Stream Smart

Connecting fish and wildlife habitat while protecting roads and public safety.

StreamSmartMaine.org

Stream Smart Road Crossing Workshop Partners

For more information, go to StreamSmartMaine.org

Stream Smart Phase II:
Road Crossing Field Survey and Assessment Two-Day Workshop

WORKSHOP OBJECTIVE: To provide information that will enable participants to gather and analyze field data relative to ecological objectives (i.e. fish passage and connected stream processes) when designing replacement structures at stream/road crossings.

Stream Smart Phase II:
Road Crossing Field Survey and Assessment Two-Day Workshop

WORKSHOP OBJECTIVE: At the end of this course, participants will understand how to:

1. Identify and evaluate specific conditions at stream/road crossing sites and collect and analyze data
2. Utilize stream survey tools and techniques including longitudinal profiles, cross sections and bed characterization
3. Develop recommendations for properly sized and installed structures that maintain ecological functions

Stream Smart Phase II:
Road Crossing Field Survey and Assessment Two-Day Workshop

DISCLAIMER: This information is in addition to and does not replace additional elements of design relative to the hydraulic capacity and structural integrity of the road/stream crossing.

Road Map of Day 1

8:30 – 9:00 Participant Registration

9:00 – 9:15 Welcome and Overview

9:15 – 10:00 Stream Smart Refresher

10:00 – 11:00 Intro to tools, site assessment, data collection

11:00 – 11:30 Travel to field site

11:30 – 12:00 LUNCH (box lunch provided)

12:00 – 3:00 Break into groups, visit stations

3:00 – 3:30 Regroup, Q&A

3:30 – 4:00 Travel back to classroom

4:00 Reminders for Day 2, depart

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Road Map of Day 2

8:30 – 9:00 Check all have spreadsheets

9:00 – 12:00 Spreadsheets and working with data from field site

12:00 – 12:30 LUNCH (provided)

12:30 – 1:30 Hydrology and Hydraulics

1:30 – 2:00 Structural Design Options

2:00 – 2:15 BREAK

2:15 – 3:45 Construction Site Concepts and Case Studies

3:45 – 4:00 Q&A, Closing Remarks, Evaluations

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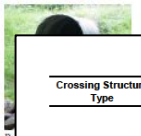

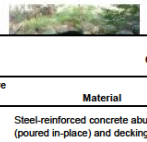

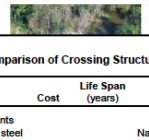

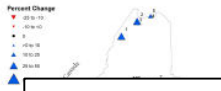

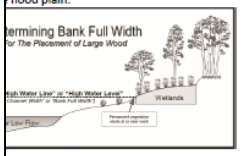

Folder Materials

Stream Smart
StreamSmartMaine.org

Connecting fish and wildlife habitat while protecting roads and public safety.

What is Stream Smart?

Stream Smart is a training program and resource for anyone responsible for contructing road-stream crossings. The goal of Stream Smart is to connect fish and wildlife habitat while protecting roads and public safety and to prepare for the large and frequent storm events that have been washing out roads around the state and the northeast.

Who Benefits?

FISH
Brook trout and other fish need to move up and down the stream.

WILDLIFE
Mink and other wildlife need to follow the fish.

PEOPLE
People need healthy streams and safe roads.

The Problem

Natural Resources Conservation Service
Maine

The USDA's Natural Resources Conservation Service (NRCS) has b
side with farmers, timber harvesters and other private landowne
natural resources on their land. NRCS is actively engaging in coop
with partners, agency biologists and most importantly local lando
restoration and enhancement projects on the landscape. Maine
tributaries have undergone dramatic changes over the last 200 y
changes influenced by humans include over-widened channels, re
structure, and a decrease in stream connectivity due to problem

Signs of Culvert Problems

Do you have problem culverts on your land?
The majority of problem culverts are caused because they are undersized. Below are some signs of problem crossings:

Assistance

The NRCS has technical and financial assistance programs to help solve identified resource problems on private land. Our programs help reduce the cost of sustainable conservation efforts that benefit the landowner and the environment.

How do you Benefit

The average shelf life of traditional round culverts is 25 years. Roads in headwater

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Science, Service, Stewardship

FS-2011-01

NOAA
FISHERIES
SERVICE

Flood Frequency Estimates for New England River Restoration Projects: Considering Climate Change in Project Design

Flood frequency estimates are used to quantify the magnitude and frequency of relatively rare or extreme river discharges. Such estimates are necessary to design many river restoration projects. For projects that include constructing new infrastructure or retrofitting existing infrastructure flood frequency estimates are required to size the infrastructure to withstand floods of specified magnitudes (e.g., events expected to recur every 100 years). For projects where infrastructure is being removed and a natural

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Comparison of Crossing Structures

Crossing Structure Type	Material	Cost	Life Span (years)	Advantages	Disadvantages
Bridge A	Steel-reinforced concrete abutments (poured in-place) and decking on steel I-beam stringers	$$$	50-75	Natural bottom, durability, snow-plowable	High cost
Bridge B	Waste-block concrete abutments with steel I-beam stringers and timber deck (possibly paved or alternate decking)	$	50-75; timber redeck 5-10	Natural bottom, low cost; simplicity	Limited abutment height; snow plowing limited
Bridge C (3-Sided Box Culvert)	Steel-reinforced concrete, galvanized steel or aluminum	$$	50-75	Natural bottom, simplicity	Weight of concrete structures can limit installation options
Open Bottom Arch	Galvanized Steel, aluminum, steel-reinforced concrete	$$	50-75	Natural bottom, ease of transport, can be low profile	Care must be taken to install and protect footings, assembly required for metal plate structures
Embedded Box Culvert	Steel-reinforced concrete	$$	50-75	Natural bottom if spans stream; variety of configurations	Must span stream and be set below stream elevation to avoid outlet perch
Embedded Pipe Arch	Galvanized steel, steel-reinforced concrete	$ - $$	20-75	Natural bottom if spans stream; wide for given volume; low cost of steel	Steel short life span; not for use with ledge
Embedded Round Pipe	Galvanized steel, plastic, steel-reinforced concrete	$	20-75	Natural bottom if spans stream; lowest cost	Limited to smaller sizes; not for use with ledge
Round Pipe (at stream grade)	Galvanized steel, plastic, steel-reinforced concrete	$	20-75	May allow fish passage over time if spans stream; lowest cost	Rarely adequate for fish passage at less than stream width (develops outlet perch); limited to smaller sizes

Maine Stream-Smart Crossings Workshop

Maine Stream Smart Road-Stream Crossing Field Workshop Glossary*

Subset of Terms Used in
am Assessment Measurements

olume of flow, and the flow width or depth associated
n: that point where water fills the channel just before
flood plain.

ow of water (and other material) through a given cross-
n square feet), given normally in cubic feet per second

that controls channel elevation and therefore local
trols can be natural streambed structures or manmade
s used in this guide, the term most commonly refers to
logs, riffle crests, boulder steps, etc. See also Key

ge in channel bed elevation resulting in local
y be nearly vertical, or more gradual, depending on grain
channel materials.

the forces and dynamics of water in open channels and
late to stream crossings to model and evaluate the likely

lture Forest Service, "STREAM SIMULATION: An Ecological Approach to Providing Passage for Aquatic Organisms at Road-Stream Crossings", May 2008.

Cross-Section Survey Data Sheet Form #___ of ____

Site Name:	SITE ID #:
Town, State/Province:	Stream Name:
Pre-restoration Post-restoration (circle	Date:
Form completed by:	Time (24hr):
Investigators:	

CROSS SECTION ID #	Left Monument (UTM) N	E
	Right Monument (UTM) N	E

Location Description	Benchmark Description
Left Monument Description	Right Monument Description

Station (STA)	Backsight (BS)	Height of Instrument (HI)	Foresight (FS)	Elevation (ELEV)	Notes
ft.	ft.	ft.	ft.	ft.	

Legend
HI = ELEV + BS; TP ELEV = HI - FS; New HI = TP ELEV + BS

LB: Left Bank
RB: Right Bank
LEW: Left Edge of Water
REW: Right Edge of Water
BKF: Bankfull
CL: Center Line
BM: Benchmark
TP: Turning Point

Stream Barrier Removal Monitoring Guide | 2007
This data sheet can be downloaded at www.gulfofmaine.org/streambarrierremoval


Why are *you* here?