# Manatash-Taneum Resilient Landscapes Project Area

## Road Survey Fall 2016 – Summer 2017

Washington Conservation Science Institute
September 2017

### Purpose and Background

This report summarizes the results of a road survey conducted in the Manastash-Taneum Resilient Landscapes Project Area (Project Area). Survey areas and roads were chosen based on the findings of the 2016 Manastash-Taneum Resilient Landscapes Project: Landscape Evaluations and Prescriptions report (Haugo et al., 2016), which identified several restoration opportunity areas throughout the Manatash-Taneum Watersheds. Figure 1 provides an overview of the Project Area and identified restoration opportunity areas. In addition to identifying restoration opportunity areas, a landscape prescription was developed that could be implemented to restore aquatic ecosystem resiliency, and address limiting factors for steelhead recovery, such as degraded floodplains, degraded channels, degraded riparian areas, lack of large wood, altered sediment inputs and routing, and impaired fish passage throughout the Project Area.

The restoration opportunity areas and landscape prescription were identified through an aquatic landscape evaluation process comprised of eight steps, one of which is an evaluation of impacts of roads on aquatic habitats. Through this evaluation process, additional roads were identified for survey in the North Fork Manastash Creek, and in the Taneum Creek, including the North and South Forks. Field surveys of these additional roads were conducted in the identified areas during the Fall of 2016 and the Spring and Summer of 2017. Surveys were primarily conducted on U.S. Forest Service and The Nature Conservancy (TNC) lands within and/or near potential forest treatment areas of the Manastash-Taneum Resilient Landscapes Project.

The data collected from the 2016/2017 road surveys provide an initial field survey to aid in the validation of the roads GIS layer that was rectified by TNC in the Summer of 2014. The data collected in 2016/2017 also provides general information regarding road and culvert conditions at road crossings of perennial and intermittent streams upslope from potential steelhead habitat. This information can be used to inform restoration planning efforts in the Project Area.

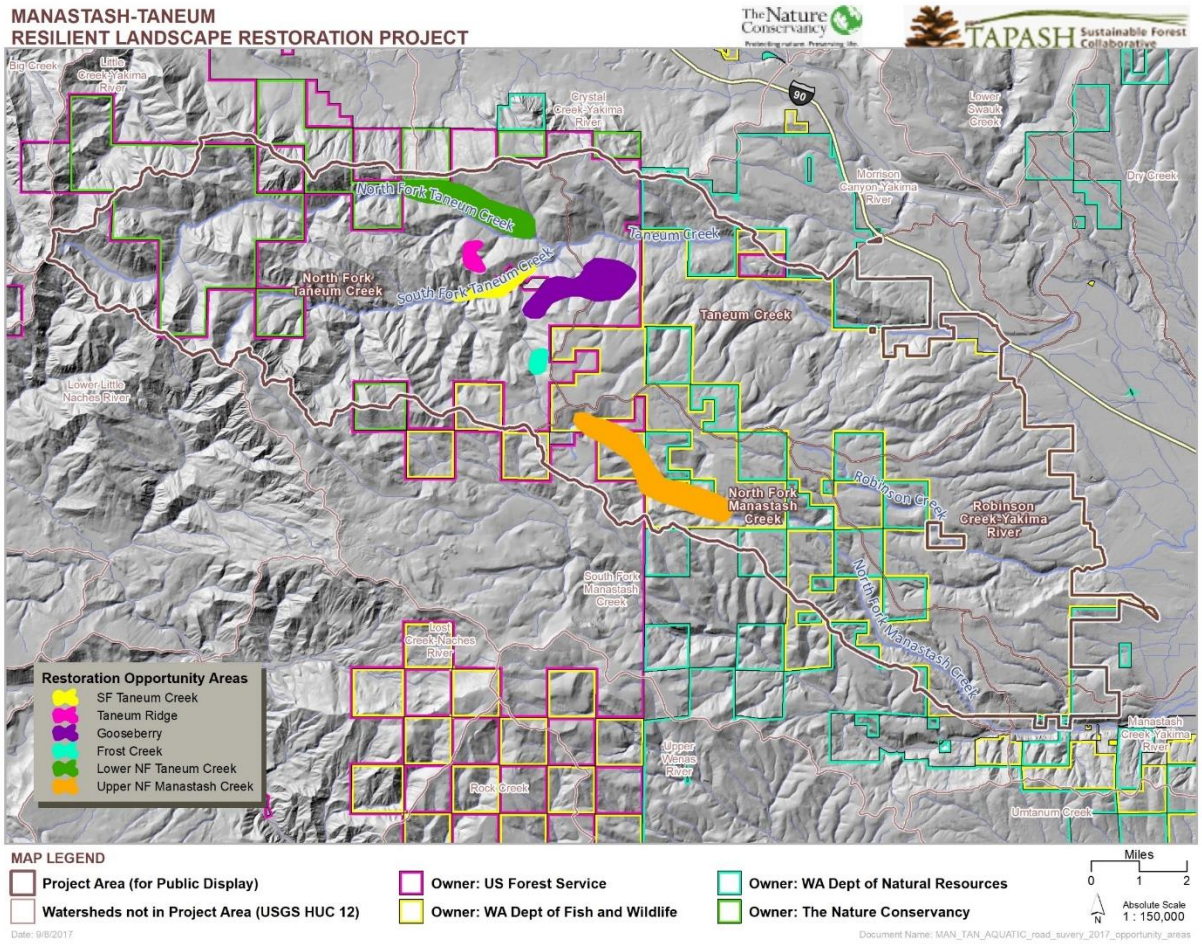


Figure 1 – Overview of Project and Restoration Opportunity Areas.

## Methods

The ArcGIS Collector App was used to collect data during the road surveys. A data collection template, with defined fields and attributes, was developed to collect standardized information for each Erosion Point along the road being surveyed. An Erosion Point is defined as a location that is or could potentially develop into an erosion and sediment delivery problem. Data recorded at each Erosion Point included: Erosion Severity; Culvert Condition; Drainage Ditch Condition; Road Surface Condition; Road Surface Type; and Comments. All Erosion Point data were recorded in the field and stored in an ArcGIS file geodatabase for the project. Figure 2 provides an example of the project geodatabase from ArcGIS Collector App.

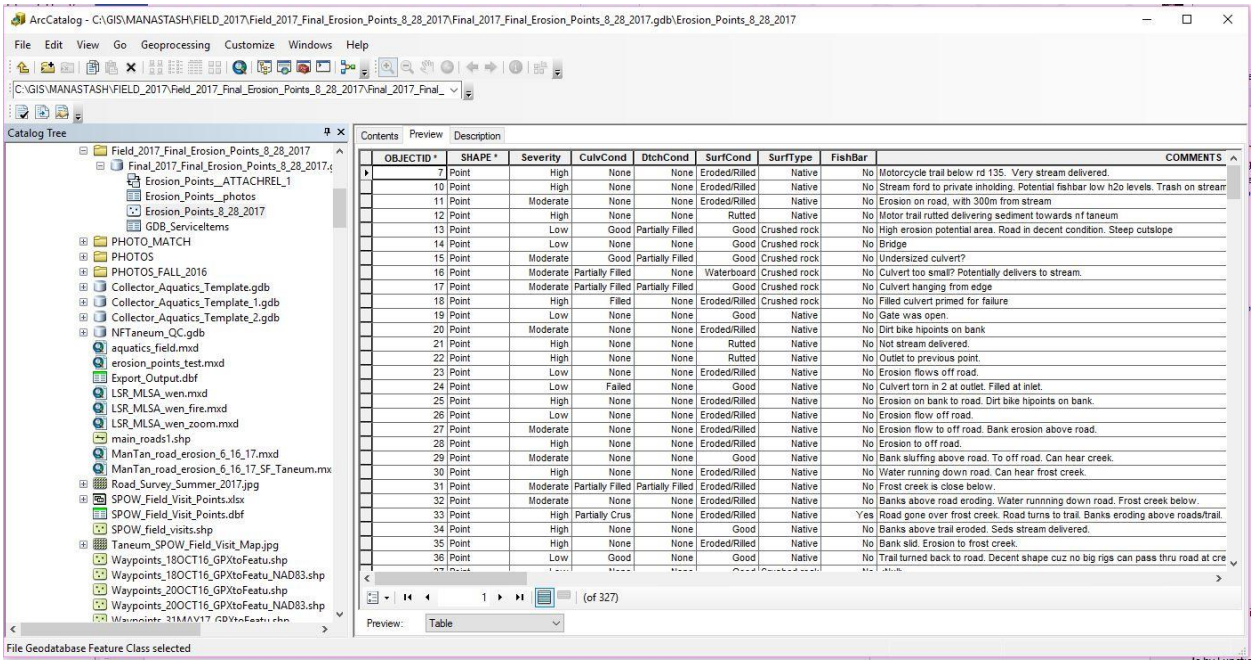


Figure 2 – Example of exported geodatabase from ArcGIS Collector App containing field collected GIS data and photos.

The following provides general definitions of the defined fields and attributes used in the data collection template:

**Erosion Severity** includes three subjective rankings: High, Moderate, and Low. The subjective nature of this ranking can make it difficult to accurately assign a value, but is still helpful in identifying the most problematic areas on the landscape. High erosion severity would be features such as a failed culvert or heavily eroded road surfaces delivering sediment directly to or in close proximity to streams. Moderate erosion severity would be features such as partially blocked culverts and notably less severe erosional issues. Low erosion severity are typically features, such as a culvert on a decommissioned road, that observers felt collecting information for would be useful but does not necessarily have any immediate erosional or sediment delivery issues.

**Culvert Condition** attributes include: None, Good, Partially Filled, Filled, Partially Crushed, Crushed, and Failed.

**Ditch Condition** attributes include: None, Good, Partially Filled, Filled, and Gullied.

**Surface Condition** attributes include: Good, Eroded/Rilled, Water Bar, Rutted, Rocky, Ripped, Decommissioned, Recontoured, and Tilled.

**Surface Type** attributes include: Native, Crushed Rock, and Paved.

Comments were recorded to provide additional descriptions and information that was not captured in the standard attributes which could be used to further determine the estimated Erosion Severity rank of the Erosion Points.

Photos were taken at most locations to accompany associated field data collected at the Erosion Points. The Erosion Points data and the attached photos are stored in the project geodatabase and can be

accessed and used to facilitate resource managers in identifying roads and locations for aquatic restoration, erosion control, and more intensive field surveys throughout the Project Area.

**Summary of Results**

As summarized in Table 1, there were a total of 327 Erosion Points collected in 10 days of road surveys. High erosion severity issues were recorded at 66 locations, 5 of these being severely failed culverts.

| High Severity | Moderate Severity | Low Severity | Total |
|---|---|---|---|
| 66 | 89 | 172 | 327 |

Table 1 – Distribution of severity rankings of field collected Erosion Points.

A majority (58) of the high severity Erosion Points are attributed to heavily eroded roads with gullying and/or the potential for the area to deliver sediment to streams. Other high severity Erosion Points include eroding/raveling cutslopes and fillslopes. Two areas on lands owned by WDFW were surveyed (Moonlight Canyon road and Upper North Fork Manastash), but not summarized in much detail in this report. Figure 3 provides an overview of the erosion severity in the Project Area.

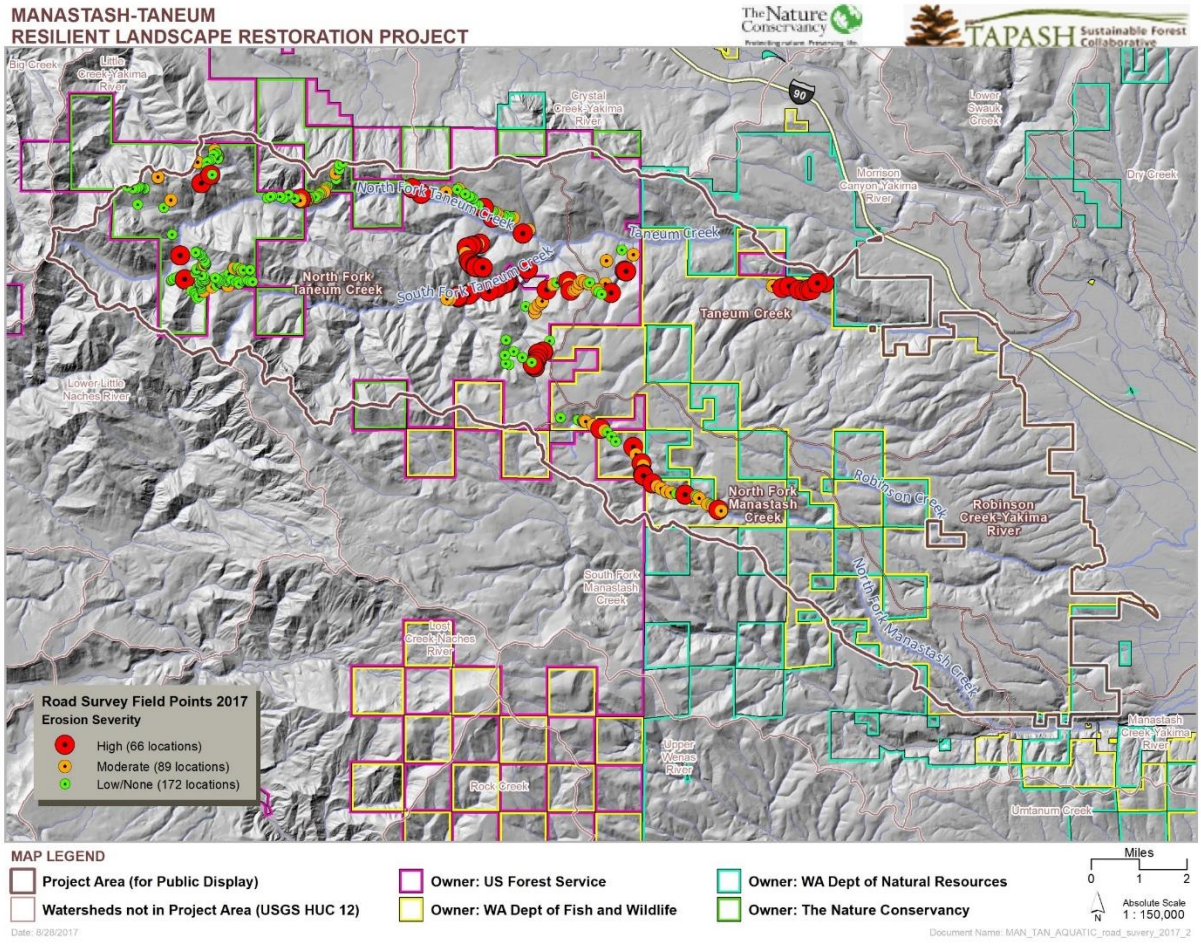


Figure 3 – Overview of Location and erosion severity of road survey field points.

**Potential Restoration Opportunity Areas**

Six potential restoration opportunity areas were identified in the Project Area and are discussed in more detail below and shown in Figure 1 and Figures 4 through 9. The following summarizes some of the more problematic areas found during the survey and can aid resource managers in identifying potential restoration opportunity areas for aquatic restoration and erosion control.

1. **Lower South Fork Taneum Restoration Opportunity Area**

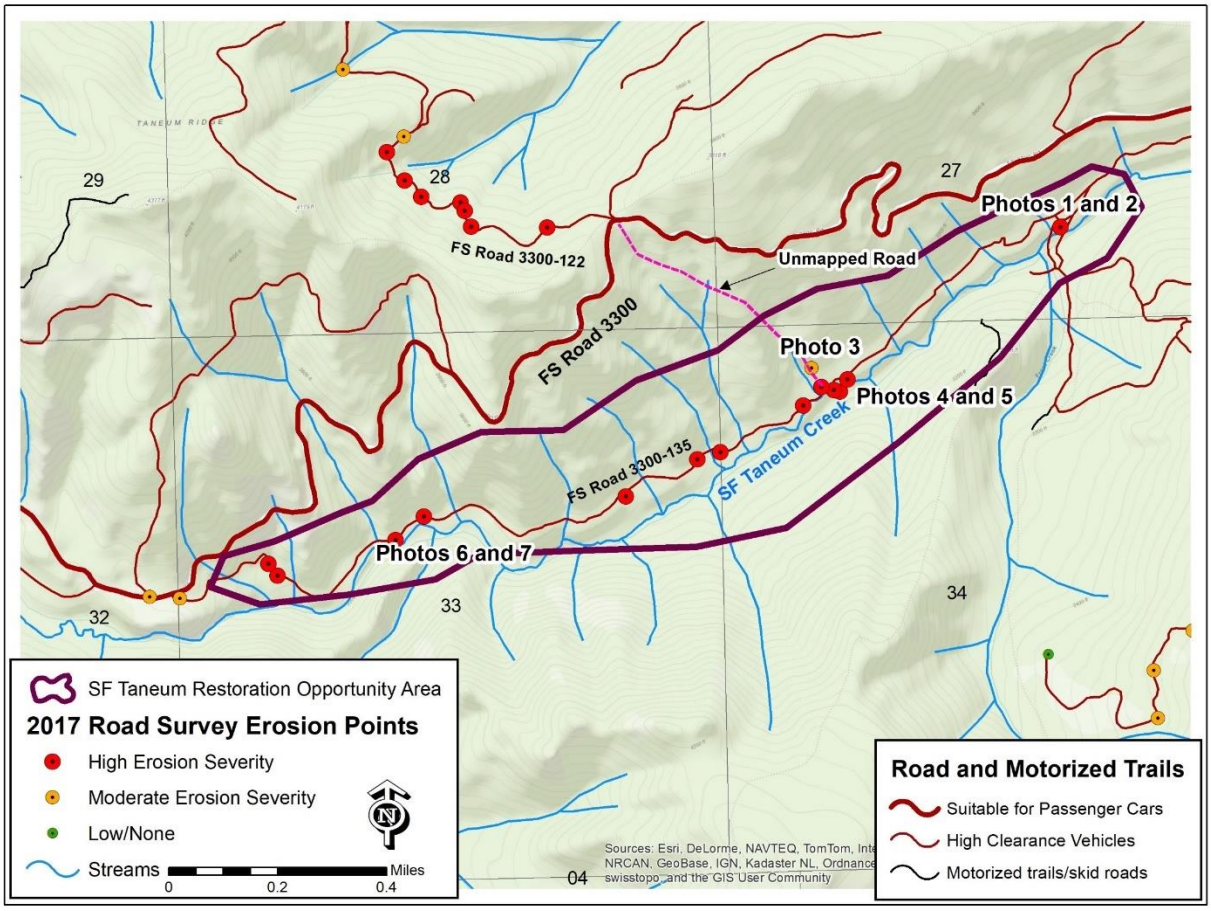


Figure 4 – South Fork Taneum Creek Restoration Opportunity Area.

*Forest Service Road 3300-135 (T19N R15E S27, 34, 33, and 32)*

- Heavily eroded road that parallels the South Fork Taneum Creek just downstream from South Fork Meadows. This road leads to private inholding in the northwest quarter of Section 34 (T19N R15E). Erosion and rutting is severe and is delivering sediment directly to the South Fork Taneum Creek in a few locations.

Photo 1 – Stream ford of South Fork Taneum Creek to private inholding.

Photo 2 – Trash dumped along bank of South Fork Taneum Creek bordered by private inholding.

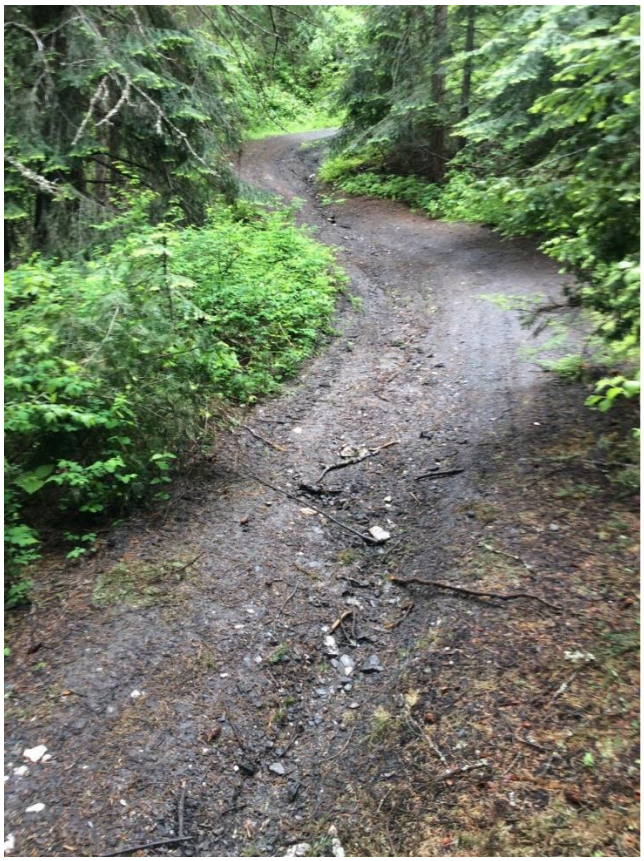

Photo 3 – Road erosion on unmapped road leading upslope north to Forest Service Road 3300 at junction with Forest Service Road 3300-122.

Photo 4 – Rutted single track coming off Forest Service Road 3300-135 adjacent to South Fork Taneum Creek.

Photo 5 – Puddle on road that drains into South Fork Taneum Creek.

Photo 6 – Rutted road that drains sediment directly to South Fork Taneum Creek.

Photo 7 – Erosion and sediment being delivered from rutted road directly to South Fork Taneum Creek.

## 2. Taneum Ridge Restoration Opportunity Area

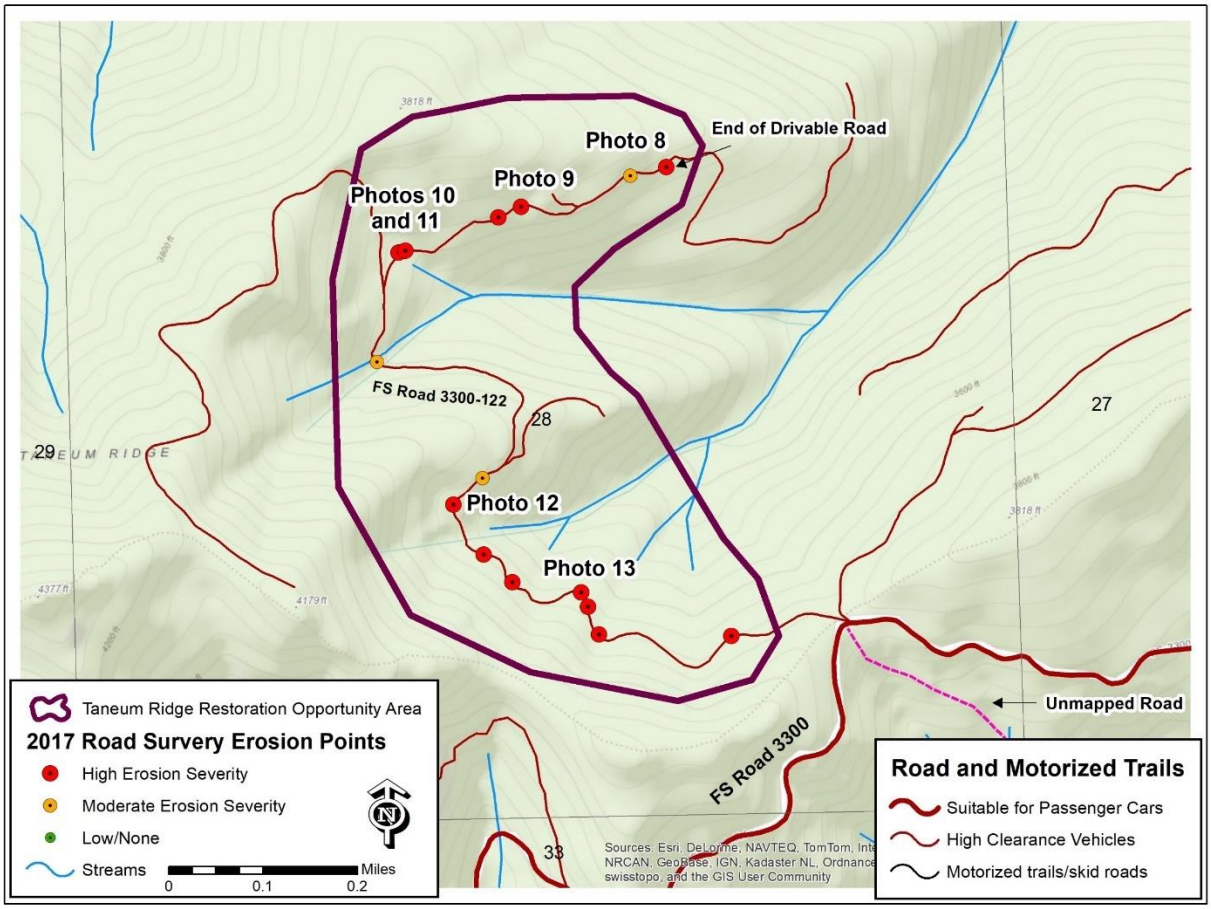


Figure 5 – Taneum Ridge Restoration Opportunity Area

*Forest Service Road 3300-122 (T19N R15E S28)*

- Heavily rutted and eroded road that results in severe puddling and mud. Most runoff is delivered to the forest floor, however there are a few intermittent creeks that can potentially contribute sediment to North Fork Taneum Creek, particularly during fall and spring months.

Photo 8 – Vehicle turnaround area with severe puddling and mud.

Photo 9 – Puddling in rutted road diverted to forest floor.

Photo 10 – Rutted road and puddling

Photo 11 (poor photo quality) – Failing culvert with erosion and gullying at outlet.

Photo 12 – Severe rutting and mud.

Photo 13 – Severe rutting, puddling, and mud.

### 3. Gooseberry Restoration Opportunity Area

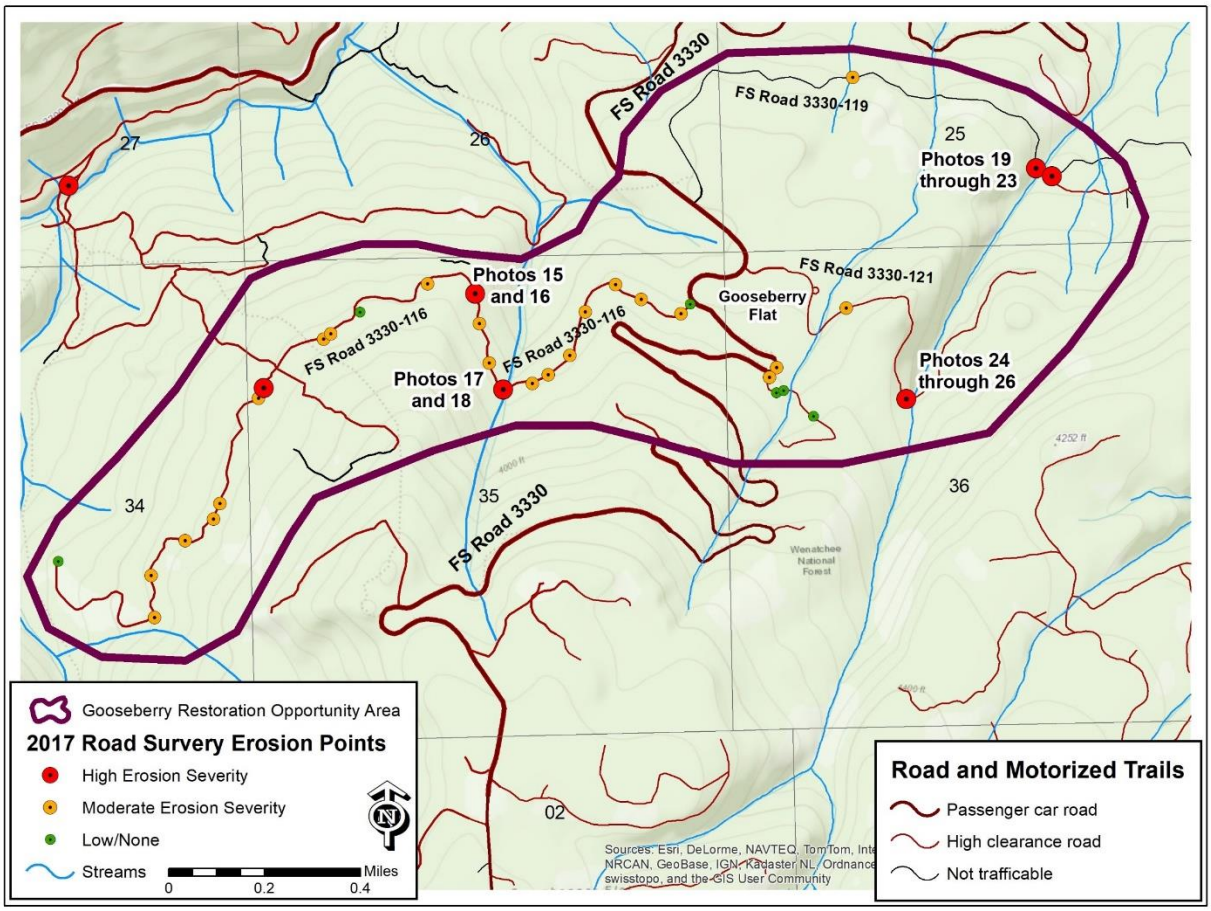


Figure 6 - Gooseberry Restoration Opportunity Area

*Forest Service Road 3330-116 (T19N R15E S34 and 35)*

- Gated road with issues of rutting, orphaned culverts, and a failing culvert in a perennial stream.

Photo 14 – Standing water on road near orphaned culvert.

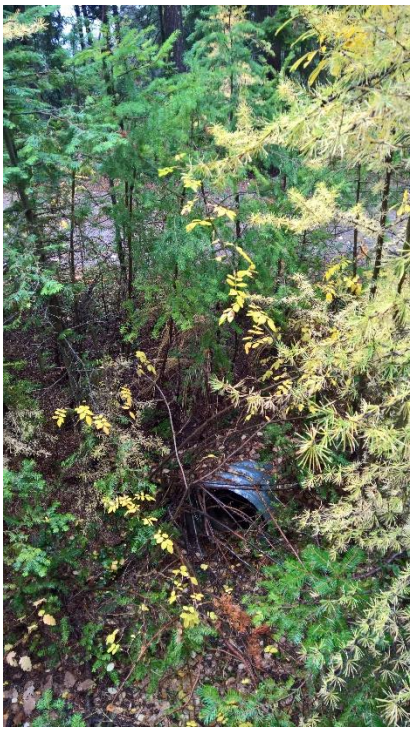

Photo 15 – Orphaned culvert near standing water on road.

Photo 16 – Erosion of fillslope around culvert outlet.

Photo 17 – Erosion of fillslope around culvert outlet.

Photo 18 – Water entering an almost completely occluded culvert. Culvert appears to be failing.

*Forest Service Road 3330-119 (T19N R15E S25)*

- Spur road that has a severely failed culvert and road erosion.

Photo 19 – Failed culvert and erosion.

Photo 20 – Failed culvert and erosion.

Photo 21 – Severe road erosion near failed culvert.

Photo 22 – Severe road erosion near failed culvert.

Photo 23 – Severe road erosion near failed culvert.

*Forest Service Road 3330-121 (T19N R15E S36)*

- Decommissioned spur road that has a severely failed culvert directly above failed culvert mentioned above in Photo 23.

Photo 24 – Failed culvert.

Photo 25 – Failed culvert.

Photo 26 – Failed culvert.

## 4. Frost Creek Restoration Opportunity Area

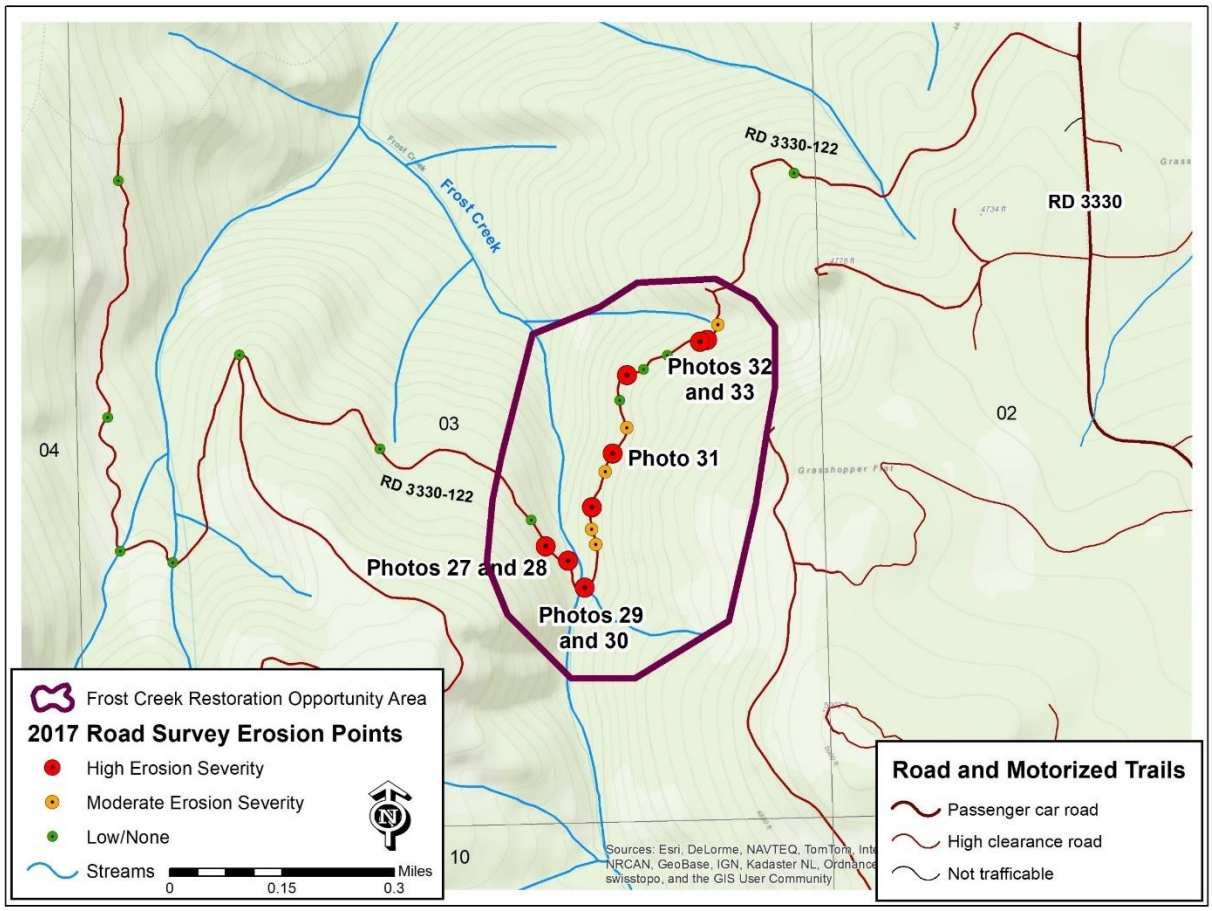


Figure 7 – Frost Creek Restoration Opportunity Area.

*Forest Service Road 3330-122 (T20N R15E S3)*

- Gated road at the eastern edge of Section 3. Has a failed culvert with severe sediment delivery at its crossing with Frost Creek. There is severe road erosion and sediment input issues in close proximity of Frost Creek.

Photo 27 – Road erosion and sediment delivery of fillslope towards Frost Creek.

Photo 28 – Raveling cutslope onto road directly above Frost Creek.

Photo 29 – Failed culvert and severe sediment delivery where remaining road crosses Frost Creek.

Photo 30 – Failed culvert at Frost Creek crossing with severe sediment delivery.

Photo 31- Gullying of fillslope towards Frost Creek. Sediment delivered to forest floor, not stream.

Photo 32 – Gully draining off of road towards Frost Creek.

Photo 33 – Eroded and gullied road surface leading off road towards Frost Creek.

## 5. Lower North Fork Taneum Creek Restoration Opportunity Area

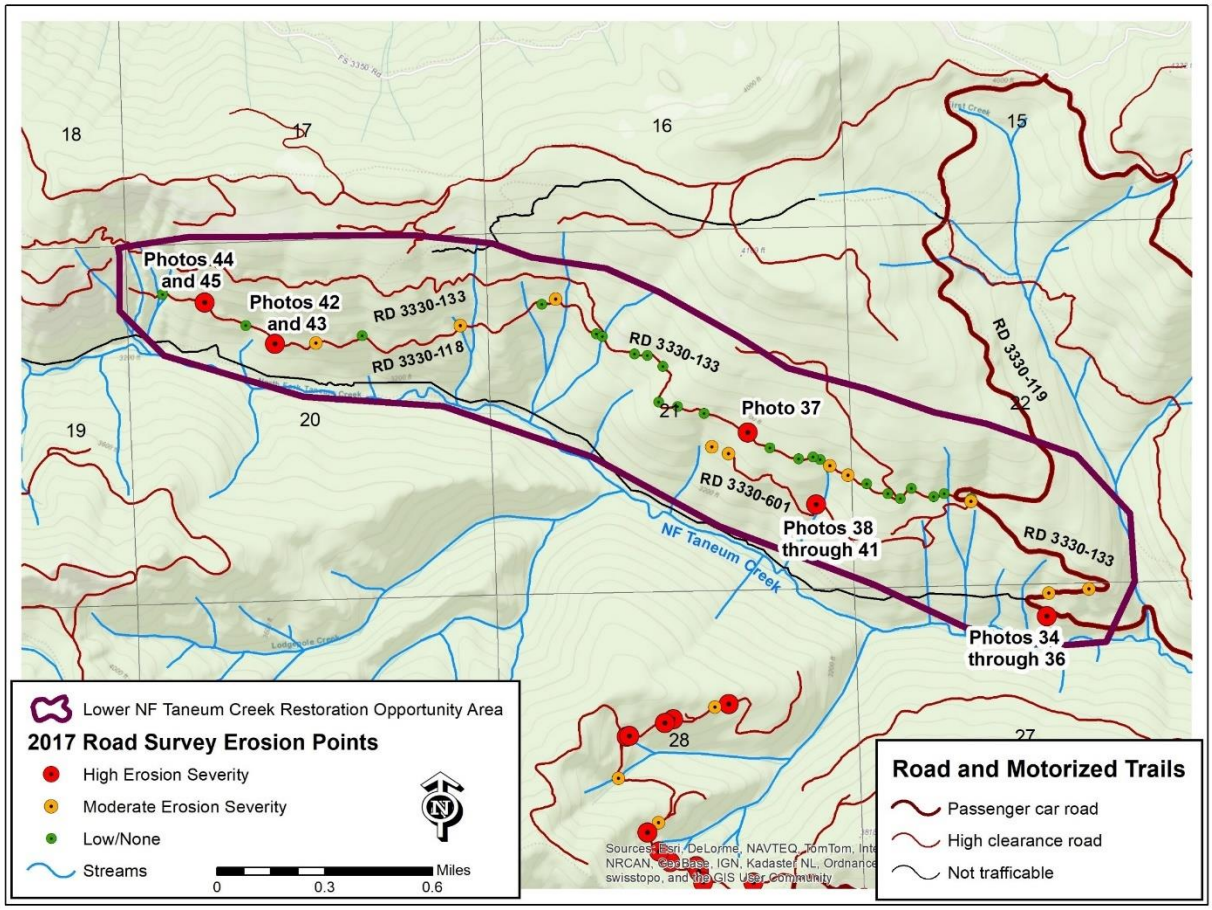


Figure 8 – Lower North Fork Taneum Creek Restoration Opportunity Area.

*Forest Service Road 3330-133 (T29N R15E S26, 27, 19, 20, 21, and 22)*

- Main road for approximately 1.5 miles to the junction of Forest Service Road 3330-119 where it is gated. From the gate, the remaining 1.2 miles is decommissioned. The decommissioned portion of the road has been ripped and water bars are present, however culverts are still in place and are problematic in a few areas.

Photo 34 – Gullied ditch leading to culvert then towards North Fork Taneum Creek.

Photo 35 – Outlet of culvert from gullied ditch.

Photo 36 – Gullied forest floor leading to North Fork Taneum Creek. Gully generated from water delivered from drainage ditch and culvert.

Photo 37 – Standing water on decommissioned road in between water bars.

*Forest Service Road 3330-601 (T29N R15E S21 and 22)*

- Decommissioned spur road approximately one mile long. Runs parallel below Forest Service Road 3330-133. The road has been ripped and water bars are present, however culverts are still in place. There are a few areas were running water is blocked by the road.

Photo 38 – Intermittent stream channel approaching decommissioned road.

Photo 39 – Water backed up at occluded culvert on decommissioned road.

Photo 40 – Road surface of decommissioned road at location of nonfunctioning culvert.

Photo 41 – Outlet of nonfunctioning culvert of intermittent stream crossing decommissioned road.

*Forest Service Road 3330-118 (T29N R15E S20 and 21)*

- Decommissioned spur road approximately 1.5 miles long and runs parallel below RD 3330-133. The road has been ripped and water bars are present, however culverts are still in place and are problematic in areas. There is one location were bank erosion of the fillslope is in fairly close proximity to North Fork Taneum Creek.

Photo 42 – Eroding fillslope of decommissioned road upslope from North Fork Taneum Creek.

Photo 43 - Eroding fillslope of decommissioned road upslope from North Fork Taneum Creek.

Photo 44 – Water diverted at nonfunctioning culvert over decommissioned road.

Photo 45 – Outlet of nonfunctioning culvert and diverted water (right) flowing from road surface.

## 6. Upper North Fork Manastash Restoration Opportunity Area

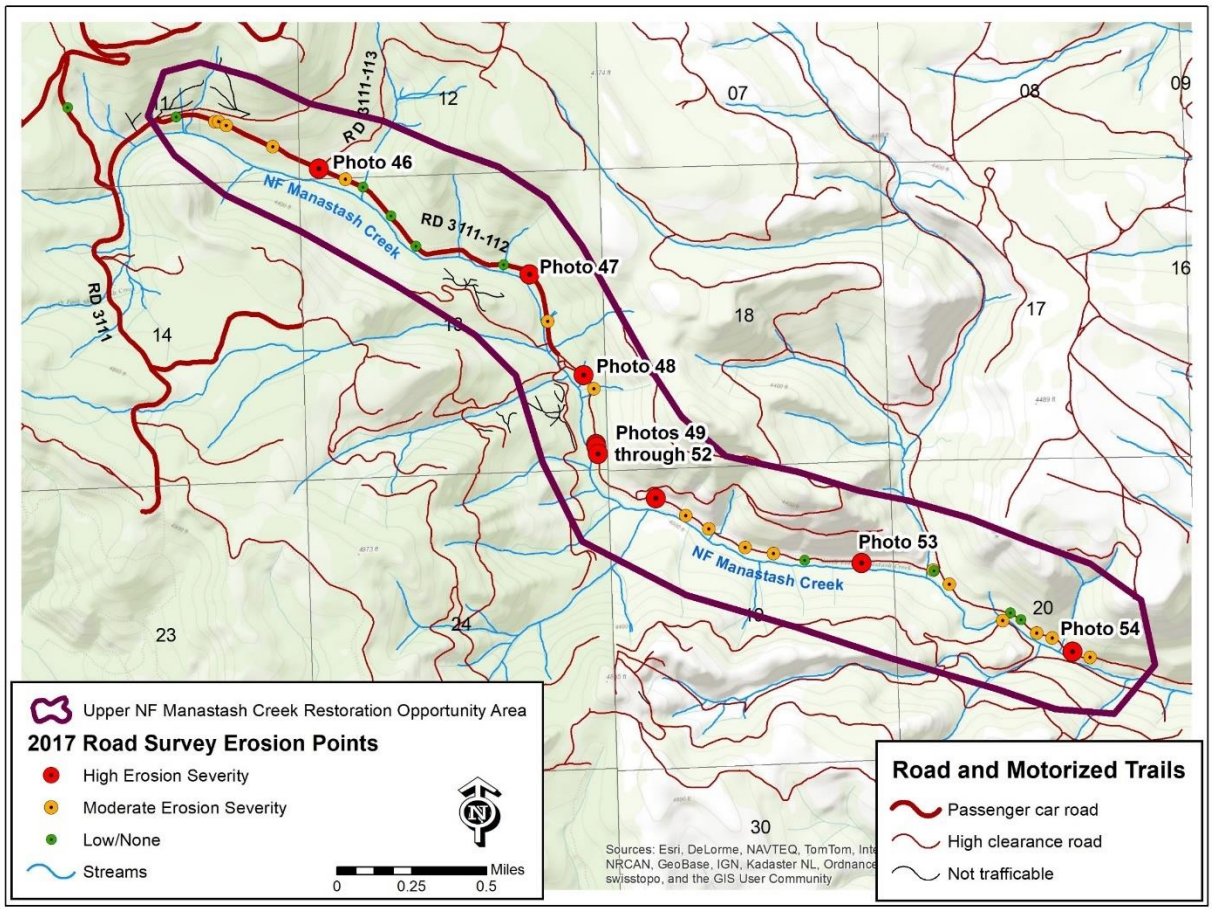


Figure 9 – Upper North Fork Manastash Restoration Opportunity Area

*Forest Service Road 3111-112 (T18N R15E S11, 12, and 13)*

- Approximately 2 miles long and closely parallels North Fork Manastash Creek to the National Forest Boundary where the remaining road becomes integrated into the Washington Department of Fish and Wildlife's green dot road system (T18N R16E S19 and 20). There are many road erosion and culvert issues in very close proximity to North Fork Manastash Creek.

Photo 46 – Road erosion with culvert problems at the junction of Forest Service Road 3111-112 and Forest Service Road 3111-113.

Photo 47 – Standing water on Forest Service Road 3111-112.

Photo 48 – Standing water and nonfunctioning culvert on Forest Service Road 3111-112.

Photo 49 – Road erosion on Forest Service Road 3111-112 adjacent to wetland.

Photo 50 - Road erosion on Forest Service Road 3111-112 adjacent to wetland.

Photo 51 – Road erosion of spur road heading towards North Fork Manastash Creek.

Photo 52 – Standing water on Forest Service Road 3111-112.

Photo 53 – Road erosion on state-owned road (Green Dot Road System).

Photo 54 – Road erosion on state-owned road (Green Dot Road System).

**North Fork Taneum Headwaters Vicinity Erosion Points**

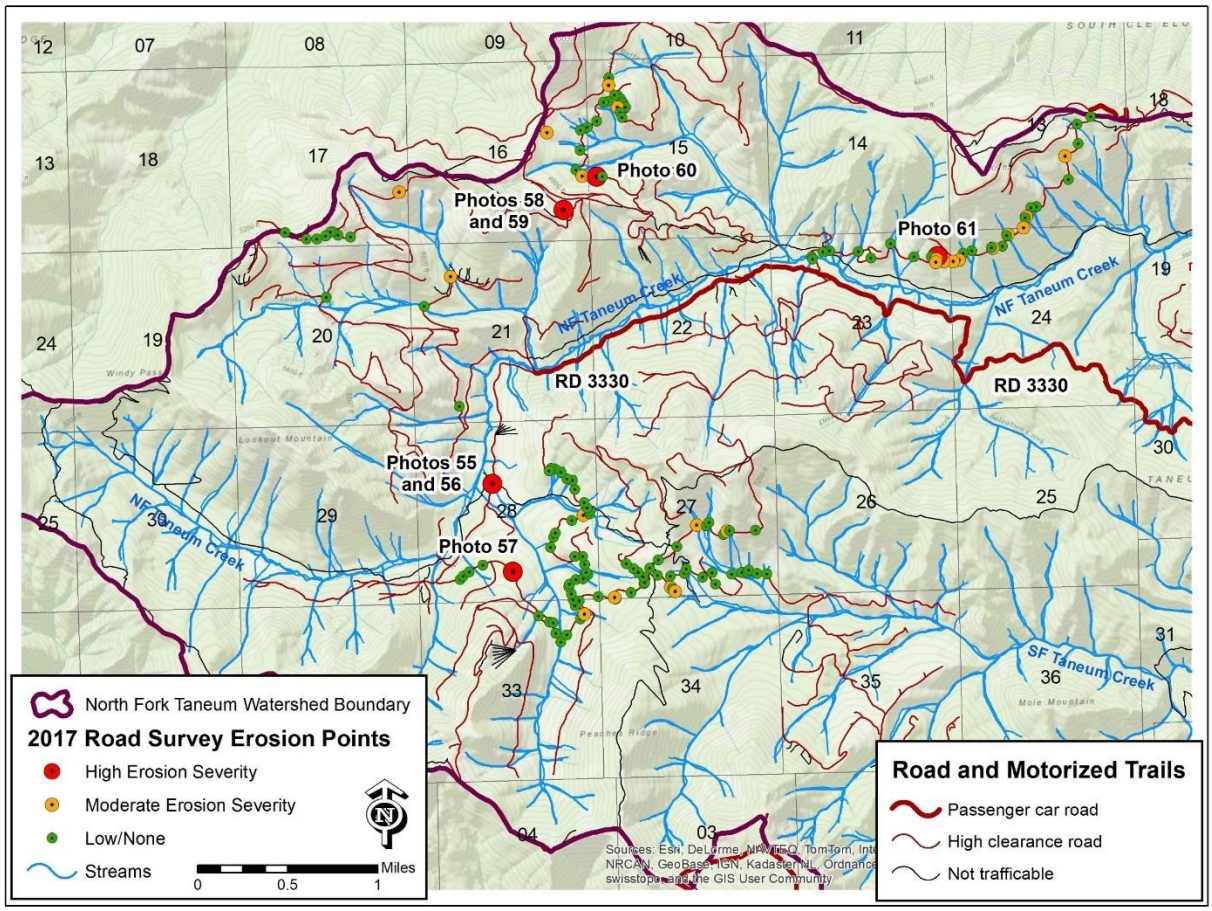


Figure 10 – North Fork Taneum Headwaters Vicinity Erosion Points.

Many roads were surveyed in the upper reaches of the North Fork Taneum Creek vicinity. Road erosion issues were not as severe as found elsewhere in the Project Area. Five locations that were considered to have high severity issues, with the potential for restoration, are identified and described below.

Photo 55 – Running water flowing down motorized trail across road and to North Fork Taneum Creek.

Photo 56 – Running water flowing down motorized trail across road and to North Fork Taneum Creek.

Photo 57 – Occluded and nonfunctioning culvert.

Photo 58 – Occluded culvert on the verge of failure.

Photo 59 – Occluded culvert on the verge of failure.

Photo 60 – Flowing water across road.

Photo 61 – Gullying in road and erosion leading to forest floor.

**Observations and Recommendations**

Based on the results of the 2016/2017 road surveys, several areas were identified that are recommended for additional field visits. These areas are mainly on lands owned by the Washington State Department of Fish and Wildlife (WDFW) and the Washington State Department of Natural Resources (WDNR), motorized trails throughout the study area, and areas outside of treatment areas proposed in the 2016 report. To better further evaluate these areas, additional road surveys could be conducted in the future using the same (or modified) ArcGIS Collector App data collection template used for the 2016/2017 road surveys. Future data and photos could be added to the existing Erosion Point geodatabase.

**References:**

Haugo, R., W. Gaines, J. Begley, J. Robertson, D. Churchill, J. Dickinson, and P. Hessburg. 2016. *Manastash-Taneum Resilient Landscapes Project: Landscape Evaluations and Prescriptions*. March.