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WETLANDS MITIGATION ISSUES RELATED TO RECONSTRUCTION OF U.S. HIGHWAY 93 ON THE FLATHEAD INDIAN RESERVATION, MONTANA

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Abstract: U.S. Highway 93 traverses some of the most ecologically sensitive wetland, riparian and aquatic habitat on the Flathead Indian Reservation. In December 2000, the Confederated Salish and Kootenai Tribes, the Montana Department of Transportation and the Federal Highway Administration entered into a Memorandum of Agreement for the Highway 93 Evaro to Polson Project. The MOA identifies the three governments' preferred conceptual roadway improvements including alignment, lane configuration, design features, and mitigation concepts for 66.3km (41.2mi) of the project. The MOA also specifies a process for the environmental and final design phase of the project. The process, as it relates to wetlands, riparian and aquatic issues, highway design details, mitigation measures, and the integration of the MOA with Tribal, Federal and State environmental regulations, is presented. The MOA also commits the three governments to cooperate in the preparation of a Supplemental Environmental Impact Statement for 18.1km (11.2mi) of the highway traversing the Ninepipe pothole wetlands complex. A summary of the current status of the Highway 93 Ninepipe SEIS and design alternatives being evaluated is also presented.

Introduction

U.S. Highway 93, the principal north-south arterial in western Montana spans the length of the Flathead Indian Reservation (FIR), the homeland of the Confederated Salish and Kootenai Tribes (Tribes). The Montana Department of Transportation (MDT) proposes to reconstruct 90.6km (56.3mi) of Highway 93 from Evaro to Polson. In December 2000, the Tribes, MDT and the Federal Highway Administration (FHWA) signed the *Highway 93 Memorandum of Agreement (MOA)* identifying lane configurations, mitigation measures and design guidelines for two segments totaling 66.3 km (41.2 mi) (CSKT, MDT, FHWA 2000). The preferred conceptual roadway improvement for the 18.1km (11.2mi) segment bisecting the Ninepipe wetlands complex and the community of Ronan will be addressed with a Supplemental Environmental Impact Statement to the MOA.

The government-to-government relationship between the Tribes, MDT and FHWA entered a new era with the negotiation and signing of the Highway 93 MOA. The intent of the MOA is to protect the cultural, aesthetic, recreational, and natural resources located along the highway corridor and to communicate the respect and value commonly held for these resources pursuant to the traditional ways of the Tribes. The roadway design is premised on the idea that the "road is a visitor" and should respond to and be respectful of the land and "Spirit of Place" – the landscape, water, plants, animals and native people of the Flathead Reservation. One of the most important design features of the MOA is a series of wildlife crossing structures for the entire length of the project.

Much of the FIR is rural and agricultural in nature but Reservation lands face accelerated development pressures due to the proximity of rapidly growing urban centers at Missoula and Kalispell, highway expansion, and the natural beauty and recreational opportunities in the area. Resident population is projected to increase by 50 percent during the period 1994 to 2025 with development expected to occur at a faster pace in the rural areas rather than the urban areas (CSKT 1996). The Tribes are concerned that an expanded highway will harm the rural character of the Flathead Reservation and adversely impact traditional cultural values.



Fig.1. Location of the Flathead Indian Reservation and U.S. Highway 93.

Wetlands and riparian areas provide for many subsistence and cultural needs of Tribal members. Tribal members utilize wetlands and riparian areas within the highway corridor for the harvest of plants, wildlife, fish and cultural material. Mitigation for impacts to wetland and riparian areas is a requirement of the MOA, the Tribes Aquatic Lands Conservation Ordinance 87A and Section 404 of the Clean Water Act.

The ecological context of the proposed wetlands mitigation plan is described by the following Reservation-wide wetland and riparian habitat trends (CSKT 1999):

1. There has been a net loss of wetland and riparian acreage.
2. The net loss has been greatest for forested, shrub and emergent wetlands.
3. There has been a net gain of deepwater habitat and unvegetated mudflats.
4. There has been a net loss of riparian areas dominated by deciduous trees and shrubs.

The proposed wetlands mitigation plan also addresses the ecological effects of the roadway throughout the life of the roadway. The overall mitigation goal is to replace wetland and riparian functions affected by the construction, operation, and lifelong maintenance of the roadway.

A prior 1993 agreement between the Tribes and MDT requires mitigation for highway construction to follow a sequence of steps (MDT and CSKT 1993). In order of priority the mitigation steps are:

1. Avoid the impact altogether by not taking an action or parts of an action.
2. Minimize the impact by limiting the degree or magnitude of the action and its implementation.
3. Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reduce or eliminate the impact over time by preservation and maintenance operations during the life of the action.
5. Compensate for the impact by replacing or providing substitute resources or environments.

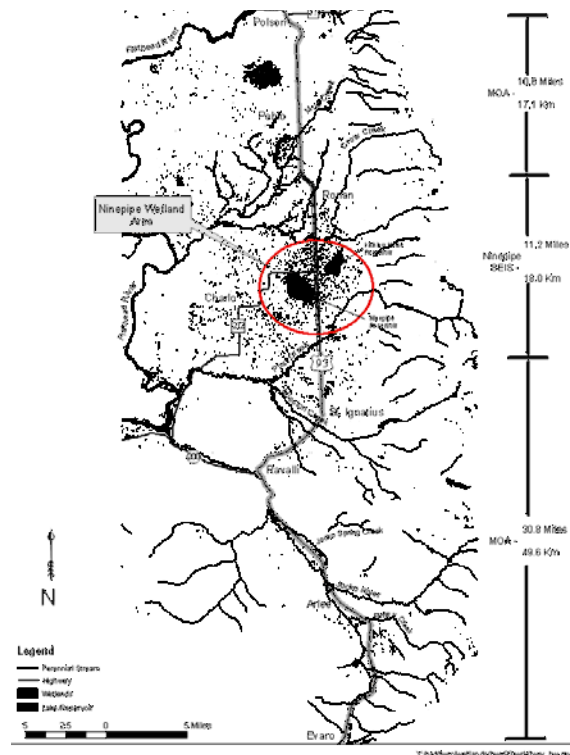


Fig. 2. Construction plans and the wetland mitigation plan for 49.6km (30.8mi) from Evaro to south of Post Creek and for 17.1km (10.6mi) from Ronan to Polson will be completed December 2003 with construction to begin in 2004. The Ninepipe Supplemental Environmental Impact Statement will be completed in 2004.

The Wetland Mitigation Plan for 66.3KM (41.2MI)

Avoid the Impact....

All parties agreed on the necessity for the highway reconstruction to correct historic design deficiencies, and to improve transportation efficiency and safety. The existing two-lane configuration is inadequate and the three governments agreed to expand the highway. The design for the reconstructed highway combines various lane-configurations and design features to meet MOA goals. The lane configuration for the 66.3km (41.2mi) is projected to unavoidably impact 20.34 hectares (50.26 acres) of wetlands.

Table 1. Summary of roadway lengths by lane configuration for 66.3km (41.2mi) in the Highway 93 Memorandum of Agreement Evaro to Polson.

Lane Configuration	Total Roadway Length	
	Km	mi
Two-lane undivided	12.12	7.53
North bound passing or climbing lane	13.76	8.55
South bound passing or climbing lane	16.57	10.30
Overlapping NB and SB passing or climbing lanes	0.80	0.50
Four-lane undivided	1.95	1.21
Four-lane divided	19.82	12.32
Couplet composed of two north bound lanes and two south bound lanes.	1.30	0.81
Total	66.32	41.22

Minimize the Impact...

Impacts to adjacent wetlands and riparian areas will be minimized by reducing roadway widths. Exceptions from MDT design standards were applied to minimize roadway width:

1. Sideslope ratios were reduced from 6:1 to 4:1 or less at wetlands and riparian areas.
2. Retaining walls were used at bridge approaches and abutments to minimize fill in floodplains.



Fig. 3. This wetland is a Category I (FHWA and MDT 1996) wetland of special concern (CSKT 1999). The new lane configuration adds a northbound passing lane. The wetland will be avoided by shifting additional highway width away from the wetland and by reducing the standard ratio 6:1 side slopes to between 4:1 and 2:1 with guardrail. The wetland is Tribal Trust land and the Tribal Council has redesignated the wetland from agricultural use to wetlands mitigation. The wetland mitigation status of the site will protect and maintain habitat connectivity between wildlife crossing structures that will be constructed north and south of the wetland.



Fig. 4. The Jocko River is a “core area” for bull trout (*Salvelinus confluentus*) recovery in Montana (Montana Bull Trout Scientific Group 1996) and is the focus of a Tribal wetland, riparian habitat and bull trout restoration program (CSKT 2000a). The existing crossing is a two-lane, approximately 30 m (100 ft) bridge lacking vertical clearance for large wildlife species passage. Buildings, septic systems, roads, bridge abutment fill, parking lots, and a horse corral occupy the floodplain. The lane configuration will be expanded from a two-lane to a three-lane. The new crossing will be a three-lane 120m (393ft) multi-span bridge with 4-5m (14-16ft) of vertical clearance. Bridge approaches will be constructed with vertical retaining walls to minimize fill in the floodplain. Buildings and the horse corral will be removed. The floodplain will be graded to original elevations and contours and planted with native wetland and riparian vegetation. Stormwater runoff from the bridge and roadway will be treated in vegetated bioswales and treatment wetlands.

Rectify the Impact...

Segments of Highway 93 were realigned in 1964. The abandoned segments at two stream crossing were never reclaimed and have continued to adversely impact stream habitat and riparian wetlands. The historical impacts will be rectified by:

1. Removing fill material from floodplains, and
2. Restoring stream channels and riparian wetlands.



Fig. 5. The historic alignment of “old Highway 93” abandoned in 1964, continues to occupy the floodplain of Finley Creek. The creek passes through the abandoned abutment in an undersized culvert. Fill material extends onto the floodplain. Fill material will be removed to original contours and elevations and used for new road construction. The stream channel and riparian area will be restored.



Fig. 6. View from abandoned roadway at Finley Creek tributary to present highway alignment where a large wildlife underpass will be constructed. The tributary passes through the abandoned roadway in an undersized culvert. Fill material will be removed to original contours and elevations and used for new road construction. The stream channel and riparian area will be fully restored. Removal of the roadbed will eliminate a barrier to wildlife movement to and from the underpass.

Reduce the Impact...

The Tribes, MDT and FHWA agreed that post-construction replanting the highway right-of-way with native plant species is an important mitigation measure to re-establish wildlife movement, habitat connectivity, hydrology and cultural landscape integrity. The *US 93 Planting and Revegetation Guidelines* (Jones and Jones 2002) describes the revegetation strategy. The guidelines include plant community descriptions, community species lists, conceptual revegetation plans, soils analysis, propagation specifications, and seeding and planting specifications.

The Tribes and MDT will cooperatively implement the revegetation plan. The responsibilities of MDT include topsoil salvage, storage, and replacement, erosion control, seed bed preparation, soil amendments, native grass seeding and mulching. Tribal responsibilities include implementing native shrub and tree planting at wetland mitigation sites, wildlife crossings, and cultural plant gathering areas. The Tribes will also salvage plant material inside construction limits prior to construction. An important strategy of the revegetation plan involves measures to reduce the area disturbed by construction. For example, grubbing, which removes plant roots and rhizomes, will not be allowed outside construction limits. Minimizing the area of disturbance will decrease the actual area requiring replanting, improve revegetation results, and reduce the overall revegetation costs. The Tribes identified preservation areas, areas supporting native plants, where all disturbances will be prohibited. Preservation areas will be delineated on construction plans and identified in the field with highly visible fencing maintained during construction. FHWA will fund a Tribal restoration botanist with responsibility for overseeing implementation of the revegetation plan and a Tribal construction inspector to ensure, among other things, that preservation areas are avoided and that preservation fencing is maintained.

The Tribes, MDT and FHWA are also exploring alternatives to standard maintenance practices such as snow removal, sand and magnesium chloride spreading, mowing, herbicide application, and woody vegetation removal within the clear zone. Such standard maintenance practices can conflict with the ecological and cultural goals of the MOA.

Compensate the Impact...

Wetland and riparian habitat will be restored, enhanced, preserved and created to compensate for unavoidable wetland impacts resulting from the reconstruction of Highway 93.

Table 2.

Summary of projected unavoidable wetland impacts for 66.3 km (41.2 mi) in the Memorandum of Agreement for U.S. Highway 93 Evaro to Polson (FHWA, MDT and CSKT 2001).

Wetland Type	Impact	
	Hectares	Acres
Forested	0.88	2.18
Shrub	6.65	16.41
Emergent	12.5	30.78
Open Water	0.80	1.99
Total Impact	20.34	50.26

One of the stated goals of the MOA is to protect the cultural, aesthetic, recreational, and natural resources located along the highway corridor. To achieve this goal on-site mitigation, within or adjacent to highway right-of-way, is preferred to off-site mitigation. The degraded condition of wetlands within the highway corridor provides many opportunities for on-site mitigation. The MOA specifies criteria to identify suitable locations for on-site wetland mitigation:

1. Identify and preserve wetlands of special concern in the project corridor,
2. Enhance and restore wetlands and riparian areas at wildlife crossing structures,
3. Restore stream and riparian habitat where culverts are removed and bridges are constructed,
4. Restore and enhance wetlands throughout the project corridor.



Fig. 7. This wetland of special concern will be preserved to protect culturally significant plants.



Fig. 8. A large wildlife underpass will be constructed at this Post Creek Tributary. The stream channel and riparian area will be restored.

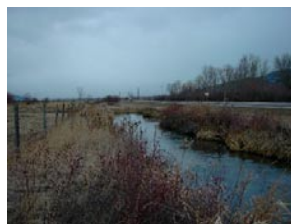


Figure 9. Jocko Spring Creek runs in a roadside ditch for approximately 180m (590ft). The creek will be relocated to a new channel constructed to replicate a reference reach. The riparian area will be planted with native riparian species. A 30m (98ft) bridge that spans the waterway plus an upland margin for wildlife passage will replace a concrete box culvert. The bridge will have vertical clearance to allow large wildlife species to pass underneath. A stormwater runoff treatment wetland will be created in the abandoned ditch.

Fourteen sites are proposed for on-site wetlands mitigation. The sites will be protected through land purchase or conservation easement. A team of Tribal, MDT, U.S. Army Corps of Engineers (Corps), and consulting restoration specialists developed the restoration designs for each site including grading plans and specifications, revegetation plans and specifications, a weed management plan and a monitoring plan. The designs focused on the development of forested, shrub, wet meadow and emergent wetland habitat to counter Reservation-wide wetland and riparian habitat trends discussed previously.

Wetland mitigation crediting to demonstrate compliance with the Tribes' Aquatic Lands Conservation Ordinance 87A is based on the Tribes' wetland compensation ratios. The ratios specify the minimum acres of wetlands that must be preserved, restored, enhanced or created to replace wetlands unavoidably impacted by the highway project. Wetlands mitigation crediting to demonstrate compliance with Section 404 of the Clean Water Act is based on the Corps' wetland mitigation crediting scenario.

Table 3.

Confederated Salish and Kootenai Tribes pre-project wetland compensation ratios (CSKT 1999).

Impacted Wetland Type	Mitigation Type			
	Preservation Wetland of Special Concern	Restoration	Enhancement	Creation
Forested / Shrub	3 to 1	2.5 to 1	4 to 1	4 to 1
Emergent / Open Water	2 to 1	1.5 to 1	3 to 1	3 to 1

On-site wetland mitigation will not provide enough mitigation credit to fully compensate for unavoidable wetland impacts within the 66.3km (41.2mi) segments. Additional off-site wetland mitigation is planned for a site recently purchased by the Tribes for wetlands and riparian restoration. The site is located approximately 1 mile west of Highway 93 near Arlee and contains approximately 81 hectares (200 acres) of degraded wetlands and a channelized reach of Finley Creek. The Tribes will restore the wetlands, stream channel and riparian area for Highway 93 wetlands mitigation. The mitigation site will be administered through a Tribal-MDT agreement that will serve as the legal instrument defining how the site will be established, operated, and credited in accordance with Tribal and Federal wetlands permit programs.

The Ninepipe Supplemental Environmental Impact Statement

The Ninepipe segment includes a rural section spanning the Ninepipe pothole wetlands complex and an urban section through the community of Ronan. The ecological, cultural and social issues involved in reconstructing the highway through the Ninepipe segment will be evaluated by the Tribes, MDT, and FHWA during the preparation of a Supplemental Environmental Impact Statement (SEIS). The three governments will consult with affected State and Federal agencies and have invited extensive public participation. The three governments have selected nine alternative lane configurations for the rural section. One of the more controversial lane configurations includes 6,870m (22,540ft) of raised parkway. Estimated unavoidable wetland impacts for the nine rural alternatives range from 7.2 to 10.1 hectares (17.91 to 24.90 acres).



Fig. 10. A high altitude infrared photograph of the Ninepipe area. The Ninepipe pothole wetlands complex supports the highest density of pothole wetlands in western Montana.

Tribal, Federal, and State governments have long recognized the value of the Ninepipe wetlands complex and have invested public funds to protect the area for future generations. The U.S. Fish and Wildlife Service (USFWS) manages the 834 hectares (2,062 acres) Ninepipe Wildlife Refuge and multiple Waterfowl Production Areas totaling 1,239 hectares (3,063 acres). The USFWS has established a conservation easement program

targeting lands within an area encompassing 5,261 hectares (13,000 acres) centered around the Ninepipe National Wildlife Refuge. Montana Fish, Wildlife and Parks (MFWP) manages Wildlife Management Areas totaling 1,376 hectares (3,400 acres). Publicly-owned parks and recreation areas, wildlife and waterfowl refuge areas and historic properties qualify for protection under Section 4(f) of the 1966 U.S. Department of Transportation Act (Title 23 of the Code of Federal Regulations [23 CFR 771.135]). Section 4(f) discourages transportation projects unless:

1. No feasible or prudent alternative to use of significant lands exists.
2. The proposed action includes all possible planning to minimize harm to the significant lands.

Use of a property protected under section 4(f) is considered acquisition of property or easement, or impacts on aesthetics, access, air quality, noise level, water quality, and land use in the vicinity. *Feasible* is considered constructible using sound engineering practices. *Prudent* is considered practicable without incurring extraordinary costs or disrupting the community (FHWA, MDT and CSKT 2003).

Over 1, 214 hectares (3,000 acres) of Tribal lands within the Ninepipe wetlands complex are managed specifically for wildlife and wildlife habitat to mitigate for impacts to wildlife and wildlife habitat resulting from the Kerr Hydro Power project on Flathead Lake. The Tribes habitat acquisition and restoration plan for Kerr mitigation identifies the Ninepipe wetlands complex as a priority area for Kerr wetland and riparian habitat mitigation (CSKT 2000b). Avoidance criteria similar to Section 4(f) will be applied to Tribal wetland and wildlife mitigation lands.



Fig. 11. Highway 93 through the Ninepipe Wildlife Refuge. The existing bridge will be replaced with a longer bridge improving connectivity for water and wildlife.

The Ninepipe wetlands complex is one of the most important wildlife habitat areas of the FIR. The Ninepipe area provides prime nesting and brood habitat for waterfowl as well as nesting habitat for a wide assortment of wetland and grassland bird species. The Tribes are reintroducing two wetland-dependent species to the Ninepipe wetlands complex: the northern leopard frog (*Rana pipiens*) and the trumpeter swan (*Cygnus buccinator*). Two grizzly bears (*Ursus arctos horribilis*) have been struck and killed while attempting to cross Highway 93 at Post Creek, and a third was killed near the Ninepipe Wildlife Refuge. Roadkill data documented 205 painted turtles (*Chrysemys picta*) killed on Highway 93 from May to August 1995 (Fowle 1995).

Mitigation Measures Considered...

The Tribes, MDT and FHWA agreed to a number of mitigation concepts for the Ninepipe segment (FHWA, MDT and CSKT 2003):

1. Minimize the footprint of the highway to the greatest extent possible allowed by transportation efficiency and safety requirements.
2. Use structures such as bridges and large box culverts to increase the permeability of the roadway to water and wildlife at Post Creek, Crow Creek, the Ninepipe Reservoir, and two large pothole wetlands bisected by the highway.
3. Provide passage structures for painted turtles at heavily-used crossing areas,
4. Provide dryland wildlife passage structures.
5. Provide bioswales to treat stormwater runoff.
6. Revegetate with native wetland and grassland species.
7. Develop access control to limit development along the highway.
8. Reduce the overall road miles within the Ninepipe wetlands complex by closing and reclaiming non-essential roads.

Conclusion

The government-to-government relationship between the Tribes, MDT and FHWA demonstrated by *Memorandum of Agreement US 93 Evaro to Polson*, is instrumental to the implementation of the proposed wetland mitigation plan. The actual highway reconstruction will take several years and require the three governments to continue the relationship of open communication and cooperation. The final impacts to wetlands and riparian areas remain to be seen and can only be determined by post-construction wetland delineation and impact assessment. Post-construction monitoring is needed to evaluate the success of the proposed wetland mitigation plan and to determine if the mitigation concepts developed for Highway 93 are applicable to future transportation planning efforts in Montana and the Nation.

Biographical Sketch: Mary Price is a wetland/riparian ecologist for the Confederated Salish and Kootenai Tribes where she has been employed for eight years. She works primarily on wetlands mitigation for highway construction and hydro power projects. She has a B.A. in environmental biology from the University of Montana and an M.S. in aquatic biology from South Dakota State University. The Highway 93 wetlands mitigation plan is the product of a dedicated team of specialists. Major contributors include Dan Lipscomb, Steve Kloetzel – Confederated Salish and Kootenai Tribes; Larry Urban, Pat Basting, Gordon Stockstad – Montana Department of Transportation; Tom Parker, Sarah Flynn, Kathleen Adams – Herrera Environmental, Inc., Cory Parker, Ints Leuters, Rene Senos – Jones and Jones Architects and Landscape Architects, Ltd.; and Todd Tillinger – U.S. Army Corps of Engineers. A special thanks goes to Donna Pridmore for her assistance with the preparation of this manuscript.

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