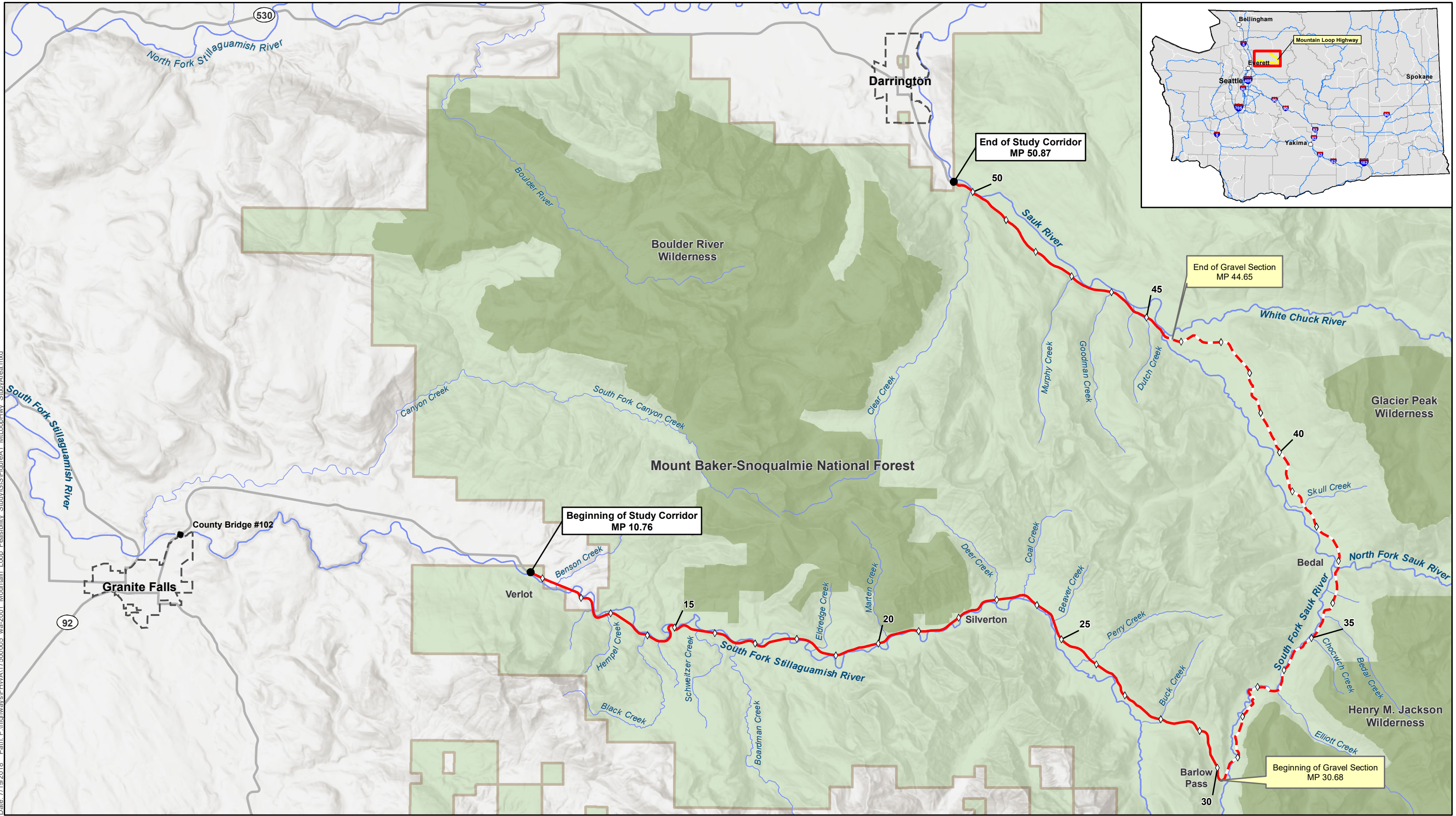




Appendix A: Figures



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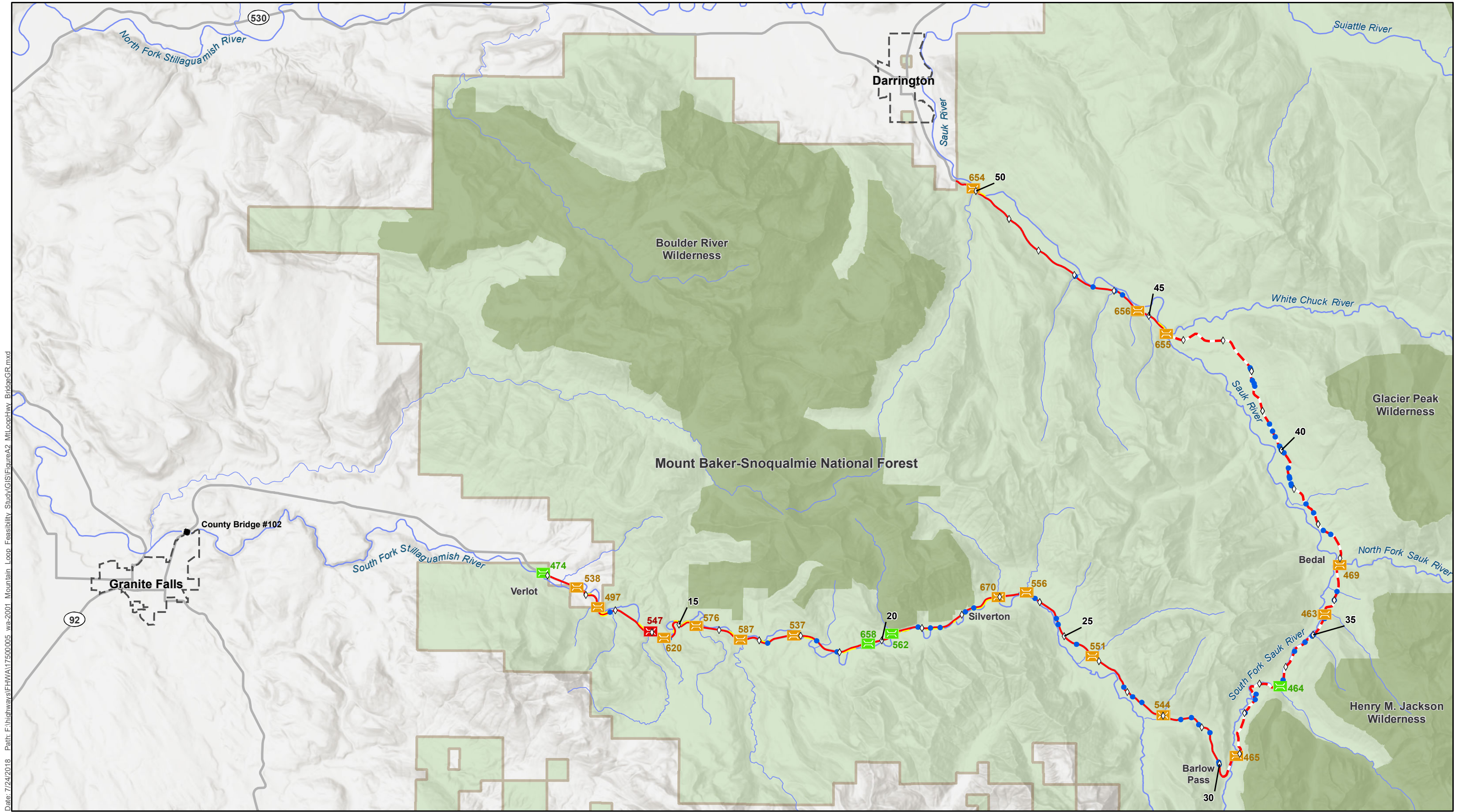
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



- ◇ Milepost
- ▭ City Limit
- River/Stream
- Roads
- ▭ National Forest
- ▭ Wilderness Area
- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)

Figure A.1
Study Area

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



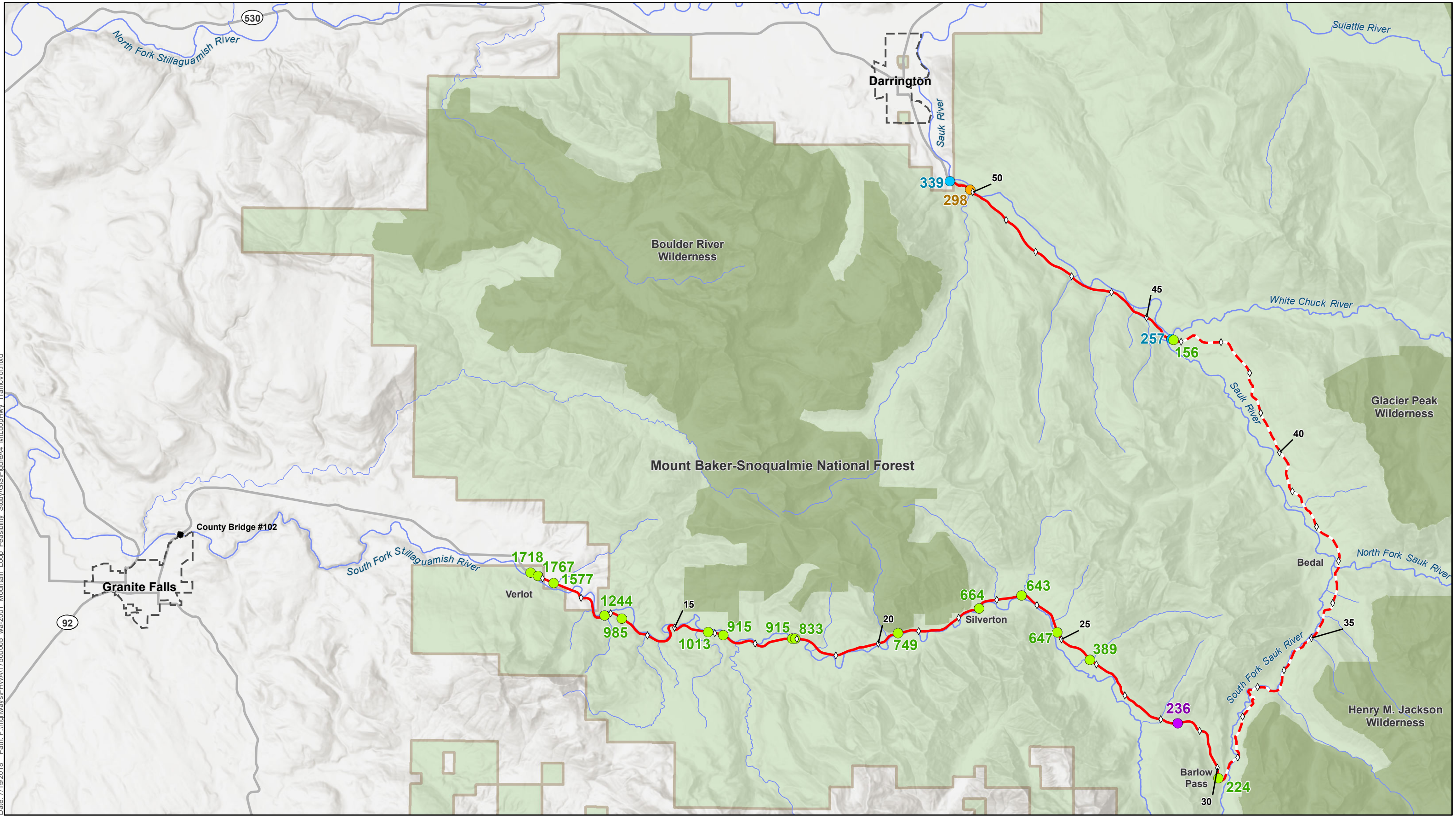
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WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



- ◇ Milepost
- ▭ City Limit
- River/Stream
- Roads
- ▭ National Forest
- ▭ Wilderness Area
- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Culvert
- Guardrail
- Bridge Condition (ID)
- ▭ 655 Good
- ▭ 655 Fair
- ▭ 655 Poor

Figure A.2
 Bridge, Culvert, and Guardrail Locations
 Mountain Loop Highway
 Feasibility Study
 Snohomish County, Washington



WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

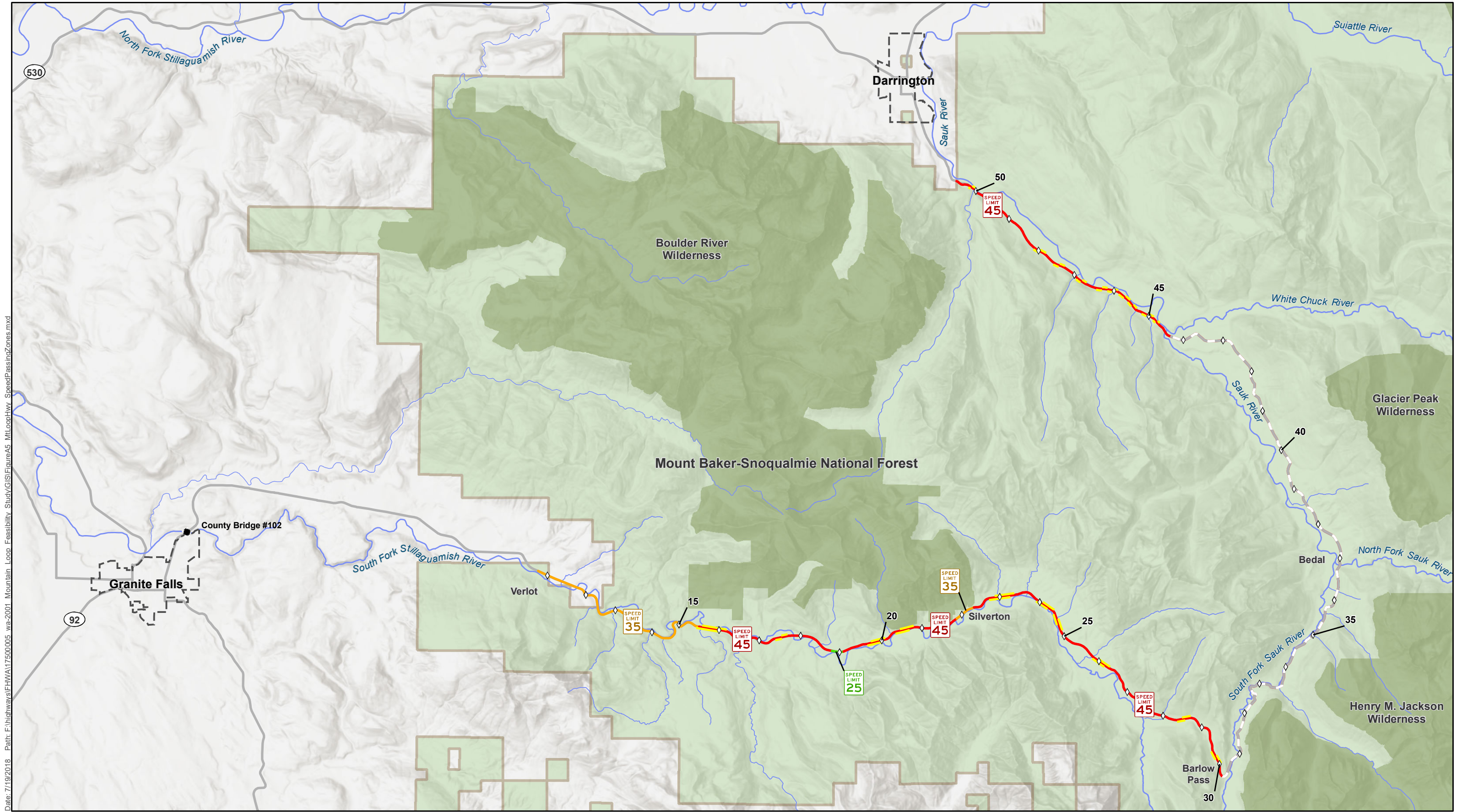
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◆ Milepost
 - - - City Limit
 - - - River/Stream
 - - - Roads
 National Forest
 Wilderness Area
 Mountain Loop Hwy (Paved)
 Mountain Loop Hwy (Unpaved)

Existing Traffic Volumes (Year of Counts)
 2011
 2013
 2015
 2017

RPA
 0 0.5 1 2 Miles
 North Arrow

Figure A.3
Existing Traffic Volumes
Mountain Loop Highway Feasibility Study
Snohomish County, Washington



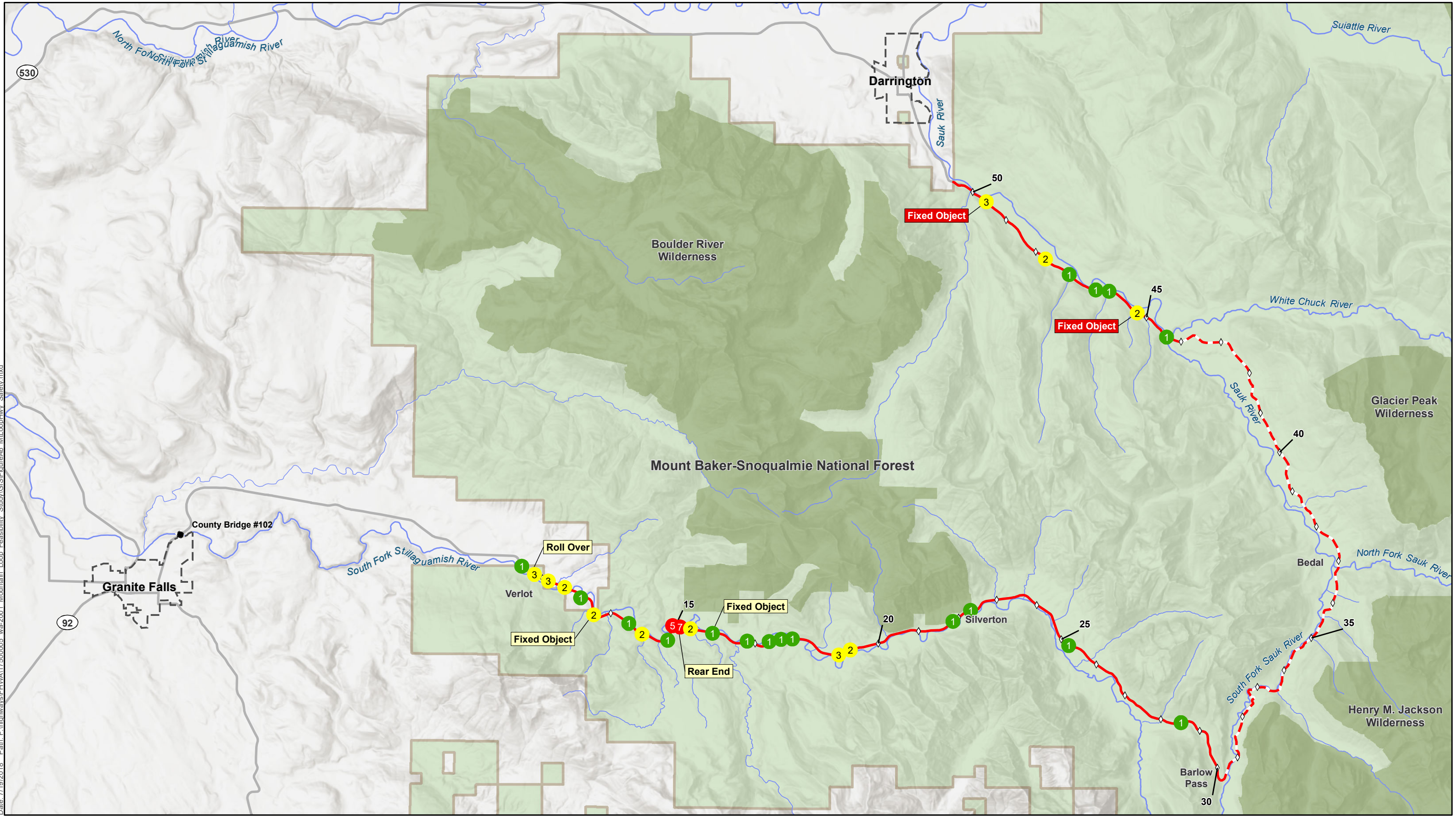
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WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



- ◇ Milepost
- ▭ City Limit
- River/Stream
- Roads
- ▭ National Forest
- ▭ Wilderness Area
- Mountain Loop Hwy (Unpaved)
- ▭ Passing Zones
- Speed**
- 25 mph
- 35 mph
- 45 mph
- Unknown/Not Posted

Figure A.4
Speed and Passing Zone Locations
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 7/19/2018 Path: F:\highways\FHWA\17500005_wa-2001 Mountain Loop Feasibility Study\GIS\FigureA6_MtLoopHwy_Safety.mxd

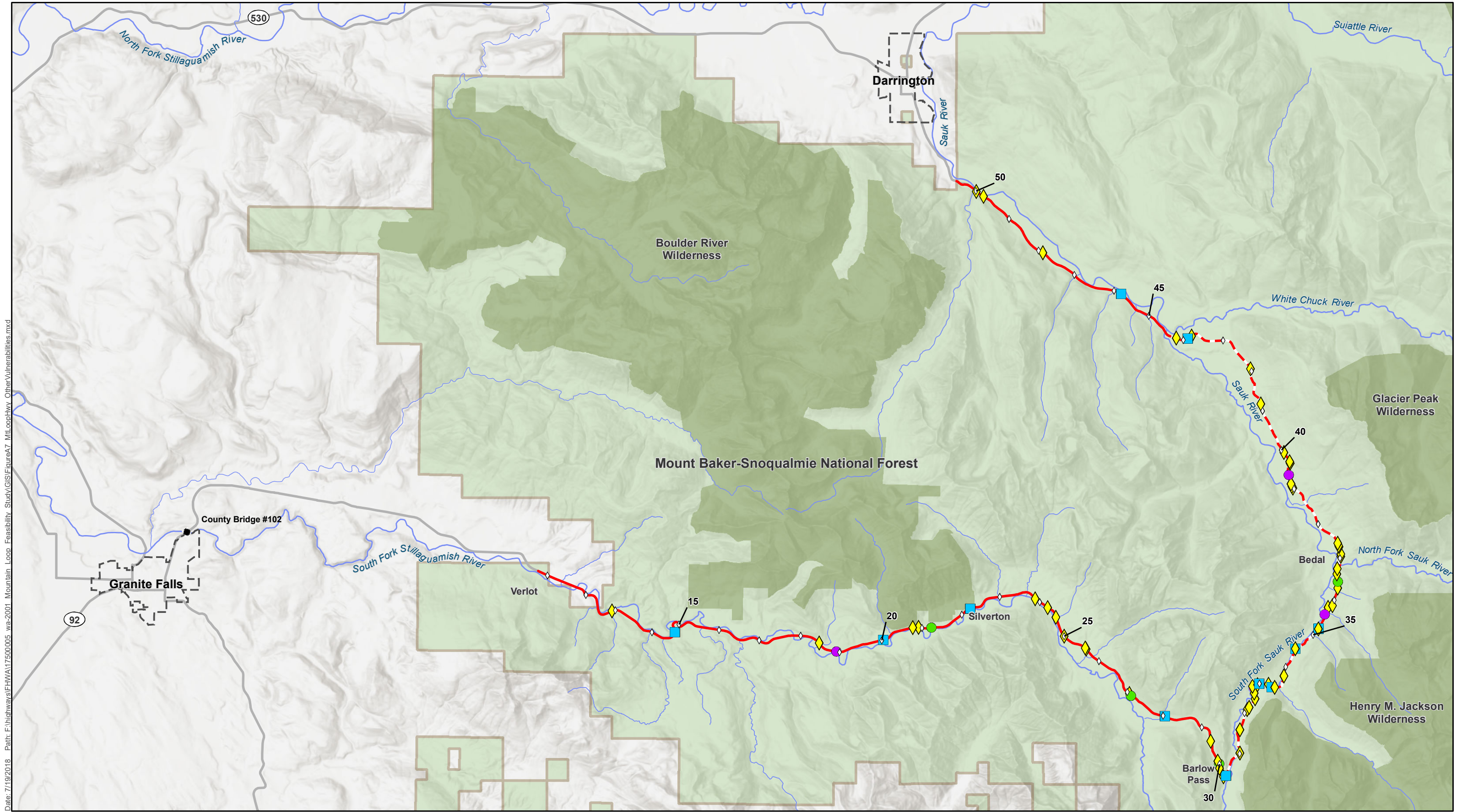
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



◇ Milepost	▭ National Forest	Number of Crashes	▭ Severe Crash
▭ City Limit	▭ Wilderness Area	● 1	▭ Fatal Crash
— River/Stream	— Mountain Loop Hwy (Paved)	● 2 - 4	
— Roads	— Mountain Loop Hwy (Unpaved)	● 5 - 7	

Figure A.5
Crash Trends

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



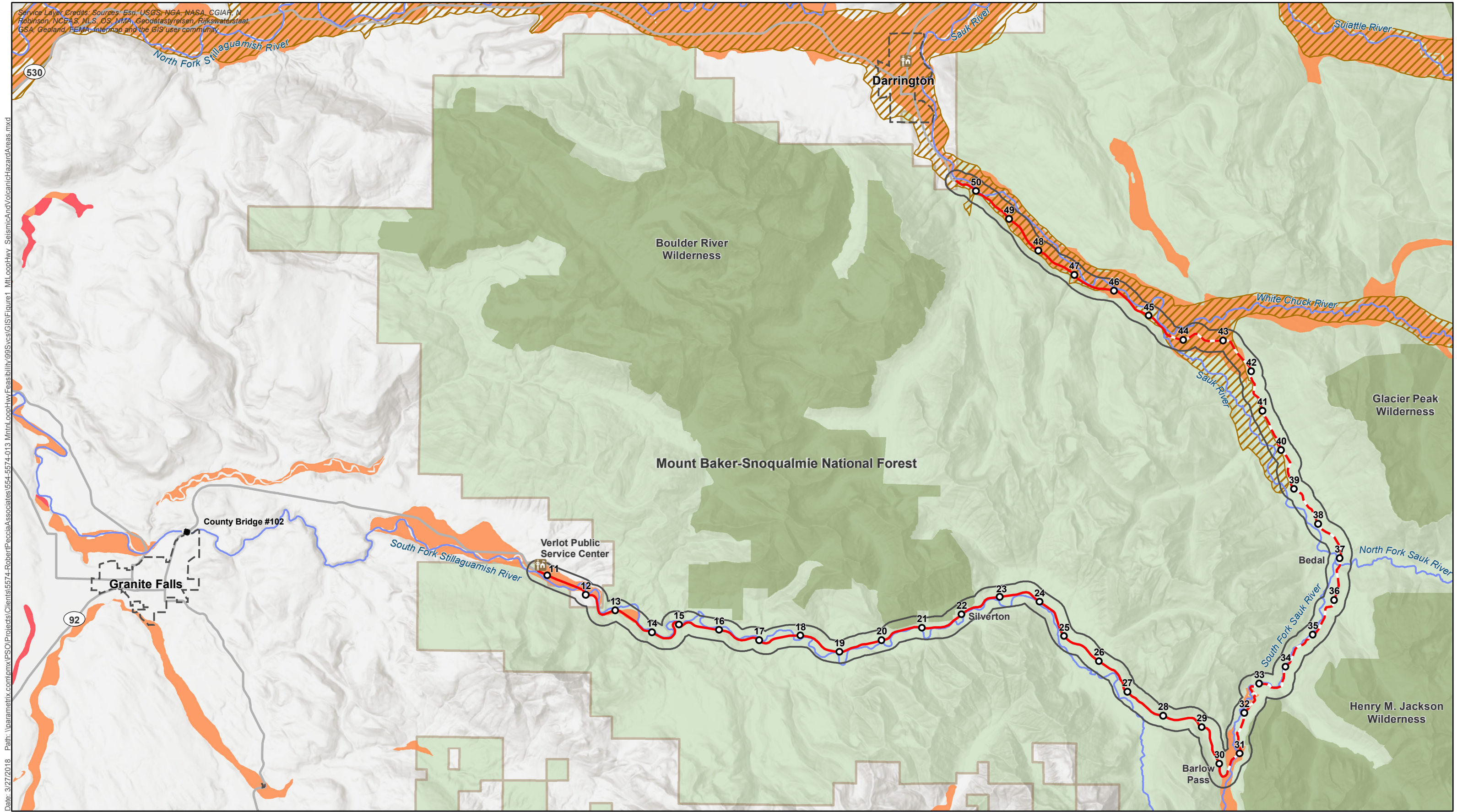
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WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



- ◇ Milepost
- ▭ City Limit
- River/Stream
- Roads
- ▭ National Forest
- ▭ Wilderness Area
- Mountain Loop Hwy (Paved)
- Mountain Loop Hwy (Unpaved)
- Drainage/Erosion Issue
- Slide Area
- ◇ Steep Slope(s)
- Washout Area

Figure A.6
Other Vulnerabilities
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington


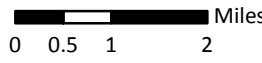


Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, MLS, OS, NMA, Geodatasyrtesen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community.

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSOI\Projects\Clients\5574-013_MtnLoopHwy_SeismicAndVolcanicHazardAreas.mxd

Parametrix

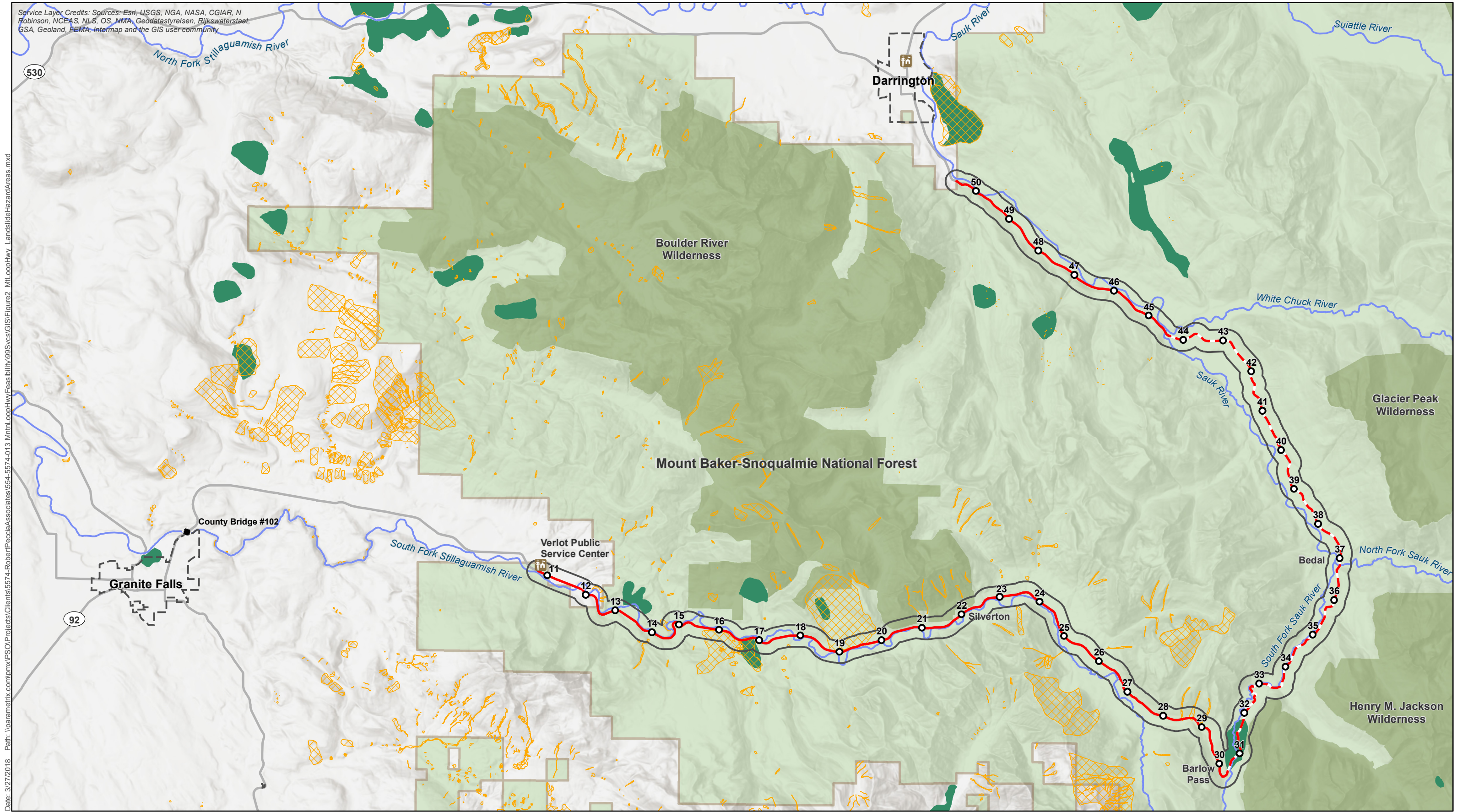
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources,

Mountain Loop Hwy (Paved)	Milepost	National Forest	Glacier Peak Lahar Hazard Area
Mountain Loop Hwy (Unpaved)	City Limit	Wilderness Area	Soil Liquefaction Susceptibility
Study Area (1/4 Mile Buffer)	River/Stream		High
			Moderate to high

Figure A.7
Seismic and Volcanic Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, MMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-0113_MtnLoopHwy_Feasibility\99Svcs\GIS\Figure2_MtLoopHwy_LandslideHazardAreas.mxd

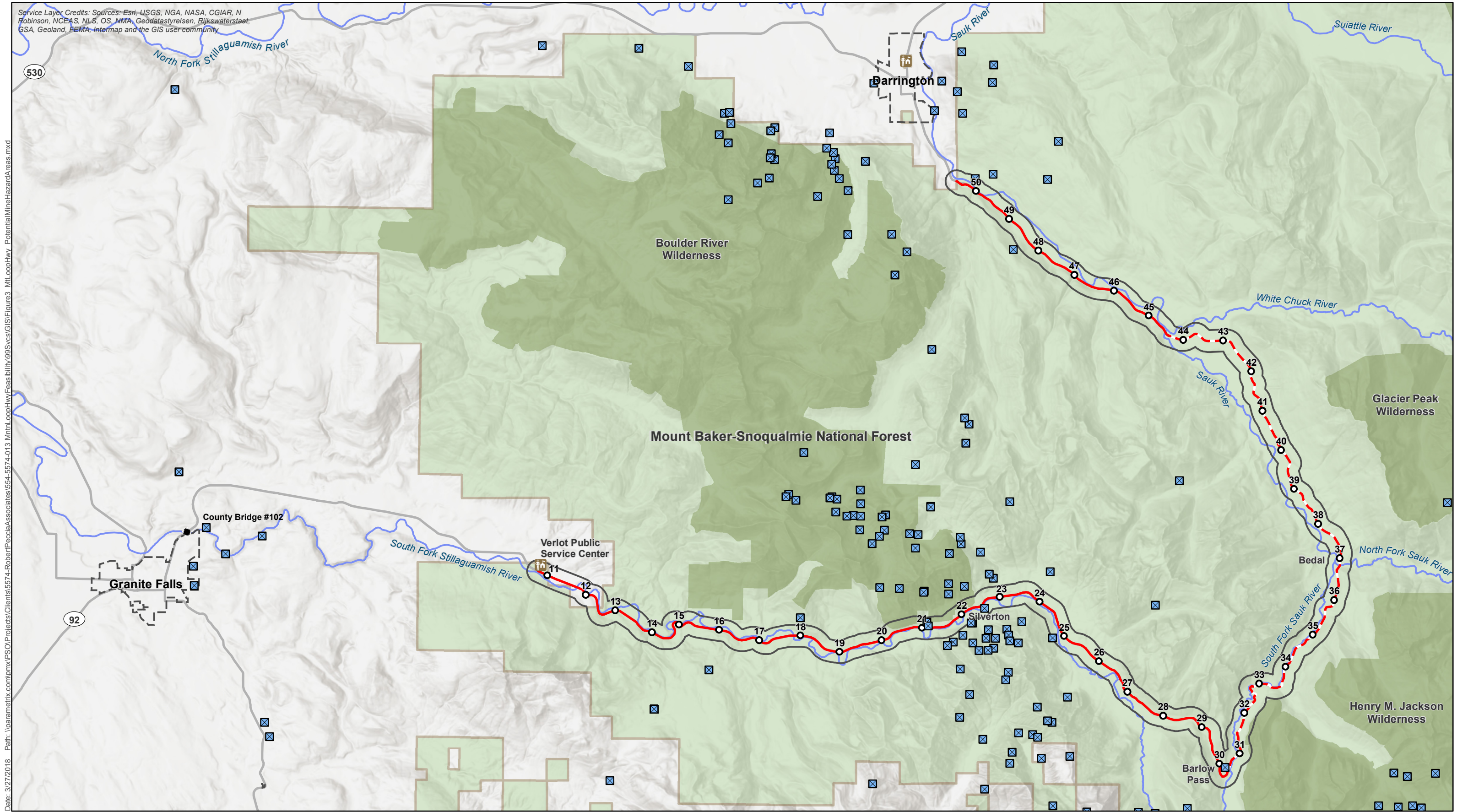
Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

0 0.5 1 2 Miles

- Mountain Loop Hwy (Paved)
- - Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- City Limit
- River/Stream
- Milepost
- National Forest
- Wilderness Area
- WDNR-Inventoried Landslides
- Landslides Identified through Geologic Mapping

Figure A.8
Landslide Hazard Areas
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, MMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-013_MtnLoopHwy_Feasibility\99Svcs\GIS\Figures3_MtLoopHwy_PotentialMineHazardAreas.mxd

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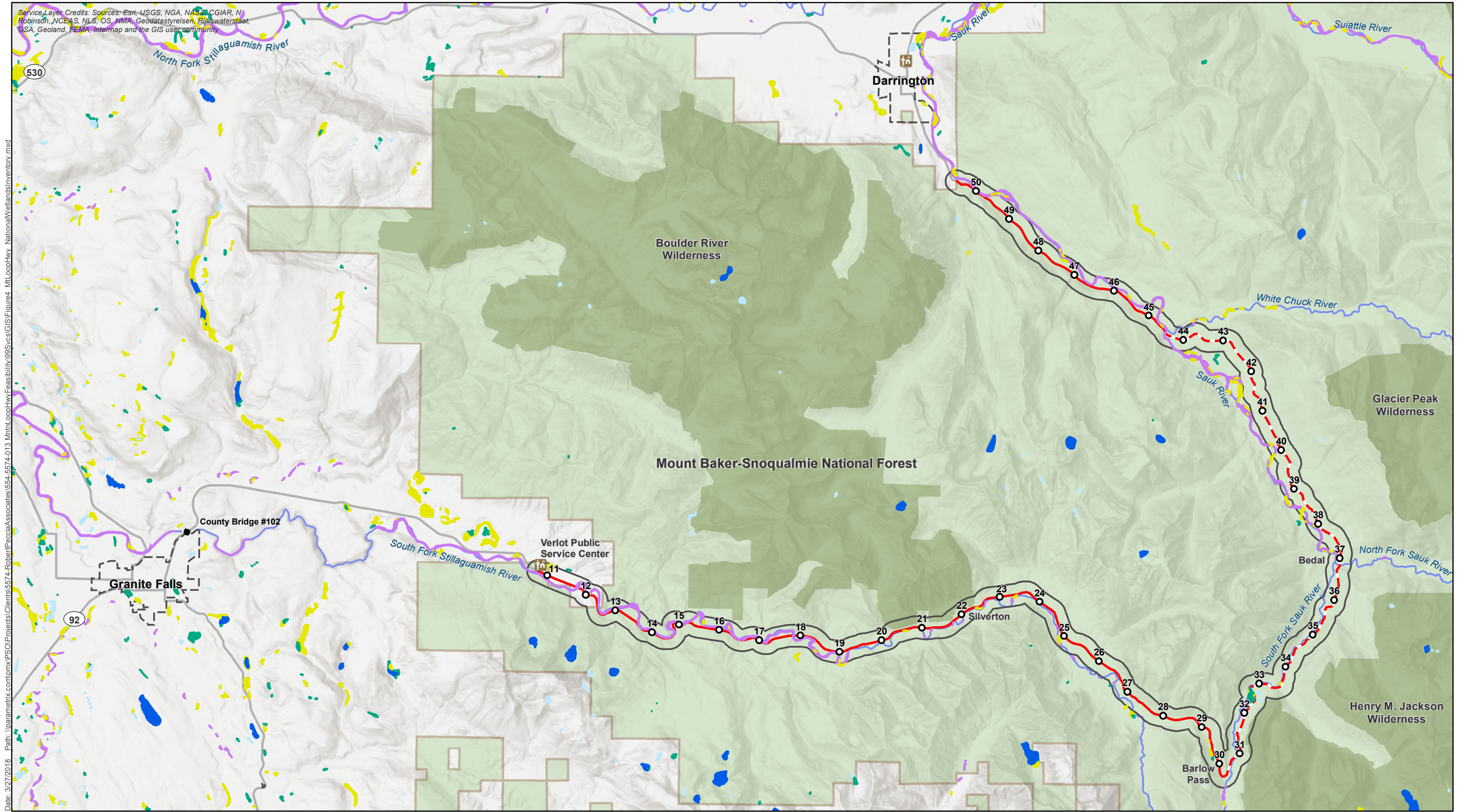
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

Miles
0 0.5 1 2

- Mountain Loop Hwy (Paved)
- - - Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- Milepost
- City Limit
- River/Stream
- National Forest
- Wilderness Area
- X Active Metal Mines

Figure A.9
Potential Mine Hazard Areas

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

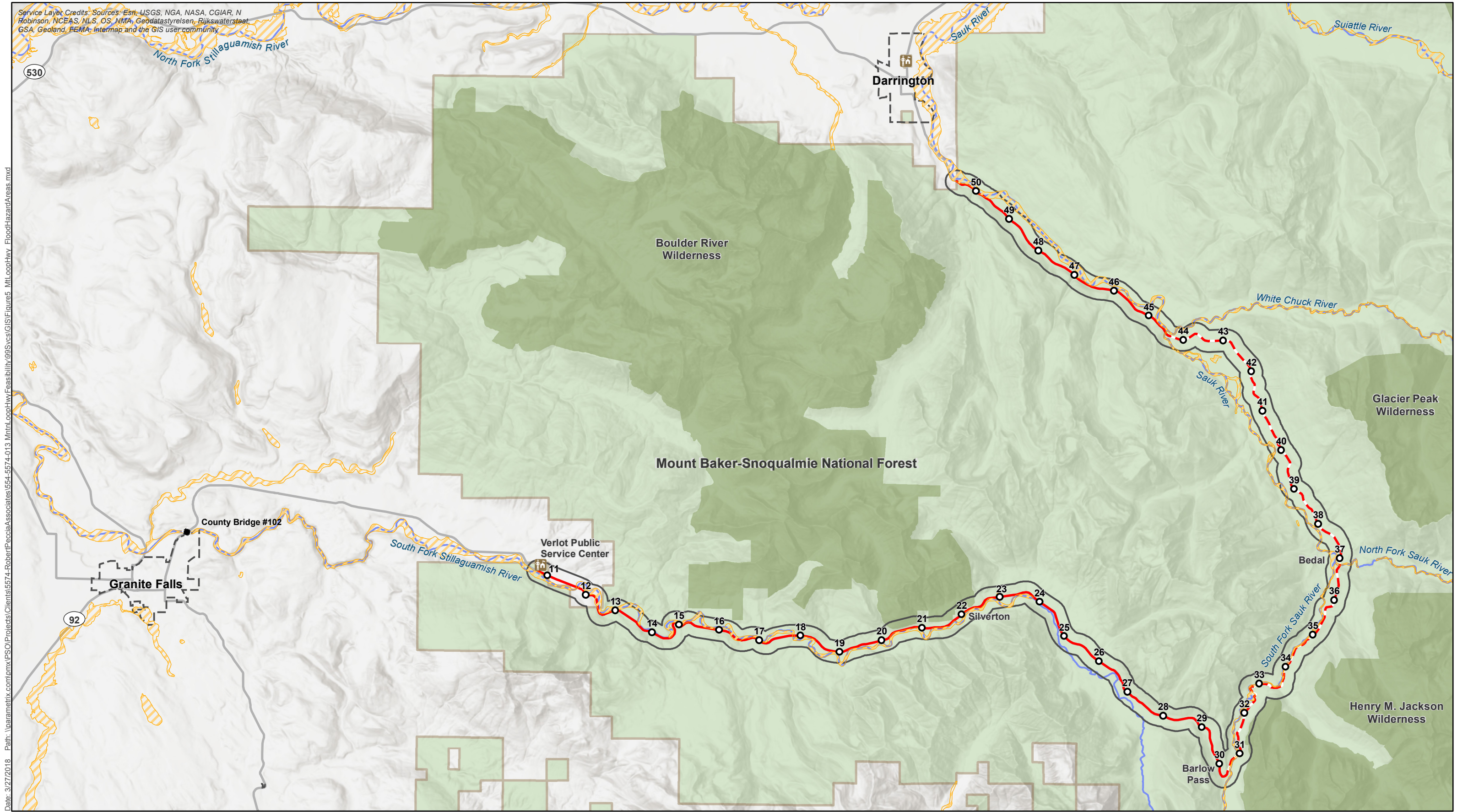
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Parametrix

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources, US Department of Fish and Wildlife (National Wetlands Inventory)

- | | | | |
|------------------------------|-----------------|---|-------------------|
| Mountain Loop Hwy (Paved) | City Limit | National Wetlands Inventory Wetland Type | Freshwater Pond |
| Mountain Loop Hwy (Unpaved) | River/Stream | Freshwater Emergent | Riverine |
| Study Area (1/4 Mile Buffer) | National Forest | Freshwater Forested/Shrub | Lacustrine (Lake) |
| Milepost | Wilderness Area | | |

Figure A.10
National Wetlands Inventory
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



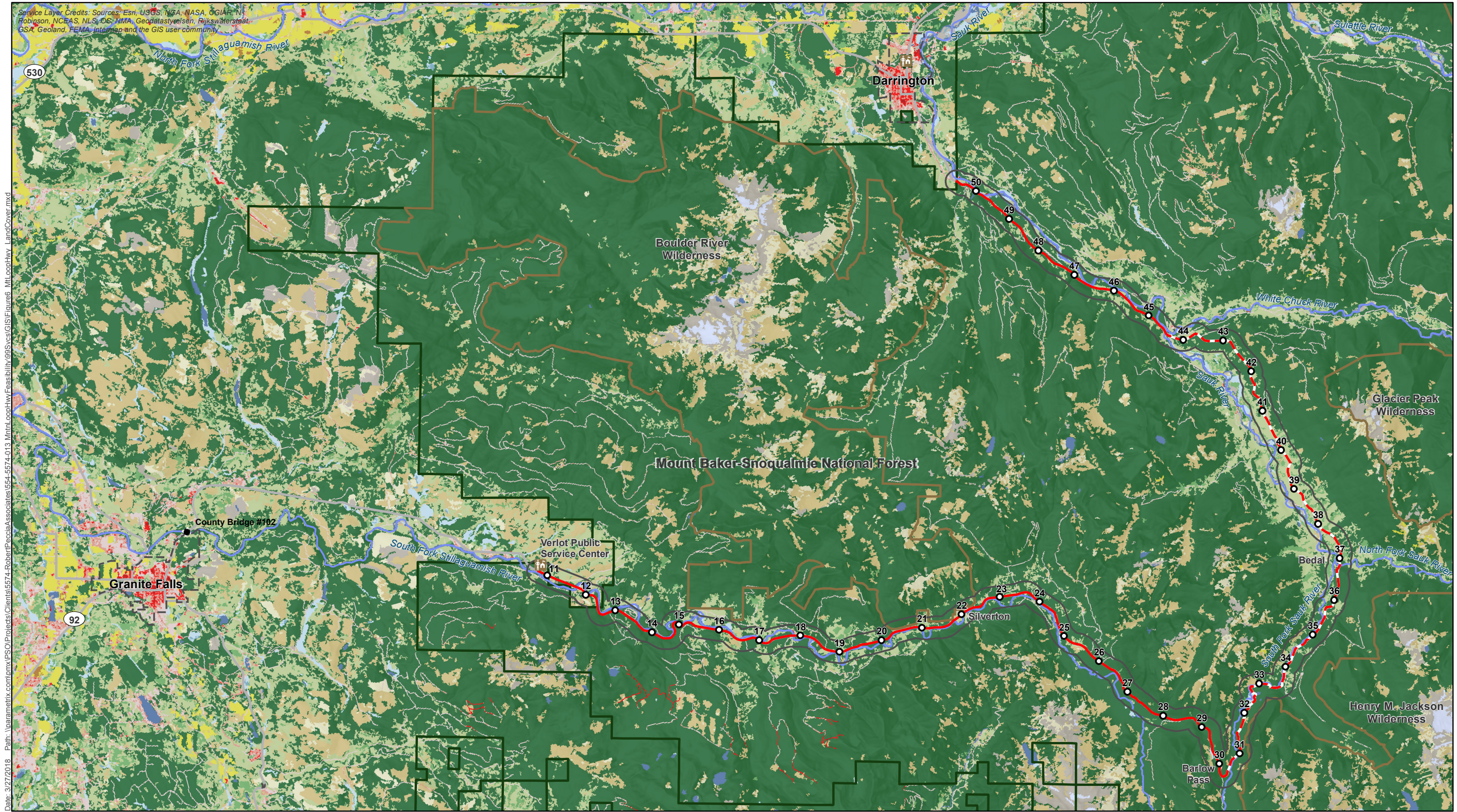
- Mountain Loop Hwy (Paved)
- - - Mountain Loop Hwy (Unpaved)
- Study Area (1/4 Mile Buffer)
- Milepost
- City Limit
- River/Stream
- National Forest
- Wilderness Area
- Mapped 100-Year Floodplain

Note: This figure depicts preliminary flood hazard data from the Federal Emergency Management Agency. Preliminary data are for review and guidance purposes only and are subject to change.

Figure A.11
 Flood Hazard Areas
 Mountain Loop Highway
 Feasibility Study
 Snohomish County, Washington

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-013_MtnLoopHwy_FloodHazardAreas.mxd

Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, OGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

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Parametrix

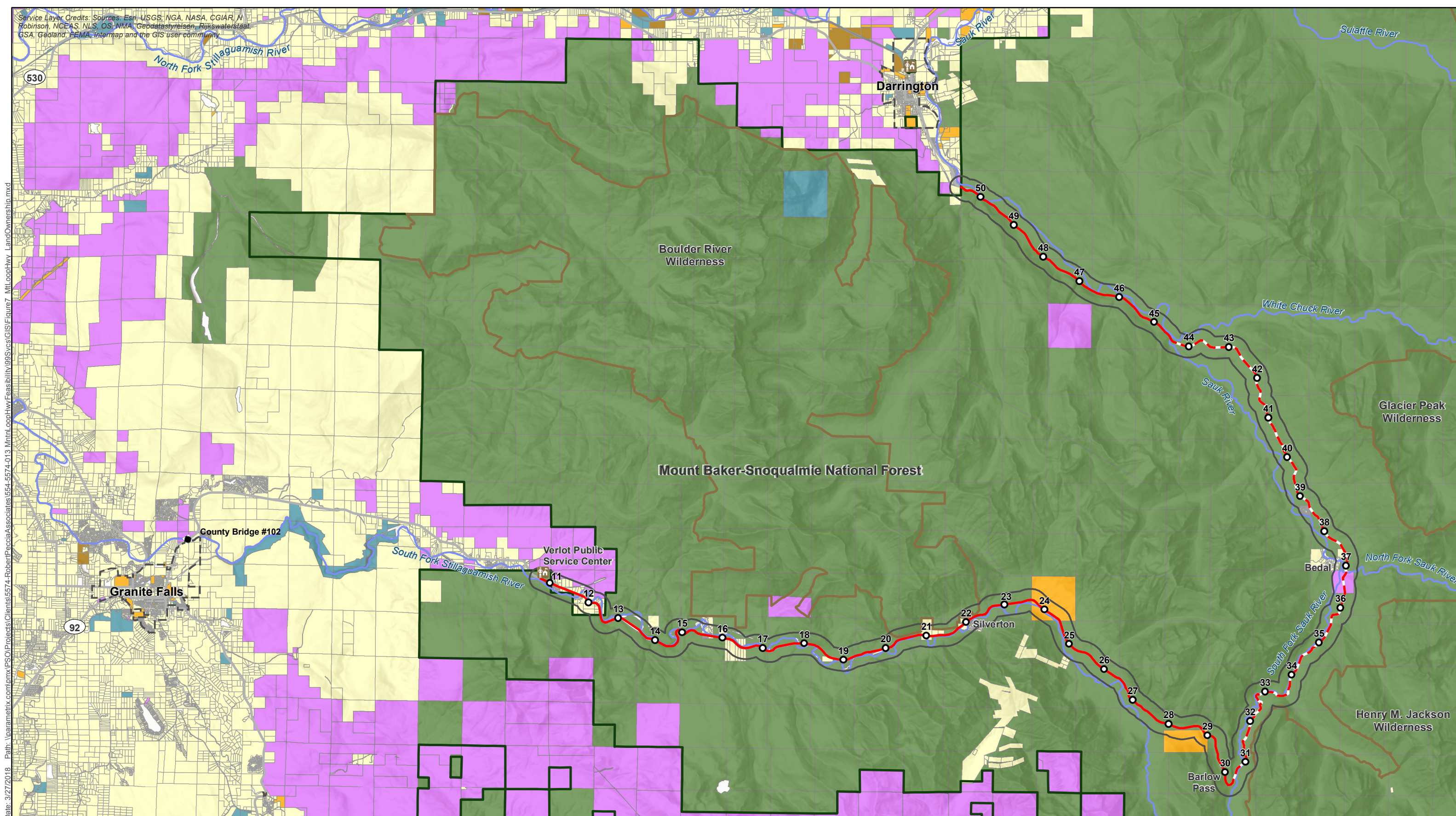
WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources, Multi-Resolution Land Characteristics Consortium (National Land Cover Database 2011)

0 0.5 1 2 Miles

<ul style="list-style-type: none"> — Mountain Loop Hwy (Paved) — Mountain Loop Hwy (Unpaved) Study Area (1/4 Mile Buffer) ○ Milepost 	<ul style="list-style-type: none"> City Limit — River/Stream National Forest Wilderness Area 	<p>Land Cover (2011 NLCD)</p> <ul style="list-style-type: none"> ■ Open Water ■ Perennial Ice/Snow ■ Developed, Open Space ■ Developed, Low Intensity ■ Developed, Medium Intensity ■ Developed High Intensity ■ Barren Land (Rock/Sand/Clay) ■ Deciduous Forest ■ Evergreen Forest ■ Mixed Forest ■ Shrub/Scrub ■ Grassland/Herbaceous ■ Pasture/Hay ■ Cultivated Crops ■ Woody Wetlands ■ Emergent Herbaceous Wetlands
--	--	--

Figure A.12
Land Cover

Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Service Layer Credits: Sources: Esri, USGS, NGA, NASA, CGIAR, M. Robinson, NCEAS, NLS, OS, NMA, Geodatasysteisen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community

Date: 3/27/2018 Path: \\parametrix.com\pmx\PSO\Projects\Clients\5574-RobertPecciaAssociates\5574-5574-013_MntLnopHwyFeasibility\99Syvs\GIS\Figure7_MtLnopHwy_LandOwnership.mxd

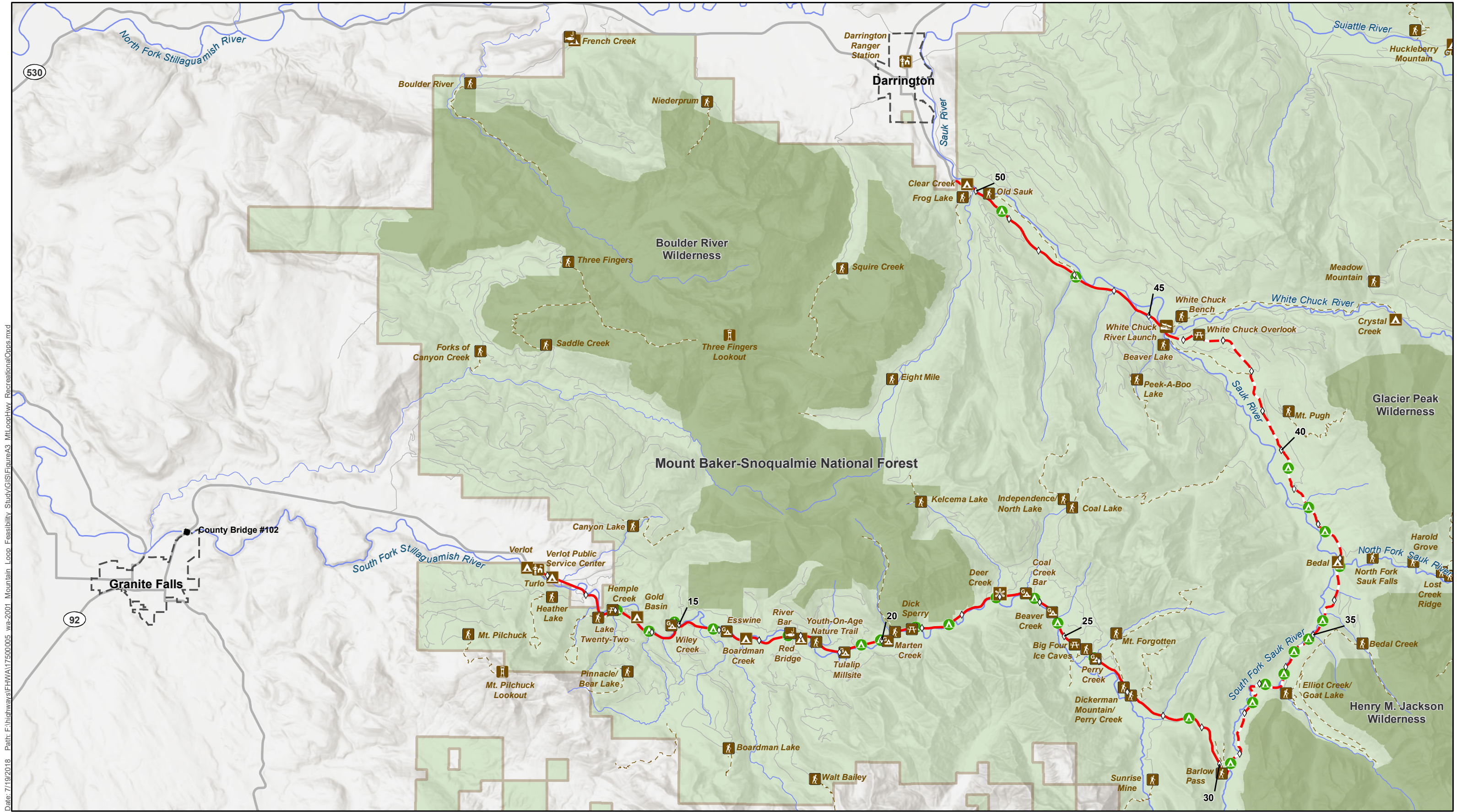
Parametrix

Source: WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources

0 0.5 1 2 Miles

- | | | | |
|------------------------------|-----------------|-----------------------|---------|
| Mountain Loop Hwy (Paved) | City Limit | Land Ownership | County |
| Mountain Loop Hwy (Unpaved) | River/Stream | National Forest | City |
| Study Area (1/4 Mile Buffer) | Wilderness Area | Tribal | Private |
| Milepost | National Forest | State | |

Figure A.13
Land Ownership
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington



Date: 7/19/2018 Path: F:\highways\FHWA\17500005_wa-2001_Mountain Loop Feasibility Study\GIS\FigureA3_MtLoopHwy_RecreationalOpps.mxd

WSDOT, Snohomish County, US Department of Agriculture, US Department of Forestry, US Geological Society, Washington Department of Natural Resources



- | | | | |
|-----------------|---------------------------------|-----------------------------|-----------------------------|
| ◇ Milepost | ▭ National Forest | 🚤 Boating Site | 🏠 Lookout / Cabin |
| ▭ City Limit | ▭ Wilderness Area | 🏕️ Campground | 🍷 Picnic Site |
| 🌊 River/Stream | --- Trail | 🎣 Fishing Site | 🎿 Snowpark |
| 🛣️ Major Roads | — Mountain Loop Hwy (Paved) | 🏕️ Group Campground | 🚶 Trailhead |
| 🛣️ Forest Roads | --- Mountain Loop Hwy (Unpaved) | 🍷 Group Picnic Site | 🌲 Dispersed Camping Site(s) |
| | | 🏠 Info Site/ Ranger Station | |

Figure A.14
Recreational Opportunities
Mountain Loop Highway
Feasibility Study
Snohomish County, Washington