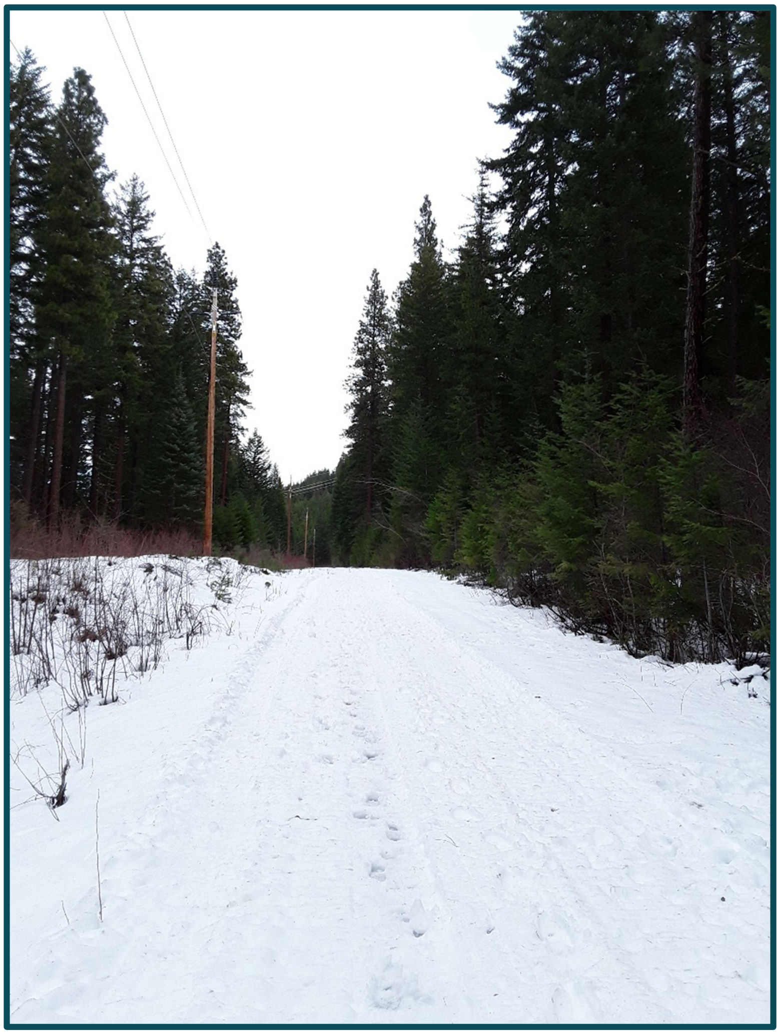
Nason Creek SR 207 Project

Silviculture Specialist Report



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Introduction

Project Description

The SR 207 project involves relocation of an existing roadway segment adjacent to Nason Creek to reduce long-term infrastructure vulnerability and improve floodplain and aquatic habitat function. The current roadway is located within the active floodplain and channel migration zone where it is subject to ongoing erosion, flooding, and maintenance challenges.

The proposed project would remove the existing roadway from the floodplain and construct a new alignment outside of active fluvial processes. Additional project components include utility relocation, modification of existing powerline corridors, and vegetation management activities such as tree removal and tree tipping. These actions are intended to restore floodplain connectivity, reduce constraints on natural stream processes, and support development of more dynamic channel and riparian conditions.

Purpose and Scope

This report summarizes existing forest conditions within the SR 207 project area and evaluates the potential effects of proposed project activities on forest structure, composition, and regeneration. The analysis is based on field-collected stand exam data and site observations. This report is intended to support project planning and environmental review by describing how forest resources may respond under both no action and proposed action scenarios.

Methodology

Sampling Design

A stand exam was conducted within the SR 207 project area to characterize existing forest structure, composition, and regeneration conditions in areas affected by project activities. Sampling followed the project-specific field protocol.

A total of seven plots were established across the project area. Plot locations were determined using GPS and distributed to capture representative stand conditions within areas influenced by both construction and restoration activities. Plots were located to capture variability in stand conditions across areas influenced by both existing infrastructure and proposed project activities.

Each plot included a combination of variable radius (point) sampling for overstory trees and fixed-area subplots for saplings, seedlings, and understory vegetation. Variable radius sampling was used to efficiently characterize overstory structure across a range of stand conditions, while fixed-area plots provided consistent measurement of regeneration and ground-layer vegetation.

Sampling intensity was adjusted during fieldwork to ensure an adequate number of trees were captured at each plot for reliable stand characterization.

Plot Establishment

Plot centers were established using GPS and marked in the field. At each plot, site variables including slope, aspect, date, and plot and stand identifiers were recorded. All data were collected using field datasheets and/or digital mapping tools as outlined in the project protocol. Equipment used included a Relaskop, diameter tape, hypsometer, compass, and GPS-enabled tablet.

Overstory Measurements

At each plot center, variable radius sampling was conducted using a Relaskop. Trees were tallied using a clockwise sweep beginning from north, with each “in” tree recorded according to standard point sampling procedures.

A combination of BAF 20 and 40 plots were used to account for variability in stand density and ensure adequate sampling of overstory conditions. All live and dead trees greater than or equal to 8 inches DBH were included in the sample. For each tally tree, the following attributes were recorded:

- Species
- Diameter at breast height (DBH)
- Total height
- Crown ratio
- Vigor class
- Damage and severity, if present

Snags were recorded if they met a minimum height of approximately 12 feet, consistent with protocol guidance.

Regeneration and Understory Sampling

Regeneration and understory vegetation were assessed using fixed-radius subplots established at each plot center. A 16.7-foot radius subplot (1/50th acre) was used to evaluate saplings, seedlings, and ground-layer vegetation.

All saplings less than eight inches DBH and seedlings were recorded within the subplot and grouped by species and size class where appropriate. Ground vegetation was assessed within the same subplot by estimating percent cover of dominant plant species.

The subplot size is consistent with standard forest inventory methods and provides a representative measure of regeneration and understory conditions across the project area.

Data Processing

Overstory tree data collected from variable radius plots were processed using the Forest Vegetation Simulator (FVS), East Cascades (EC) variant (Release 20240930). FVS was used to summarize stand density, species composition, and structural characteristics based on plot-level measurements.

Following data import, a quality assurance and quality control (QA/QC) review was conducted to verify data integrity and consistency with field records. This included checking species codes, diameter values, tree counts, and plot expansion to ensure consistency with field datasheets.

In addition to FVS processing, overstory data were independently summarized in Microsoft Excel to evaluate diameter class distribution and describe stand structure across the project area. Diameter classes were grouped to illustrate the range and distribution of tree sizes observed during field sampling.

All understory (sapling and seedling) data were compiled and processed in Excel. Data were summarized by species and size class to characterize regeneration density and composition within the sampled stands.

These methods provide a consistent basis for describing stand structure and evaluating potential changes under project conditions.

Current Conditions

Figure 1. Representative photo of forest stand from plot inventory

The forest within the SR 207 project area is structurally complex, with variability in vertical and horizontal spacing. Species composition is dominated by Douglas-fir, followed by ponderosa pine, grand fir, and black cottonwood, with minor representation from bigleaf maple. These species occur across multiple size classes, contributing to a heterogeneous forest structure.

Stand density averages approximately 108 trees per acre (TPA) with a basal area of 194 ft²/ac and a quadratic mean diameter of 18.5 inches. Relative density is approximately 46%, indicating that the stand is on the higher end of moderately stocked. There is some available growing space, though competition is present and expected to increase over time.

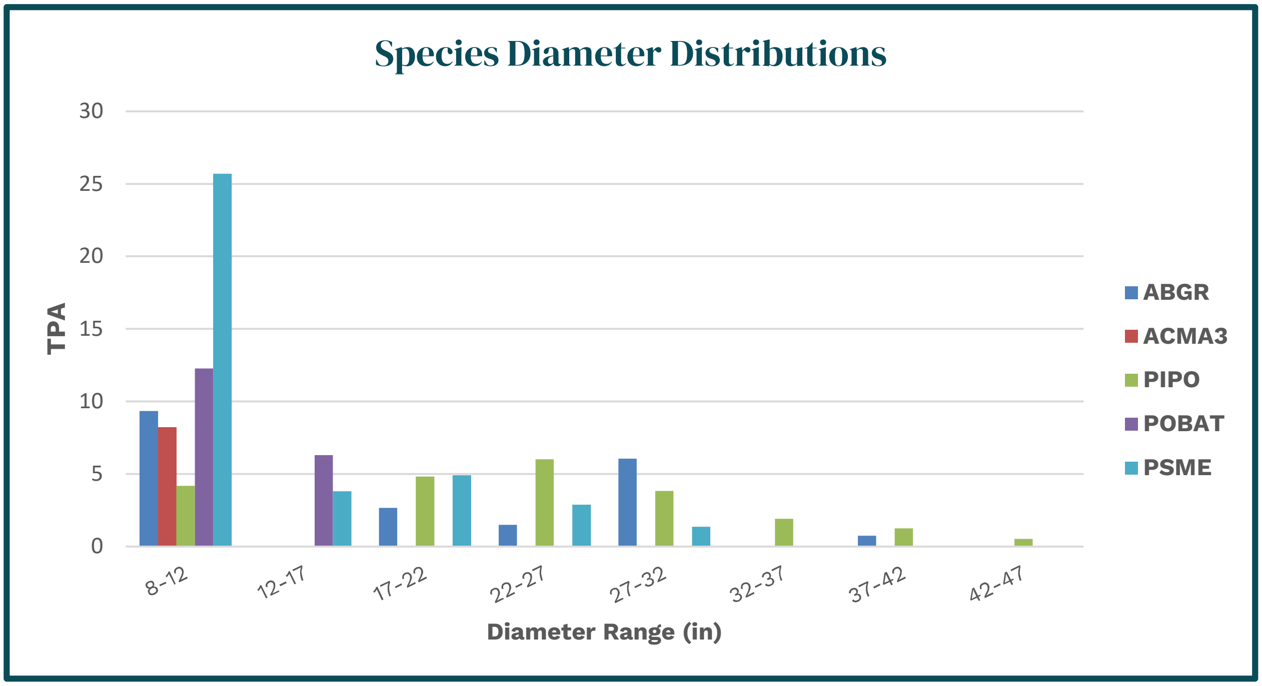

Figure 2. Figure 2. Diameter distribution by species (TPA). Species codes: PSME = Douglas-fir, PIPO = ponderosa pine, ABGR = grand fir, POBAT = black cottonwood, ACMA3 = bigleaf maple.

Diameter distribution is weighted toward smaller size classes, with approximately 55% of total TPA occurring in the 8 to 12 inch class (Figure 3). Additional trees are distributed across mid and larger diameter classes, resulting in a multi-cohort structure. While smaller trees dominate numerically, basal area is concentrated in larger diameter classes, particularly within the 22- to 32-inch range, which collectively contribute a substantial portion of total stand basal area. This indicates that larger trees play a dominant role in overall stand structure and function.

Overall species composition reflects a mixed-conifer system with both shade-tolerant and shade-intolerant species present. Douglas-fir accounts for approximately 36% of total TPA, followed by ponderosa pine (21%), grand fir (19%), and black cottonwood (17%), with minor representation from bigleaf maple (8%).

No significant evidence of insect infestation or pathogen activity was observed within the project area. Tree conditions were generally good, with no widespread indicators of decline. Localized areas of windthrow were observed, primarily in lower elevation areas near the existing roadway. These events are likely associated with recent high wind exposure and edge effects created by the road corridor. Downed woody material was present throughout the stand, with most material in decay classes 1 to 3, indicating relatively recent inputs and ongoing decomposition processes.

A well-developed midstory layer is present across portions of the stand. Sapling density averages 207 TPA and is dominated by grand fir, with minor representation from bigleaf maple and Douglas-fir. Saplings exhibit an average DBH of approximately 3.3 inches and an average height of approximately 37 feet, indicating established vertical structure and ongoing recruitment into the overstory.

Seedling regeneration is variable and spatially patchy across sampled plots. Seedlings were only observed in a subset of plots, with several plots containing no measurable regeneration. Where present, regeneration was composed entirely of grand fir, with densities ranging from 0 to 900 TPA within individual plots and averaging approximately 267 TPA across all plots. Average seedling height was approximately 3 feet, indicating early-stage establishment.

The patchy distribution of regeneration suggests that establishment is occurring in localized microsites rather than uniformly across the stand. This variability is likely influenced by overstory shading, competition from the midstory layer, and site-specific conditions.

Understory vegetation was assessed under leaf-off conditions with partial snow cover, which limited full species detection and likely underrepresents of some herbaceous and low-growing species. The understory is dominated by vine maple, with estimated cover ranging from approximately 60% to 100% across much of the project area. Additional commonly observed species include salmonberry, Oregon grape, hawthorn, Oregon boxwood, and rough horsetail.

Overall, regeneration and understory conditions reflect a dense midstory and shrub layer with patchy seedling establishment. This structure contributes to vertical complexity but may also limit widespread regeneration due to competition and shading.

Environmental Analysis

Alternative 1 – No Action

Figure 3. Example of bank erosion and undercutting along Nason Creek within the project area.

The No Action alternative assumes that no changes are made to the existing SR 207 alignment, adjacent infrastructure, or stream conditions within the project area.

Under these conditions, channel migration and floodplain interaction would continue to influence forest structure within the active floodplain. Between the stream and roadway, trees are concentrated in two slightly elevated forested areas, each approximately 1 to 3 acres in size. These areas support mixed conifer and hardwood species, including ponderosa pine, grand fir, Douglas-fir, black cottonwood, and bigleaf maple. Forest structure is characterized by large-diameter overstory trees with mixed-size, but not dense, regeneration.

Field observations suggest that these areas are already experiencing erosion and instability. Bank undercutting, exposed roots, and recent tree fall were observed in multiple locations, indicating reduced rooting support. These conditions appear to increase susceptibility to windthrow, especially where banks are already undercut, and many trees are likely experiencing stress and elevated risk of mortality.

Under a No Action scenario, these processes would continue. Ongoing bank erosion would further reduce soil support, resulting in additional tree tipping and continued recruitment of large wood into the active channel. While this contributes to in-channel habitat complexity, it also represents a continued loss of standing forest structure within these areas.

Over time, these forested areas would likely become increasingly fragmented and reduced in extent as erosion continues to act on their margins. Observations from northern portions of the project area indicate that similar areas have already diminished, with evidence of past canopy conditions extending beyond what is currently present. Field observations of erosion and tree fall support this trajectory.

Overall, the No Action alternative maintains a trajectory of ongoing forest loss within floodplain margins driven by channel migration, with continued large wood recruitment but reduced persistence of standing trees in these positions.

Alternative 2 – Proposed Action

The Proposed Action includes relocation of the existing SR 207 roadway, removal of the current road prism from the active floodplain, construction of a new roadway outside of the channel migration zone, and associated utility modifications. These actions are intended to restore floodplain connectivity, reduce long-term infrastructure vulnerability, and improve aquatic and riparian habitat conditions.

Because each component of the proposed action affects forest resources in different ways and at different spatial scales, the analysis is presented by individual project elements. These include removal of the existing roadway, construction of the new roadway, utility and powerline installation, and vegetation management activities such as tree removal and tree tipping.

Separating these components allows for a clearer evaluation of how each action influences forest structure, composition, and distribution across the project area, while also distinguishing between localized impacts and broader, process-driven changes associated with floodplain reconnection.

2.A Removal of Existing Road

Removal of the existing roadway and reconnection of adjacent areas to the floodplain represents the primary driver of change to forest conditions within the project area. This action would increase soil moisture, periodic inundation, and groundwater influence across portions of the existing forest.

On the north side of SR 207, forested areas occur as two small (<1 acre) slightly elevated areas adjacent to active flow paths. These areas support mixed conifer and hardwood composition, including ponderosa pine, grand fir, Douglas-fir, black cottonwood, and bigleaf maple. Forest structure is characterized by large-diameter overstory trees and smaller diameter cohorts, with the mid and lower canopy primarily composed of grand fir.

These areas currently support trees under wet conditions, suggesting that existing inundation patterns remain compatible with tree survival. Following roadway removal and floodplain reconnection, these areas may continue to support trees if water levels remain similar and flow energy is reduced through expansion of the active floodplain. Some trees may persist as part of a wet forest or wooded floodplain condition; however, long-term persistence will depend on local channel adjustment, bank stability, and the duration of saturated soil conditions.

South of the roadway, the forest canopy is more continuous, with breaks occurring primarily in currently inundated wetland areas. These forested areas occupy slightly elevated ground surrounding existing wetlands and are less directly influenced by active channel processes. Following roadway removal, portions of this area may be incorporated into the expanded floodplain or potentially into a new channel alignment, depending on how flow paths adjust after reconnection.

The extent to which these areas function as active channel versus floodplain will influence vegetation response. Areas that become part of the active channel are unlikely to support persistent tree cover, while areas that remain within the floodplain may continue to support trees on elevated microsites, with increased stress in lower positions due to more frequent or prolonged soil saturation.

Ponderosa pine and Douglas-fir are less tolerant of prolonged soil saturation and may experience reduced vigor where root zones remain saturated for extended periods. Grand fir, which dominates the mid and lower canopy, exhibits greater tolerance to periodic saturation and may persist longer, though it is expected to become increasingly restricted to elevated microsites as wetter conditions expand.

Based on spatial analysis, approximately 55.6 acres of forested land occur on the south side of the stream. Of this area, an estimated 22.7 acres would be subject to increased inundation following floodplain reconnection. This represents approximately 41% of the forested area expected to experience a shift in hydrologic regime.

Over time, these areas are expected to transition toward less dense overstory conditions, with reduced conifer dominance and increased representation of species adapted to wetter environments, including bigleaf maple and black cottonwood. As inundation frequency and soil saturation increase, stand density is expected to decline due to mortality of less tolerant species and limited conifer regeneration in saturated areas.

Resulting conditions are expected to resemble a heterogeneous mosaic of wet forest, hardwood-dominated patches, riparian vegetation, and open wetland areas rather than a continuous closed-canopy forest.

2.B Construction of New Road

Construction of the new roadway would result in approximately 9 acres of disturbance within the project area. However, much of this disturbance would occur along the existing Reiche Road corridor, which is already used for powerline maintenance and is currently in a disturbed or low-density condition.

New forest clearing would be limited to areas outside of the existing corridor. Approximately 0.8 acres north of the powerline corridor and 2.5 acres south of the corridor would require new construction and associated tree removal. An additional 0.5 acres would overlap with the existing utility corridor, which currently lacks tree cover and would not result in additional forest impact.

This action would primarily represent an expansion of the existing corridor, requiring removal of trees along the roadway margin and increasing edge conditions. Because this area is already disturbed and managed for utility access, effects to overall stand structure would be minor.

Within areas of new construction, impacts would include direct removal of trees, loss of canopy cover, and conversion of forested conditions to maintained roadway. These effects would be localized and confined to the construction footprint.

In addition to direct tree removal, construction would introduce new edge conditions along the roadway corridor. Increased exposure to wind and light may result in localized stress, increased susceptibility to windthrow, and changes in regeneration patterns near the road edge.

Impacts would occur immediately during construction, with long-term effects including permanent loss of forest cover within the roadway footprint and ongoing vegetation management to maintain roadway clearance. Tree removal within these areas would affect small portions of the stand and would not substantially alter overall species composition or stand structure at the project scale.

2.C Utility and Powerline Installation – Forest Effects

Utility and powerline installation would result in localized vegetation modification within the eastern portion of the project area and along the existing Reiche Road corridor.

Within the eastern corridor, tree removal would be limited and would primarily occur in higher elevation areas. Approximately 10 to 20 trees are expected to be removed, affecting roughly 0.5 acres of forest. These areas are relatively low density and largely composed of regenerating grand fir, resulting in minimal impact to overall stand structure.

In steeper portions of the corridor, trees would be topped rather than fully removed to maintain required clearance from the powerline. These areas contain tall trees, approximately 185 feet in height, and topping is expected to result in high mortality due to structural damage and increased exposure. Approximately 1.7 acres would be affected by topping. These stands are dense and exhibit signs of decline, including dieback and the presence of existing snags.

Along Reiche Road, installation of the new line would require road widening and vegetation clearing along the roadway edge. This would result in removal of trees adjacent to the road and pruning of retained trees to maintain long-term clearance from the line. These actions would expand the existing corridor, reduce canopy continuity, and increase edge conditions along the roadway.

Overall, impacts from utility and powerline installation are localized and relatively minor compared to other project components. Effects include small-scale tree removal, localized canopy reduction, and conversion of limited areas to lower-density or early-seral vegetation. These activities are not expected to substantially alter stand composition or structure at the project scale.

Impacts would occur immediately during construction, with longer-term effects including maintained vegetation clearance within the corridor and continued suppression of tree regeneration in managed areas.

2.D Tree Tipping/Vegetation Management

Tree tipping and vegetation management would occur within targeted areas adjacent to the restored channel and floodplain to promote large wood recruitment and increase habitat complexity. Trees would be felled or pushed over to create log jams, enhance channel structure, and support development of off-channel habitat.

Large wood placement would utilize salvaged whole trees, including trees with intact rootwads and crowns. Design specifications indicate use of trees approximately 12 to 18 inches in diameter, with lengths ranging from 40 to 80 feet depending on structure type. Trees removed during construction would be incorporated into these features where feasible.

These activities would result in localized disturbance to soils and existing vegetation, including root plate exposure, soil displacement, and short-term increases in sediment mobilization. Tree tipping converts standing trees to downed woody material, increasing surface roughness and organic inputs within the floodplain and contributing to development of more complex channel and floodplain structure.

Trees within these areas may also experience increased exposure following adjacent vegetation removal and floodplain reconnection. As a result, some level of additional mortality is expected beyond directly tipped trees, particularly for individuals located near newly opened edges or within areas of increased soil saturation.

The spatial extent of tree tipping is expected to overlap with areas influenced by floodplain reconnection, though the total number of trees directly affected would be less than those influenced by hydrologic change alone. Impacts are therefore localized but concentrated within restoration zones.

In the short term, these activities may result in localized disturbance and increased sediment mobilization. Over the long term, tree tipping is expected to enhance habitat complexity, increase large woody debris recruitment, and support development of dynamic channel and floodplain processes consistent with restoration objectives.

Summary of Effects on Forest Resources

The Proposed Action would result in a range of effects to forest resources, with impacts varying from localized disturbance to broader, process-driven changes associated with floodplain reconnection.

Removal of the existing roadway and reconnection of the floodplain would represent the primary driver of change within the project area. This action would alter hydrologic conditions across approximately 22.7 acres, resulting in increased soil saturation and periodic inundation. These changes are expected to reduce conifer dominance and stand density in affected areas, while promoting development of a more spatially variable mosaic of wet forest, hardwood-dominated patches, riparian vegetation, and open wetland conditions.

Construction of the new roadway would result in limited direct forest removal, primarily confined to approximately 3.3 acres of new disturbance outside of existing corridors. These impacts would be localized and would not substantially alter stand structure or composition at the project scale.

Utility and powerline installation would result in minor, localized vegetation modification within an already disturbed corridor. Effects would include small-scale tree removal, topping, and increased edge conditions, but would remain limited in extent and are not expected to substantially affect overall forest conditions.

Tree tipping and vegetation management would convert standing trees to large woody material within targeted restoration areas. While this results in localized loss of standing structure, it supports increased habitat complexity and contributes to development of dynamic channel and floodplain processes over time.

Overall, the Proposed Action would shift portions of the project area from relatively continuous mixed conifer forest toward a more heterogeneous landscape influenced by floodplain processes, while maintaining forest structure across the majority of the site.