12 E. Fish Passage Program: Barrier Evaluation Form - Single Culvert at Crossing

Location Information

Project Name: **Adamson – Clear Creek #1**			IAC/SRFB Project #:	Date of Visit:	
Old FPA #:	New FPA #:			HPA #:	
GPS Location: Set the GPS Datum to WGS84 and format to decimal degrees (not degrees, minutes, seconds)			Latitude:	Longitude:	
¼ Section: NW	Section: **5**		Township: **26**	Range: **18** East ☐ West	
County: **Chelan County**			Parcel #: **261805200000**		
Stream Name: **Clear Creek**			WRIA #: **45**		
Tributary To: **Chiwawa River**			Stream #:		
Driving Directions: From Leavenworth travel North on the Chumstick Highway. Just past Plain turn right onto the Chiwawa Loop Road, travel for approximately 3.5 miles to Forest Service Road 6105. Site is located at first road crossing on private property.					

Landowner Information

Landowner Name: **Jim Adamson**			Landowner Agent: **n/a**		
Mailing Address: **20111 Chiwawa Loop Road**			Mailing Address: **n/a**		
City: **Leavenworth**	State: **WA**	Zip: **98826**	City: **n/a**	State:	Zip:
Phone: ( )	Fax: ( )		Phone: ( )	Fax: ( )	
Cell: ( )	Email:		Cell: ( )	Email:	

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98811**
Phone: **509.667.6567**	Fax: **509.677.6727**	Cell: **509.679.9345**	Email: **alan.schmidt@co.chelan.wa.us**

Barrier Information (measurements in meters)

Is the stream fish-bearing? ☒ Yes ☐ No ☐ Unknown			Species, if known: **summer steelhead**		
Is this culvert a fish passage barrier? ☒ Yes ☐ No ☐ Unknown ☐ Level B needed					
Shape: **Round**	Material: **CMP**	Span/Diam: **48-in./1.46m**	Rise:	Water depth in culvert:	Outfall drop:
Length: **25-ft. 7.6m**	Culvert slope(%): **1.3%** ☐ Laser level ☐ Transit ☒ Other (describe) **Harza Fish Barrier Inventory**				
Streambed material throughout culvert: ☐ Yes ☒ No ☐ Unknown			Apron: ☒ None ☐ Upstream ☐ Downstream ☐ Both		
Road width: **16-ft. 5.2m**	Road fill at DS end: **8-ft. 2.6m**	Plunge pool: Length to tailout:	OHW width:	Max depth:	
Bankfull width (outside of culvert influence): **16-ft. / 4.88m**			Culvert span/bankfull width ratio:		
Problem with culvert: ☐ Outfall drop ☒ Slope ☐ Velocity ☐ Depth			Percent passability: ☒ 0% ☐ 33% ☐ 67% ☐ 100%		
Will this culvert be entered into the WDFW-FPDSI (formerly SSHEAR) database? ☐ Yes ☒ No If yes, Site ID **#:**					
Comments:					

Attachments
☒ Photos ☐ Level A Assessment ☒ Site Map ☐ Other ☒ Additional Comments

Fish Passage Program: Expanded Barrier Evaluation Form

Project Information

Project Name: **Adamson - Clear Creek #1**	***IAC/SRFB Project #:***	***Date:*** **9-17-06**

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **WA**	Zip: **98001**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6527**	Email:

Watershed Information

Basin area (square miles above culvert):	Amount of habitat available upstream: **2.7mi. / 4.3 km.**

Stream flow: ☒ Perennial ☐ Intermittent ☐ Unknown Source of information:

Has a barrier inventory been conducted in the watershed? ☒ Yes ☐ No If yes, list source and date completed: **Harza 2000**

Are there downstream barriers? ☐ Yes ☒ No If yes, describe. List source; use separate sheet if necessary:

Are there upstream barriers? ☒ Yes ☐ No If yes, describe. List source; use separate sheet if necessary: **2-Barrier culverts Forest Service Barrier Inventory**

Has the stream been walked? ☐ Yes ☐ No If yes, information source:

Has a WDFW Priority Index number been calculated for this barrier? ☐ Yes ☐ No If yes, PI#:

Fish Species/Use

Species present at site: ☐ Bull trout/Dolly ☐ Chinook ☐ Chum ☐ Coho ☐ Cutthroat ☐ Resident Trout ☐ Sockeye ☒ Steelhead ☐ Pink ☐ Brook/Brown

Information source: **Harza/BioAnalysts 2002**

Current fish use downstream from barrier (include source of information): **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the subject barrier culvert. (Cameron Thomas, personal communication 2006)**

Current fish use upstream from barrier (include source of information): **see above**

What species and life history stages might use the habitat made accessible by the project? **Spawning and rearing habitat for Upper Columbia steelhead, spring Chinook and bull trout**

Provide a qualitative description (canopy and instream cover, channel stability and complexity, spawning gravel quality and quantity, human alterations) of the habitat that will be made available by barrier correction, if available. Include source of information: **Clear Creek is a 2nd order stream with an average gradient of 3%. It is mostly located on National Forest Land and is typified by mature second growth timber with an active riparian zone on both sides. Barrier removal will provide available tributary habitat primarily for ESA listed summer steelhead, but may also benefit coho, endangered spring Chinook and threatened bull trout. (Cameron Thomas, personal communication 2006)**

Fish Passage Program: Correction Analysis Form

Site Information (measurements in meters)

Project Name: **Adamson - Clear Creek *#1***	***IAC/SRFB Project #:***	***Date:*** **9-17-06**
Bankfull Width (outside of influence from the culvert): **16ft. / 4.88m**	Utilities Crossing: ☐Yes ☐ No ☒ Unknown	
Road Fill at Downstream End: **8ft.** / **2.4m**	Road Width: **16ft. / 4.88m**	
Road Description/condition (mainline, spur road, driveway/access): **private driveway access**		

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98801**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6727**	Email:

Upstream Habitat/Channel Description

Channel Slope (outside of culvert influence): **3%**%	Regrade Potential (streambed US – streambed DS, in feet):
Dominant Substrate: ☐ sand (<.20") ☒ gravel (.20"–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: **There are 2 additional barrier culverts at RM 2.0 and RM 2.5 which are also a part of the Clear Creek Passage Program and are included in this replacement application.**	

Downstream Habitat/Channel Description

Channel Slope: **3%**% (outside of culvert influence)
Additional downstream information, habitat description, other site conditions or concerns: **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the subject barrier culvert. (Cameron Thomas, personal communication 2006)**

Correction Options and Preferred Alternative

Options to consider – Provide up to three site-appropriate correction alternatives.

Option 1: **Modular Steel Bridge**

Option 2: **Bottomless Arch Structure**

Option 3: **Retro-fit existing culvert**

Preferred alternative - Provide a one or two paragraph recommendation for this site. Include any site-specific concerns that will need to be addressed during design and construction: **In keeping with the intent of WAC 220-110-070 which states that bridges are the preferred structures for fish bearing waters.**

1. **Modular Steel Bridges- The proposed design concept for the Clear Creek Passage Program is to utilize modular steel bridges set on pre-cast concrete abutments. These structures are consistent with WAC 220-110-070 Water Crossing Structures, which contains specific language for encouraging bridge structures at road crossings as oppsed to culvert pipes.**

2. **Bottomless Arch Structure- This type of structure provides fish passage and is relatively easy to construct. It typically includes sections of steel arch plates which are bolted together and connected to either pre-cast or cast in place concrete footings. Estimated costs are typically equal to modular steel bridges.**

3. **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. In addition, the local permitting agencies prefer other alternatives.**

Cost Estimates

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

Option 1: $99,965

Option 2: $131,892

Option 3: $39,874

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

12b. In-Stream Passage Cost Estimate

IN-STREAM PASSAGE includes those items that affect or provide fish migration up and downstream to include road crossings (bridges and culverts), barriers (dams, log jams), fishways (ladders, chutes, pools), and log and rock weirs.

Complete only items that apply to your project.
TOTAL COST must include the SRFB and Sponsor's Match Contribution.
Use only whole dollar amounts.
(ENTER ON PRISM TAB 5)

Alternative 1 Replace existing culvert with Modular Bridge					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Bridge	Each	1	37,000	Length/width	30x16
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	6	9,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,000	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,000	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,659**		
Sub-Total			**76,896**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**23,069**		
TOTAL COST			**99,965**		

Purchase of equipment is not an allowable cost.

Alternative 2 Replace existing culvert with Super-Cor box culvert					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**

Alternative 2 **Replace existing culvert with Super-Cor box culvert**					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**
Super-Cor Bottomless Arch	Each	1	42,800	Length/width	35x20
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,200	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**7515**		
Sub-Total			**101,455**		
Architecture, Engineering, & Admin. **(30% of Sub-Total)**			**30,436**		
TOTAL COST			**131,892**		

Purchase of equipment is not an allowable cost.

Alternative 3 **Retrofit existing culvert**					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Retro-fit existing culverts	Each	1		Length/width	
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		2,200	Describe	Dust abatement
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**272**		
Sub-Total			**30,672**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**9,202**		
TOTAL COST			**39,874**		

This alternative would require a hydraulic analysis before this option could be considered.

12 E. Fish Passage Program: Barrier Evaluation Form - Single Culvert at Crossing		
Location Information		
Project Name: **Forest Service – Clear Creek #2**	IAC/SRFB Project #:	Date of Visit:
Old FPA #:	New FPA #:	HPA #:
GPS Location: Set the GPS Datum to WGS84 and format to decimal degrees (not degrees, minutes, seconds)	Latitude:	Longitude:

¼ Section: **NW**	Section: **5**	Township: **26**	Range: **18** East ☐ West
County: **Chelan County**		Parcel #: **n/a National Forest**	
Stream Name: **Clear Creek**		WRIA #: **45**	
Tributary To: **Chiwawa River**		Stream #:	
Driving Directions: From Leavenworth travel North on the Chumstick Highway. Just past Plain turn right onto the Chiwawa Loop Road, travel for approximately 3.5 miles to Forest Service Road 6105. Site is located at first road crossing on private property.			

Landowner Information

Landowner Name: **USFDA Forest Service**			Landowner Agent: **n/a**		
Mailing Address: **215 Melody Lane**			Mailing Address: **n/a**		
City: **Wenatchee**	State: **WA**	Zip: **98807**	City: **n/a**	State:	Zip:
Phone: (**509**) **664-9300**	Fax: ( )		Phone: ( )	Fax: ( )	
Cell: ( )	Email:		Cell: ( )	Email:	

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98811**
Phone: **509.667.6567**	Fax: **509.677.6727**	Cell: **509.679.9345**	Email: **alan.schmidt@co.chelan.wa.us**

Barrier Information (measurements in meters)

Is the stream fish-bearing? ☒ Yes ☐ No ☐ Unknown			Species, if known: **summer steelhead**		
Is this culvert a fish passage barrier? ☒ Yes ☐ No ☐ Unknown ☐ Level B needed					
Shape: **Round**	Material: **CMP**	Span/Diam: **48-in./1.46m**	Rise:	Water depth in culvert:	Outfall drop:
Length: **25-ft. 7.6m**	Culvert slope(%): **1.3%** ☐ Laser level ☐ Transit ☒ Other (describe) **Harza Fish Barrier Inventory**				
Streambed material throughout culvert: ☐ Yes ☒ No ☐ Unknown			Apron: ☒ None ☐ Upstream ☐ Downstream ☐ Both		
Road width: **16-ft. 5.2m**	Road fill at DS end: <**8-ft. 2.6m**	Plunge pool: Length to tailout:	OHW width:	Max depth:	
Bankfull width (outside of culvert influence): **10-ft. / 3.05m**			Culvert span/bankfull width ratio:		
Problem with culvert: ☐ Outfall drop ☒ Slope ☐ Velocity ☐ Depth			Percent passability: ☒ 0% ☐ 33% ☐ 67% ☐ 100%		
Will this culvert be entered into the WDFW-FPDSI (formerly SSHEAR) database? ☐ Yes ☒ No If yes, Site ID **#:**					
Comments: **This culvert is presents a velocity barrier to juveniles, contains no substrate in the culvert, and therefore blocks access to a stream wetland complex that could provide up to 0.5 mi. of overwintering habitat for juvenile steelhead.**					

Attachments

☒ Photos ☐ Level A Assessment ☒ Site Map ☐ Other ☒ Additional Comments

Fish Passage Program: Expanded Barrier Evaluation Form

Project Information

Project Name: **Forest Service - Clear Creek #2**	***IAC/SRFB Project #:***	***Date:*** **9-17-06**

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **WA**	Zip: **98001**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6527**	Email:

Watershed Information

Basin area (square miles above culvert):	Amount of habitat available upstream: **2.1 mi. / 4.3 km.**

Stream flow: ☒ Perennial ☐ Intermittent ☐ Unknown Source of information:

Has a barrier inventory been conducted in the watershed? ☒ Yes ☐ No If yes, list source and date completed:
Harza 2000

Are there downstream barriers? ☒ Yes ☐ No If yes, describe. List source; use separate sheet if necessary:
1 barrier culvert at RM 0.5

Are there upstream barriers? ☒ Yes ☐ No If yes, describe. List source; use separate sheet if necessary:
1 barrier culvert at RM 1.7 Forest Service Barrier Inventory

Has the stream been walked? ☐ Yes ☐ No If yes, information source:

Has a WDFW Priority Index number been calculated for this barrier? ☐ Yes ☐ No If yes, PI#:

Fish Species/Use

Species present at site: ☐ Bull trout/Dolly ☐ Chinook ☐ Chum ☐ Coho ☐ Cutthroat ☐ Resident Trout ☐ Sockeye ☒ Steelhead ☐ Pink ☐ Brook/Brown

Information source: **Harza/BioAnalysts 2002**

Current fish use downstream from barrier (include source of information): **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the first barrier culvert (RM 0.5). (Cameron Thomas, personal communication 2006)**

Current fish use upstream from barrier (include source of information): **see above**

What species and life history stages might use the habitat made accessible by the project? **Spawning and rearing habitat for Upper Columbia steelhead, spring Chinook and bull trout**

Provide a qualitative description (canopy and instream cover, channel stability and complexity, spawning gravel quality and quantity, human alterations) of the habitat that will be made available by barrier correction, if available. Include source of information: **Clear Creek is a 2nd order stream with an average gradient of 3%. It is mostly located on National Forest Land and is typified by mature second growth timber with an active riparian zone on both sides. Barrier removal will provide available tributary habitat primarily for ESA listed summer steelhead, but may also benefit coho, endangered spring Chinook and threatened bull trout. (Cameron Thomas, personal communication 2006)**

Fish Passage Program: Correction Analysis Form

Site Information (measurements in meters)

Project Name: **Forest Service - Clear Creek #2**	***IAC/SRFB Project #:***	***Date:*** **9-17-06**
Bankfull Width (outside of influence from the culvert): **10ft. / 2.4m**	Utilities Crossing: ☐ Yes ☐ No ☒ Unknown	
Road Fill at Downstream End: <**8ft.** / **2.4m**	Road Width: **16ft. / 4.88m**	
Road Description/condition (mainline, spur road, driveway/access): **Forest Service Road # 6105**		

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98801**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6727**	Email:

Upstream Habitat/Channel Description

Channel Slope (outside of culvert influence): **3%**%	Regrade Potential (streambed US – streambed DS, in feet):

Dominant Substrate: ☐ sand (<.20") ☒ gravel (.20"–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: **There are 2 additional barrier culverts at RM 0.5 and RM 1.7 which are also a part of the Clear Creek Passage Program and are included in this replacement application.**

Downstream Habitat/Channel Description

Channel Slope: **3%**% (outside of culvert influence)

Additional downstream information, habitat description, other site conditions or concerns: **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the subject barrier culvert. (Cameron Thomas, personal communication 2006)**

Correction Options and Preferred Alternative

Options to consider – Provide up to three site-appropriate correction alternatives.

Option 1: **Modular Steel Bridge**

Option 2: **Bottomless Arch Structure**

Option 3: **Retro-fit existing culvert**

Preferred alternative - Provide a one or two paragraph recommendation for this site. Include any site-specific concerns that will need to be addressed during design and construction: **In keeping with the intent of WAC 220-110-070 which states that bridges are the preferred structures for fish bearing waters.**

4. **Modular Steel Bridges- The proposed design concept for the Clear Creek Passage Program is to utilize modular steel bridges set on pre-cast concrete abutments. These structures are consistent with WAC 220-110-070 Water Crossing Structures, which contains specific language for encouraging bridge structures at road crossings as opposed to culvert pipes.**

5. **Bottomless Arch Structure- This type of structure provides fish passage and is relatively easy to construct. It typically includes sections of steel arch plates which are bolted together and connected to either pre-cast or cast in place concrete footings. Estimated costs are typically equal to modular steel bridges.**

6. **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. In addition, the local permitting agencies prefer other alternatives.**

Cost Estimates

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

Option 1: $99,965

Option 2: $131,892

Option 3: $39,874

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

12b. In-Stream Passage Cost Estimate

IN-STREAM PASSAGE includes those items that affect or provide fish migration up and downstream to include road crossings (bridges and culverts), barriers (dams, log jams), fishways (ladders, chutes, pools), and log and rock weirs.

Complete only items that apply to your project.
TOTAL COST must include the SRFB and Sponsor's Match Contribution.
Use only whole dollar amounts.
(ENTER ON PRISM TAB 5)

Alternative 1 Replace existing culvert with Modular Bridge					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Bridge	Each	1	37,000	Length/width	30x16
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	6	9,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,000	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,000	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,659**		
Sub-Total			**76,896**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**23,069**		
TOTAL COST			**99,965**		

Purchase of equipment is not an allowable cost.

Alternative 2 Replace existing culvert with Super-Cor box culvert					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**

Alternative 2 **Replace existing culvert with Super-Cor box culvert**					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**
Super-Cor Bottomless Arch	Each	1	42,800	Length/width	35x20
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,200	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**7515**		
Sub-Total			**101,455**		
Architecture, Engineering, & Admin. **(30% of Sub-Total)**			**30,436**		
TOTAL COST			**131,892**		

Purchase of equipment is not an allowable cost.

Alternative 3 **Retrofit existing culvert**					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Retro-fit existing culverts	Each	1		Length/width	
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		2,200	Describe	Dust abatement
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**272**		
Sub-Total			**30,672**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**9,202**		
TOTAL COST			**39,874**		

This alternative would require a hydraulic analysis before this option could be considered.

12 E. Fish Passage Program: Barrier Evaluation Form - Single Culvert at Crossing

Location Information

Project Name: **Forest Service – Clear Creek #3**		IAC/SRFB Project #:	Date of Visit: **9-17-2006**
Old FPA #:	New FPA #:		HPA #:
GPS Location: Set the GPS Datum to WGS84 and format to decimal degrees (not degrees, minutes, seconds)		Latitude:	Longitude:
¼ Section: **SW**	Section: **9**	Township: **26**	Range: **18** East ☐ West
County: **Chelan County**		Parcel #: **n/a National Forest**	
Stream Name: **Clear Creek**		WRIA #: **45**	
Tributary To: **Chiwawa River**		Stream #:	
Driving Directions: From Leavenworth travel North on the Chumstick Highway. Just past Plain turn right onto the Chiwawa Loop Road, travel for approximately 3.5 miles to Forest Service Road 6105. Site is located at first road crossing on private property.			

Landowner Information

Landowner Name: **USFDA Forest Service**			Landowner Agent: **n/a**		
Mailing Address: **215 Melody Lane**			Mailing Address: **n/a**		
City: **Wenatchee**	State: **WA**	Zip: **98807**	City: **n/a**	State:	Zip:
Phone: (**509**) **664-9300**	Fax: ( )		Phone: ( )	Fax: ( )	
Cell: ( )	Email:		Cell: ( )	Email:	

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98811**
Phone: **509.667.6567**	Fax: **509.677.6727**	Cell: **509.679.9345**	Email: **alan.schmidt@co.chelan.wa.us**

Barrier Information (measurements in meters)

Is the stream fish-bearing? ☒ Yes ☐ No ☐ Unknown			Species, if known: **summer steelhead**		
Is this culvert a fish passage barrier? ☒ Yes ☐ No ☐ Unknown ☐ Level B needed					
Shape: **Round**	Material: **CMP**	Span/Diam: **48-in./1.46m**	Rise:	Water depth in culvert:	Outfall drop:
Length: **25-ft. 7.6m**	Culvert slope(%): **2.7%** ☐ Laser level ☐ Transit ☒ Other (describe) **Harza Fish Barrier Inventory**				
Streambed material throughout culvert: ☐ Yes ☒ No ☐ Unknown			Apron: ☒ None ☐ Upstream ☐ Downstream ☐ Both		
Road width: **16-ft. 5.2m**	Road fill at DS end: <**8-ft. 2.6m**	Plunge pool: Length to tailout:	OHW width:	Max depth:	
Bankfull width (outside of culvert influence): **10-ft. / 3.05m**			Culvert span/bankfull width ratio:		
Problem with culvert: ☒ Outfall drop ☐ Slope ☐ Velocity ☐ Depth			Percent passability: ☒ 0% ☐ 33% ☐ 67% ☐ 100%		
Will this culvert be entered into the WDFW-FPDSI (formerly SSHEAR) database? ☐ Yes ☒ No If yes, Site ID **#:**					
Comments: **This culvert is presents a outfall drop barrier to juveniles, contains no substrate in the culvert, and therefore blocks access to a stream wetland complex that could provide up to 0.5 mi. of overwintering habitat for juvenile steelhead. The culvert has failed, the spiral construction is unraveling and a hole has formed in the culvert at the road edge.**					

Attachments
☒ Photos ☐ Level A Assessment ☒ Site Map ☐ Other ☒ Additional Comments

Fish Passage Program: Expanded Barrier Evaluation Form

Project Information

Project Name: **Forest Service - Clear Creek *#3***	***IAC/SRFB Project #:***	***Date:*** **9-17-06**

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **WA**	Zip: **98001**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6527**	Email:

Watershed Information

Basin area (square miles above culvert):	Amount of habitat available upstream: **0.5 mi. / 0.8 km.**

Stream flow: ☒ Perennial ☐ Intermittent ☐ Unknown Source of information:

Has a barrier inventory been conducted in the watershed? ☒ Yes ☐ No If yes, list source and date completed:
Harza 2000

Are there downstream barriers? ☒ Yes ☐ No If yes, describe. List source; use separate sheet if necessary:
2 barrier culvert at RM 0.5 and RM 1.5 Forest Service barrier inventory

Are there upstream barriers? ☐ Yes ☒ No If yes, describe. List source; use separate sheet if necessary:

Has the stream been walked? ☐ Yes ☐ No If yes, information source:

Has a WDFW Priority Index number been calculated for this barrier? ☐ Yes ☐ No If yes, PI#:

Fish Species/Use

Species present at site:
☐ Bull trout/Dolly ☐ Chinook ☐ Chum ☐ Coho ☐ Cutthroat ☐ Resident Trout ☐ Sockeye
☒ Steelhead ☐ Pink ☐ Brook/Brown

Information source: **Harza/BioAnalysts 2002**

Current fish use downstream from barrier (include source of information): **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the first barrier culvert (RM 0.5). (WDFW redd surveys & Cameron Thomas, personal communication 2006)**

Current fish use upstream from barrier (include source of information): Red band rainbow and brook trout.**see above**

What species and life history stages might use the habitat made accessible by the project? **rearing habitat for Upper Columbia steelhead.**

Provide a qualitative description (canopy and instream cover, channel stability and complexity, spawning gravel quality and quantity, human alterations) of the habitat that will be made available by barrier correction, if available. Include source of information: **Clear Creek is a 2nd order stream with an average gradient of 3%. It is mostly located on National Forest Land and is typified by variety of age class second growth timber with an active riparian zone on both sides. Barrier removal will provide available tributary habitat primarily for ESA listed summer steelhead, but may also benefit coho. (Cameron Thomas, personal communication 2006)**

Fish Passage Program: Correction Analysis Form

Site Information (measurements in meters)

Project Name: **Forest Service - Clear Creek #3**	***IAC/SRFB Project #:***	***Date:*** **9-17-06**
Bankfull Width (outside of influence from the culvert): **10ft. / 2.4m**	Utilities Crossing: ☐ Yes ☐ No ☒ Unknown	
Road Fill at Downstream End: <**8ft.** / **2.4m**	Road Width: **12ft. / 3.7m**	
Road Description/condition (mainline, spur road, driveway/access): **Forest Service Road # 6105**		

Evaluator Information

Evaluator Name: **Alan Schmidt**		Affiliation: **Chelan County Natural Resources Department**	
Mailing Address: **316 Washington St. Suite 401**			
City: **Wenatchee**		State: **Washington**	Zip: **98801**
Phone: **509-667-6567**	Cell: **509-679-9345**	FAX: **509-667-6727**	Email:

Upstream Habitat/Channel Description

Channel Slope (outside of culvert influence): **3%**%	Regrade Potential (streambed US – streambed DS, in feet):
Dominant Substrate: ☒ sand (<.20") ☒ gravel (.20"–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: **There are 2 additional barrier culverts at RM 0.5 and RM 1.5 which are also a part of the Clear Creek Passage Program and are included in this replacement application.**	

Downstream Habitat/Channel Description

Channel Slope: **3%**% (outside of culvert influence)
Additional downstream information, habitat description, other site conditions or concerns: **Chiwawa River has known occurrence of steelhead, spring Chinook, and bull trout (Harza BioAnalysts 2002) Up to 30 redds have been found below the subject barrier culvert. (WDFW redd survey & Cameron Thomas, personal communication 2006)**

Correction Options and Preferred Alternative

Options to consider – Provide up to three site-appropriate correction alternatives.

Option 1: **Modular Steel Bridge**

Option 2: **Bottomless Arch Structure**

Option 3: **Retro-fit existing culvert**

Preferred alternative - Provide a one or two paragraph recommendation for this site. Include any site-specific concerns that will need to be addressed during design and construction: **In keeping with the intent of WAC 220-110-070 which states that bridges are the preferred structures for fish bearing waters.**

7. **Modular Steel Bridges- The proposed design concept for the Clear Creek Passage Program is to utilize modular steel bridges set on pre-cast concrete abutments. These structures are consistent with WAC 220-110-070 Water Crossing Structures, which contains specific language for encouraging bridge structures at road crossings as opposed to culvert pipes.**

8. **Bottomless Arch Structure- This type of structure provides fish passage and is relatively easy to construct. It typically includes sections of steel arch plates which are bolted together and connected to either pre-cast or cast in place concrete footings. Estimated costs are typically equal to modular steel bridges.**

9. **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. In addition, the local permitting agencies prefer other alternatives.**

Cost Estimates

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

Option 1: $99,965

Option 2: $131,892

Option 3: $39,874

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

12b. In-Stream Passage Cost Estimate

IN-STREAM PASSAGE includes those items that affect or provide fish migration up and downstream to include road crossings (bridges and culverts), barriers (dams, log jams), fishways (ladders, chutes, pools), and log and rock weirs.

Complete only items that apply to your project.
TOTAL COST must include the SRFB and Sponsor's Match Contribution.
Use only whole dollar amounts.
(ENTER ON PRISM TAB 5)

Alternative 1 Replace existing culvert with Modular Bridge					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Bridge	Each	1	37,000	Length/width	30x16
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	6	9,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,000	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,000	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	.5	1,000	Describe	Re-vegetation
Sales Tax			**5,659**		
Sub-Total			**76,896**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**23,069**		
TOTAL COST			**99,965**		

Purchase of equipment is not an allowable cost.

Alternative 2 Replace existing culvert with Super-Cor box culvert					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**

Alternative 2 **Replace existing culvert with Super-Cor box culvert**					
Item	**Unit**	**Qty.**	**Total Cost**	**Description Needed**	**Description (60 characters max.)**
Super-Cor Bottomless Arch	Each	1	42,800	Length/width	35x20
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		1,000	Describe	Dust abatement
Traffic control	Lump sum		1,200	Describe	Flaggers as necessary
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**7515**		
Sub-Total			**101,455**		
Architecture, Engineering, & Admin. **(30% of Sub-Total)**			**30,436**		
TOTAL COST			**131,892**		

Purchase of equipment is not an allowable cost.

Alternative 3 **Retrofit existing culvert**					

Item	Unit	Qty.	Total Cost	Description Needed	Description (60 characters max.)
Retro-fit existing culverts	Each	1		Length/width	
Carcass placement	Linear ft			Describe	
Culvert improvements	Each			Describe	
Dam removal	Each			Describe	
Debris removal	Each			Optional	
Diversion dam	Each			Size/material	
Fishway	Each	1	3,400	Length/width	120ft./24ft.
Log control (weir)	Each			Optional	
Mobilization	Lump sum		2,000	Optional	Transport equipment
Permits	Lump sum		7,000	Optional	Design coordination
Rock control (weir)	Each	4	6,000	Optional	Grade control structures
Roughened channel	Linear ft	120	3,000	Describe	New streambed
Signage	Each		1,200	Describe	Construction signing
Site maintenance	Lump sum		2,200	Describe	Dust abatement
Utility crossing	Lump sum		1,000	Describe	Future utility extension
Water management	Lump sum		5,000	Describe	Stream diversion
Work site restoration	Acres	1	2,000	Describe	Re-vegetation
Sales Tax			**272**		
Sub-Total			**30,672**		
Architecture, Engineering, & Admin. (30% of Sub-Total)			**9,202**		
TOTAL COST			**39,874**		

This alternative would require a hydraulic analysis before this option could be considered.