



IMPROVING CONNECTIVITY FOR HUMANS AND FISH

Fish Habitat Improvements included in the
Sterling Highway MP 157-169 Rehabilitation

Presenters

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INTRODUCTIONS



Heidi Robuck, P.E.
DOWL

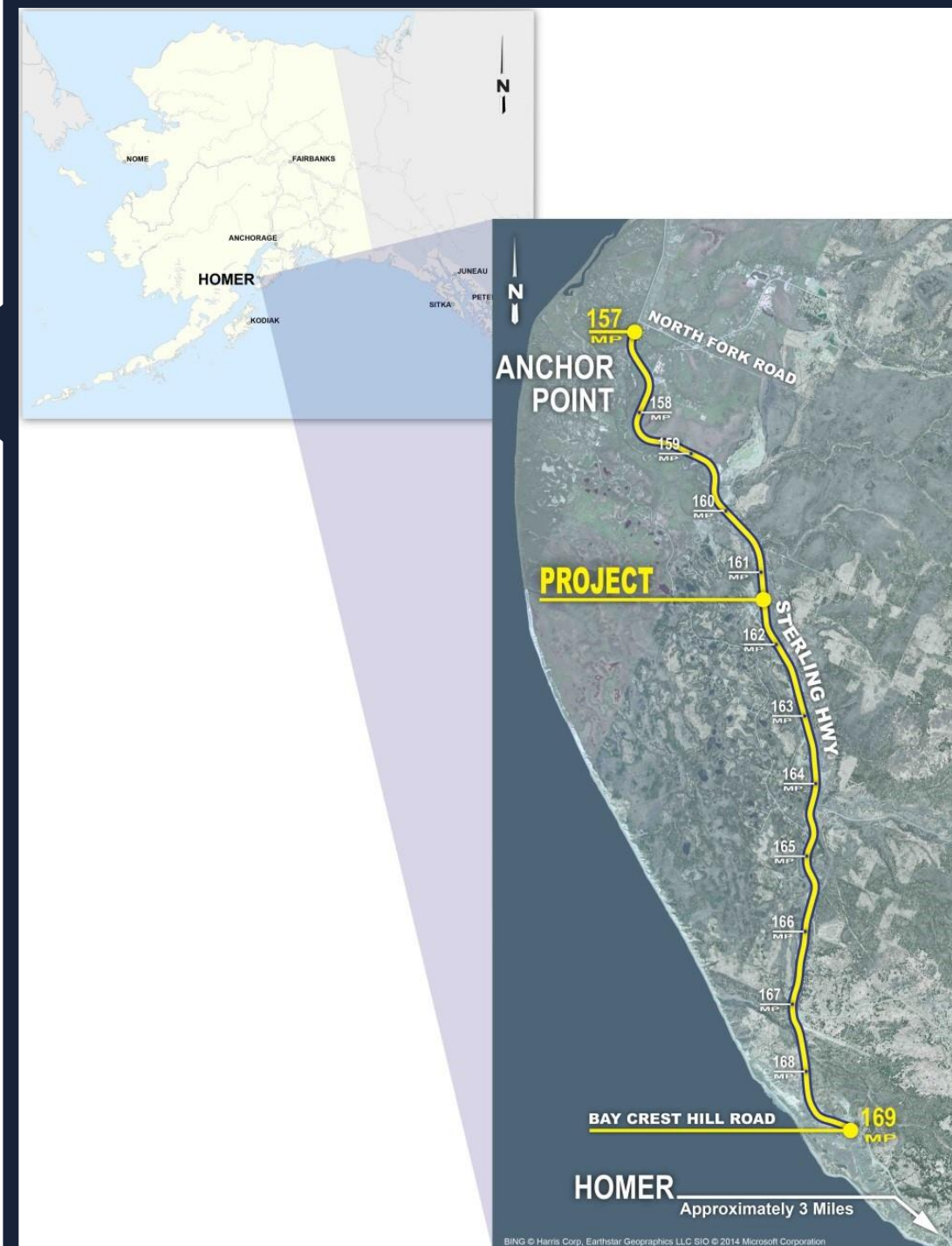


Ariel Hippe, P.E.
DOWL



PROJECT OVERVIEW & OBJECTIVES

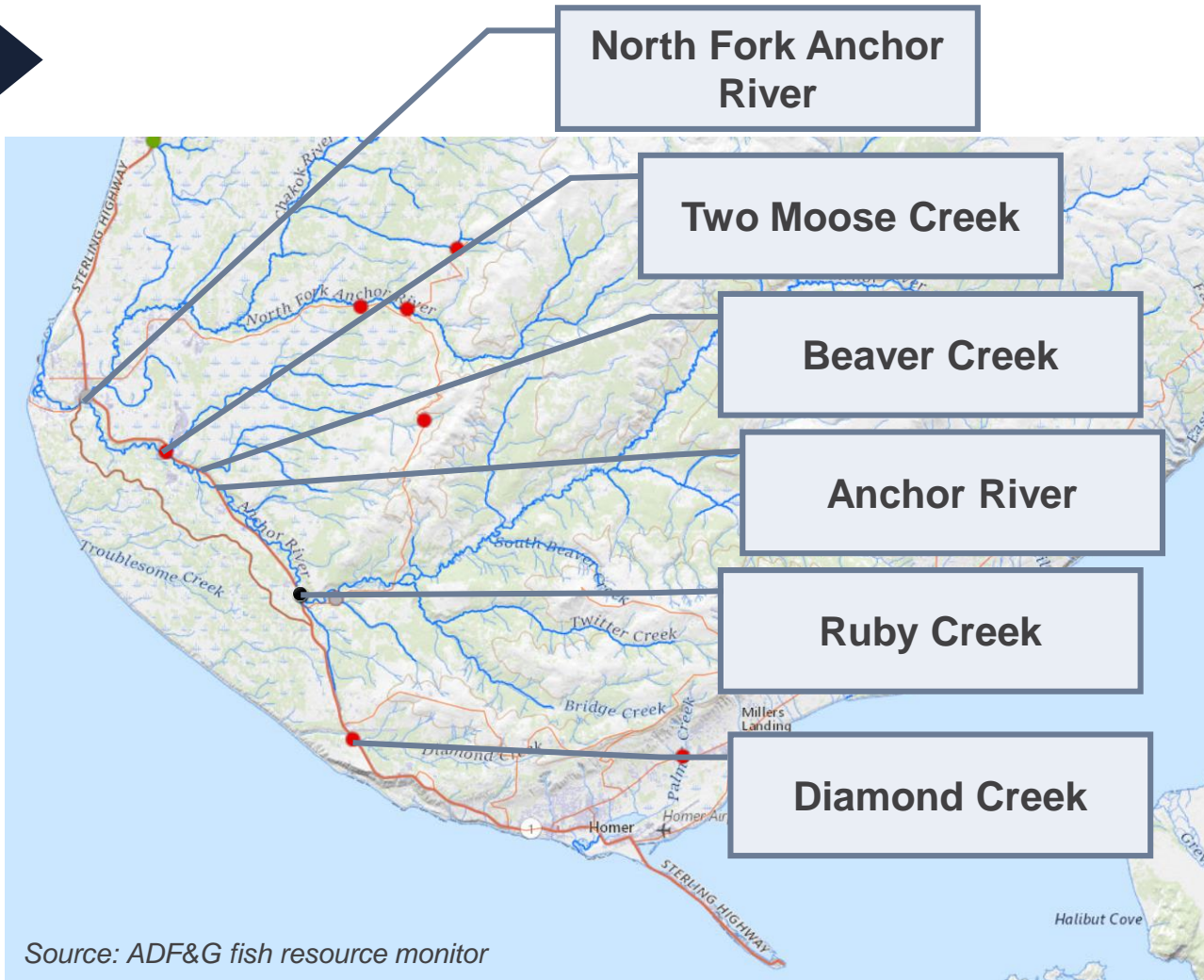
- Sterling Highway from Anchor Point (MP 157) to Homer (MP 169)
- Department of Transportation and Public Facilities 3R (resurfacing, restoration, and rehabilitation) project
- Objectives
 - Restore structural integrity
 - Extend service life
 - Improve safety



FISH HABITAT IMPROVEMENTS

- Two bridges
 - North Fork Anchor River Bridge
 - Anchor River Bridge
- Five fish passage culverts
 - Two Moose Creek
 - Beaver Creek
 - Ruby Creek (2 crossings)
 - Diamond Creek
- Five erosion sites



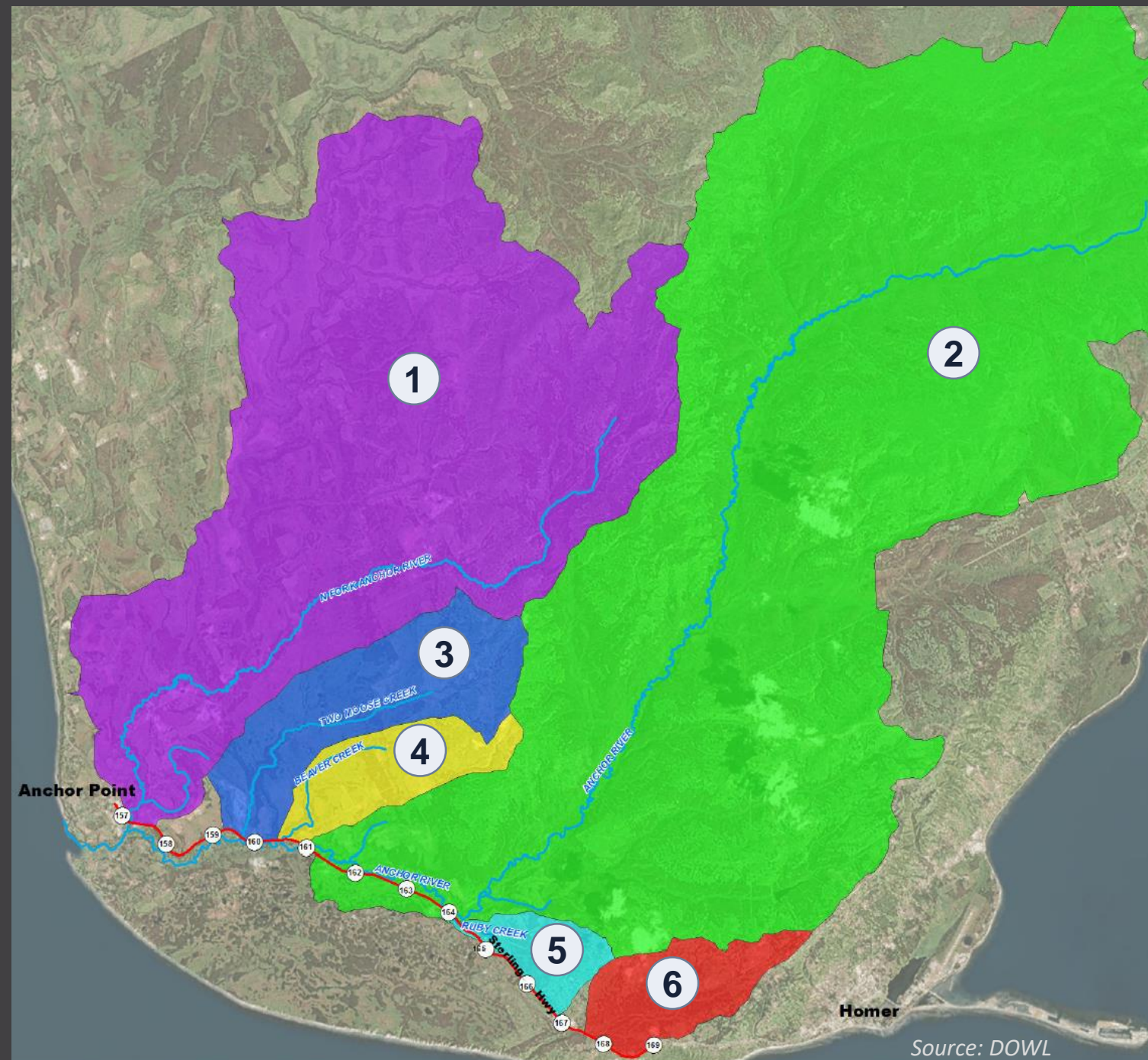


Source: ADF&G fish resource monitor

**RESTORED
CONNECTIVITY**

DRAINAGE BASINS

- 1 North Fork Anchor River
 - 45,772 Acres
- 2 Anchor River
 - 83,282 Acres
- 3 Two Moose Creek
 - 6,845 Acres
- 4 Beaver Creek
 - 3,367 Acres
- 5 Ruby Creek
 - 1,768 Acres
- 6 Diamond Creek
 - 3,324 Acres

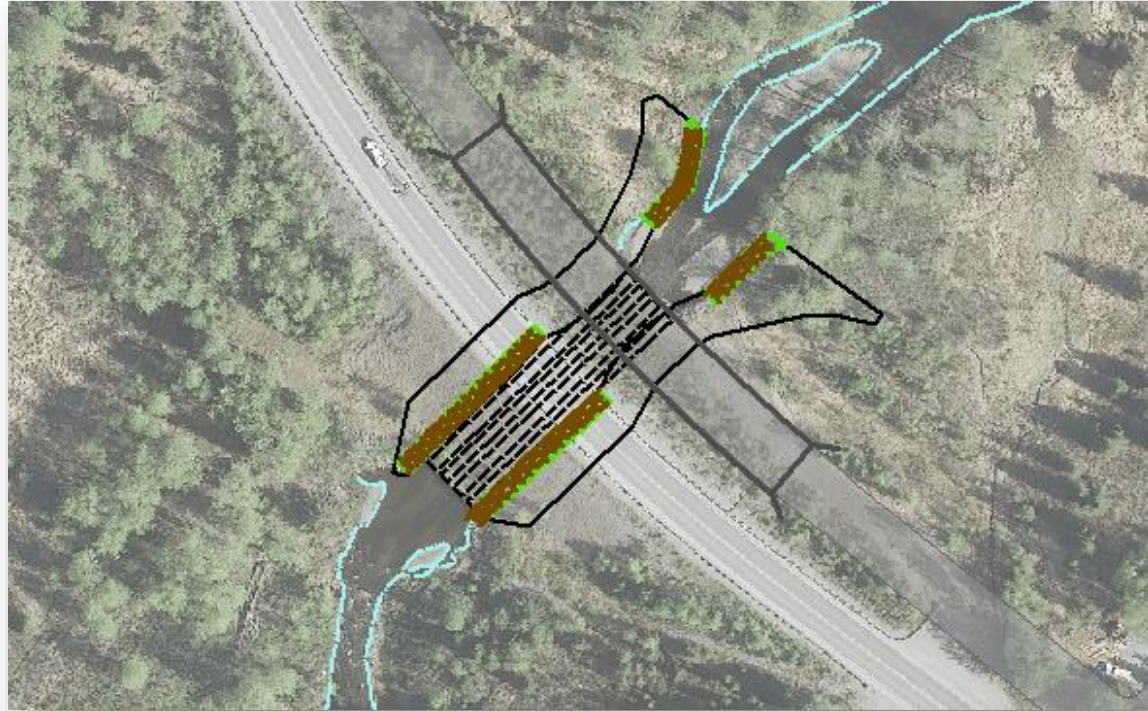




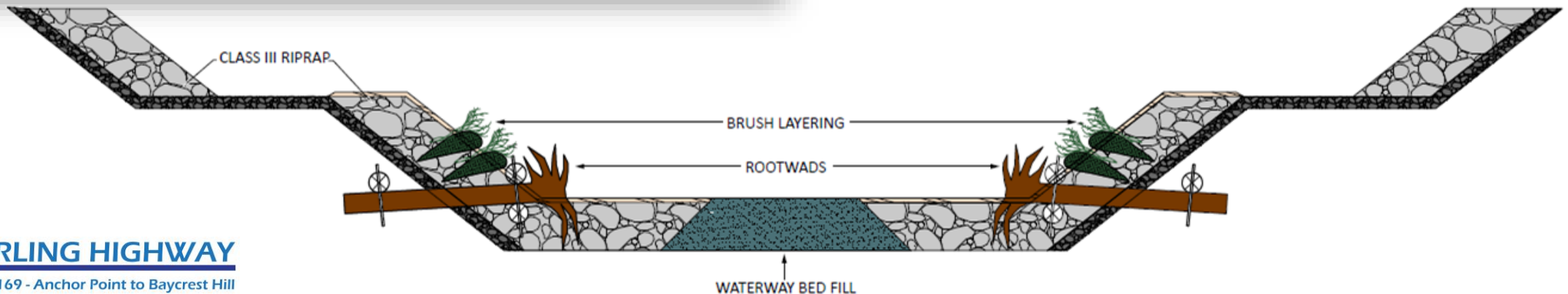
NORTH FORK ANCHOR RIVER

- Four existing 8-foot culverts

NORTH FORK ANCHOR RIVER BRIDGE



- 306-foot 3-span bridge
- Open channel flow to be restored to North Fork Anchor River with banks incorporating rootwads and brush layering

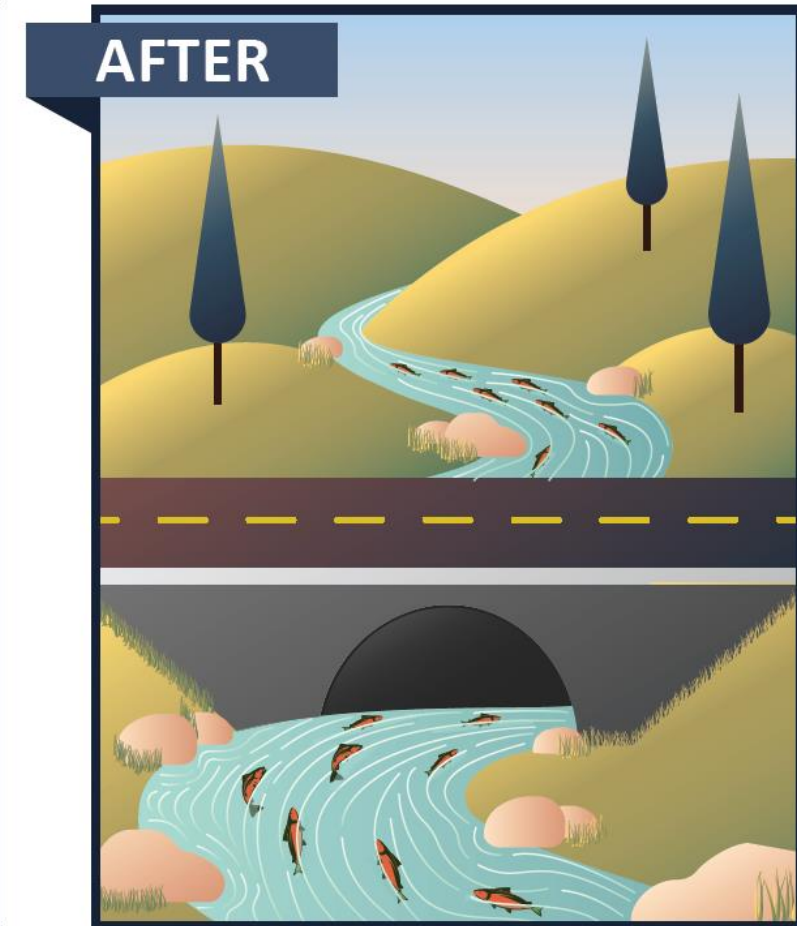




ANCHOR RIVER BRIDGE

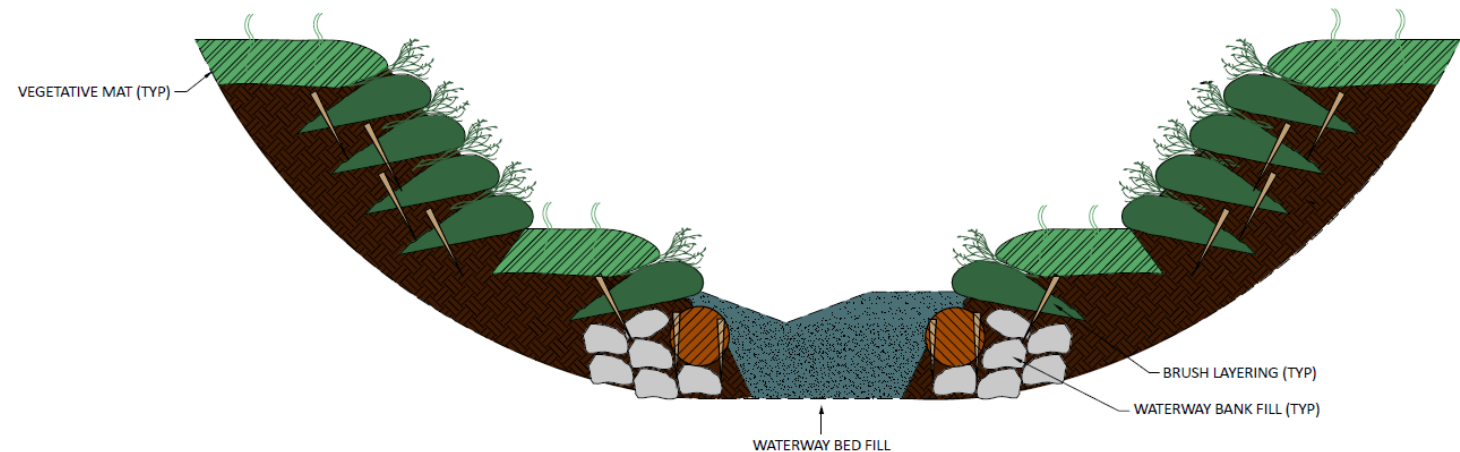
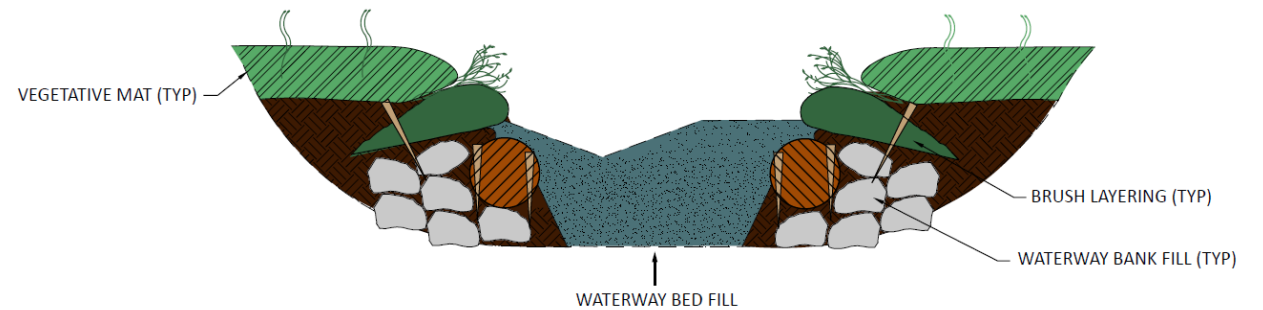
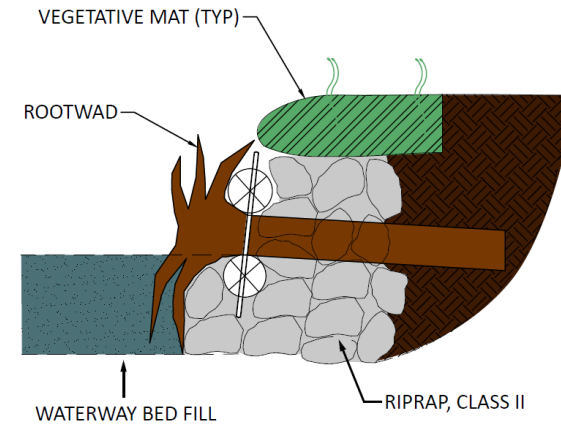
FISH PASSAGE CULVERTS

- Five fish passage culvert sites
- Design based on the 2001 Memorandum of Agreement between Alaska DOT&PF and ADF&G



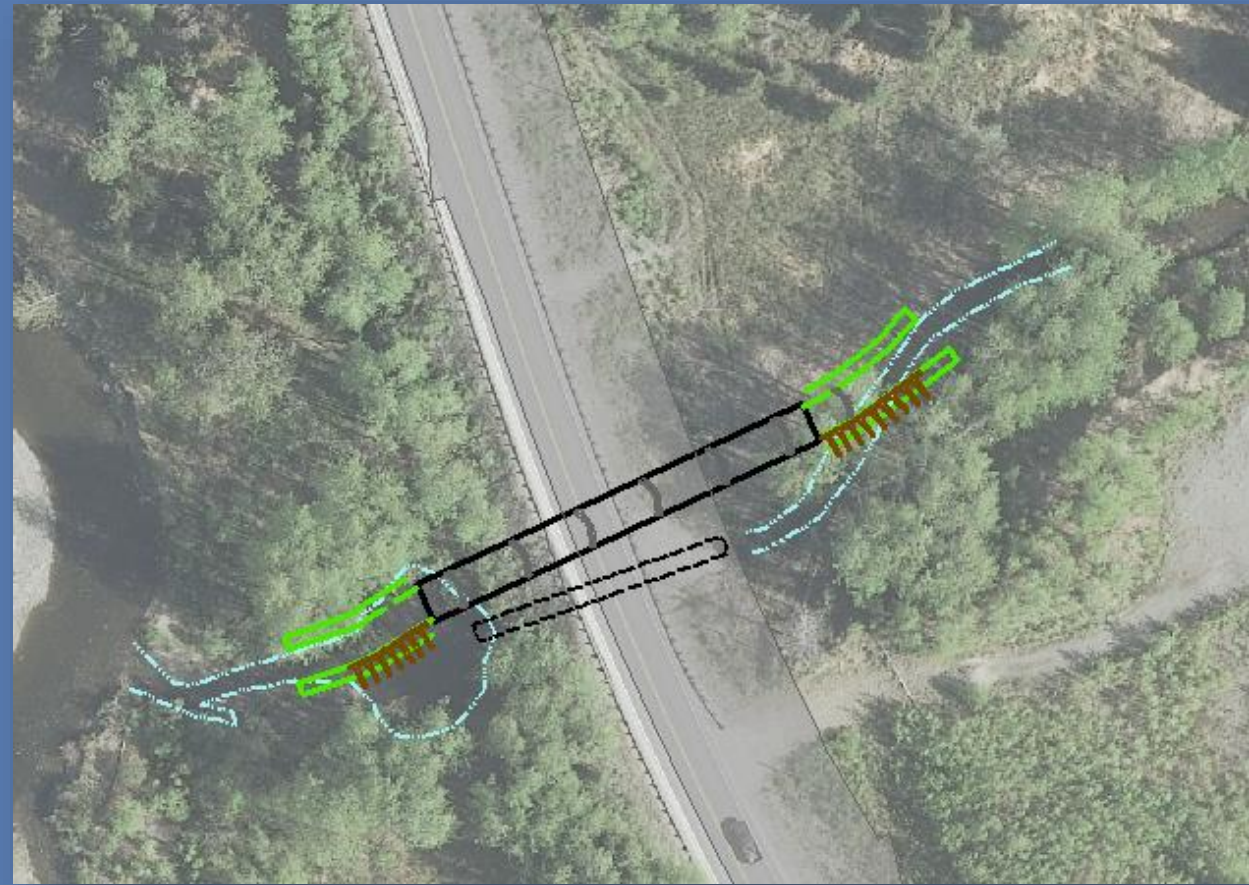
STREAM RECONSTRUCTION

- **Rootwad Banks**
 - Vegetative mat
 - Rootwads
 - Riprap
- **Brush Layering Banks**
 - Vegetative mat
 - Brush layering with willow
 - Coir logs
 - Waterway bank fill
 - *Riprap and borrow*





Source: DOWL 2014



TWO MOOSE CREEK

Before

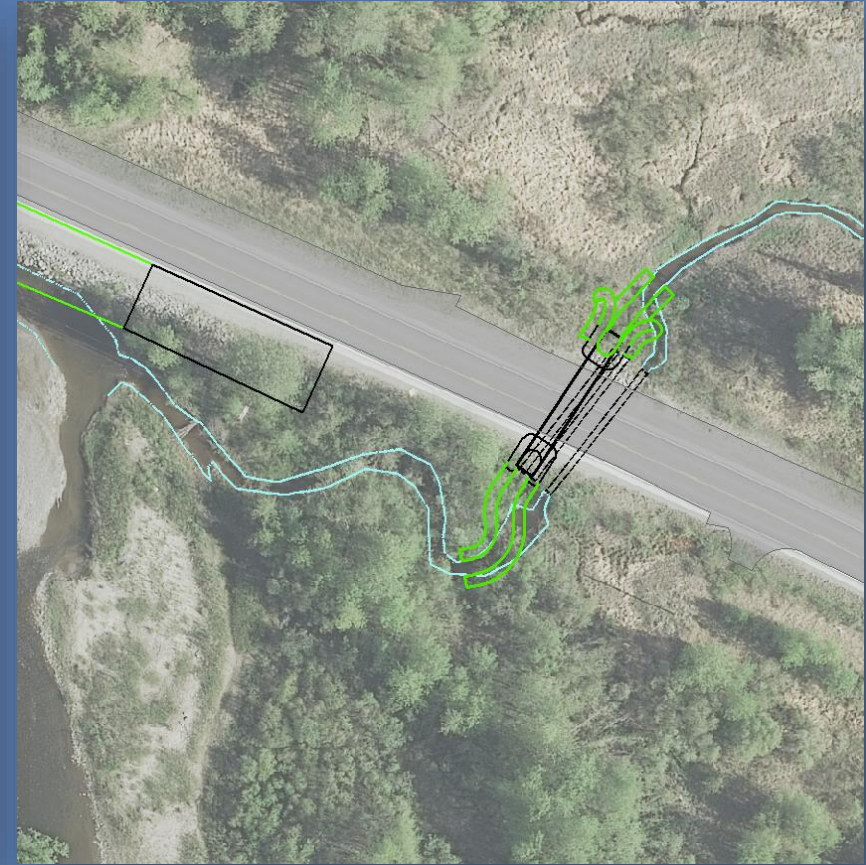
- 8-foot round structural steel plate pipe

After

- 18-foot round embedded structural steel plate pipe
 - *Type I headwalls*



Source: DOWI, 2014



BEAVER CREEK

Before

- 48-inch round CMP
 - *Two 48-inch round CMP overflow culverts*

After

- 10-foot round structural steel plate pipe
 - *Type I headwalls*



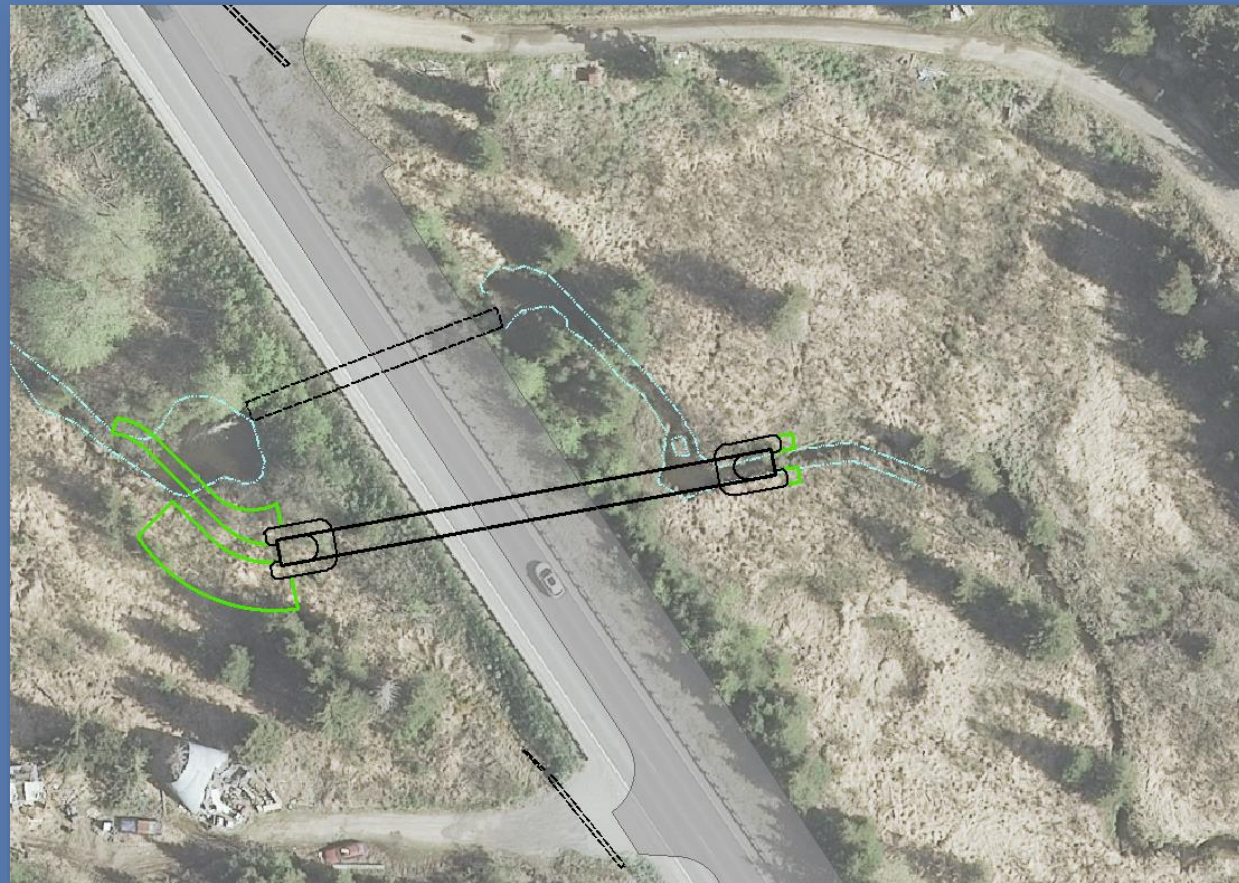
RUBY CREEK (2 CROSSINGS)

Before

- 48-inch round CMP (Ruby #1)
- 36-inch round CMP (Ruby #2)

After

- Two 8-foot round structural steel plate pipes
– *Type I headwalls*



DIAMOND CREEK

Before

- 8-foot round structural steel plate pipe

After

- 10-foot round structural steel plate pipe
 - *Type I headwalls*

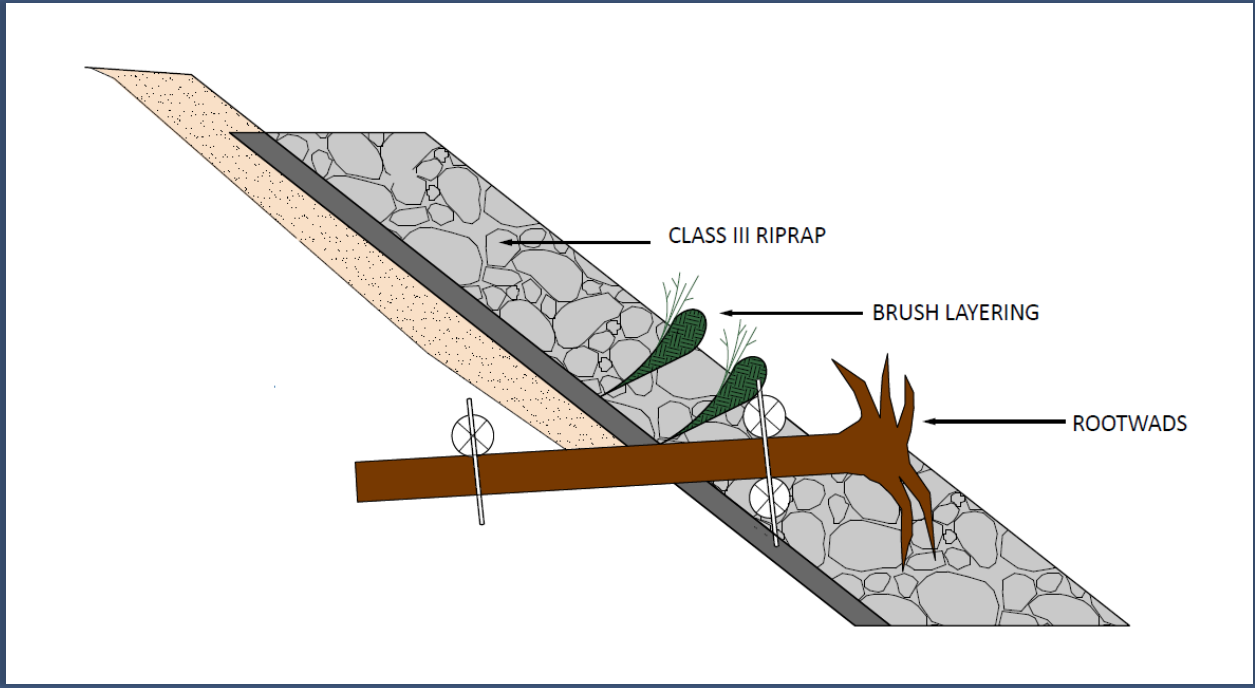


Source: DOWL 2014



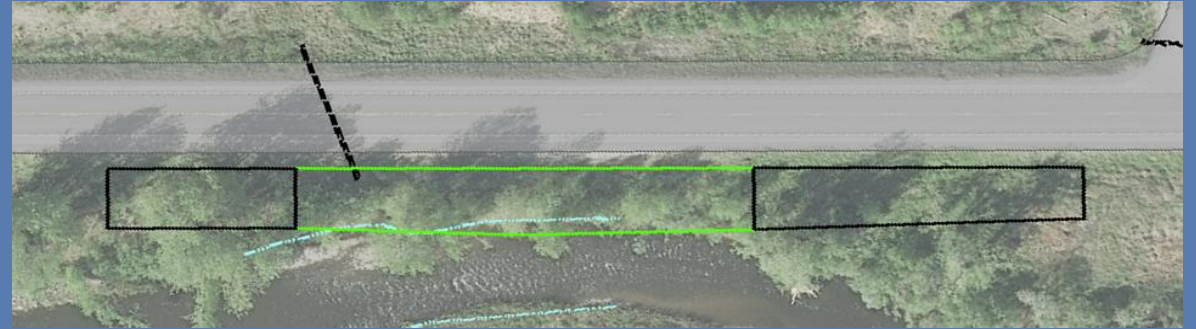
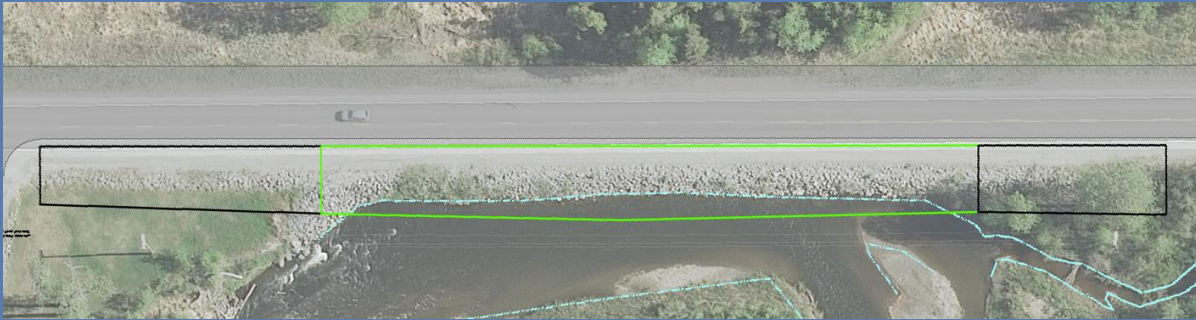
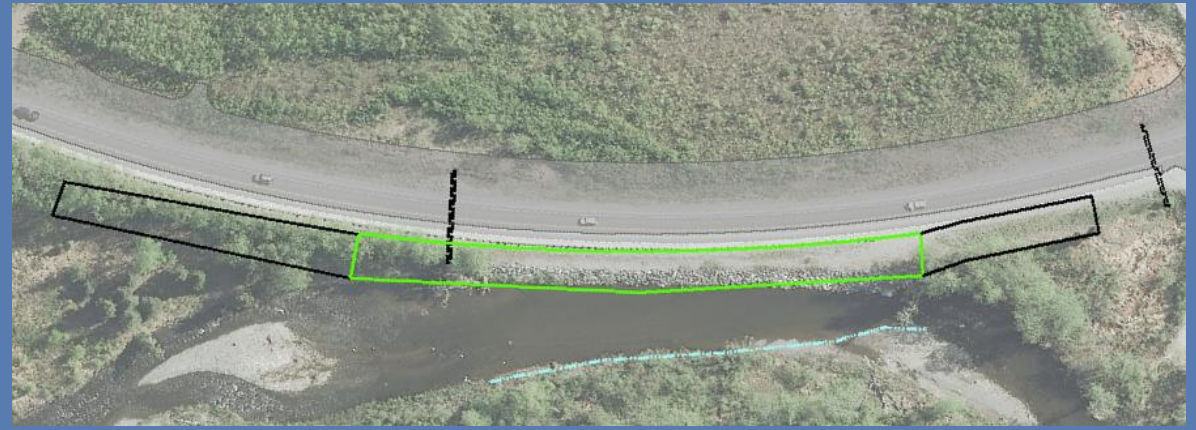
EROSION SITES

- Five Erosions sites, four incorporating habitat features



Source: DOWL 2019

VEGETATED REVETMENT



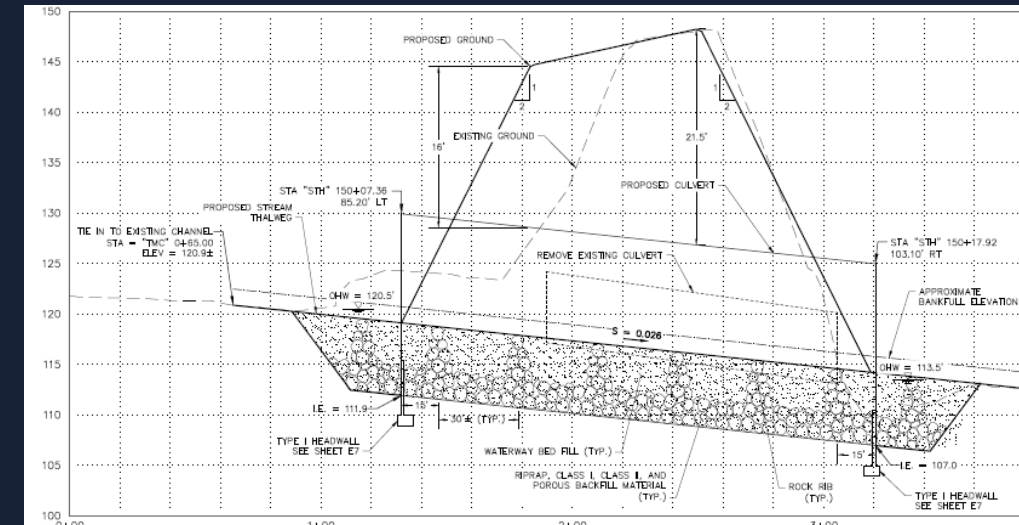
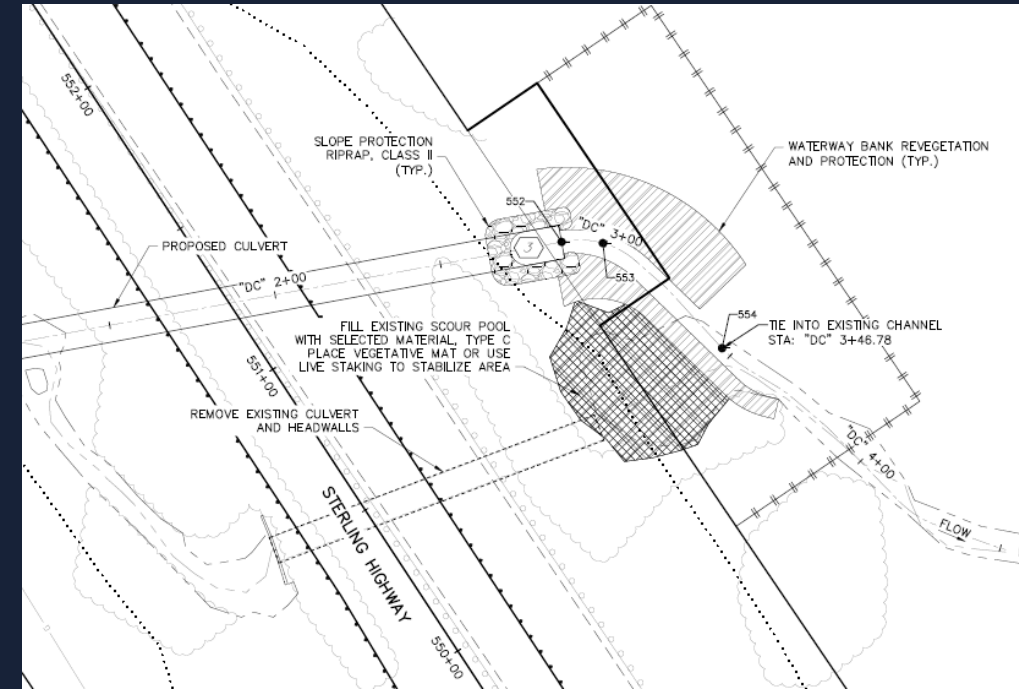
EROSION CONTROL SITES

Habitat features

- Four erosion mitigation sites on the Anchor River incorporate rootwads and brush layering

CHALLENGES/DESIGN CONSIDERATIONS

- **Evolving design standards**
- **Depth of cover**
 - Two Moose and Diamond Creek structure shapes limited by deep cover
 - Beaver and Ruby Creek constrained by shallow cover
- **Diamond Creek alignment**
 - Limited right-of-way at outlet
 - Significant channel realignment
- **Balancing habitat features and robust erosion design**
 - North Fork Anchor River bridge
 - Erosion mitigation sites



THANK YOU!

Any questions or comments?





NORTH FORK ANCHOR RIVER BRIDGE

Upstream reach, before and after 2017 rehabilitation



Source: DOWL, 2014



Source: DOT&PF, 2017

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