

Road/Stream Crossing Inventory

1. Introduction

Sediment has been identified as one of the primary pollutant threats to our water quality. Road/Stream crossings can become a conduit for this pollution when excessive soil from roads and/or eroding banks at the culvert placement, flow into a tributary. These road/stream crossings range from 18-inch culverts to two lane highway bridges. The cumulative effects of sedimentation are an area of concern in stream systems, as they can directly affect diverse fish and riparian dependent wildlife. Sediment can cover aquatic spawning beds and clog fish gills as well as impair water quality. As part of the critical area evaluation for the Rifle River Watershed Plan an inventory of all public road/stream crossings within the watershed was conducted. The purpose of this inventory was to identify and document all of the road crossing sites on the numerous tributaries of the Rifle River Watershed.

Method

On site field evaluations were performed to inventory each potential crossing. A Road/Stream Crossing Field Data Form was completed at each site. A series of photographs were also taken to document existing conditions at each crossing. Each site was visited to assess potential problems that may contribute nonpoint source pollution and impact water quality. Data collected at the crossings included detailed information about the location, road characteristics (width, shoulder, drainage, approaches, surface), culvert condition, erosion and runoff problems. Stream characteristics such as width, depth, current and substrate were also recorded.

At each crossing, soil erosion was evaluated in terms of existing and potential conditions; additionally, various physical measurements were made and each site was documented with an inlet and an outlet photograph. This information was compiled into a database for evaluation.

One of the key functions of an inventory is to aid in the prioritization of sites for improvement. Each crossing was assigned a "score" along with a corresponding severity ranking category: Minor, Moderate or Severe. The ranking is designed to reflect the relative severity of existing and potential erosion conditions at each site. In general, the severity ranking will be one of several considerations for improvement decisions. Point scores were calculated using the scoring work sheet and the sites were assigned the severity rankings as follows:

<u>Point Score Total</u>	<u>Severity Category</u>
0-15	Minor
16-29	Moderate
≥30	Severe

Severity rankings are useful as a quick reference to sites that fall within a specific category. However, it is expected that resource managers will carefully review candidate sites for improvement by paying closer attention to individual scores before selection of sites for implementation.

Definitions of the terms used in data collection and severity ranking are provided below:

Adjacent Landowners: Ownership was determined from county plat book maps. Recent ownership may not be reflected and should be re-checked prior to any improvement work.

Corrective Measures/Drainage Control Features: Any best management plan measures used to correct site-specific erosion problems; generally these include diversion outlets, erosion blankets, and sediment basins.

Embankment: The area surrounding the culvert. The slope associated with the inlet and outlet of a corrugated metal pipe or box culvert.

Extent of Erosion: This category provides a subjective assessment of the observation of sand deposition, gullies, or similar conditions at the sites. It does not reflect erosion potential.

Fish Passage Problem: This refers to the flow through a culvert and whether or not fish can move through the culvert in either direction. Certain obstructions have the potential to impede passage such as a perched culvert.

Flow Through Culvert: This is an indication of obstruction to flow. Obstructed flow is generally associated with large debris accumulations such as beaver dams or due to large sediment inputs associated with run-off or grading.

Fill: Refers to the amount of material (e.g. sand, soil, gravel, etc.) over the culvert.

Length of Approaches: The downward slope of a road approaching a stream crossing where typically the stream is located at the low point.

Recommended Treatment: One or more best management practices recommended for each crossing. The practices are selected based on proven ability to reduce sedimentation and are generally accepted by road and water resource professionals.

Runoff Pathway: The course of runoff to a stream channel. This may be via two general routes, the road or ditch/shoulder. Typically, roads with a surface of either gravel or sand result in runoff traveling down the road.

Slope of Approaches: The ratio of an increase in height over the distance of a given road and is usually expressed as a percentage.

Stream Current: Average upstream and downstream current was observed and classified as slow, medium, or fast.

Vegetation: Defines the presence, absence, and relative abundance/condition of existing vegetation on the embankments of a given crossing. Generally, vegetation that is at all disturbed by access or road grading is considered to be partial.

Wetlands: Any stand of vegetation that is typical of an area of land that is at least partially inundated by water for part of the year.

Visible Down Cutting: This indicates the distance or drop from the base of the culvert outlet to the surface of water.

ROAD/STREAM CROSSING SEVERITY INDEX

RIFLE RIVER WATERSHED

Site I. D. _____

Factors Contributing to Severity	Points	Site Score
ROAD SURFACE	Paved: 0 pt Gravel: 3 pt Sand and Gravel: 6 pt Sand: 9 pt	
LENGTH OF APPROACHES	0-4 ft: 1 pt 41-1000 ft: 3 pt 1001-2000 ft: 5 pt > 2000 ft: 7 pt	
SLOPE OF APPROACHES	0 %: 0 pt 1-5%: 3 pt 6-10 %: 6 pt >10 %: 9 pt	
WIDTH OF ROAD, SHOULDERS & DITCHES	< 15 ft: 0 pt 16-20 ft: 1 pt > 20 ft: 2 pt	
EXTENT OF EROSION	Minor: 1 pt Moderate: 3 pt Severe: 5 pt	
EMBANKMENT SLOPE	Bridges: 0 pt >2:1 slope: 1 pt 1:5-2:1 slope: 3 pt Vertical or 1:1 slope: 5pt	
STREAM DEPTH	0-2 ft: 1 pt >2 ft: 2 pt	
STREAM CURRENT	Slow: 1 pt Moderate: 2 pt Fast: 3 pt	
VEGETATIVE COVER OF SHOULDERS & DITCHES	Heavy: 1 pt Partial: 3 pt None: 5 pt	
TOTAL	0-15 Minor 16-29 Moderate ≥ 30 Severe	

Road/Stream Crossing Data Form

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ROAD STREAM CROSSING FIELD DATA FORM

Collected By: _____
Date: _____

Field I.D. Number: _____
Site I.D. _____

LOCATION

Stream Name: _____ County: _____ Road Name: _____

Crossing Name: _____ Township: _____ T _____ R _____ Sec. _____

Type of Crossing:
 Bridge
 Single Culvert
 Twin Culverts
 Triple Culverts
 Other _____

Adjacent Landowners:
 USA
 State
 Local Gov't.
 Private
 Other _____

ROAD DATA

Width at Crossing _____ ft.
 Road Surface: _____ paved
 _____ gravel
 _____ sand
 Maintenance: _____ seasonal
 _____ year around

APPROACHES

	Left	Right
Length:	_____ ft.	_____ ft.
Slope:	_____ 0%	_____
	_____ 1-5%	_____
	_____ 6-10%	_____
	_____ >10%	_____

Location of low point:
 at stream
 other _____

Ditch/Shoulder Vegetation

_____ none _____
 _____ partial _____
 _____ heavy _____

Existing drainage control features:
 None _____ Present and functional
 Need repair _____

Average width of grade, including shoulders and ditches _____ ft.

Runoff path: _____ roadway _____ ditch

CULVERT DESCRIPTION

Length _____ ft.
 Diameter _____ inches
 Material: _____ galvanized
 _____ concrete
 _____ other _____

Condition: _____ good
 _____ fair
 _____ poor

Flow through culvert: _____ clear
 _____ obstructed

Fish passage problem? _____

Fill Depth: Inlet Outlet
 _____ ft. _____ ft.

Embankment: _____ vertical _____
 _____ 1:1 _____
 _____ 1.5:1 _____
 _____ 2:1 _____
 _____ >2:1 _____

STREAM CHARACTERISTICS

	Upstream	Downstream
Ave. Width:	_____ ft.	_____ ft.
Ave. Depth:	_____ ft.	_____ ft.
Ave. Current	_____ slow _____	_____
	_____ moderate _____	_____
	_____ fast _____	_____

Predominant substrate type: _____ sand _____
 _____ sand/gravel _____
 _____ gravel _____
 _____ muck _____
 _____ other _____

Adjacent wetlands: _____ yes _____ no

Water Temperature: _____

Visible down cutting _____ yes _____ no _____ inches

Comments: _____

CONDITIONS AND TREATMENT

Erosion Conditions:

- Streambank erosion beside crossing
- embankment erosion
- culvert outlet erosion
- pool formation at culvert outlet
- shoulder/ditch erosion
- sand/soil over bridge or crossing
- other _____

Recommended Treatment (number):

- pavement
- paved curb & gutter
- erosion control structures ()
- sediment basins ()
- extend culverts ()
- diversion outlets ()
- increase fill
- replace culverts ()
- other _____

Extent:

- minor moderate extreme

Reason for recommendation: _____

Cause: _____

PHOTOS Film Number _____

times: _____

SITE SKETCH

