

Putting It All Together: STH 139

2008 WI State Project 9110-06-60

Duck Creek

Florence County, WI

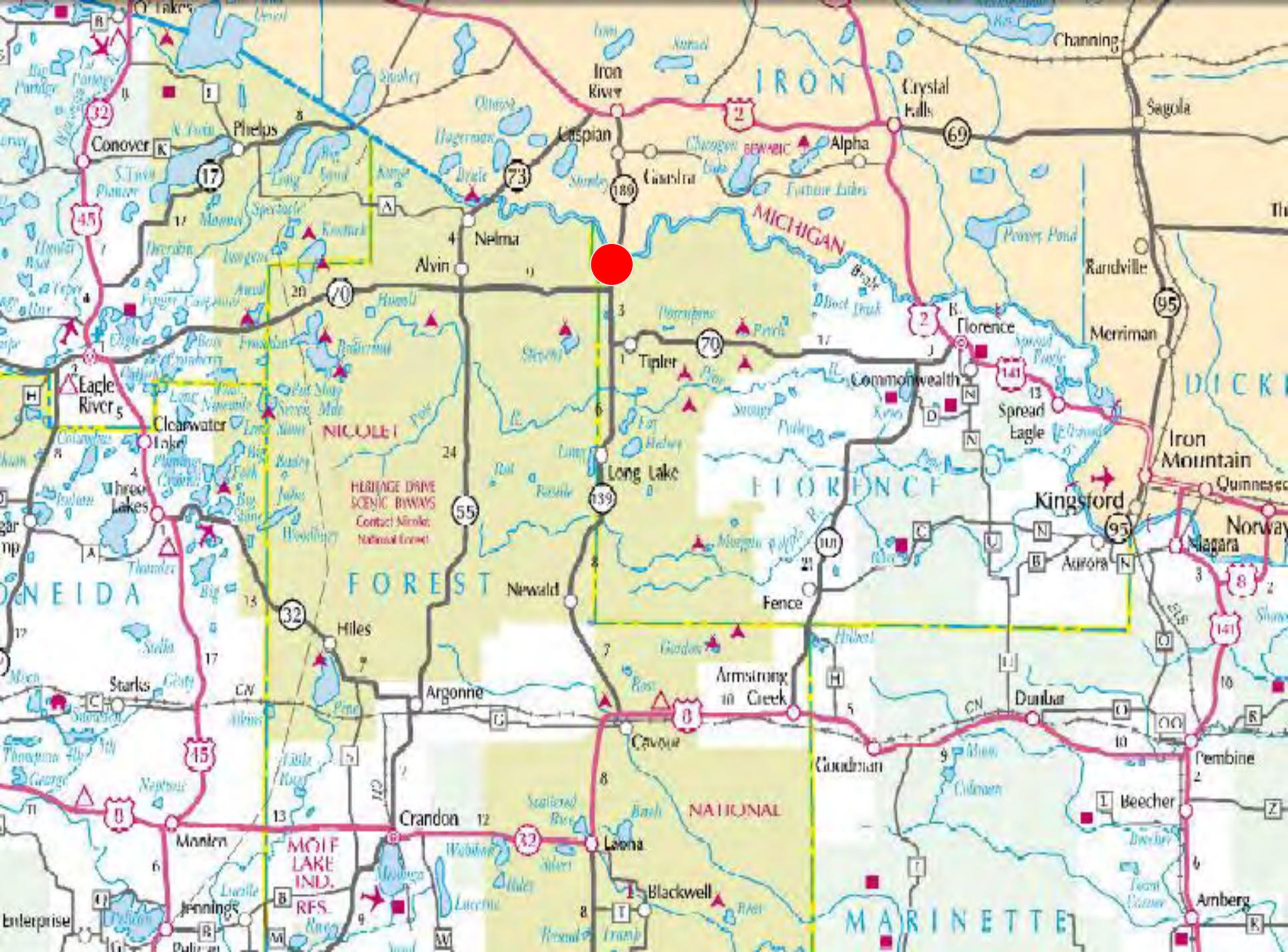


Jon Simonsen, WDNR

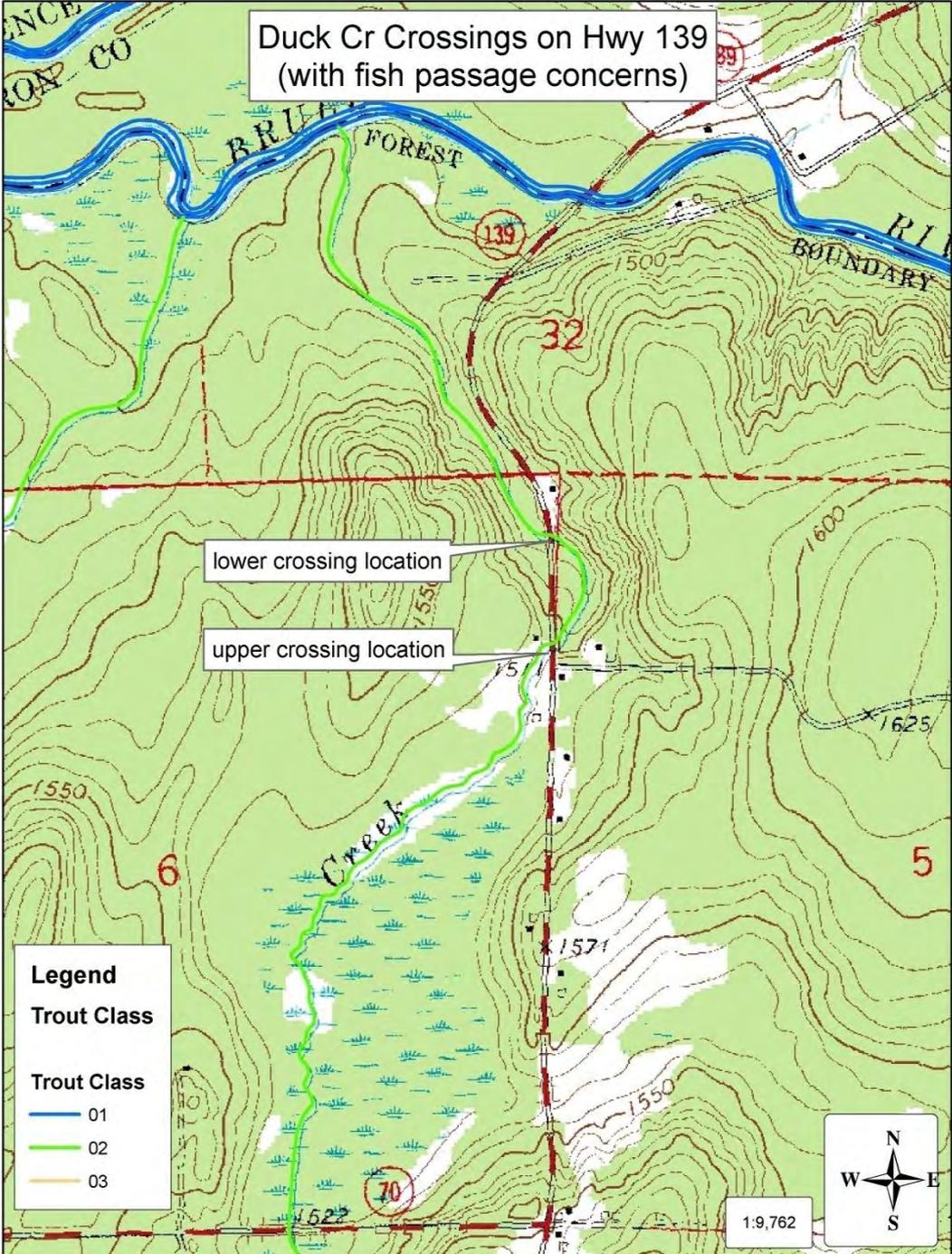
Dale Higgins, USFS

Michael Kretschmer, P.E., WDOT





Duck Cr Crossings on Hwy 139
(with fish passage concerns)



Legend

Trout Class

Trout Class	Color
01	Blue
02	Green
03	Orange



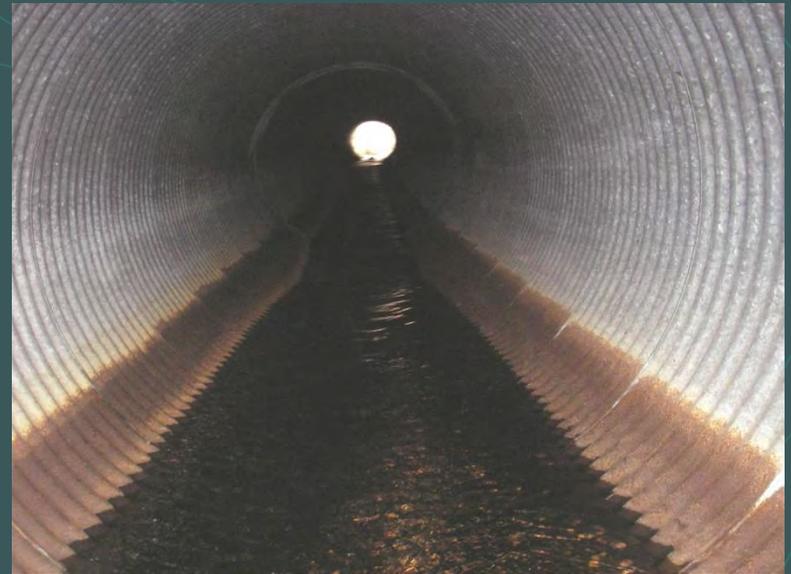
A vertical strip on the left side of the slide shows a topographic map of a road corridor. The map features contour lines, a road network, and a yellow line indicating a specific project area. The background of the slide is a dark teal color with light teal wavy lines.

WisDOT Perspective

- Preventative Maintenance Project
 - Pavement Mill and Overlay
 - Deck Repairs
 - Beam Guard Replacement
 - Culvert Replacements

WDNR & US Forest Service Perspective

- Two crossings on Duck Creek were Restricting AOP
- WDOT Project Provided an Opportunity to Restore AOP



Cooperation

- Project moved up one yr, planning compressed
- Survey Information
- Culvert and Stream Simulation Design
- Cost Estimating / Cost Share
- Project Agreement
- Plan Development
- Construction:
 - Contractor - culverts
 - USFS C&M Crew – sheet pile and streambed

A vertical strip on the left side of the slide shows a topographic map of the Duck Creek area. It features contour lines, a yellow line representing the creek, and a red line representing a road. The map is partially obscured by the text on the right.

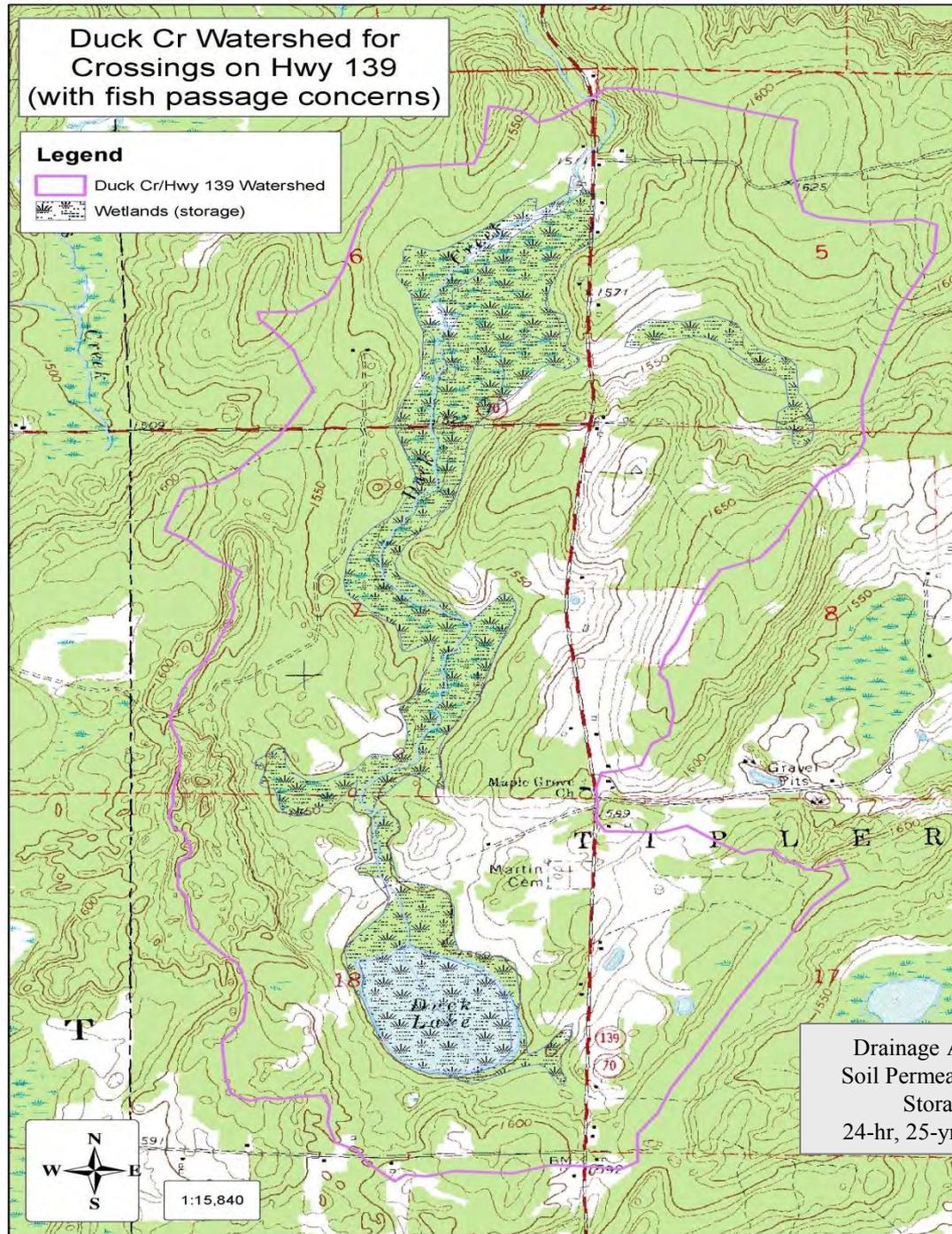
Duck Creek Characteristics

- 3.6 Mile - Coldwater Tributary to the Brule River
- Class II and III Brook Trout Water (WDNR 2002)
- Currently Managed as Class I Water
- Important spawning and rearing habitat for Brule R
- Coldwater refugia for Brule R
- Resident brook trout

Duck Cr Watershed for Crossings on Hwy 139 (with fish passage concerns)

Legend

-  Duck Cr/Hwy 139 Watershed
-  Wetlands (storage)

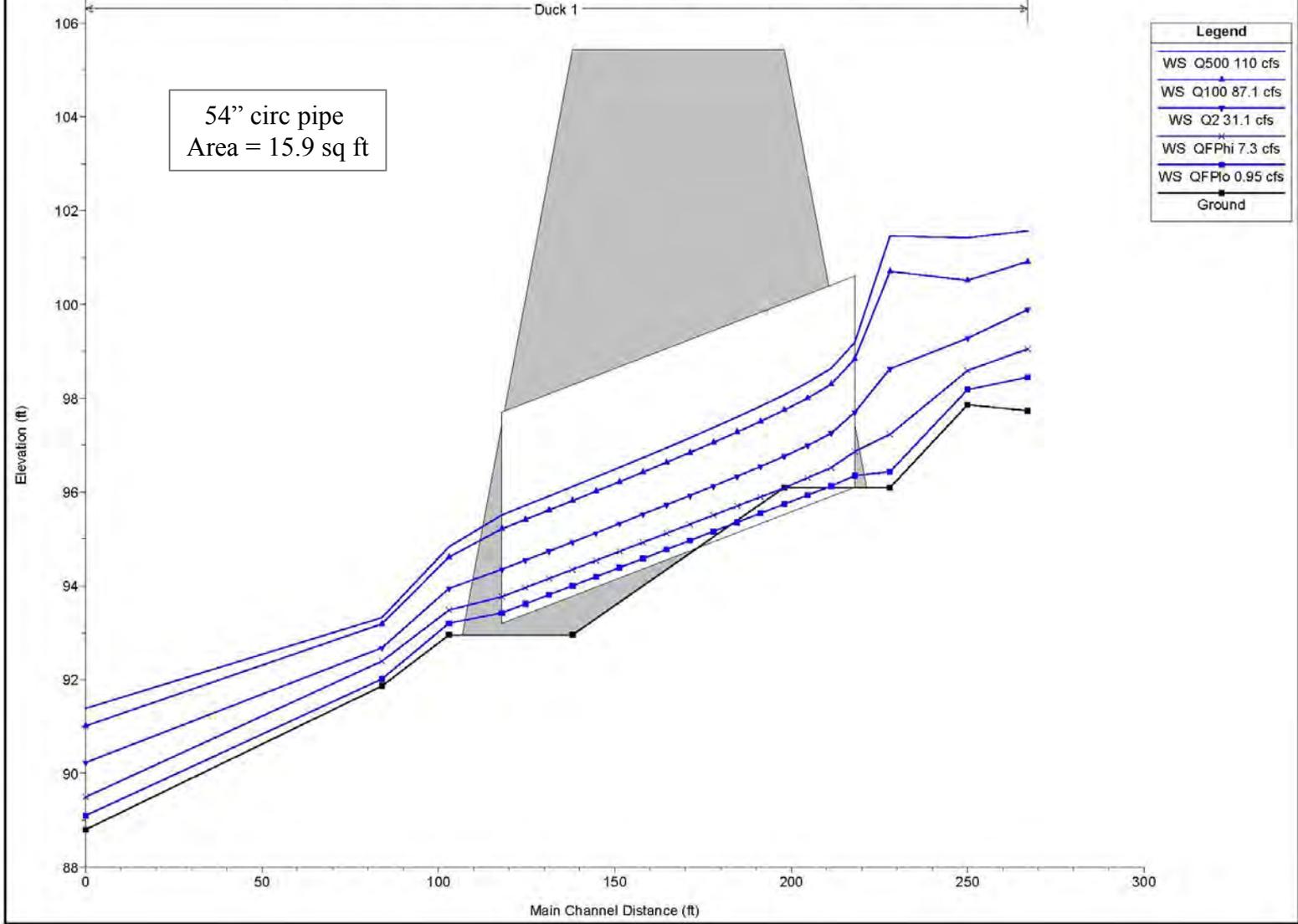


Drainage Area = 3.15 sq mi
Soil Permeability = 1.65 in/hr
Storage = 16.5 %
24-hr, 25-yr Ppt = 4.24 inches

Existing Culvert – Upper Crossing



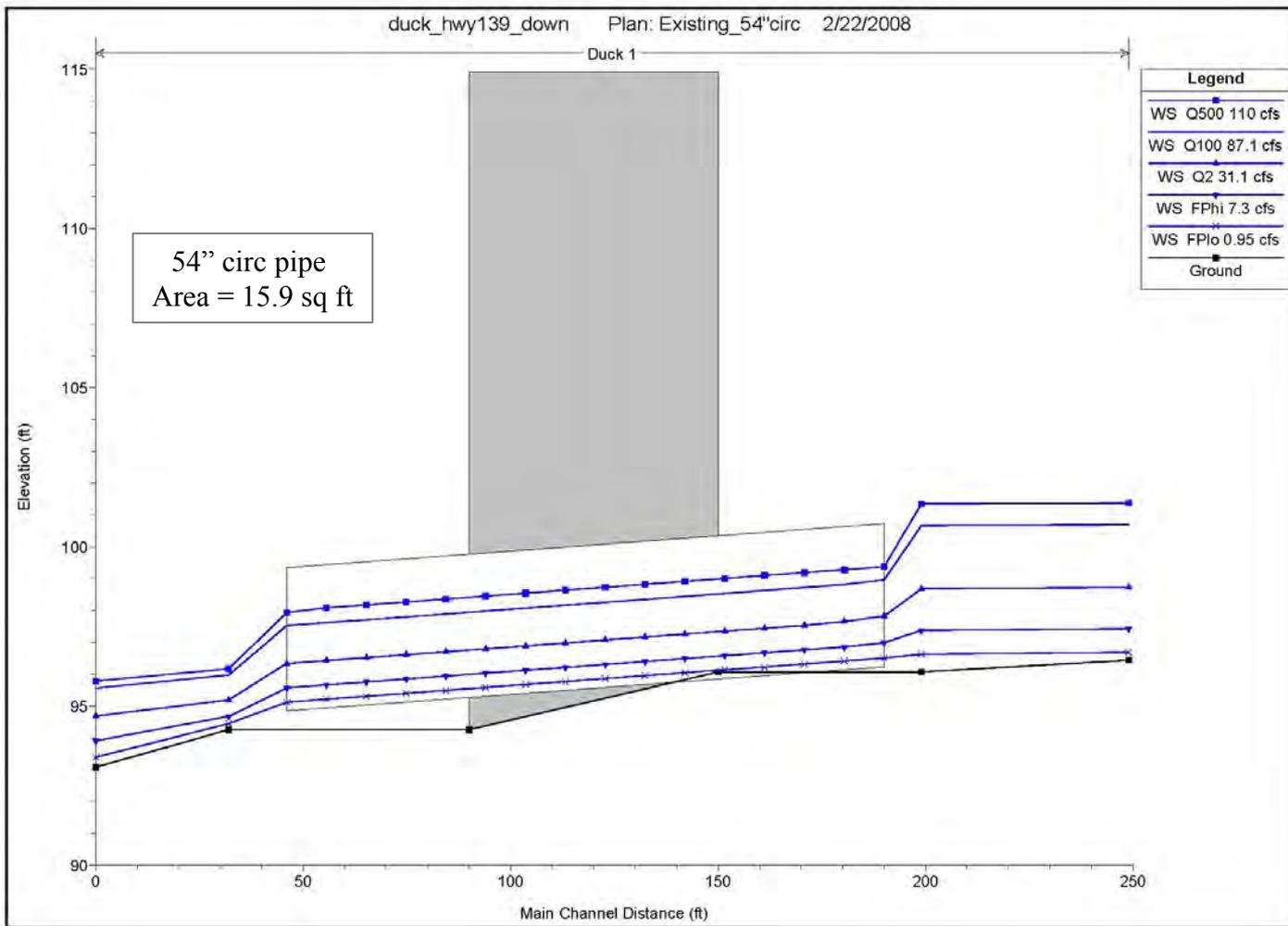
Duck Cr at Highway 139 Upstream Crossing Plan: Existing 54" Circular CMP 2/26/2008



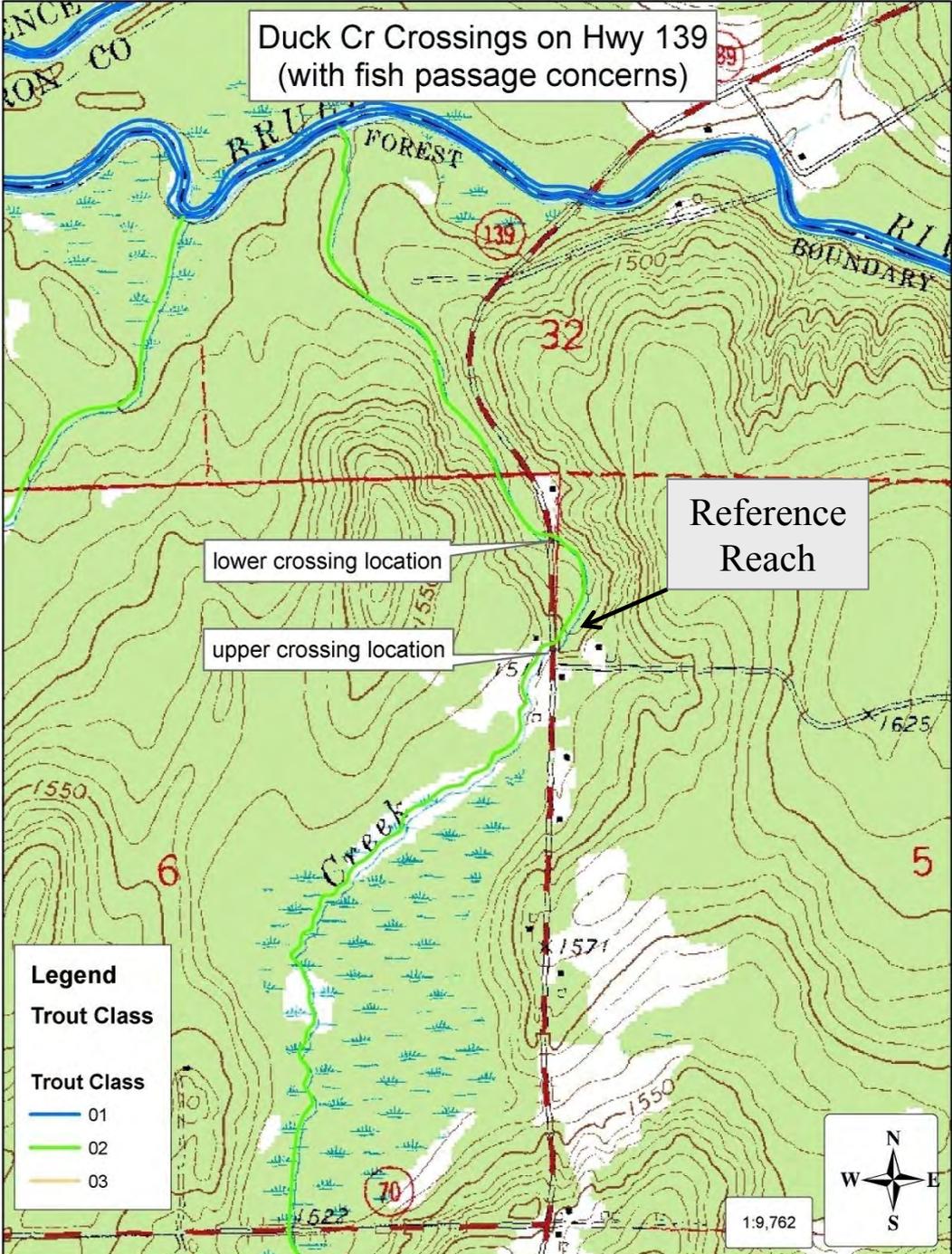
Existing Culvert – Lower Crossing



duck_hwy139_down Plan: Existing_54'circ 2/22/2008



Duck Cr Crossings on Hwy 139
(with fish passage concerns)



lower crossing location

upper crossing location

Reference Reach

Legend

Trout Class

Trout Class	Color
01	Blue
02	Green
03	Orange

1:9,762



Reference Reach

(located 118 ft downstream from upper crossing)



Mean Bankfull Width = 7.2 ft

Range of BFWs = 5.7-9.9 ft



Gradient = 3.4%

D50 = 105 mm (small cobble)

Range from sand to boulders

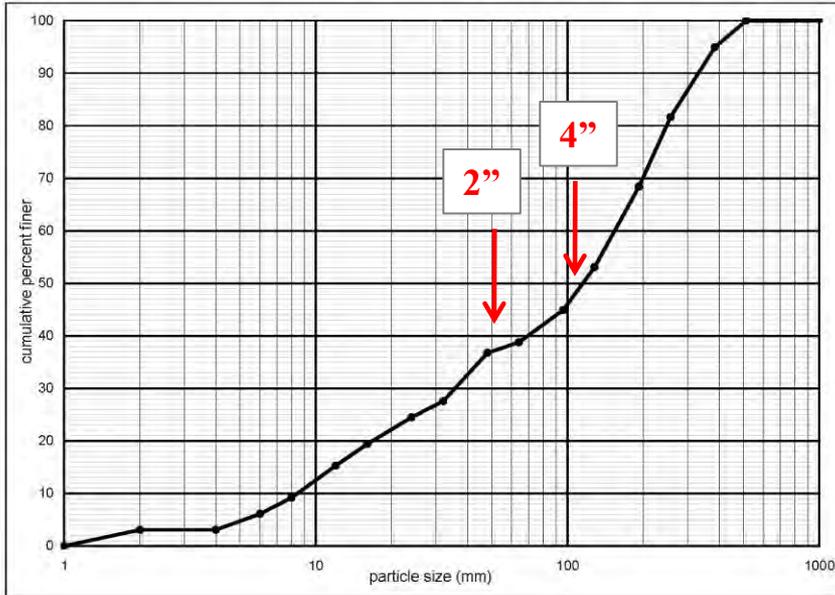
Designing for Aquatic Organism Passage at Road-Stream Crossings

Duck Cr @ Hwy 139 Pebble Count Data, Reference Reach, 118 ft Downstream from Upper Crossing

particle size interval name	size interval (mm)	count or frequency	percent frequency	cumulative percent finer
very large boulders	2048 to 4096	0	0.00	100.00
large boulders	1024 to 2048	0	0.00	100.00
medium boulders	512 to 1024	0	0.00	100.00
small boulders	384 to 512	5	5.10	94.90
	256 to 384	13	13.27	81.63
large cobbles	192 to 256	13	13.27	68.37
	128 to 192	15	15.31	53.06
small cobbles	96 to 128	8	8.16	44.90
	64 to 96	6	6.12	38.78
very coarse gravel	48 to 64	2	2.04	36.73
	32 to 48	9	9.18	27.55
coarse gravel	24 to 32	3	3.06	24.49
	16 to 24	5	5.10	19.39
medium gravel	12 to 16	4	4.08	15.31
	8 to 12	6	6.12	9.18
fine gravel	6 to 8	3	3.06	6.12
	4 to 6	3	3.06	3.06
very fine gravel	2 to 4	0	0.00	3.06
sand, silt, or clay	< 2	3	3.06	0.00
Total count		98	100.00	

percentile	particle size (mm)
d95	400
d84	270
d50	120
d16	13
d5	5

% boulders	18.37
% cobbles	42.86
% gravels	35.71
% sands, silts, clays	3.06



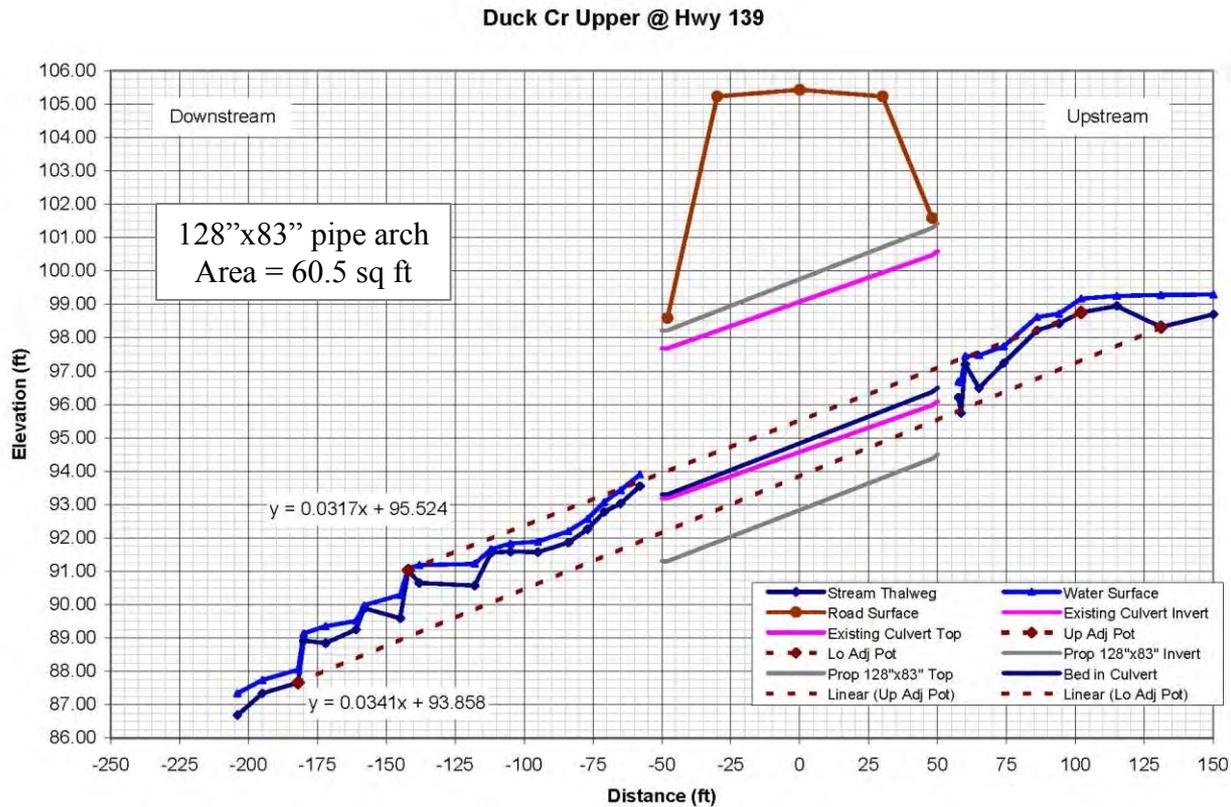
Streambed Mix for Duck Cr Culverts at Highway 139

Size (inches)	% Passing	% by Volume	Size Range	Volume Needed (cu yds)		
				Lower Xing	Upper Xing	Both
20	100	15	12-20"	15	11	25
12	97	15	8-12"	15	11	25
8	70	25	4-8"	25	18	42
4	45	10	2-4"	10	7	17
2	37	15	3/4-2"	15	11	25
<3/4	22	20	sand-3/4"	20	14	34
Total		100		100	70	170

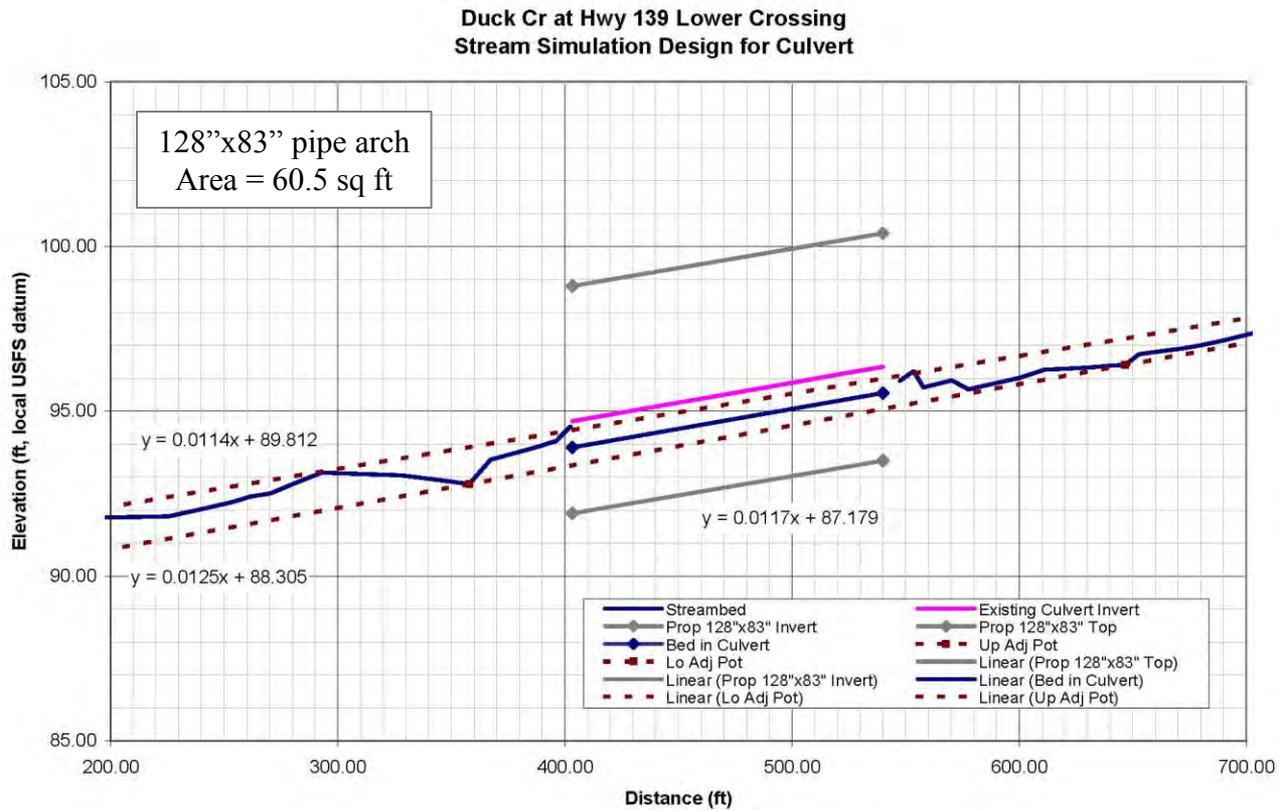
Note: volume assumes 0.7 cu yd/ft of culvert length
 Note: also need 410 rocks 18-24", 320 for banks and 90 for bands



Proposed Design: Upper Crossing



Proposed Design: Lower Crossing



A vertical strip on the left side of the slide shows a topographic map with contour lines and a yellow line indicating a construction path.

Construction Schedule

- Begin Construction: June 4, 2008
- End Construction: July 18, 2008

Construction: Upper Crossing













































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Construction: Lower Crossing





























A vertical strip on the left side of the slide shows a topographic map of a stream area. The map features contour lines, a stream channel, and various colored overlays representing different project components or land use. The stream flows from the top towards the bottom of the strip.

Construction Details

- WisDOT Contract:
 - Culvert Installation: 4 Days
- US Forest Service:
 - Stream/Culvert Bed Mix: 3 Days
- WisDOT Contract:
 - Clean up and Restoration: 1 Day

Cost Share

- WisDOT Construction Project Cost: \$1.65 M
- WisDOT Pipe Installation Cost: \$23,450
(\$110,950 – \$87,500)
 - Upper Culvert Crossing Cost:
 - Culvert Pipe: \$350/LF; 100LF = \$35,000
 - Miscellaneous: \$6,400
 - Lower Culvert Crossing Cost:
 - Culvert Pipe: \$350/LF; 150 LF = \$52,500
 - Miscellaneous: \$17,050

Cost Share

- US Forest Service Project Cost: \$116,530
 - US FS Cost Share Agreement: \$87,500
 - Special Earmark Funds (SAFETEA-LU)
 - US FS Labor/Equipment Cost: \$29,030

- Combined:
 - Total Construction Cost of Pipe Installation:
\$139,980

Questions

