

An aerial photograph of a mountain range. The foreground and middle ground are covered in dense, dark green coniferous forests. The mountain peaks are rocky and appear to have some snow or light-colored rock patches. The sky is a clear, bright blue.

Road and Bridge Project Case Studies on the Mt. Baker-Snoqualmie NF

Road Maintenance, Improvements,
and Decommissioning

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Storm Related Road Damages

- Transportation system being maintained beyond design life-aging infrastructure
- Major consecutive rain-on-snow events
- Limited funding
- NEPA analysis required



Excessive Water and Debris Flow Damages



- Under-sized culverts
- River bank erosion
- Major flood events
- Debris as a major factor



Bridge Washouts



Recreation Infrastructure Damages



Campground and Trail Damages



Legacy Road Program

- FY 2008 Omnibus Appropriations bill created a program to allocate \$40 million nationally to
 - Conduct road/trail repair and maintenance
 - Road decommissioning
 - Removal of fish passage barriers
 - Road repairs required due to recent storm events
- Based on urgent need
 - Areas where roads may be contributing to water quality problems
 - Areas which water bodies support threatened, endangered or sensitive species.
- Decommissioning unauthorized roads no longer on the road system

Legacy Funding

- Pacific NW Region 6 was allocated \$8,370,000 for FY 2008 (\$499,000 for the MBS NF)
- Focus fundings
 - Road/trail repair and maintenance in environmentally sensitive areas
 - Storm damage risk reduction for roads
 - Urgently needed repair of storm damage on roads that are not qualified for ERFO funding
 - Aquatic organisms passage
 - Road decommissioning
 - Out year planning
 - Monitoring

Legacy Objectives

- Objective
 - To protect aquatic resources and infrastructure
 - Applying relatively low-cost treatments across the road network to reduce the likelihood and consequences of catastrophic failures associated with large storm events, “Storm-proofing”
 - Tools used
 - Dips at road-stream crossings
 - Water bars
 - Drain dips
 - Decommissioning
- High priority Roads
 - Operational maintenance level 2
 - Low traffic volumes
 - High aquatic risks
 - Anticipated lack of future maintenance

ERFO

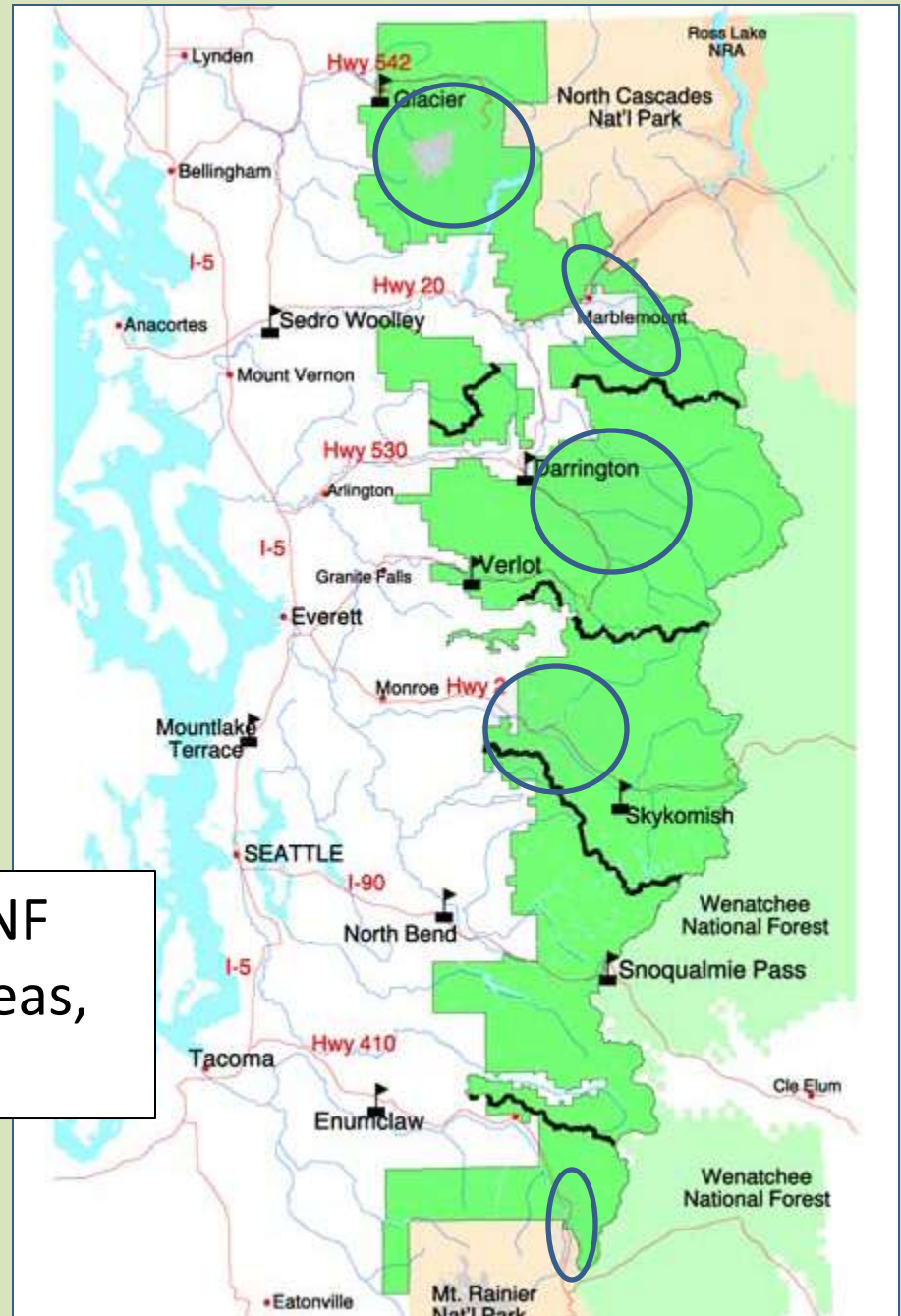
Emergency Relief for Federally Owned Roads

- Federal Highway Administration (FHWA) Program
- Provides assistance in repairing and restoring roads damaged by natural disasters
- Guidelines to follow
 - Unexpected heavy expenditures due to storm damage
 - Declared a natural disaster area
 - Minimum threshold of \$5,000 per damage site
 - Replace-in-Kind, or cost-benefit analysis to justify betterment

Other Funding Sources

- Appropriated road maintenance funds
- Appropriated flood supplemental funds
- Timber sales
- Recovery funds (ARRA-Stimulus)
- Rural Aid to County (RAC)
- Partnership Agreements

Mt. Baker-Snoqualmie NF
Map of storm damage areas,
2003



Road Decommissioning

Before, Bessemer Mt. Roads



After decommissioning



Trail Conversion



Converted 13.7 miles into decommissioned road and 6 miles into trail contributing the Mountains to Sound trail system

Storage of Roads

- Intended to future use
- Rock-lined drainage dips
- In-sloped roads-to ditch-to crossing



Culvert Upgrades



- From 2-24" culverts to 8' culvert
- Appropriate to flow volumes
- Less susceptible to debris blockage



Culvert Upgrades

- FSR 41
- Debris/slide potential
- 60" diameter culvert



Slide prevention

- New Culvert: 24' span, 12' rise
- Additional erosion control measures



Aquatic Organism Passage Improvements

- Identified as a fish-bearing stream
- Under-sized for the natural width of the stream
- Functional 24" wood plank culvert (non-historical)



- Stream natural width (up and downstream): 14 feet
- Limited height of fill

Aquatic Organism Passage Culvert Improvements

- Replaced with 18' span-4-8" high aluminum plate culvert
- Match natural stream width
- Allow natural flow



Campground Improvements

- Defining ditches to match capacity
- Securing camping spurs with additional drainage support through culverts



Water Relief Improvements



Ditch work



- Undersized culverts
- Debris
- Saturated roadways
- Re-defining ditches
- Rock-lined for shoulder/ditch reinforcement



Drainage Dips



- With variable flows
- Debris shoots/channels
- Maintenance Level 2 Roads

Bridges



- White Chuck Bridge collapsed 2003
- Erosion near abutments
- Stream changed course in 2006



White Chuck Bridge

- Re-built in 2008
- Built downstream
- Approx. 3 million
- Administered by Federal Highways



Boundary Bridge



- 240' long bridge
- Bridge washout- 2003 (Largest flood recorded for the drainages in this area)
- 2006 floods caused more erosion to the SW approach
- Fisheries and Wild and Scenic River concerns with the idea of adding another pier in the channel
- Intent is to span across the river without disturbing the SW side

Boundary Bridge Repairs



- Solution: Built a 210 long panel truss bridge
- Total bridge span: 405 feet
- Supported by the 2nd piers, and piles driven on the SW approach with reinforcement
- Bridge launched to other side, with the possibility of bridge extension if ever needed, additional 100 feet

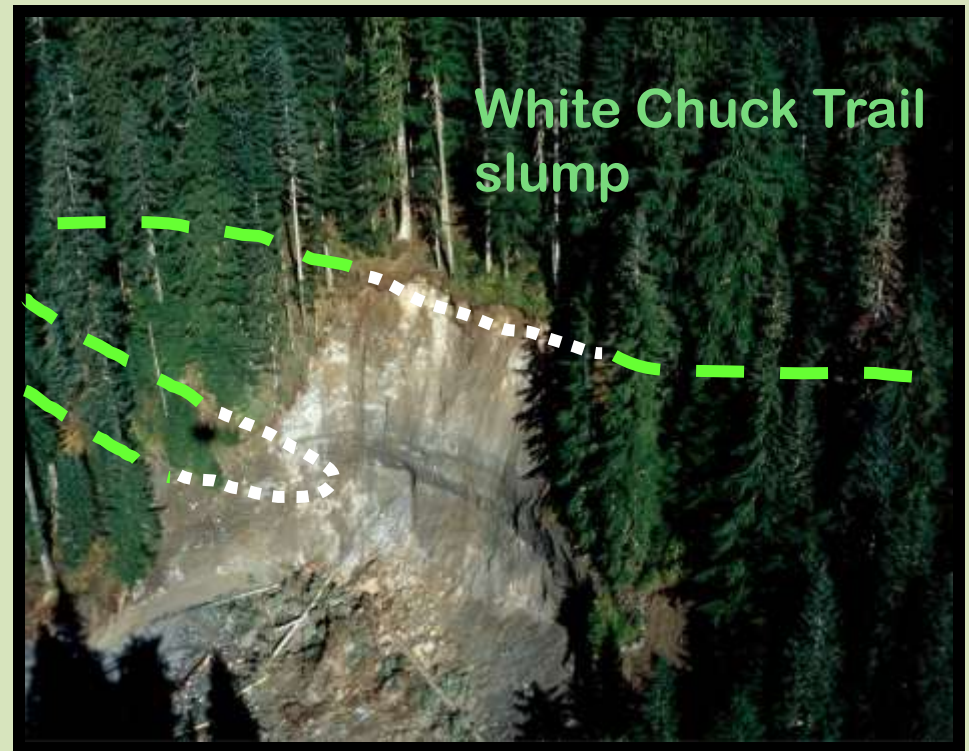


Work in Progress-White River Bridge



Road Failures

- Steep slopes
- Roads paralleling rivers
- Saturated ground due to storm events and maintenance needs
- Aging infrastructure



Road Improvements-new alignments

- Moving away from erosion potential areas
- Greater road width
- Moving farther away from streams/rivers





Questions

Credits
All MBS