Barrier Evaluation Form - Single Culvert at Crossing (Instructions at end of worksheet)

Location Information

Project Name: North Road Culvert		**IAC/SRFB Project #:** 08-1962	**Date of Visit:** 2005
GPS Location: Datum - WGS84; Format - decimal degrees		**Latitude:** 47.603641	**Longitude:** -120.645733
¼ **Section:** SE	**Section:** 1	**Township:** 24N	**Range:** 17 ☒ **East** ☐ **West**
County: Chelan		**Parcel #:** 241701550007	
Stream Name: Chumstick Creek		**WRIA #:** 45	**Stream #:**
Tributary To: Wenatchee River			
Driving Directions: From Wenatchee, drive west on Highway 2; at Leavenworth turn north (right) on Chumstick Highway; go approximately 1 mile and turn east (right) onto North Road. The culvert is located approximately 1/8th mile from Chumstick Highway, where the North Road crosses over Chumstick Creek.			

Landowner Information

Landowner: **Chelan County Public Works**		Mailing Address: **316 Washington Street, Suite 401**	
City: **Wenatchee**	State: **WA**	Zip: **98801**	Phone: (**509**) **667-6415**
Cell: ( )	Fax: (**509**) **667-6250**	Email: **greg.pezoldt@co.chelan.wa.us**	
Landowner Agent: **N/A**		Mailing Address:	
City:	State:	Zip:	Phone: ( )
Cell: ( )	Fax: ( )	Email:	

Evaluator Information

Evaluator Name: **Jesse Chan**		Affiliation: **US Bureau of Reclamation**	
Mailing Address: **1150 Curtis Road, Suite 100**		City: **Boise**	State: **ID** Zip: **83706-1234**
Phone: **(208) 378-5218**	FAX:	Cell:	Email: **JCHAN@pn.usbr.gov**

Barrier Information (measurements in meters)

Is the stream fish-bearing? ☒ Yes ☐ No ☐ Unknown	Species: **Upper Columbia steelhead, spring Chinook, redband rainbow trout and coho.**

Fish-bearing criteria: ☐ Fish Observation ☐ Stream Type ☐ SASSI/Stream Catalog ☐ Physical Criteria

☒ Other: **USFS has documented steelhead and rainbow trout upstream of the culvert; spring Chinook have been noted downstream of the culvert; coho may also use Chumstick Creek when passage is opened**

Will this culvert be entered into the WDFW-FPDSI (formerly SSHEAR) database? ☐ Yes ☒ No If yes, Site ID #:			
Shape: **Round**	Material: **SPS**	Apron: ☒ None ☐ Upstream ☐ Downstream ☐ Both	Span: **9'3"**
Rise: **9'3"**	Length: **178**	Water Depth in Culvert: **0.5 feet**	Water Surface Drop: **0.7 feet**
Drop Location: ☒ Outlet ☐ Inlet ☐ Inside		Countersunk: ☐ Yes ☒ No ☐ Unknown	Culvert Slope(%): **2%**
Bankfull Width (outside influence of culvert): **15 ft**		Culvert Span/Bankfull Width Ratio: **9.25:15 (0.62)**	
Plunge Pool: Length (culvert to tail-out): **30 ft** OHW width: **25 ft** Max depth: **2.0 ft**		Road fill DS: 50'	Road width: **24'**
Fishway Present? ☐ Yes ☒ No (if yes, describe in Comments)		Tidegate Present? ☐ Yes ☒ No ☐ Unknown	
Is this culvert a fish passage barrier? ☒ Yes ☐ No ☐ Unknown ☐ Level B needed			
Problem with culvert: ☐ WS drop ☐ Slope ☒ Velocity ☐ Depth		Percent Passability: ☐ 0% ☒ 33% ☐ 67% ☐ 100%	
Habitat Quality: ☐ Excellent ☒ Good ☐ Poor ☐ Unknown			
Comments: During an UCRTT meeting on June 11, 2008, it was stated that "on the whole, the Chumstick has very good habitat, productive, good riparian conditions" (UCRTT 2008).			
Attachments			
☐ Photos ☐ Level A Assessment ☐ Site Map ☐ Other ☐ Additional Comments			

Correction Analysis Form *(Instructions at end of worksheet)*				
Site Information (measurements in feet)				
Project Name: *North Road Culvert*		***IAC/SRFB Project #:*** *08-1962*		***Date:*** *2005*
Bankfull Width (outside influence of culvert): **15'**		Utilities Crossing: ☒Yes ☐ No ☐ Unknown Telephone underground; power over the ground		
Road Fill at Culvert Invert: **50'**		Road Width: **24'**		
Road Description/condition (mainline, spur road, driveway/access): **mainline (paved)**				
Evaluator Information				
Evaluator Name: **Jesse Chan**		Affiliation: **US Bureau of Reclamation**		
Mailing Address: **1150 Curtis Road, Suite 100**		City: **Boise**	State: **ID**	Zip: **83706-1234**
Phone: **(208) 378-5218**	FAX:	Cell:	Email: **JCHAN@pn.usbr.gov**	
Upstream Habitat/Channel Description				
Channel Slope (outside of culvert influence): **2**%		Regrade Potential (streambed US – streambed DS in feet): **channel will be regarded to meet streambed**		
Dominant Substrate: ☐ sand (<1/5") ☒ gravel (1/5"–3") ☐ cobble (3"-12") ☐ boulder (>12") ☐ bedrock				
Additional upstream information, habitat description, other site conditions or concerns, including potential regrade impacts relative to channel stability and habitat: approximately 7 miles of upstream habitat will be reconnected by replacing the North Road Culvert and several other private culverts in 2009.				
Downstream Habitat/Channel Description				
Channel Slope: **2**% (outside of culvert influence)				
Additional downstream information, habitat description, other site conditions or concerns: Steelhead and spring Chinook have been observed downstream from the North Road Culvert.				
Correction Options and Preferred Alternative				
Options to consider – Provide up to three site-appropriate correction alternatives. Option 1: **Retrofit existing culvert** Option 2: **Bottomless arch structure** Option 3: **Concrete bridge**				
Preferred alternative - Provide a one or two paragraph recommendation for this site. Include any site-sp concerns that will need to be addressed during design and construction: three (3) alternatives were act considered, including retrofitting the existing culvert, bottomless arch culvert and a concrete bridge. *1) Retro-fit the existing culvert.* A low-cost option to eliminate a fish passage barrier is to retro-				

fit the existing culvert structure with a modified roughened channel or with baffles where necessary. This method does not adequately address the fish passage barrier problem or requires an unacceptable commitment to maintenance. This option does not pass 100 year flows nor does it pass debris. In addition, the local permitting agencies prefer other alternatives.
2) Bottomless arch structure. This type of structure provides fish passage and is relatively easy to construct. It typically includes sections of galvanized steel arch plates which are bolted together and connected to pre-cast concrete footings. The reason we are not using this option is because it has a similar cost as a bridge, due to site conditions.
3) Concrete Bridge. These structures are consistent with the intent of WAC 220-110-070- Water Crossing Structures, which contains specific language for encouraging bridge structures road crossings as opposed to culvert pipes.

Cost Estimates

Rough cost estimate* - Attach detailed cost breakdown using the appropriate cost estimate template, provided separately.

Option 1: $256,500

Option 2: $1,400,000

Option 3: $1,188,125

* This is a rough approximation of project costs; actual costs may vary depending on specifications identified during final project design.