



Kersh-Wishkah Flood Reduction

Project Update

May 16, 2013 – WDFW, Montesano, WA

Project Update Summary



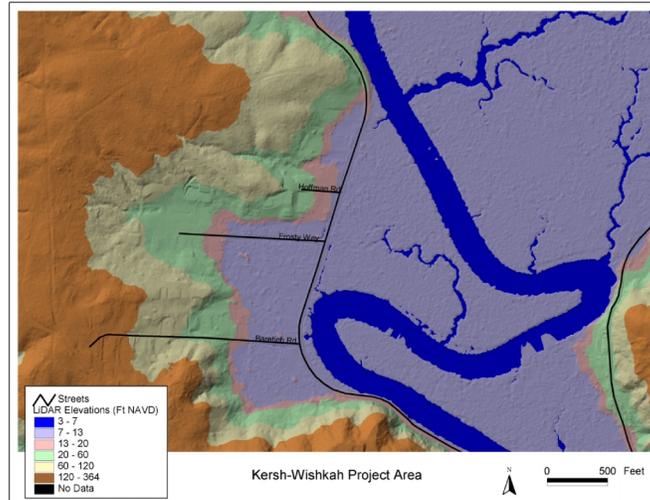
Completed:

- Project Goals and Criteria Memo
- Data Collected and Memo
- Bathymetric Survey
- Topographic Survey
- Permit Information Collected
- Check-in Meeting W/Regulators 5/15
- Geotechnical Investigation
- Tide and Flood Modeling
- Conceptual Options Developed

Tasks Remaining:

- Finalize Recommended Alternative
- Final Report
- Budget and Scope For Next Phase

Background – LiDAR Map (FEMA, 2009)



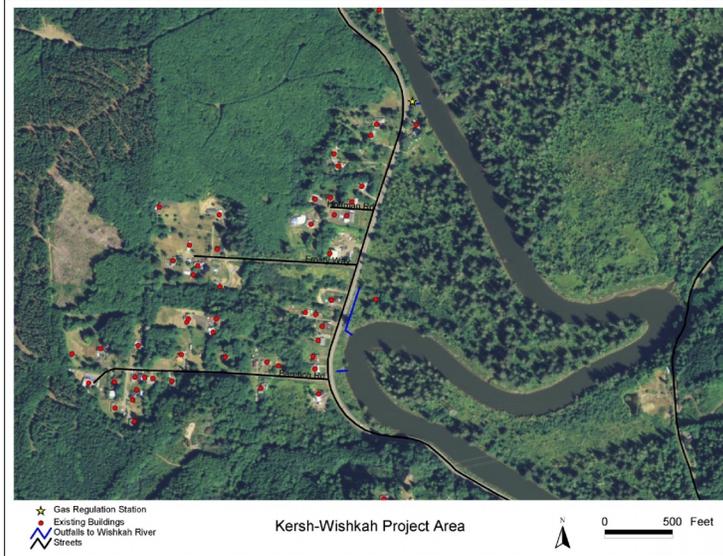
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Background – Project Area Map, 1942



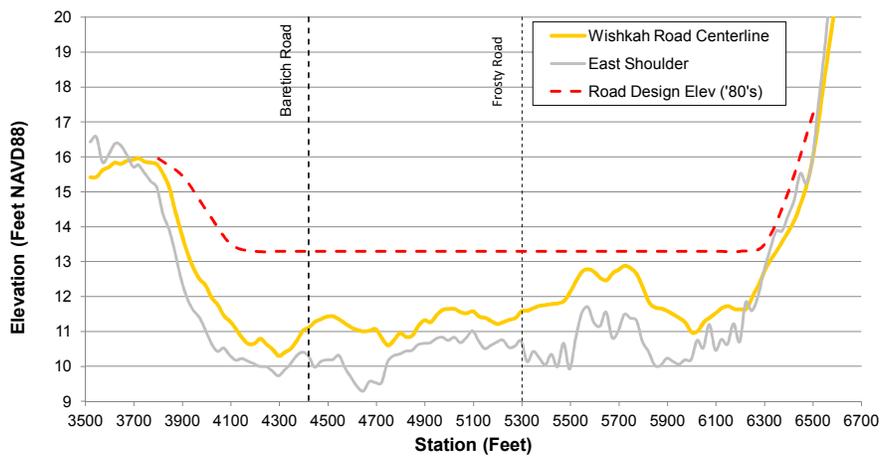
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Background – Project Area Map, 2011



5

Background - Wishkah Road Elevation, 1980's Design vs. 2009 LiDAR



6

Background – Baretich/Wishkah Road Culvert



Open culvert
allows backflow
during high water
in Wishkah River



7

Flooding History - Photos



8

Flooding History - Photos



Thanksgiving - 2011



Flooding History - Photos



Geotechnical Report Findings



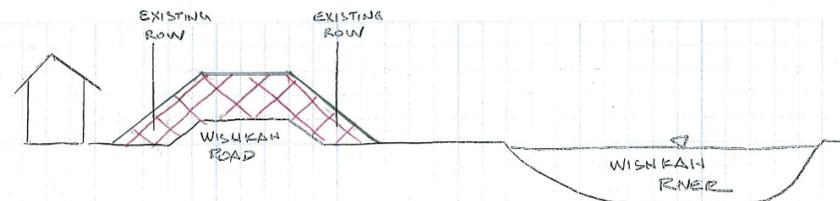
- Soft soils encountered throughout
- Depth of soft soils is less in northern portion of the project, where weathered bedrock was encountered at varying depths
- Sheet pile flood wall appears to be feasible
- Raising road or building a new levee not recommended due to expected settlement and subsidence

11



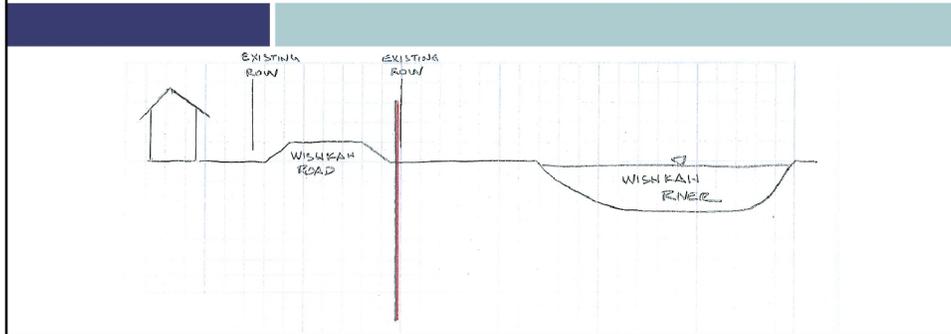
Option 1 – Raise Road

- Features – Raise road grade to provide flood protection
- Advantages – Flood protection for road and homes
- Disadvantages – More ROW, grade/access issues, potential settlement of underground utilities, cost to rebuild roadway section, reduced floodplain volume, infeasible due to predicted settlement
- Critical issues – Open culvert and soft, settling soils



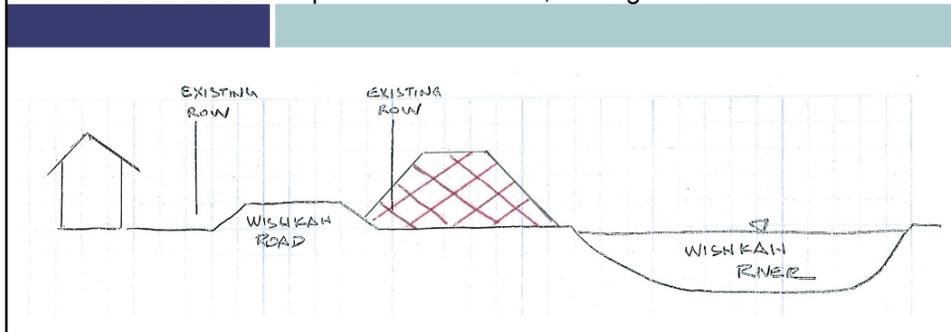
Option 2 – Sheet Pile Flood Wall

- Features – Interlocking z-type steel sheet pile with embedment depth 2-2.5 times height above ground
- Advantages – Flood protection for road and homes, minimal disturbance, no additional ROW likely
- Disadvantages – Added cost if obstructions are encountered
- Critical issue – Open culvert



Option 3 – Levee

- Features – Separate embankment for flood protection
- Advantages – Flood protection for road and homes, minimal disturbance to roads and residences
- Disadvantages – Requires more ROW, disturbance to sensitive areas, stability concern next to river, reduced floodplain storage volume, infeasible due to settlement
- Critical issues – Open culvert and soft, settling soils



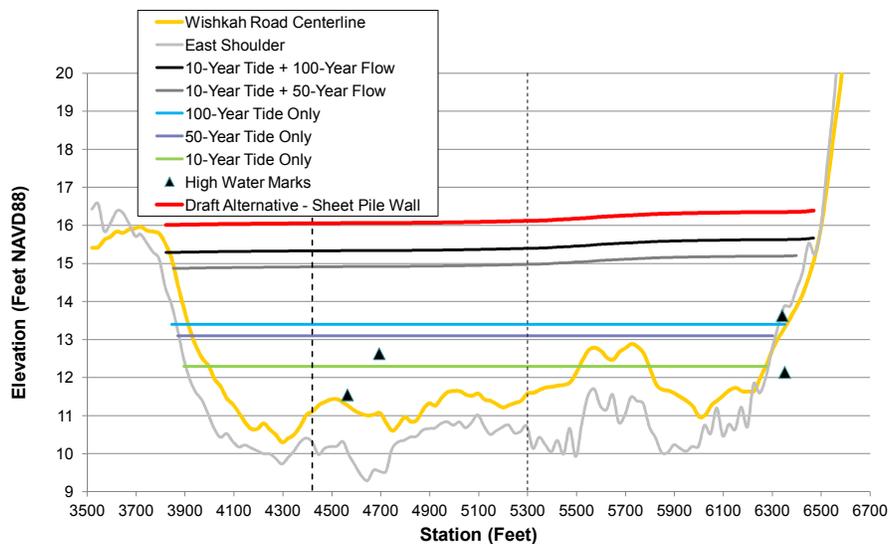
Option 4 – Relocate Road

- Features – Move road to elevate it above floodplain
- Advantages – Flood protection for road
- Disadvantages – Requires ROW, doesn't protect homes, high cost
- Critical issues – Topography and cost = infeasible

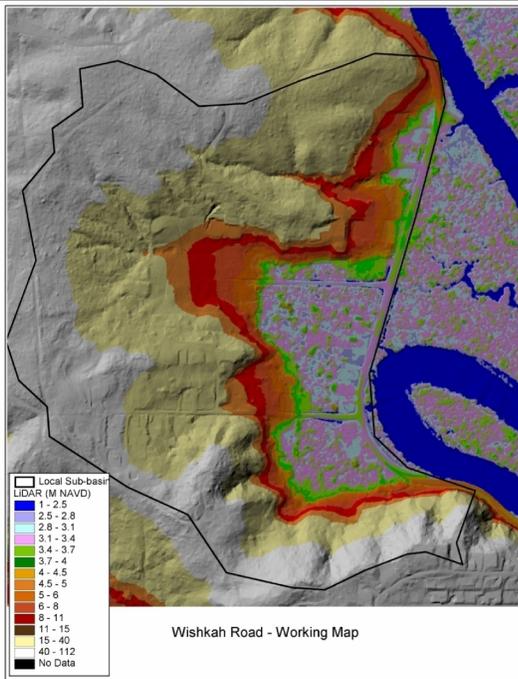
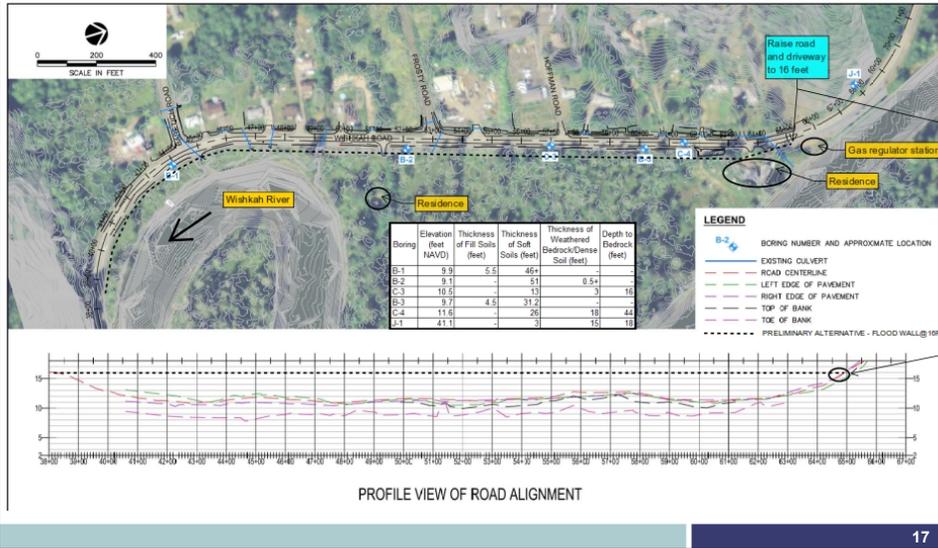
Characteristics of Possible Wishkah Road Realignment:

	Existing	Alternative 1	Difference
Length	4,550	7,300	2,750
Minimum Elevation (ft NAVD)	10	13	3
Maximum Elevation (ft NAVD)	27	190	163
Maximum Slope	6%	33%	27%

Recommended Alternative



Recommended Alternative – Flood Wall @ 16' NAVD



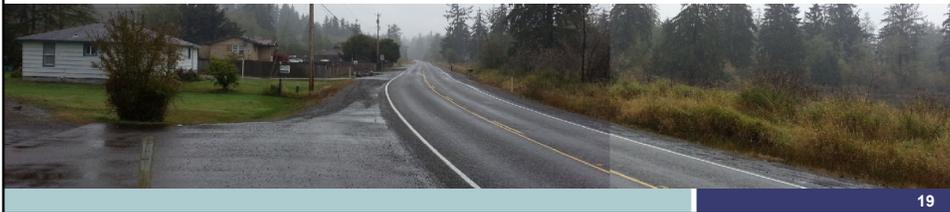
Draft Alternative – Local Drainage

- Local sub-basin
- Local “reservoir”
- Tidal channel – potential fish habitat enhancement

Design and Permit Considerations



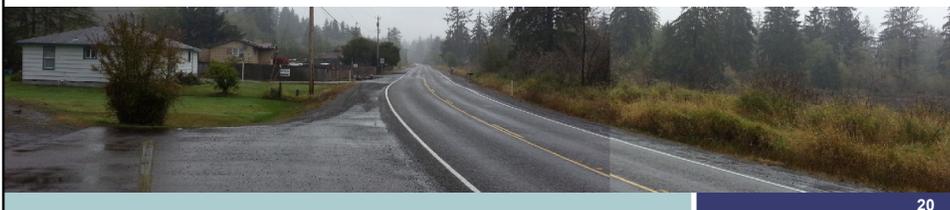
- Open culvert at Baretich Road – flapgate needed to avoid flooding
- No flapgate reportedly due to presence of fish (stickleback) when last studied
- Monitor fish presence along Baretich Road and/or mitigate for reduced access from river



Design and Permit Considerations



- Wetland impacts
- Access to gas regulator station
- Evaluate feasibility of raising portions of the road to reduce costs (at ends and possibly in northern 1/3)
- Local flooding and sizing of drainage structures through wall



Design and Permit Considerations



- Purchase residences on east side of road to:
 - Restore floodplain
 - Remove potential water quality threats
 - Provide potential habitat improvement opportunities
- Project cost



21

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22