Passage Through Crossings Assessment

SITE

Forest _____ District _____

Route number: _____ **INFRA milepost:** _____

Milepost: _____from junction of road no. _____

Crossing ID number _____
Structure_____of _____
Structure milepost_____

Watershed 6th HUC or name: _____Stream name: _____

7.5-minute quad name: _____ Land ownership: _____ **NF** _____ Other: _____

Legal description: T. _ _ S / N, R. _ _ E / W, Sec. _ _, _ _ ¼ of _ _ ¼ Principal meridian_____

X/Y Coordinates _____ **Coordinate system** _____**Datum**_____

Surveyor names: _____ **Field date: ___ / ____ / ____**

CROSSING STRUCTURE

Shape

- ☐ Circular
- ☐ Box
- ☐ Open-bottom arch
- ☐ Pipe-arch
- ☐ Ford
- ☐ Vented ford
- ☐ Bridge
- ☐ Other: _____

Dimensions (inches)

width: _____ height: _____

Rust line: _____ (feet)

Ford data: sag _____
F_1 _____
F_2 _____

Multiple structures at site:

___# other openings identical to main structure
Mileposts _____

___# different openings with forms completed

___ # overflow pipes----no forms completed
Mileposts_____

___ # overflow pipes with forms completed

Structure shape comments_____

Structure material

- ☐ Spiral CMP
- ☐ Annular CMP
- ☐ Structural plate

☐ Steel ☐ Aluminum

- ☐ Concrete
- ☐ PVC
- ☐ Wood or log
- ☐ Other: _____

Corrugations

- ☐ 2 2/3 x ½ inch
- ☐ 3 x 1 inch
- ☐ 5 x 1 inch
- ☐ 6 x 2 inch (SSP only)
- ☐ None
- ☐ Paved or smooth invert
- ☐ Other: _____

Skew from road

____degrees

Inlet type

- ☐ Projecting
- ☐ Mitered
- ☐ Wingwall 10-30°
- ☐ Wingwall 30-70°
- ☐ Headwall
- ☐ Apron
- ☐ Trashrack
- ☐ Other: _____

Describe: _____
_____

Outlet configuration

- ☐ at stream grade
- ☐ cascade over riprap
- ☐ freefall into pool
- ☐ freefall onto riprap
- ☐ outlet apron
- ☐ Other: _____

Describe: _____
_____
_____
_____

Fill Volume
L_u (upstream fill slope length):_____
L_d (downstream fill slope length):_____
S_u (slope of upstream fill):_____%
S_d (slope of downstream fill):_____%
W_r (Road Width):_____
W_f (length of road on fill): _____
W_c (length of fill base):_____

Baffles, weirs or other internal structures: Yes No Material: _____

Describe (see sketch): _____

Pipe condition: ☐ Breaks inside culvert (Location_____)

☐ Fill eroding ☐ Debris plugging inlet (% blockage_____) ☐ Bent inlet ☐ Bottom worn through

☐ Poor alignment with stream ☐ Debris in culvert (rock or wood) ☐ Bottom rusted through ☐ Water flowing under culvert

☐ Other _____ Describe overall condition _____

_____

Diversion Potential: Yes No Comments:

Crossing ID Number _____ **Structure** ___**of** ____

SURVEY.

Station[1]	BS (+)	HI	FS (-)	Elevation	Notes
				100.00	

Tailwater Cross Section
Describe:

Station[1]	BS (+)	HI	FS (-)	Elevation	Notes

Long profile (required points)

P_1 inlet gradient control point
P_2 inlet invert
P_3 roadway surface
P_4 outlet invert
P_5 pool bottom
WS_5 or WS_6 water surface at outlet pool taken at P_5 or P_6
P_6 tailwater control
P_7 downstream end of profile
WS_7 water surface at P_7

Tailwater cross-section (minimum recommended points)
Left bankfull
Left edge of water
Left toe of bank
Thalweg
Right toe of bank
Right edge of water
Right bankfull

[1] Station: The distance (ft) along the profile or transect from the starting point.

Crossing ID number _____ **Structure ___ of** ____

STREAMBED SUBSTRATE RETENTION IN STRUCTURE

☐ No substrate in structure
☐ Discontinuous layer of substrate in structure begins at _____ ft; ends at _____ft (measured from inlet)
☐ Substrate is continuous throughout structure

If present, substrate depth at inlet _____ft;substrate depth at outlet _____ ft

SUBSTRATE PARTICLE SIZES number 1up to 3 in order of sizes occupying most streambed area

	Bedrock	Boulders	Cobbles	Gravel	Sand	Silt/Clay	Organics	Aquatic macrophytes
Culvert								
Downstream near tailwater control								

BANKFULL channel widths---outside of culvert influence (ft): (1) _____ (2) _____

(3) _____ (4) _____ (5) _____ **Average** _____

CALCULATIONS FROM SURVEY

Culvert slope: _ _. _ **%** $\frac{\text{elev } (P_2 - P_4)}{\text{dist } (P_2 - P_4)}$ *100

Outlet drop (F): _ _. _ (P_4 minus P_6)

Channel gradient: ____ **%** upst; _____% downst

Inlet gradient: ___ **%** $\frac{\text{elev } (P_1 - P_2)}{\text{dist } (P_1 - P_2)}$ x (100)

Ratio of inlet width to channel width : _____

Residual inlet depth: _____ ($P_6 - P_2$)

Substrate ratio: ____(depth of substrate/structure height)

Residual pool depth: _____ ($P_6 - P_5$)

FIELD PASSAGE EVALUATION

__ **Resembles natural channel** __ **Passage adequate (species/lifestage)** _____

__ **Passage indeterminate** __ **Passage inadequate (species/lifestage)** _____

Comments:

_____
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Crossing ID number _____ **Structure ___ of ____**

Comments: (See instructions for list of potential items needing comments)

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PHOTOGRAPHS---identify and provide captions

Required photos:
1. Inlet from upstream
2. Outlet from downstream
3. Tailwater control

Photo caption	X/Y Coordinates	***Comments***
1. Inlet from upstream		
2. Outlet from downstream		
3. Tailwater control		

Crossing ID number _____ Structure ___ of ____

SITE SKETCH

Include:
North Arrow
Direction of stream flow
Culvert/channel alignment
Lay of tape if needed
Photo point locations and numbers
Wingwalls and inlet / outlet aprons
Multiple structures
Baffle configurations
Weirs and other instream structures
Debris jams inside, upstream and downstream near site, depositional bars
Trash racks, screens, standpipes etc. that may affect passage
Damage to or obstacle inside structure
Location of Riprap for bank armoring or jump pool formation
Tailwater cross-section location

Optional Channel Reference Data

Crossing ID Number _____ **Structure ___of** ____

CHANNEL SLOPE---- measured outside of culvert influence
Upstream (include upstream channel cross section in reach)

Slope = cumulative elevation change/cumulative distance

Station	BS (+)	HI	FS (-)	Elevation	Cumulative

Upstream slope _____

Downstream

Station	BS (+)	HI	FS (-)	Elevation	Cumulative

. Downstream slope _____

Note: Slope measurements should be taken at the water surface and at the same stream feature (such as, pool and pool, or riffle and riffle).

Reference cross-section
Describe location:

Station	**BS (+)**	**HI**	**FS (-)**	**Elevation**	**Notes**

Reference cross section recommended points (minimum)

Left bankfull Thalweg Right toe of bank
Left edge of water Right edge of water
Left toe of bank Right bankfull

Measured Discharge _____cfs

Manning's n _____

Crossing ID number _____

Site Biological information – (Core data and prioritization data)

ANALYSIS SPECIES

Core data			Prioritization data	
Species	**Life Stage**	**Comments**	Upstream habitat blocked (mi)	Downstream habitat blocked (mi)
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				

Habitat Quality Notes:

Watershed Information – Prioritization data

Exotic Species Crossing Barrier

Upstream crossings**:** No. of crossings_____ Distance to 1st crossing (ft): _____Barrier Y ☐ N ☐ Distance to 2nd crossing (ft): _____Barrier Y ☐ N ☐	Downstream crossings: No. of crossings_____ Distance to 1st crossing _____ mi Barrier Y ☐ N☐ Distance to 2nd crossing _____mi Barrier Y ☐ N☐
Other upstream barriers: No. of barriers: _____ Distance to 1st barrier: _____mi Height _____ft Distance to 2nd barrier: _____ mi Height _____ft	Other downstream barriers: No. of barriers _____ Distance to 1st barrier: _____mi Height _____ft Distance to 2nd barrier: _____ mi Height _____ft

Is a barrier necessary at this site to meet management objectives, that is---passage barrier okay?

Yes No

Passage Through Crossings Assessment

Multiple Structures Supplemental Form

Crossing ID number _____
Structure_____**of** _____
Structure milepost _____

CROSSING STRUCTURE

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☐ Poor alignment with stream ☐ Debris in culvert (rock or wood) ☐ Bottom rusted through ☐ Water flowing under culvert

☐ Other _____ Describe overall condition _____

_____

_____

Diversion Potential (prioritization data): Yes No Comments:

Crossing ID Number _____ **Structure** ____ **of** ____

SURVEY.(Use same control points as for structure 1. Integrate survey if possible.)

Station[1]	BS (+)	HI	FS (-)	Elevation	Notes
				100.00	

Tailwater Cross Section (only applicable if in a different channel from structure 1 (eg. side channel)
Describe:

Station[1]	BS (+)	HI	FS (-)	Elevation	Notes

Long profile (required points)

P_1 inlet gradient control point
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P_5 pool bottom
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Outlet drop (F): _ _._ _ (P_4 minus P_6)

Channel gradient: ____ **%** upst; _____% downst

Inlet gradient: ___ **%** $\frac{\text{elev } (P_1 - P_2)}{\text{dist } (P_1 - P_2)}$ x (100)

Ratio of inlet width to channel width : _____

Residual inlet depth: _____ ($P_6 - P_2$)

Substrate ratio: ____(depth of substrate/structure height)

Residual pool depth: _____ ($P_6 - P_5$)

FIELD PASSAGE EVALUATION (use if in different channel from structure 1)

__ **Resembles natural channel** __ **Passage adequate (species/lifestage)** _____

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Comments:

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Crossing ID number ________________________ **Structure** ____ **of** ____

Comments: (See instructions for list of potential items needing comments)

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2. Outlet from downstream
3. Tailwater control

Photo caption	X/Y Coordinates	***Comments***
1. Inlet from upstream		
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3. Tailwater control		

Crossing ID number _____ **Structure** ____ **of** ____

SITE SKETCH (Only use if this structure is at some distance from structure 1. All related structures should be on same sketch.)

Include:
North Arrow
Direction of stream flow
Inlet/channel alignment—include compass bearing for pool alignments
Lay of tape if needed
Photo point locations and numbers
Wingwalls and inlet / outlet aprons
Multiple structures
Baffle configurations
Weirs and other instream structures
Debris jams inside, upstream and downstream near site, depositional bars
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