

UNALASKA LAKE AND LOWER ILIULIUK RIVER RESTORATION

City of Unalaska

November 19, 2014
6:00 – 8:00 pm
Unalaska High School

This project is funded with qualified outer continental shelf oil and gas revenues by the Coastal Impact Assistance Program, Fish and Wildlife Service, U.S. Department of the Interior.



INTRODUCTION TO THE PROJECT TEAM

PND Engineers, Inc.

- **Paul Kendall, PE – Project Manager**
- **Alexandra West, EIT – Hydrologist**
- **Lisa Baughman– Public Involvement**

TONIGHT'S OBJECTIVES

- Introduction
- Short Course
- Recap from 1st Meeting
 - Project Purpose and Need
 - Grant Overview and Budget Summary
- Project Update & Overview of Reports
- Next Steps
- Questions, Comments, and Suggestions

SHORT COURSE - THE BASICS

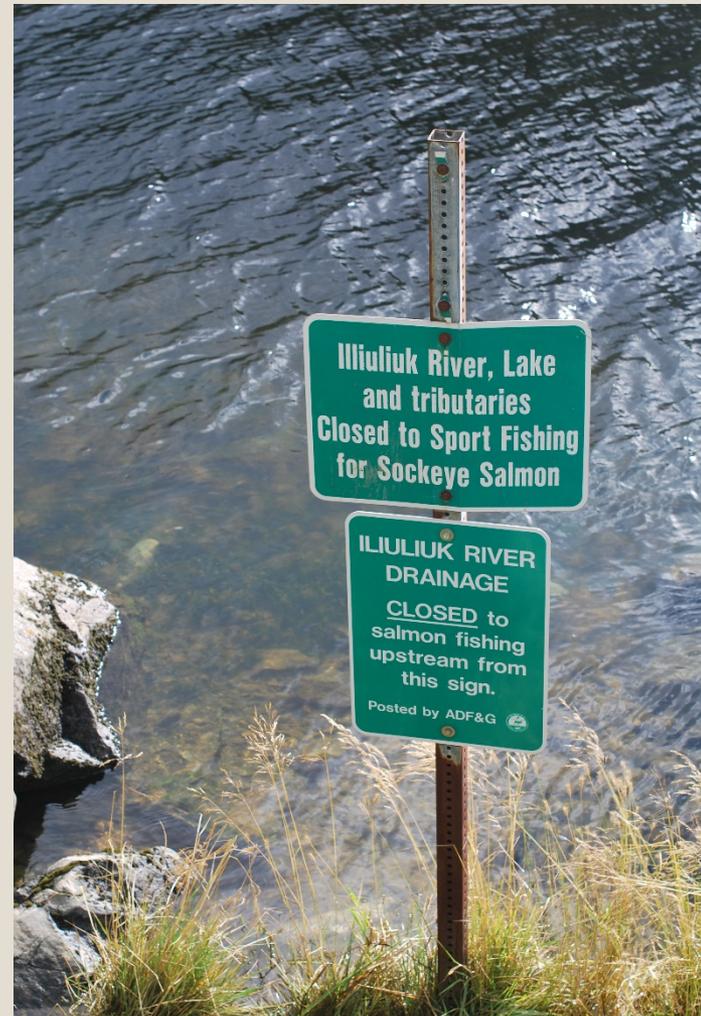
- **Watershed**
- **Stormwater**
- **Riparian**
- **SMPP – Stormwater Management Program Plan**
- **RMP – Restoration and Management Plan**
- **EPA – Environmental Protection Agency**
- **ADEC – Alaska Department of Environmental Conservation**
- **BMPs – Best Management Practices**
- **CWA – Clean Water Act**

RECAP

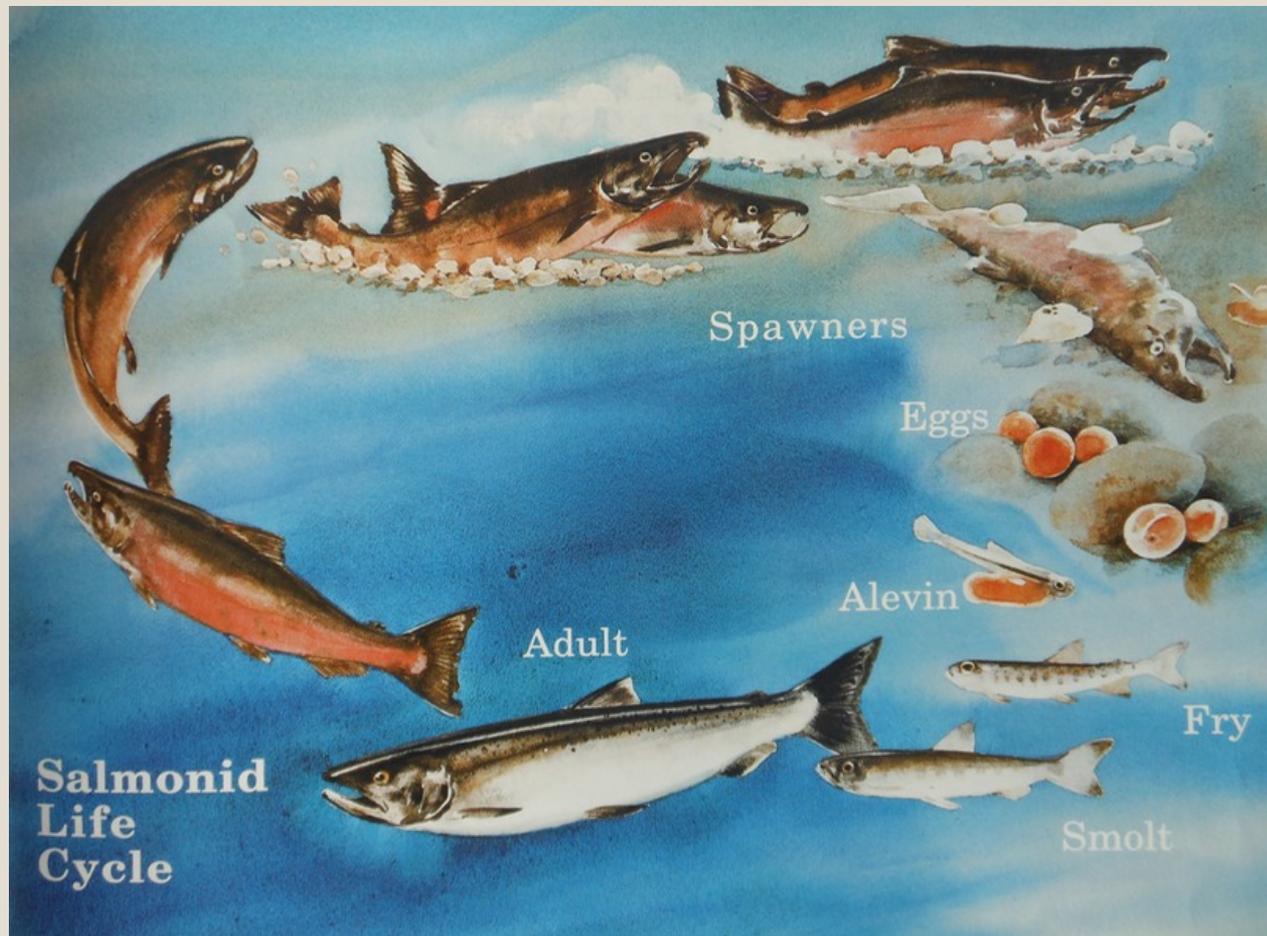
- **Two-Part Project**
 - **Unalaska Lake Restoration (SMPP)**
 - **Lower Iliuliuk River Restoration (RMP)**
- **Two separate grants funded by the Coastal Impact Assistance Program**
 - **Unalaska Lake Restoration**
 - **Year 1: \$100,000**
 - **Year 2: \$526,657**
 - **Lower Iliuliuk River Restoration Phase I**
 - **Year 1: \$100,000**
 - **Year 2: \$251,657**

PROJECT PURPOSE AND NEED

- Concern for the sockeye salmon population
- Concern for the watershed and lower river bank riparian zones



SALMONID LIFE CYCLE



WATERSHED USE BY SALMON

- Unalaska Watershed is home to
 - Sockeye,
 - Coho,
 - Pink,
 - and very few Chum.

SEDIMENTATION ISSUES

- Definitions
- What causes suspended sediment and high turbidity in the watershed?
- Issues with suspended sediment and high turbidity
- Other sedimentation issues



UNALASKA LAKE RESTORATION



Photo courtesy of Abi Woodbridge's public comment

UNALASKA LAKE RESTORATION

- **Issues discussed in the grant**
 - **Most impacted watershed in AWCERSA**
 - **Turbidity & sedimentation**
 - **Substantially degraded**
 - **Impacts to salmon**

- **Reconnaissance & Public Comment**
 - **Maintenance on storm drain system**
 - **Sediment control on roads**
 - **Sediment control during operations & maintenance**

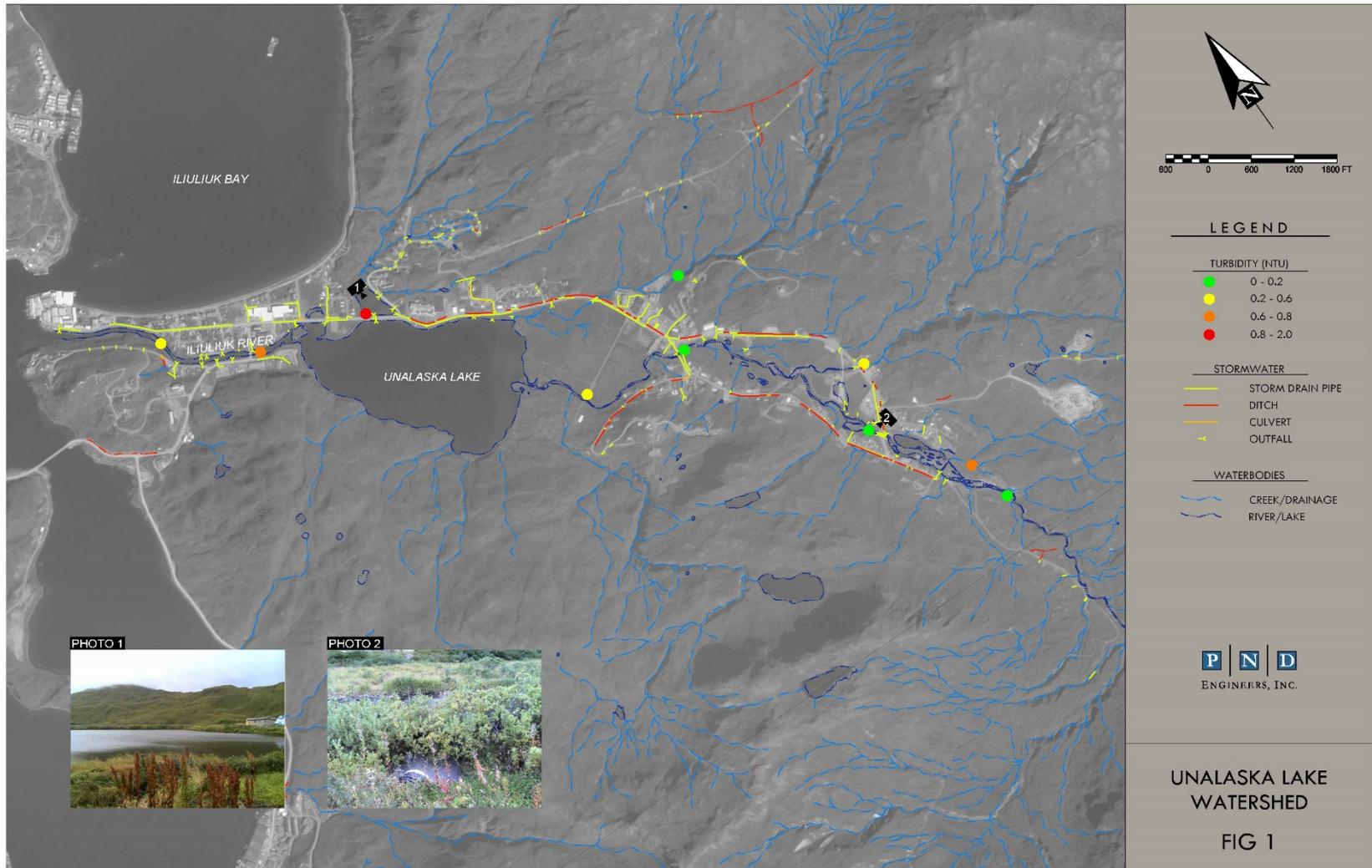
UNALASKA LAKE RESTORATION

- **What does an SMPP entail?**
 - Public education and outreach
 - Public involvement and participation
 - Illicit discharge detection and elimination
 - Construction site runoff control
 - Post-construction stormwater management
 - Municipal operations and maintenance
- **Focus for the Unalaska Lake watershed is
TURBIDITY & SEDIMENT**

STATE OF ALASKA WATER QUALITY STANDARDS

- **Dissolved Inorganic Substances**
 - “TDS may not exceed 1,000 mg/L.”
 - “A concentration of TDS may not be present in water if that concentration causes or reasonably could be expected to cause an adverse effect to aquatic life.”
- **Sediment**
 - “The percent accumulation of fine sediment in the range of 0.1 mm to 4.0 mm in the gravel bed of water used by anadromous or resident fish for spawning may not be increased more than 5% by weight above natural conditions...”
- **Turbidity**
 - “May not exceed 25 NTU above natural conditions.”
 - “For all lake waters, may not exceed 5 NTU above natural conditions.”

UNALASKA LAKE WATER QUALITY



UNALASKA LAKE RESTORATION PUBLIC EDUCATION & OUTREACH

- Training program
- Public Outreach
 - Media Outreach
 - Educational Outreach



Photo courtesy of Abi Woodbridge's public comment

UNALASKA LAKE RESTORATION PUBLIC INVOLVEMENT & PARTICIPATION

- **Public review of SMPP**
 - **Happening now!**
- **Future public involvement will be necessary for implementation of this program and could greatly offset the cost of construction and other implementation measures required to achieve the goals of the SMPP.**

UNALASKA LAKE RESTORATION ILLICIT DISCHARGE ELIMINATION

- Identification and inspection of illicit discharges and illegal connections
- Outfalls
 - Discharge into treatment system
 - Treated prior to discharge
 - Private landowners should not discharge site runoff directly into a water body.
- Spill prevention and response

UNALASKA LAKE RESTORATION CONSTRUCTION SITE RUNOFF

- Construction can cause a large production and discharge of sediment into waters of the U.S.
- Examples of required permits
 - USACE permit for filling wetlands
 - Alaska Construction General Permit (CGP)
 - > 1 acre disturbance
 - Storm Water Pollution Prevention Plan (SWPPP)
- Appropriate use of BMPs

BEST MANAGEMENT PRACTICES

- Straw wattles
- Inlet protection
- Silt fences
- Sediment basins



UNALASKA LAKE RESTORATION POST-CONSTRUCTION STORMWATER MANAGEMENT

- **Development and implementation strategies for structural and nonstructural BMPs**
- **Development of ordinances and regulations to address post-construction runoff**
- **Requirements for construction site owners and operators**
- **Require adequate, long-term operation and maintenance of structural stormwater improvements**
- **Conduct site inspections**
- **Track all permanent stormwater facilities that discharge into the City's system or a water body**

UNALASKA LAKE RESTORATION MUNICIPAL OPERATIONS & MAINTENANCE

- **Debris Control Program**
 - Street sweeping
 - Storm drain system cleaning and maintenance
- **Erosion Control BMP Program**
 - Identification of sites
 - Use of appropriate BMPs



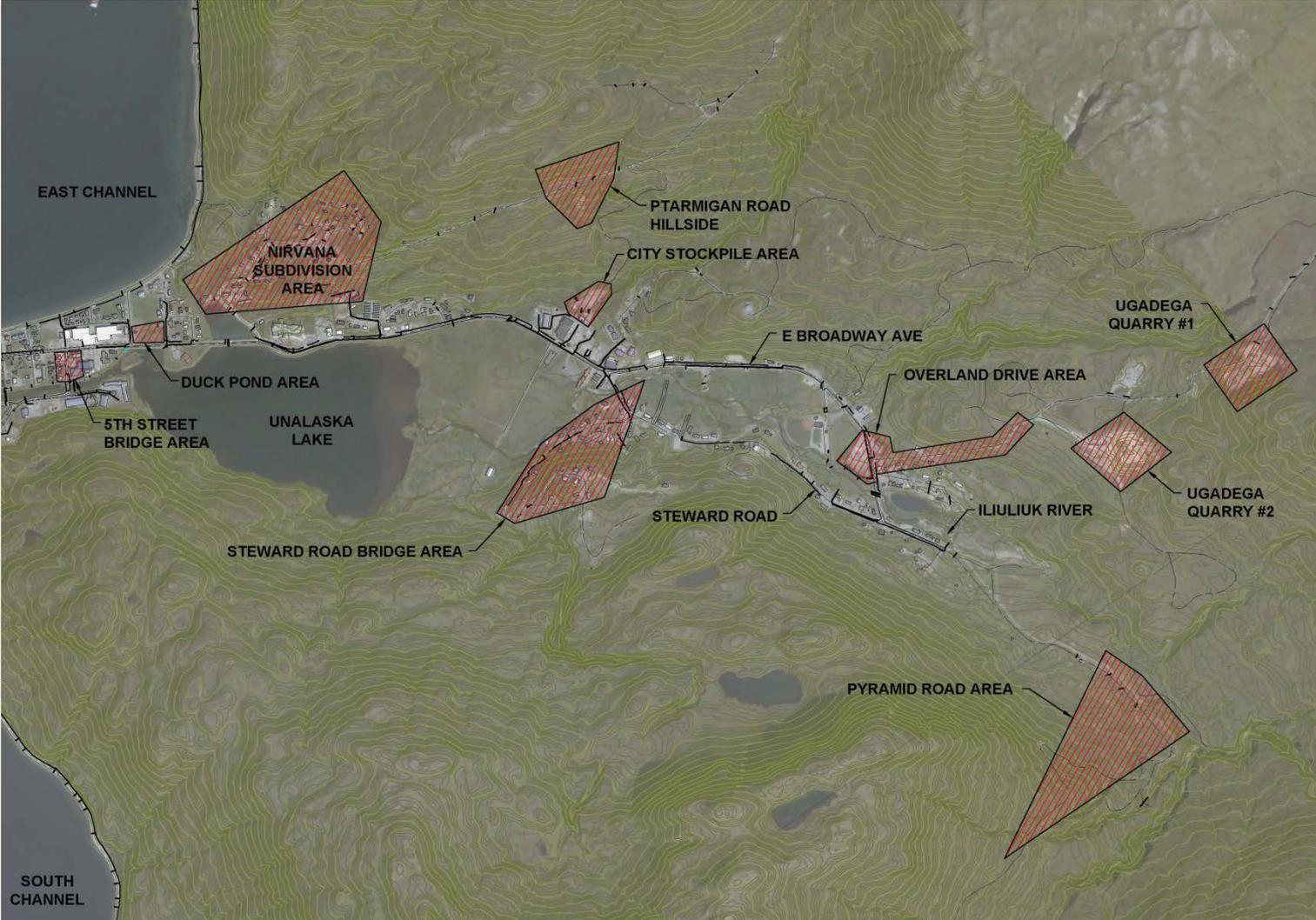
Photo: City of Unalaska Website

POTENTIAL EROSIONAL SITES

- Ptarmigan Road Hillside
- Nirvana Subdivision
- Steward Road Bridge Area
- Overland Drive
- 5th St. Bridge Area
- Ugadega Quarries
- Steward Road
- City Stockpile
- Duck Pond Lot



POTENTIAL EROSIONAL SITES



EROSION CONTROL/REMEDIATION OPTIONS

- **Implementation of erosion & sediment control BMPs**
 - Swales
 - Vegetated slopes
 - Outlet protection
 - Settling basins
 - Detention and/or retention ponds
 - Oil and grit separators
- **Improving check dam system on Overland Drive**
- **Restore natural drainage paths with culverts**
- **Road surface treatment**
- **Maintenance of the existing storm drain system (oil and grit separators)**
- **Addition of detention ponds and swale system around the Nirvana Subdivision**

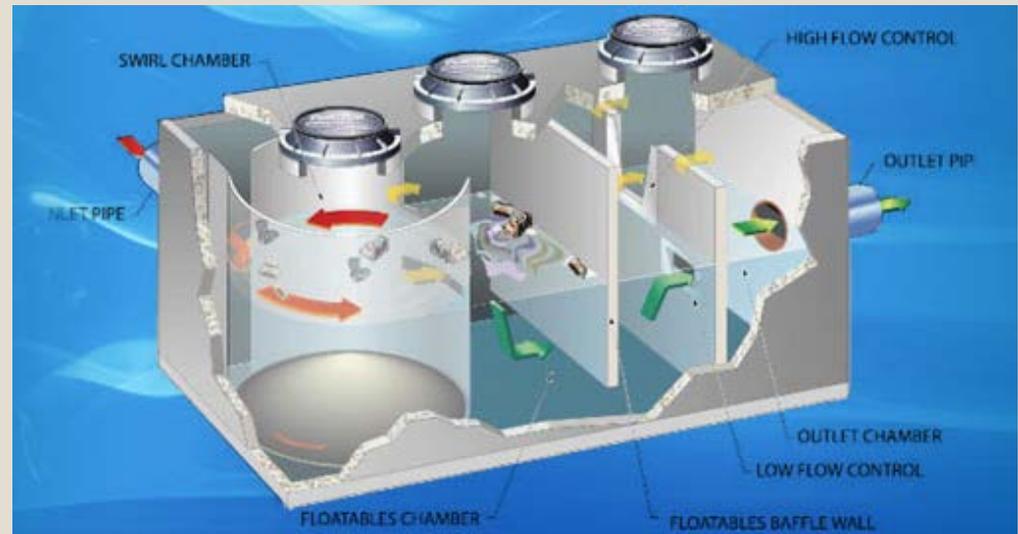
VEGETATED SWALE



SETTLING BASIN



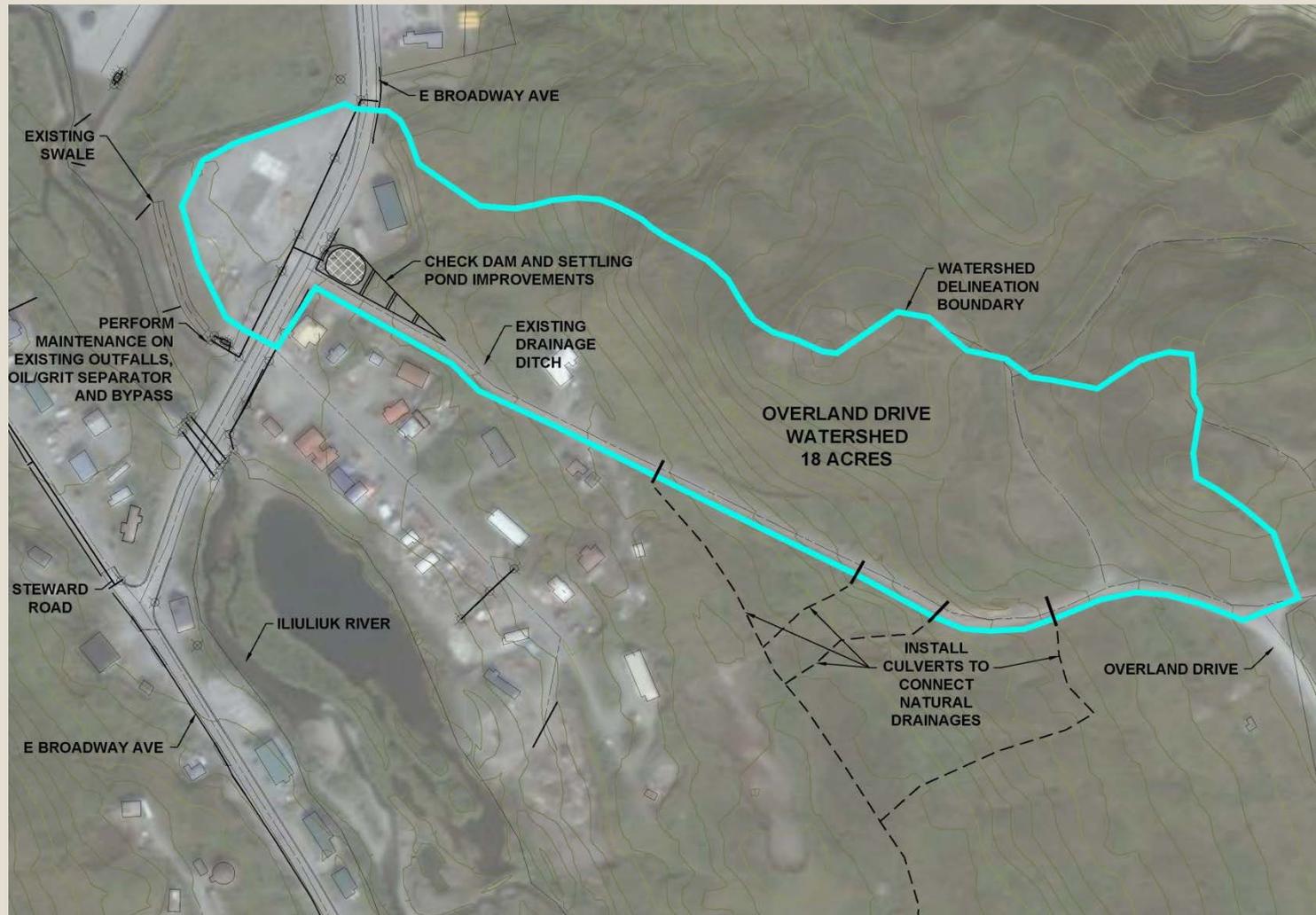
OIL & GRIT SEPARATORS



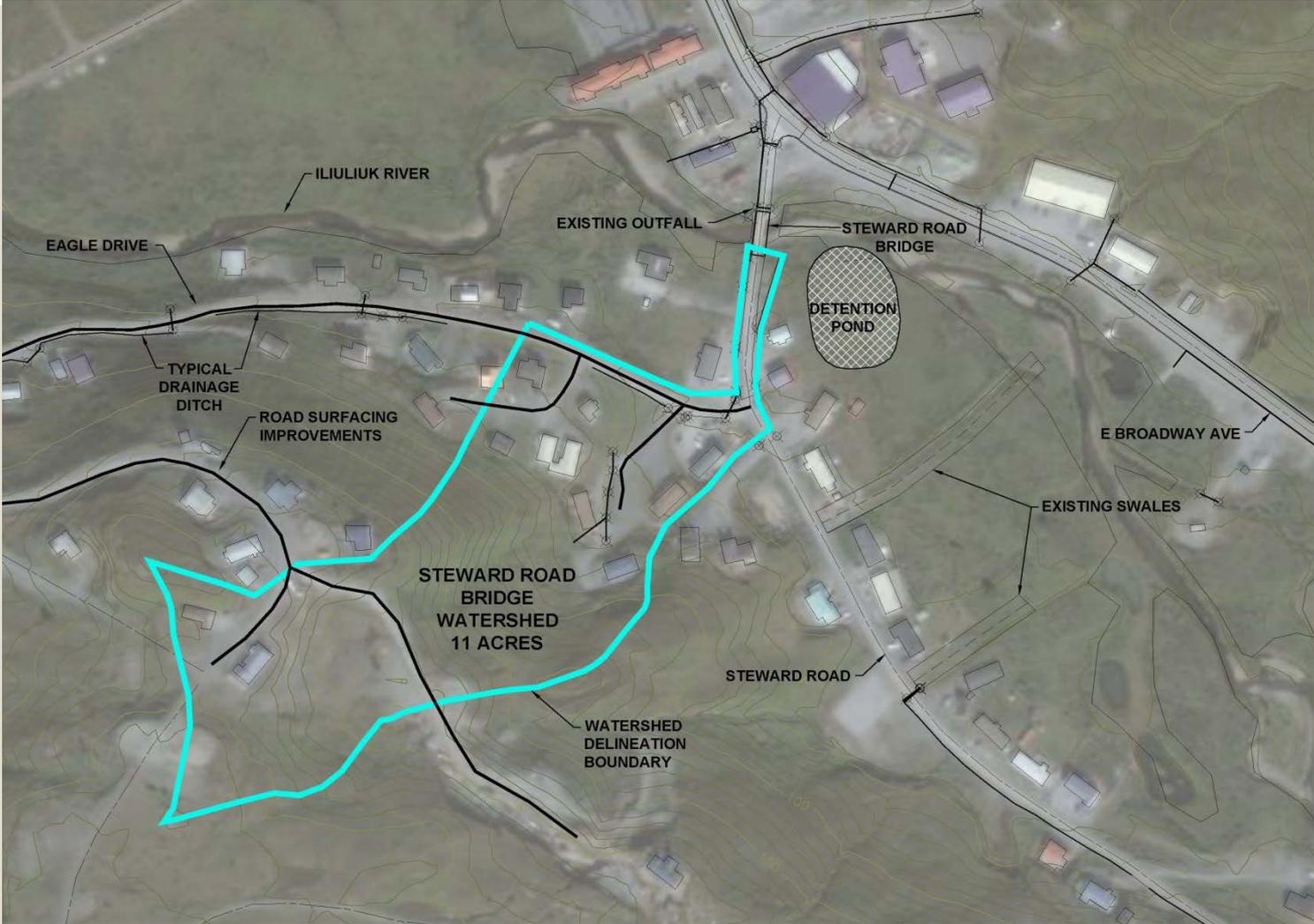
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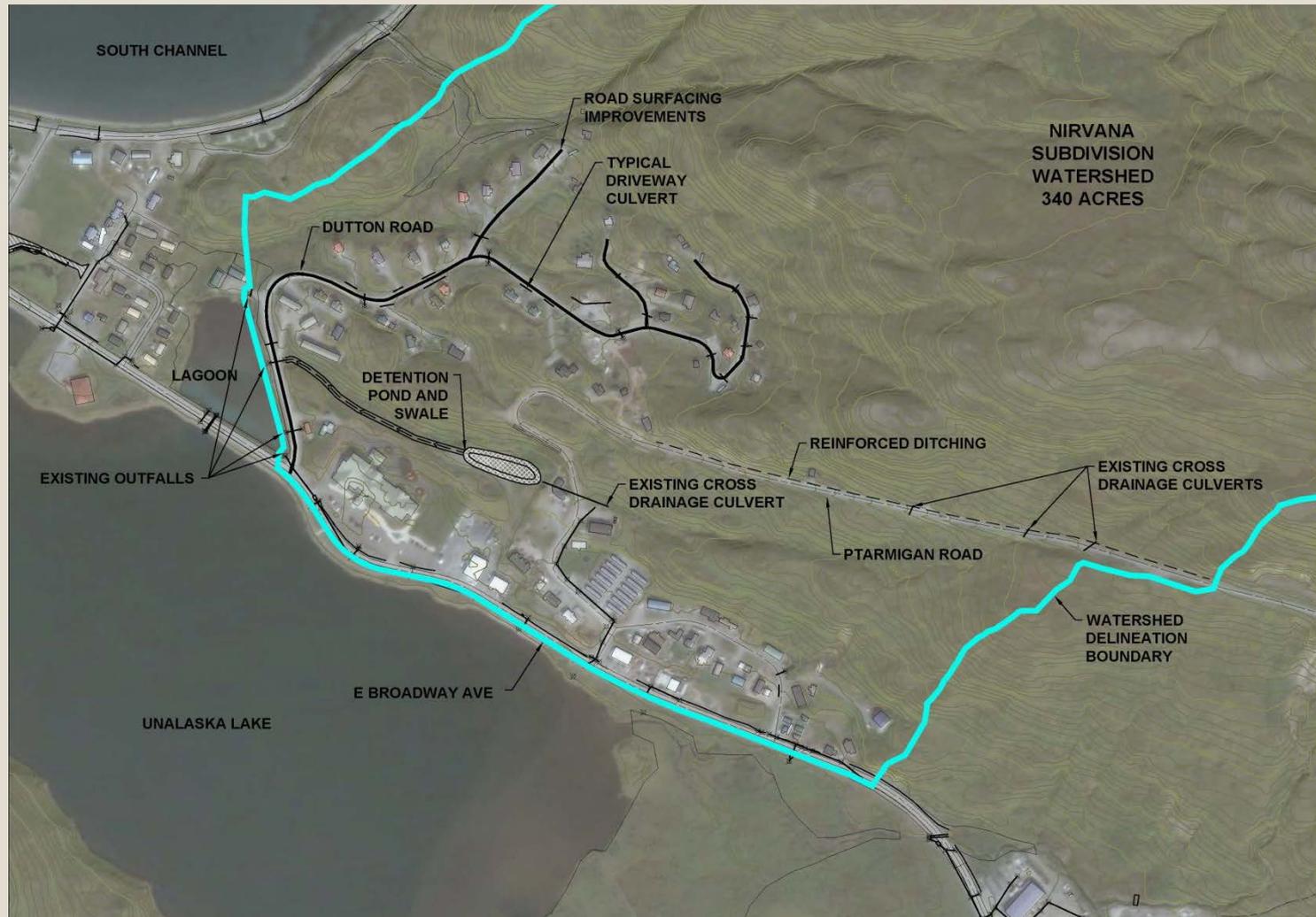
OVERLAND DRIVE



STEWARD ROAD BRIDGE



NIRVANA SUBDIVISION



5TH STREET BRIDGE



OTHER RESTORATION OPTIONS (NOT EROSION RELATED)

- **Duck Pond Lot**
 - Recently filled
 - Utilize the City-owned property along the northern border of this lot
 - Add vegetated buffer or berm and ditches to treat runoff from King St. and Armstrong Ct.
- **Revegetation of aquatic grasses in Unalaska Lake**
 - Need to determine species
 - Assess feasibility

DUCK POND LOT



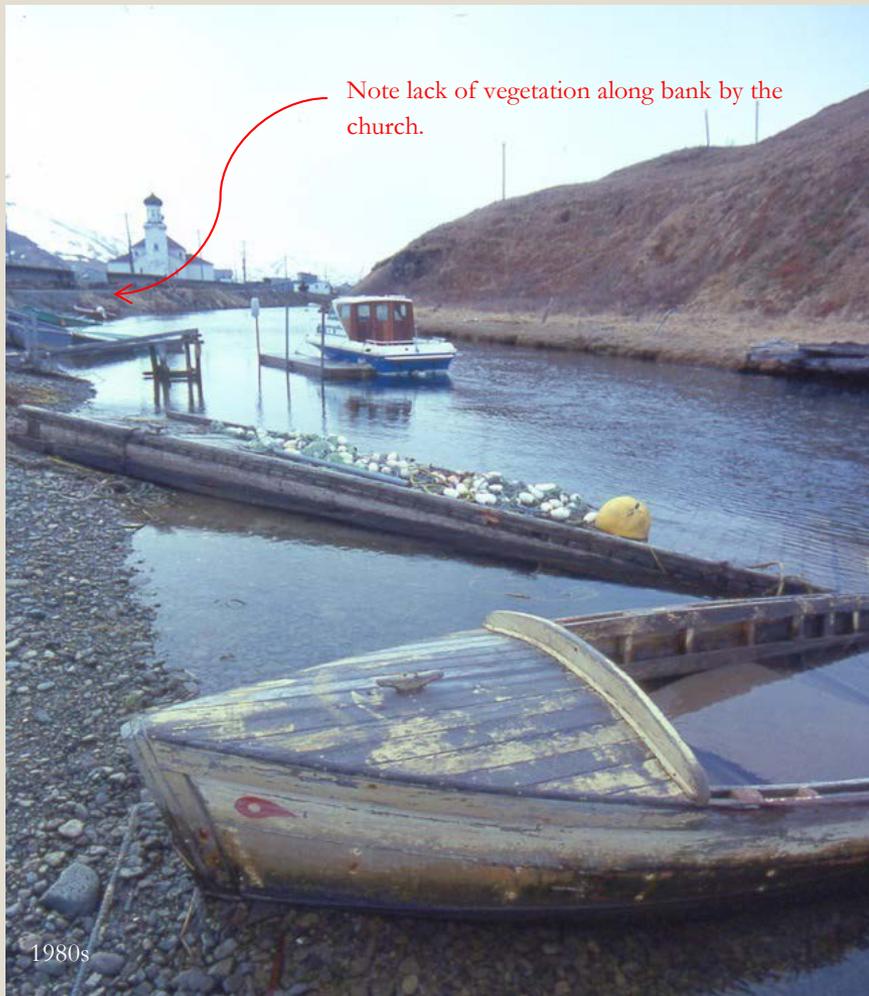
LOWER ILIULIUK RIVER RESTORATION



LOWER ILIULIUK RIVER RESTORATION

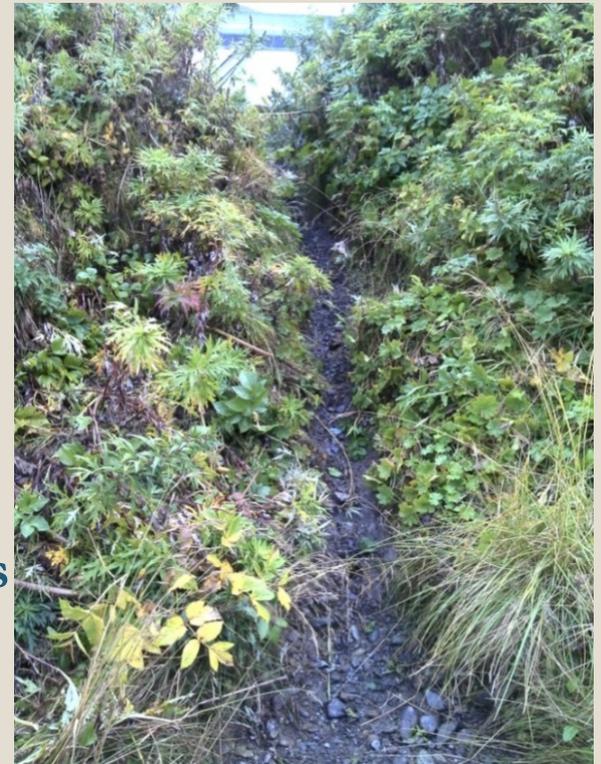
- **Issues discussed in the grant**
 - Impacted by snow removal practices
 - Trampling by recreational and subsistence fishers without riparian management
 - Bank damage and erosion
 - Counting sockeye salmon returns
- **Reconnaissance & Public Comment**
 - Erosion due to trampling and due to surface drainage
 - Vegetation has been established on its own since the 80s
 - Counting the sockeye salmon returns

LOWER ILIULIUK RIVER RESTORATION



LOWER ILIULIUK RIVER RESTORATION

- **What does the RMP entail?**
 - **Discussion on existing conditions**
 - Erosion due to lack of vegetation from foot traffic
 - Erosion due to surface drainage
 - Sedimentation from road
 - Need to count returning salmon
 - **Restoration Options**
 - Fish weir or sonar
 - Erosion prevention
 - Operations & maintenance improvements
 - Educational kiosks
 - Revegetation



LOWER RIVER EXISTING CONDITIONS



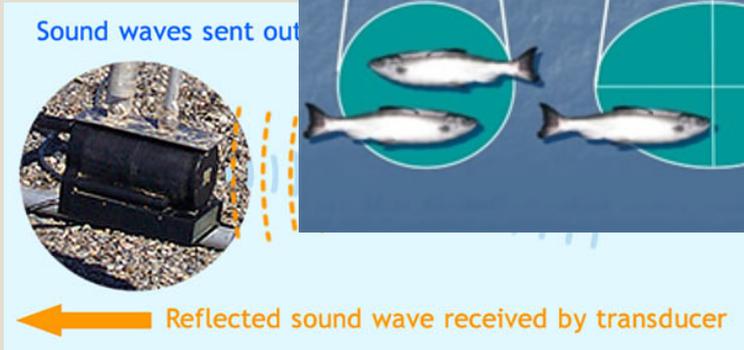
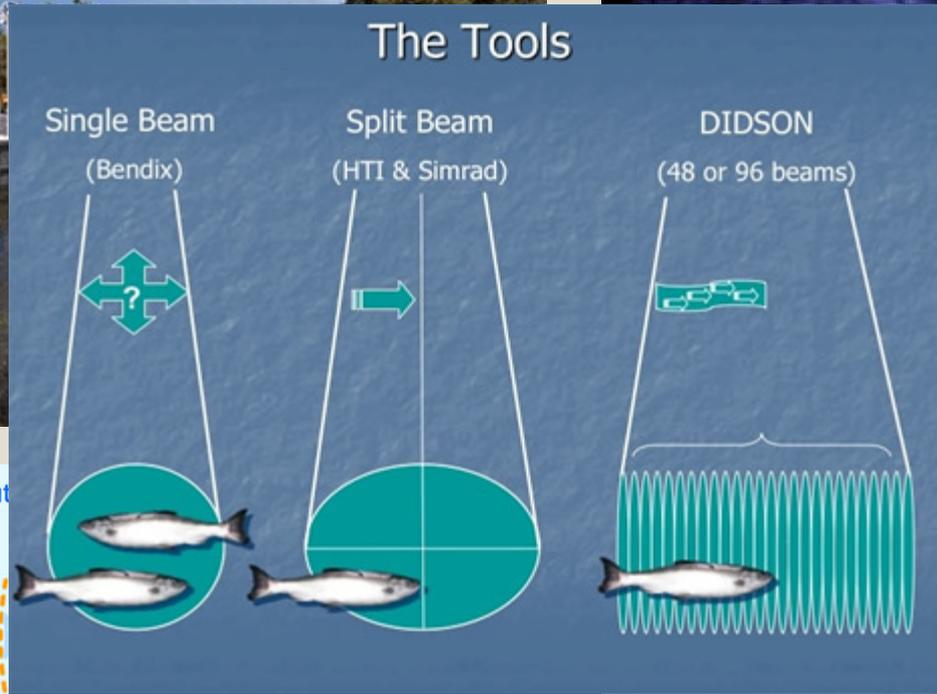
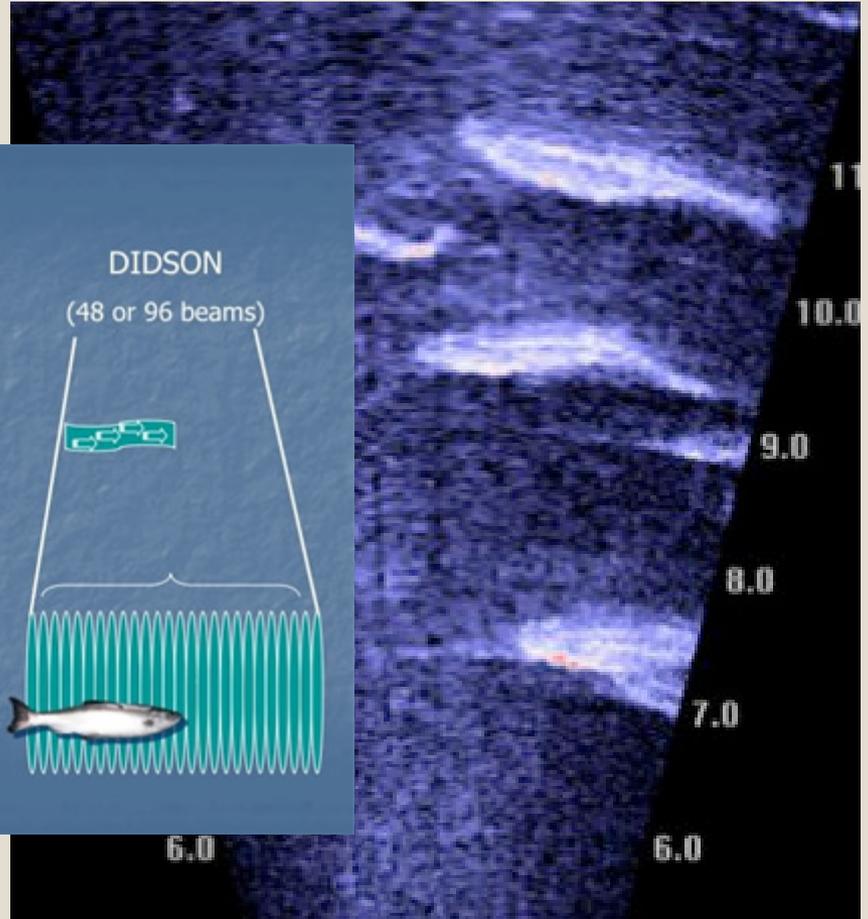
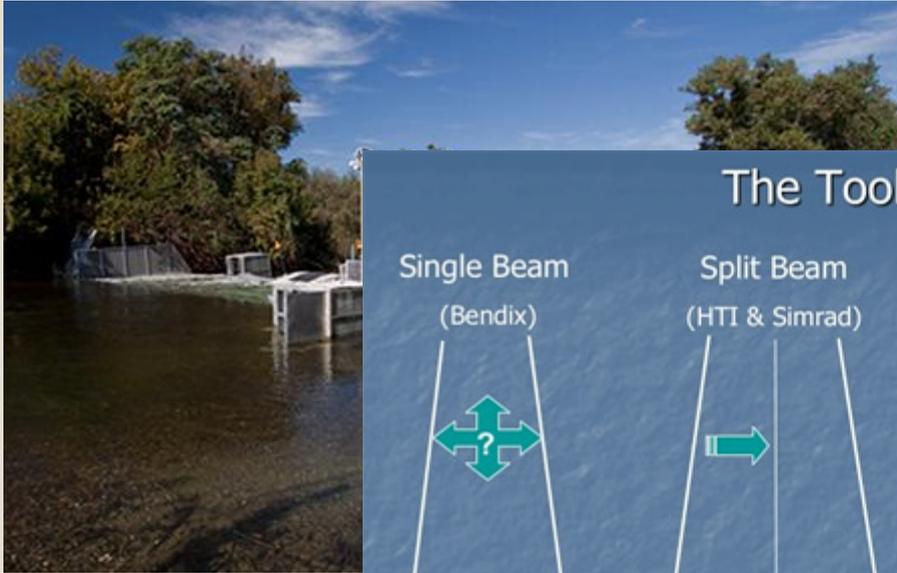
LOWER RIVER EXISTING CONDITIONS



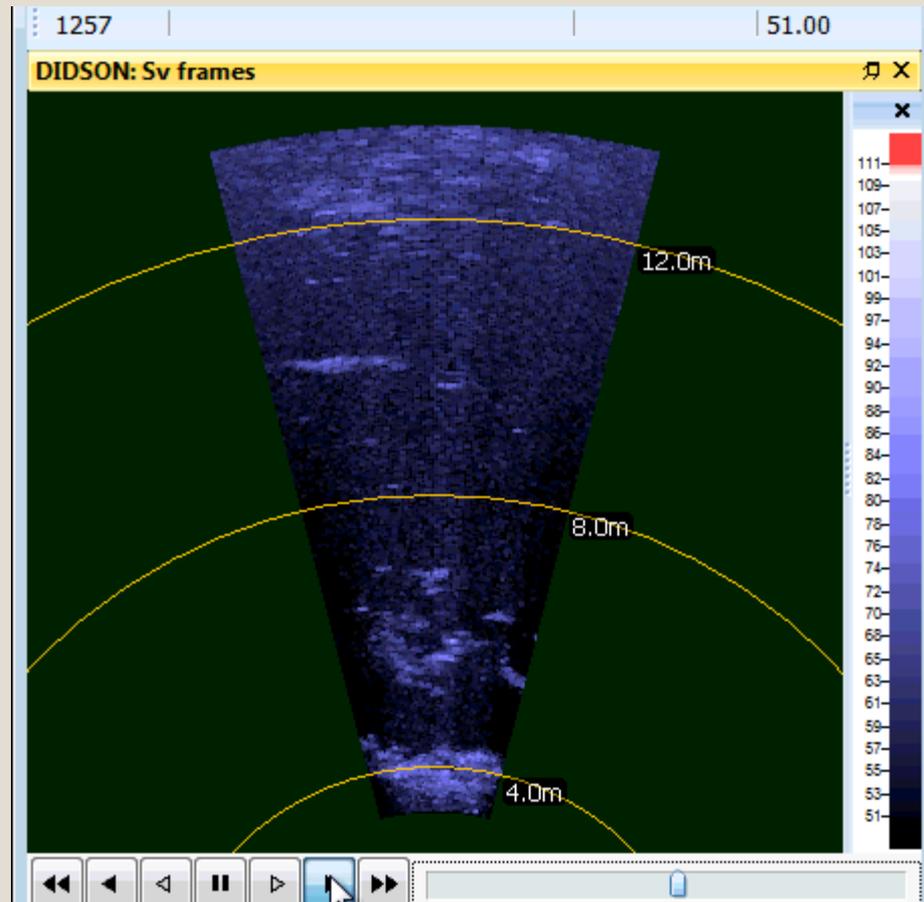
WEIR VERSUS SONAR

- Multiple options for assessing sockeye salmon returns
- Weirs
 - Stationary tripod weir
 - Resistance board weir
 - Upfront cost (~\$50,000)
 - DOES NOT INCLUDE USE OR ROUTINE MAINTENANCE!
 - Requires manning and counting fish
 - Requires frequent maintenance
 - Requires installation and removal every year
- Sonar
 - Higher upfront cost (~\$100,000)
 - Portable and records data for later use
 - Little maintenance required
 - <http://www.youtube.com/watch?v=GM5o8gR8XuY>
 - <http://www.adfg.alaska.gov/index.cfm?adfg=sonar.didson>

WEIR VERSUS SONAR



DIDSON SONAR FOOTAGE



EROSION PREVENTION

- Light-penetrating stairs
- Coir logs w/ revegetation
- Interpretive kiosks



EROSION PREVENTION

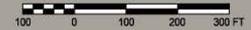


PUBLIC EDUCATION, OUTREACH, AND INVOLVEMENT

- Fish weir construction
- Fish counting
- Revegetation
- Interpretive kiosks
- Community participation
 - Lower river cleanup
 - Continued work after grant funding is used



LOWER RIVER IMPLEMENTATION OPTIONS



LEGEND

-  LIGHT PENETRATING STAIRS
-  WETLANDS
-  NO SALMON FISHING YEAR ROUND
-  EDUCATIONAL KIOSK
-  REVEGETATION
-  POTENTIAL GUARD RAIL

P | N | D
ENGINEERS, INC.

LOWER ILIULIUK RIVER
RESTORATION & MANAGEMENT PLAN
RESTORATION/IMPLEMENTATION OPTIONS

FIG 5-1

NEXT STEPS

- Gather more comments
- Assess site survey
- Identify priority sites and discuss remediation options
- Develop cost estimates for implementation and compare options
- Discuss options and make recommendations within project reports
- Submit draft for public review
- Submit final reports and present at City Council meeting early 2015 (date TBD)

PROJECT SCHEDULE

Task	Begin Date	Completion Date
Milestone I – Site Reconnaissance	9/2014	9/2014
Milestone II – 1 st Stakeholder Meeting	10/2014	10/2014
Milestone III – Submit Draft SMPP and RMP (35% Level) and Supporting Documents to City	10/2014	10/2014
Milestone IV – 2 nd Stakeholder Meeting	TONIGHT!	11/2014
Milestone V – Submit Draft SMPP and RMP for Public Review	11/2014	12/2014
Milestone VI – Submit Final SMPP and RMP and Present	1/2015	1/2015

QUESTIONS?

We are happy to answer questions and welcome your comments. Please share your knowledge of these project areas and opinion on what would make this project a success!

CONTACT:

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