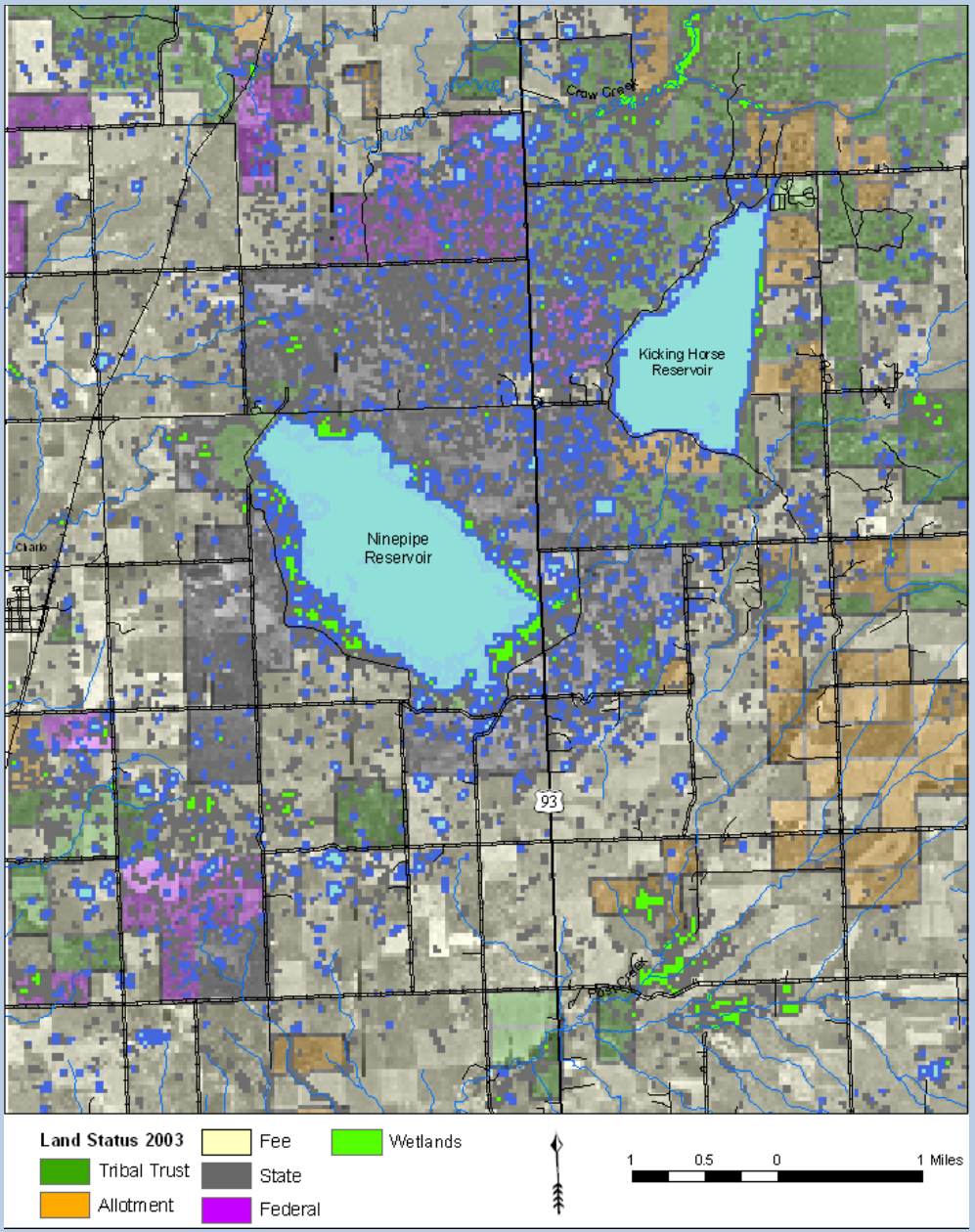


Wetland Mitigation



CSKT acquired a 81 ha. tract, restored the wetland and riparian habitat and sold habitat mitigation credits to MDOT.

Ninepipe-Kicking Horse SEIS was completed, but construction is not planned until after 2023. 32 years and counting.



What Works?

- Believing in the partners & process
- Being open to new ideas and concepts
- Communication
- Trust
- Patience – a lot of it
- Focus on resolving the problem and the desired end product
- Working together