

# 2022 Clackamas Meadows Timber Sale



## Project Assessment

Confederated Tribes of Warm Springs and Bureau of Indian Affairs

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# Purpose and Need for Action

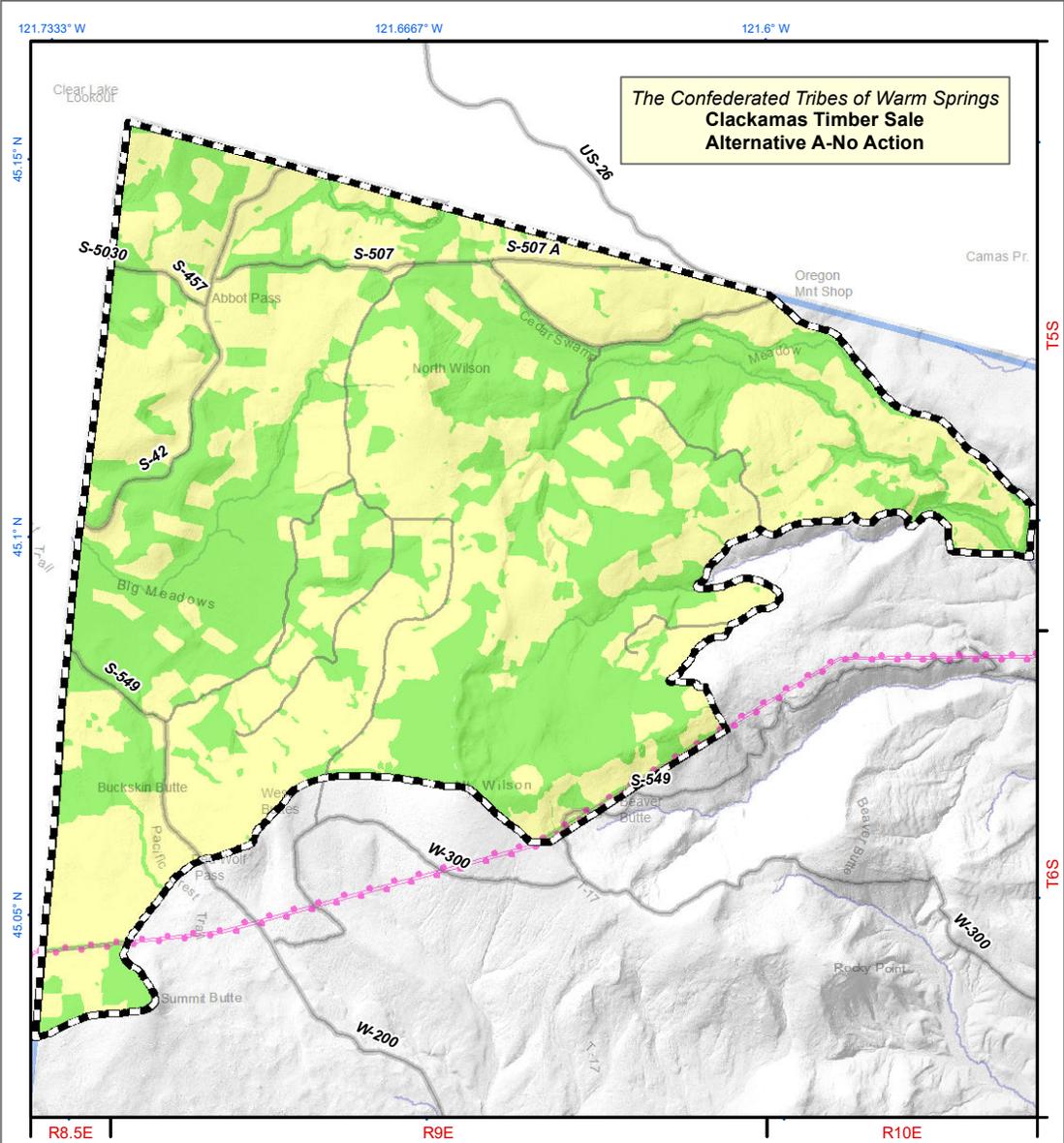
The Confederated Tribes of Warm Springs performs forest management activities and 22 responsibilities for the Bureau of Indian Affairs by and through a 638 contract. Pursuant to that contract, the Confederated Tribes' Branch of Natural Resources is proposing a timber harvest in the Beaver Forest Planning Unit. The proposed sale is located within the Beaver Creek, Oak Grove Fork (Clackamas River), and Clear Creek watersheds on the Warm Springs Reservation. The Clackamas Meadows Timber Sale (2022 Timber Sale) is being proposed to capture volume established by the annual allowable cut, and to supply timber and preserve jobs at Warm Springs Timber Company (WSTC). The sale was developed under the project assessment process outlined in the Integrated Resources Management Plan (IRMP) at the direction of the Resource Management Inter-Disciplinary Team (RMIDT). The proposed action would harvest trees impacted by overstocking, root disease, dwarf mistletoe, insects and stem decay. Two alternatives were formulated and various types of harvests were considered for this project.

The project assessment analyzes a harvest of approximately 25 million board feet of net volume timber, which provides a portion of the allowable cut over the next 10-year planning cycle (2022-2031). The annual allowable cut is 18.1 million board feet for the year 2023. A volume above the target is listed under Alternative B to allow for discrepancies in the database and field verifications, and acres dropped due to environmental conditions, or constraints within the IRMP. The actual volume to be harvested under the project will depend on which alternative is selected and approved by the Confederated Tribes. However, Alternative B is the only option that assesses a timber harvest targeting the anticipated allowable cut for 2022.

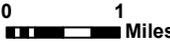
The project assessment is not a decision document. It provides a summary of the Project Interdisciplinary Team's (PIDT) analyses, which are on file in the corresponding departments. The summary offers alternatives for implementing the project and explains the probable effects of each alternative. Alternative A accounts for the "no action" approach, while Alternative B represents a "balanced" approach as required under the IRMP. Acting on information contained in the final project assessment, RMIDT, with concurrence from the BIA superintendent, will review the assessment and take comments from the tribal public before producing a decision document that will provide guidelines for the project's implementation. The superintendent's decision will be documented in a finding of no significant impact (FONSI) that will be attached to the forest officer's report.

## Public Review and Comment

The tribal public has been involved in the planning process through scoping meetings and committee interaction with the PIDT and RMIDT. Scoping meetings were held February 4<sup>th</sup>, 2020 at the Simnasho Longhouse, and August 3<sup>rd</sup>, 2022 at Warm Springs Fire Management. Approximately 12-15 members of the public participated at the Simnasho meeting and only one member participated at the Warm Springs Fire Management meeting. Due to Covid-19 outbreak there was a two-year delay in finalizing the scoping for this project. A tour of the area was conducted on September 1, 2022 to gather membership input.

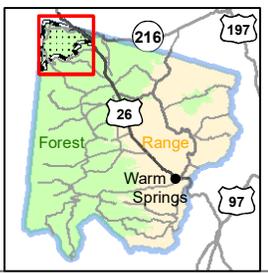


The Confederated Tribes of Warm Springs  
 Clackamas Timber Sale  
 Alternative A-No Action

  
  
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**No Proposed Actions**

-  Sale Area Boundary
-  Major Roads in Sale Area
-  Previous Harvest
-  Unharvested Areas
-  Transmission Lines
-  Named Streams



# Project Alternatives

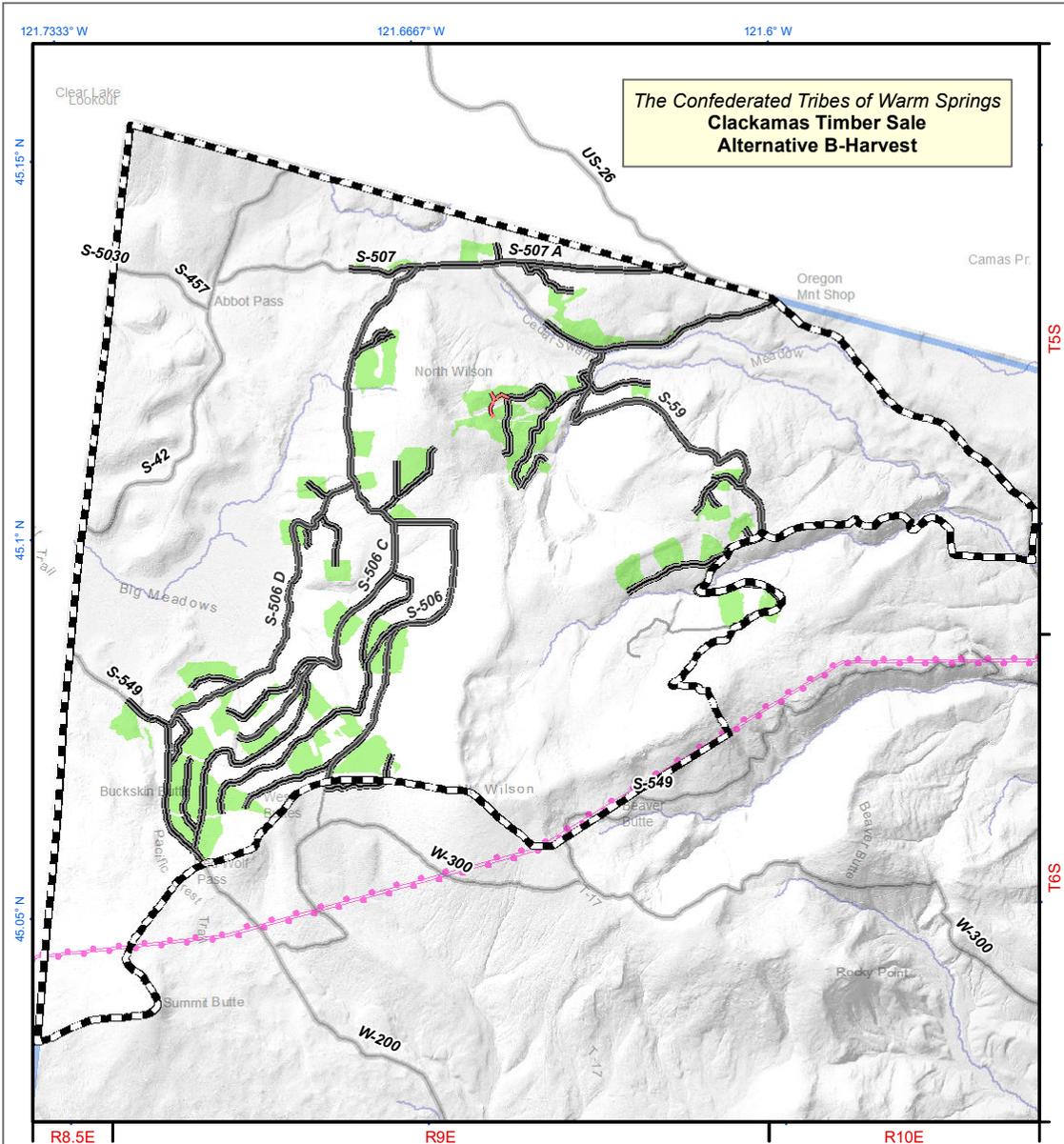
This section provides an explanation of the two proposals that represent a range of alternatives for the 2022 Timber Sale. It describes both of the alternatives and provides information regarding harvest volume, harvest type, logging method, slash treatment, acres to be planted, and road system changes. Maps are used to outline the project area, and to identify proposed roads and harvest blocks. There are quick-reference tables to compare the alternatives using indicators for each resource, the project interdisciplinary team’s recommended alternative, and a statement on monitoring.

## Alternative A – No Action

The goal of this alternative is to maintain the area’s present conditions and existing uses. Activities such as livestock grazing, hunting, recreation, salvage logging and cultural food gathering would continue as in the past. Previously approved restoration projects would also continue under this alternative. Alternative A provides a baseline to compare the effects of the other alternative. The primary features of Alternative A are displayed in Table 1.

**Table 1 – No Action**

Net Harvest Volume	As approved
Net Treatment Acreage	Variable
Harvest Method	Timber salvage
Logging Method	Dependent on topography
Slash Treatment	As needed
Tree Planting	As needed
Road Maintenance	Variable
New Road Construction	None
Road Closure	None
Road Eradication	None





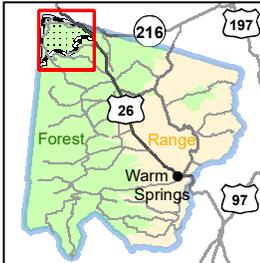
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**Proposed Actions**

- Haul Routes
- New Road Construction
- Harvest Blocks
- Sale Area Boundary
- Major Roads in Sale Area
- Transmission Lines
- Named Streams



# Alternative B

The Alternative B map shows the project area and proposed harvest blocks. Alternative B targets a net timber harvest volume approximating the annual allowable cut, while limiting negative impacts to associated resources. A gross volume of 27.5 million board feet of timber on approximately 1,963 acres has been analyzed in this assessment. A total harvest for this sale will be capped at 25 million board feet. The gross volume includes a buffer to allow for blocks that may be dropped as field work proceeds and additional resource concerns are identified.

The emphasis of this alternative is to provide desirable timber to Warm Springs Timber Company and preserve jobs, treat high and moderate priority stands with forest health issues, reduce hazardous fuel loads, and generate income for the tribes. Prescriptions will address insect and disease problems, low growth rates and overstocking. Alternative B's prescriptions include approximately 36 percent regeneration harvests, 42 percent commercial thin, 19 percent overstory treatment and 3 uneven age treatment. The primary features of Alternative B are displayed in Table 2.

**Table 2 - Harvest**

Net Harvest Volume	27.5 million board feet
Treatment Area	1,963
Harvest Method	
Commercial Thin	823
Landscape	56
Overstory Removal	373
Seed Tree	491
Shelterwood	220

Logging Method	
Tractor	1,967

Slash Treatment	
Machine Pile and Burn	691
Tops to Landings*	1,963
Pile and Burn Landings Only	1,963
Broadcast Burn	491
*Tops may be left under a harvester forwarder system.	
Area to be Planted with Trees	691
New Road Construction	0.5 miles
Road Maintenance	45.9 miles

# Comparison of the Alternatives

Table 3 compares proposed harvest volumes and harvest types of the two alternatives and Table 4 lists the key resources, indicators and effects of each alternative.

**Table 3 – Alternatives**

	Alternative A	Alternative B
Net Harvest Volume	Variable	27.5 million board feet
Treatment Area	As Approved	1,963
Harvest Method		
Commercial Thin	0*	823
Landscape	0*	56
Overstory Removal	0*	373
Seed Tree	0*	491
Shelterwood	0*	200

\* Acres previously approved through the sale process for other timber sales would be harvested.

**Table 4 – Alternatives by Resource**

Indicator	Alternative A	Alternative B
<b>Water</b>		
CRA percent by watershed (threshold is 25 percent for each)		
Oak Grove	N/A	N/A
Clear Creek	N/A	N/A
Beaver Creek	N/A	N/A
<b>Fish</b>		
Large woody debris	N/A	1.4/100 meter
Pool frequency and quality	N/A	3.5/100 meter
Stream width to depth ratios	N/A	10.7
Stream bank stability	N/A	100 percent
<b>Cultural Resources</b>		
- Known sites potentially affected in sale area	N/A	0
- Acreage Requiring Cultural Survey	0	1963/1963
- Acreage Previously Surveyed	N/A	90/1963
- Blocks with culturally significant plant concerns	N/A	37/43

<b>Timber</b>	<b>Alternative A</b>	<b>Alternative B</b>
Acres treated by timber priority:		
Low	0	455
Medium	0	691
High	0	821
Average stand age class in treated area		
0 - 40	8075	9215
41 - 80	3537	3006
81 - 120	3880	3592
121 - 150	3191	3016
151+	7534	7390
<b>Range</b>		
Additional Animal Use Month's	0	621
Noxious weed infestation potential	No change	Moderate
<b>Soil</b>		
Acres of harvest on sites rated severe/moderate for:		
Acres of harvest on sites rated severe/moderate for:		
Windthrow	0	146/201
Erosion	0	908/567
Compaction	0	766/1,200
Fire Damage	0	0/146
<b>Economy</b>		
Estimated sale value	0	\$4.2 million
Total employment	0	90 jobs
<b>Transportation</b>		
Miles new road construction	0.0	2.2
Miles road control (gates)	0.0	1.7
Miles road maintenance	0.0	50.0
Road density (miles/section) sale-wide	2.6	2.6
Wilson Creek WMZ	2.7	2.7
Big Meadow	2.2	2.2

<b>Wildlife</b>		
<b>Big Meadows WMZ (5,635)</b>	<b>Alternative A</b>	<b>Alternative B</b>
<u>Cover to Forage Ratio (proportion)</u>	2.4	2.0
<i>IRMP Standard: 40 to 60 percent</i>	2.4	2.0
Hiding Cover	2.4	2.0
Thermal Cover	0.2	0.2
	0.3	0.3
Open Roads Density (miles per section)	2.2	2.2
<i>IRMP Standard: Less than 2.0 miles per section</i>	2.2	2.2
<b>Wilson Creek WMZ (9,382 acres)</b>	2.2	2.2
Cover to Forage Ratio	2.2	1.9
<i>IRMP Standard: 40 to 60 percent</i>	2.2	1.9
Hiding Cover	2.2	1.9
Thermal Cover	0.2	0.2
	0.3	0.3
Open Roads Density (miles per section)	3.5	2.8
<i>IRMP Standard: Less than 2.0 miles per section</i>	3.5	2.8

### **Actions Common to All Alternatives**

The harvest of green trees previously approved through the timber sale process will continue until completed. Salvage operations may be conducted under each of the alternatives. Generally, salvage operations harvest scattered fire-, wind- and insect-killed or damaged trees both inside and adjacent to existing harvest blocks.

### **Recommended Alternative**

The PIDT for the 2022 Clackamas Meadows Timber Sale recommends Alternative B be approved. This recommendation was reached by consensus.

### **Monitoring**

PIDT members should randomly select 10 percent of the harvest blocks for monitoring. Monitoring should be conducted on the 2022 Clackamas Meadows Timber Sale within 2 years after harvest is completed. The objective of this project will be to determine whether the timber sale was implemented as described in the selected alternative and in accordance with IRMP standards and best management practices, and to ensure these actions are effective.

# Affected Environment

This section is made up of 10 resource-related subsections arranged in the following order: Water, Fish, Wildlife, Cultural Resources, Timber, Range, Soil, Economics, Transportation and Fire.

The Affected Environment write-ups provide the reader with a general overview of current conditions within the proposed sale area and supply baseline information that makes it easier to analyze alternatives and their potential impacts. They deal with subjects listed in Table 4 as issue indicators, including water quality measurements, the length of openings adjacent to riparian zones, cover/forage ratios for wildlife, health and age of standing timber, the presence of cultural plants and archeological sites, road densities, and other current conditions. The environmental consequences of each alternative are summarized within the resource subsections.



**Stable old-growth stands will not be harvested under the 2022 Clackamas Meadows sale.**

# Water

The 2022 timber sale proposes to harvest acres in watersheds (Oak Grove Fork, Clear Creek, Beaver Creek). Oak Grove Fork has (11,010) acres, Clear Creek (2,980) acres, and Beaver Creek (45,892) acres. Total stream miles within affected watersheds are: Oak Grove 20, Clear Creek 4, and Beaver Creek 120. There are 729 wetland acres in Oak Grove, 20 in Clear Creek and 920 in Beaver Creek watersheds.

The project area does not entail all of Beaver watershed while the other two are fully within the project area. All three watersheds in the project area are considered origin or headwaters water bodies. Beaver Creek flows through and out of the Reservation, and the other two watersheds flow off the Reservation. These watersheds are characterized by high precipitation in the form of snow and rain with fairly high elevations, which combined produce clear and cold water. Mount Wilson, North Wilson, Buckskin Butte, and Big Meadows are notable physical features. Notable streams within watersheds include Cedar Swamp Creek, Beaver Creek, Clear Creek, Oak Grove Fork and Wilson Creek.

## Alternative A

The goal of this alternative is to maintain the area's present conditions and existing uses. Activities would continue as in the past and previously approved restoration projects would also continue under this alternative. Alternative A provides a baseline to compare the effects of the other alternative.

## Alternative B

A total of 1,963 acres are proposed for this 2024 project. Treatments include seed tree, salvage, commercial thins, and biomass prescriptions. The percentage of (1,966) total harvest acres are 6% in clear creek, 35% in beaver creek and 59% in oak grove watersheds. Integrated Resource Management Plan BMP's and standards should suffice for treatments. With the lacking of a winter plan or guidance for winter logging an above and beyond IRMP- a snow/wet weather plan for logging- including transportation, must be shared and documented prior to any winter activities.

# Fish

The Clackamas Meadows Timber Sale consists of 1,963 acres of timber located in the northwest portion of the Warm Springs Reservation. Elevation ranges from 2240 to 5560. Harvest is proposed throughout multiple watersheds including Wilson Creek, Clear Creek, and Oak Grove Fork. Fish bearing streams within this timber sale area provide important spawning and juvenile rearing habitat for spring Chinook salmon, steelhead, Pacific lamprey, and rainbow trout.

Numerous tributaries provide spawning and rearing habitat within the timber sale area. Pacific lamprey have been documented in Beaver Creek. Steelhead, rainbow trout, and spring Chinook spawn and rear in Beaver Creek.

Timber harvest, associated road construction, and livestock grazing have been extensive in the proposed timber sale area. Roads within riparian zones are also abundant. Protection of riparian areas along all streams, springs, and wetlands within the proposed timber sale area is crucial to the continued maintenance of water quality for fish spawning and rearing. Riparian protection provides several benefits which include maintaining cold water temperatures, large wood inputs for the formation and maintenance of fish habitat, reducing sediment inputs to the stream, creating a source of organic materials used by aquatic macro-invertebrates, and streambank stabilization.

Redd counts (spawning nests) for spring Chinook salmon and summer steelhead occurs annually in Beaver Creek downstream of the sale area. Spring Chinook salmon redd counts date back to 1986. Observed redd abundances vary annually with a maximum of 172 in 2000 and a minimum of 4 in 2007 and 2013. On average, 53 spring Chinook redds are observed annually. The number of redds counted has been trending downward since counts began. Since 1982, observed summer steelhead redds have been highly variable with a minimum of 4 in 1986 and a maximum of 68 in 2001. The annual amount of redds observed has been slightly increasing in Beaver Creek, however the trend of summer steelhead passing the Warm Springs National Fish Hatchery has been relatively static since 1977.

Pacific lamprey spawning has been observed in Beaver Creek, however the abundance of returning adults is thought to be extremely low. From 2006-2009 radio tracking of returning adults showed that a small percentage (about 8 percent) of tagged fish were found in Beaver Creek. Additionally, an adult lamprey was observed on a redd during stream habitat surveys in 2011. In 2009, a study revealed average densities of ammocoetes (juvenile lamprey) in suitable habitats of Beaver Creek to be about 21.2 fish per square meter.

Properly functioning stream systems on the eastside of the Cascade Mountains contain substrates with relatively low amounts of fine sediments. As per IRMP standards, no more than 20% of the streambed composition in fish-bearing streams may be less than 6.4 millimeters in size. Mostly, fine sediment compositions exceed that standard within and downstream of the sale area. Sediment samples were collected in Beaver Creek near known summer steelhead and spring Chinook spawning locations. Those samples showed a range of fine sediment compositions below 6.4 millimeters to be between 31% and 33%. Other samples were collected in the stream adjacent to Highway 26, near the

uppermost perennial stream segments, and contained compositions of just over 60% fine sediments.

Generally, fish habitat conditions in Beaver Creek are not optimal. For example, within the lower reaches (approximately 13 miles) about 8 pools per mile exists and many lack sufficient depth and habitat complexity. Furthermore, Highway 26 affects instream habitat conditions within the upper stream reaches. Along the highway, fish habitat conditions are poor as reflected by a lack of instream large wood, straight channelized stream segments, excessive streambed fine sediments and few pools.

### **Alternative A**

Under this alternative, there would be no additional effect to fish, habitat, or water quality in the Wilson Creek, Clear Creek, Oak Grove Fork, and the Upper Warm Springs River watersheds.

### **Alternative B**

In alternative B, 1,963 acres would be affected by timber harvest and log hauling. IRMP buffers for each class of stream will be maintained and this will reduce the immediate effect on fish habitat. However, long term changes of the hydrologic cycle in each watershed can alter stream temperature, runoff timing, and reduce fish habitat complexity. To help mitigate adverse effects associated with the proposed Sale, the following measures should be taken:

1. On class I streams 200-foot heavy machinery exclusion buffer zone should be maintained around all stream channels. Only hand-thinning for fire suppression purposes should be permitted within the buffer zone. Wood generated from hand-thinning activities should be deposited into stream channels where possible, to generate habitat complexity and shelter for fish.
2. Steep hills, particularly those adjacent to stream channels, should be avoided when selecting logging treatment blocks.
3. Construction of new roads should be kept to a minimum, and all new roads should be decommissioned/obliterated at the conclusion of the sale.
4. Proper erosion and runoff control measures, e.g., silt fences and wattles, must be maintained in high-risk/heavy-use areas.
5. All disturbed landing areas should be re-seeded with native vegetation following the conclusion of the Sale.
6. The Sale should include additional mitigation measures, such as decommissioning pre-existing problem roads in the area.

# Wildlife

Mule deer, black-tailed deer, Rocky Mountain elk, and Roosevelt's elk are important subsistence foods for Tribal members and are commonly found within the Northwest corner of the Reservation. Spotted owl, black bear, mountain lion, bobcat, grouse and many other non-game species also inhabit these areas. A known wolf pack has also utilized portions of the project area. All wildlife species have four major habitat requirements: forage, water, cover, and space.

Disturbance factors such as timber harvest, grazing, road construction, and fire suppression have altered and influenced the habitat available for wildlife. Natural disturbances such as wind, fires, insect outbreaks, and floods have also played a significant role in altering the ecosystem. Two wildlife management zones (WMZs) were designated through IRMP for this area (Big Meadows, and Wilson Creek).

Approximately 51 percent of the 2022 project area consists of all or a portion of these two WMZs. Portions of the area have poor connectivity in the forest landscape and reduced escapement cover, resulting in higher vulnerability to hunting and predation.

Roads are a significant factor to habitat fragmentation because they divide large landscapes into smaller patches and convert interior habitat into edge habitat. Timber harvest within forested areas, ramping up in the mid 20<sup>th</sup> century, steered towards a proliferation of road networks within forest ecosystems inhabited by mule deer and elk. These roads reduce big game use of adjacent habitat and disrupt migration, and as a result, heavily influence their distributions across the landscape. The accelerated rate of habitat fragmentation that occurs as a result also impacts population rates. Open roads and road densities are a continuing concern for many of the Tribal membership. In accordance with IRMP standards, the average open road densities in WMZs will not exceed 2.0 miles per section. At the present time, open road densities in the Big Meadows and Wilson Creek WMZs is 2.22 and 2.76 respectively, exceeding this standard and reducing habitat effectiveness.

WMZs were created through the IRMP processes to “emphasize healthy management of vegetation for deer and elk benefit”. Specific temporal and habitat management restrictions apply to timber harvests within WMZs to attain goals set forth by IRMP. While WMZs emphasize vegetation management for the benefit of deer and elk, many other species benefit from the timber harvest restrictions and intact cover in WMZ's from focused vegetative treatments.

IRMP requires that cover to forage ratios of 40% (minimum) to 60% respectively. IRMP standards also state that WMZ's in the mixed conifer and higher elevation plant associations should maintain 20% of the acreage in the thermal cover. Thermal cover offers a unique microclimate that is warmer in the cold weather and cooler in the hot weather and provides many wildlife species a reprieve from extreme weather conditions. Thermal cover areas also hold more moisture during the hot summer months providing deer and elk with more palatable forage than surrounding areas. Stands comprised of both thermal cover and hiding cover are of particular importance to deer and elk populations. At the present time cover-to-forage ratios for Big Meadows is 56:40% and Wilson Creek 52:44% (see table).

The hiding cover standard in IRMP is set at 20% within WMZs. Currently, the hiding cover percentage for Big Meadows is 22%, and for Wilson Creek is 23%.

Seasonal restrictions limit harvest in seasonal ranges (winter and summer) while deer and elk are present. Winter range blocks in this sale are of particular concern for deer and elk. Recent fires, livestock, and juniper encroachment have degraded much of the winter range habitat Reservation wide. Within both WMZs, big game habitat composition consists of 33% winter range and 67% summer range.

The sale area primarily encompasses summer range; including transition zones with migration routes used during fall and spring. Big Meadows is considered critical big game birthing/nurturing habitat, and so are portions of the Wilson Creek WMZ. The rest of these WMZs are prime summer range for deer, elk and bear. Deer and elk utilize this area based on seasonal trend inventories (fall and spring) and past telemetry studies. Tribal members interviewed about this area confirmed its importance for producing both quality buck deer and bull elk. 2020 Reservation big game surveys estimated populations of 3,798 mule deer, and 1,734 Elk, which is below the carrying capacity of the 14,000 animals on the landscape. These species heavily utilize both the summer and winter range in the sale area and the migration corridors that maintain connectivity on the landscape.

#### **Alternative A**

At the present time, the open road densities for the two WMZs within the sale area exceed the IRMP threshold of 2 miles per section. Alternative-A would have no influence on this condition, as road density would not be affected.

Cover-to-forge ratios for all WMZ's within the sale area will remain at current levels. No change in these conditions would occur under Alternative-A.

Thermal cover percentages for the two WMZs in this sale are currently meeting IRMP standards and this alternative will not change those conditions.

Hiding cover percentages will not change under this alternative. Hiding cover in Big Meadows and Wilson Creek WMZs would remain under IRMP standards.

Few adverse effects to wildlife or habitat would be added to present conditions. Without harvest, stands would continue to mature, therefore decreasing the amount of edge habitat. Deer and elk would become dependent on wildfire and other disturbances for the creation of new openings in the forest that provide forage in summer range areas. A more mosaic of forest openings created by wildfire would dominate the landscape, thus increasing biodiversity. Depending on management and vegetative responses to these disturbances, IRMP standards and other functioning wildlife habitat ecosystems will change (positively or negatively) over time.

#### **Alternative B**

This alternative would convert approximately 765 acres to new openings through regeneration harvests, and alter structural diversity on 1,197 acres through commercial thinning and overstory removal. Levels of impact to wildlife resources would be more severe under this alternative than Alternative A, because there would be more stand conversion and fragmentation.

This alternative would alter the structural diversity of 1,963 acres of wildlife habitat out of 15,019 acres present in both WMZs, 4,612 acres of which is categorized as thermal cover. Nearly 40% of this habitat would be converted to new openings with no thermal cover. Logging activity would cause direct disturbance to regenerated trees, snags and downed logs, but increase forage species for 1-2 years following harvest. This would shift species utilization and occupancy due to change in cover types, forage types and active disturbance from logging activities.

There will be changes in the cover forage ratios for the WMZs as the acres that are currently classified as cover decrease and the forage acres increase. This is primarily the result of regeneration harvest, with lessened intensity of impacts from thinning treatments.

The majority of WMZ thermal cover percentages will continue to meet IRMP standards even with the projected overall decrease. Big Meadows (32%) Wilson Creek (28%) will both still meet IRMP standard.

The existing open road densities with the WMZ's currently exceeds standards. Any existing spur roads in this sale will be obliterated after harvest or after post sale activities are completed. Any existing closed roads opened to facilitate harvest will be closed following harvest or at the completion of post-sale activities.

7 blocks of this sale covering 275 acres (14% of the total sale treatment area) are in winter range. The rest of the blocks occur within spring-summer-fall range or a combination of all. Seasonal restrictions for winter logging will need to be implemented in areas considered "critical big game winter range". This would likely be areas near and adjacent to the eastern and southern portions of the Wilson Creek WMZ blocks, and the western blocks of the Big Meadows WMZ blocks in the Clackamas project area.

Most of the blocks within the Big Meadows and Wilson Creek WMZs are within or near prime large big game habitat and travel corridor, with adjacent blocks to the east and south acting as a migration corridor for mule deer and elk as well as winter range critical habitat. This sale as planned would reduce current and potential nesting and roosting habitat and reduce forage and dispersal habitat.

# Cultural Resources

A review of Cultural Resource Department (CRD) records has identified six prior cultural resources inventories (90 acres) within the Clackamas Meadows Project area (1,963 acres). Of the previous inventories, none have been completed since 2013. None of the previously documented cultural properties within the Clackamas Meadows Project area meet current standards.

There are no blocks proposed within the Project that have been completely surveyed. Only two blocks have been surveyed at 75-percent or more, however neither of these areas have been surveyed in a capacity that meets current standards. The majority of previously surveyed acreage falls along the edges of timber sale blocks, where previous surveys of neighboring blocks slightly overlap the boundaries of the proposed Project. There are no previously recorded cultural resources within the Project area, however this is likely due to the high amount of previously unsurveyed acreage included in the Project.

Previous surveys in the area have noted a significant number of cultural plants including but not limited to Oregon grape, bear grass, blueberry, choke cherry, huckleberry, thimble berry, wild strawberry, mountain willow, western red cedar, black lichen, and bear berry.

Cultural resources within the Project area may have been affected in the past by ground disturbing activities. These resources should be protected, preserved and managed in a manner consistent with Tribal Ordinance 68, Chapter 490 “Protection and Management of Archaeological Historical and Cultural Resources” and Section 106 of the National Historic Preservation Act of 1966 as amended. In addition, all cultural resources will be managed under Tribal Ordinance 74, the Integrated Resources Management Plan. Prior to Project implementation, a cultural resources survey of the Project area to identify new archaeological resources and buffer known sites for protection is required.

## **Alternative A**

Alternative A would not alter the level of impact to areas containing archaeological sites and materials, because no changes to the current condition and management of the area are proposed.

## **Alternative B**

Within the 1,963 acres proposed for harvest under Alternative B a total of 90 acres have been previously surveyed. No cultural resources were identified within the 90 acres that were previously surveyed. Due to the scale and scope of the Project, cultural resources survey of the 1,966 acres that have not been previously surveyed at a capacity that meets current standards must be completed prior to Project implementation. In addition, any new road construction or skid trails would have to be inventoried should this alternative be implemented. Cultural resources identified during this survey should be flagged with a 30 meter buffer for avoidance. Directional felling away from buffered areas should be implemented.

Alternative B may impact several species of cultural plants listed above, which can be mitigated as necessary if encountered during survey. Huckleberry plants identified during cultural resources survey and layout within the Project area may be mitigated and

protected from ground disturbing activities. This may include limiting the implementation phase to specific times of the year, logging over a minimum two foot snowpack, with monitoring of snow conditions and temperature, or limiting equipment use and skidding distances.

## Timber

The 2022 Clackamas Meadows Timber Sale is located in the northwest corner of the Reservation within the Clackamas and Mt. Wilson forest planning units (FPU). This area consists primarily of mixed-conifer, cool-moist forest types as well as lodgepole pine flats. Past harvesting and fire suppression have shaped the current stand compositions and densities into a mix of plantations, unhealthy overstocked stands, and older structurally diverse forest types. Prescriptions associated with this timber sale treat: 1) stocking control in commercial thins; 2) unhealthy, stagnant older stands with regeneration cuts; and 3) high density plantations with commercial thinning and biomass treatments.

### Alternative A

Alternative A continues current management within the proposed project area, including but not limited to timber salvaging. This alternative would not proactively address timber health issues related to green timber sales.

### Alternative B

An estimated 821 acres are rated as high priority for treatment, 691 acres are rated as moderate priority, and 455 are rated as low priority. For this timber sale, the relative percentages of proposed treatment groups by acres are: 1) regeneration – 49 percent; 2) lodgepole salvage/thin – 17 percent; 3) commercial thin – 26 percent; and 4) biomass – 8 percent. Harvest blocks have the following age class distribution by acres: 40-79 years - 15.3 percent; 80-119 years - 20.2 percent; and 150+ years - 64.4 percent. The table below shows the distribution of proposed harvest acres by management group. Blocks 61-65 will be logged over of snow at least two feet deep.

**Table 5 – Impacted acres by Management Group**

Management Group	Growth Potential per Acre	Impacted Acres	Percent of Harvest Blocks
<b>1: Ponderosa Pine</b>	200 board feet per year	0	0
<b>2: Ponderosa Pine/Douglas Fir</b>	360 board feet per year	0	0
<b>3: Mixed Conifer</b>	427 board feet per year	0	0
<b>4: Grand Fir</b>	613 board feet per year	0	0
<b>5: Hemlock/Beargrass</b>	493 board feet per year	376	24%
<b>6: Mtn. Hem./Lodgepole Pine</b>	461 board feet per year	0	0
<b>8: Silver Fir</b>	638 board feet per year	1587	76%

## Range

The establishment of non-native invasive species such as Houndstongue (*Cynoglossum officinale*), Scotch broom (*Cytisus scoparius*) and tansy ragwort (*Jacobaea vulgaris*) are present in small isolated pockets, although knapweed (*Centaurea spp*) is prevalent along many of the main roads within the project area. These species are easily spread by vehicles and heavy equipment, and establish readily along access roads and areas where native vegetation is removed or heavily disturbed. They provide direct competition to native species for water, nutrients and space within the plant community.

Managed and unmanaged livestock typically do not utilize this area due to the higher elevation and distance to rangelands and district livestock operations, with the exception of Big Meadows which is used periodically by grazers. The forage base is considered important for wildlife and may be of value to livestock in the short term, if logged, Beargrass (*Xerophyllum tenax*) is a culturally significant species that occurs in the higher elevation forested and meadow communities. Beargrass may be initially impacted by skidding and harvest activities but readily reproduces following disturbance.

Disturbance through logging and road activities has been the primary vector for spread of noxious weed species into the northwestern portion of the Reservation. Tansy and Houndstongue are primarily found in seed tree and old clear-cut units within the sale area while knapweed can be found along most major roads in the system.

### **Alternative A**

Alternative A would not change the current condition of forage resources nor increase the potential of noxious weed spread into existing plant communities.

### **Alternative B**

The noxious weed potential would be moderate and greater in comparison to the no action alternative due to the number of acres disturbed and miles of roads utilized during harvest operations.

# Soil

Soils of the 2022 Timber Sale are located atop the shoulder, back and toe slopes of the central Oregon Cascade Mountains and are comprised of mid- and low-elevation ecosystems. The Cascade Mountains were created from a series of ancient volcanic eruptions which produced high peaks of silica rich pumice and wide expansive plateaus of basalt. Additionally, glaciation and weathering processes have scoured and sculpted the landscape which is present today. Soils found in the proposed sale units are very deep to deep (greater than 40 inches), moderate to poorly developed gravelly or cobbly sandy loams which typically contain a high content of rock fragments (30-65 percent by volume). These soils were formed from cinder, volcanic ash, and colluvium (soil material and volcanic rock fragments moved by creep, slide or local wash and deposited at the base of steep slopes). Volcanic soils are quite fertile and are instrumental in generating the Reservation's diverse and vigorous forestlands. These cool wet soils on mountain slopes promote slow to fairly rapid runoff and due to the coarse nature of these soils and locations on gentle slopes, the risk of surface erosion is slight to moderate, but still a potential impact of concern within a few blocks. Compaction is moderate to high on toe slopes and terraces where alluvial processes have created soils with finer minerals. Productivity and seedling establishment can be inhibited by large amounts of gravel and cobbles. Fire damage is increased in soils with a high content of coarse fragments and affects soil erodibility, plant recovery rates, and productivity. These soils will transmit heat to a greater depth in a shorter period of time. Mature trees are subject to a moderate potential of windthrow due to a restricted rooting depth, high content of rock, and salvage history of the area. Soils found typically in this area are the Howash, Mackatie-Kutcher, Pinhead, and JoJo soil mapping units. Turbidity in Cedar Swamp, Wilson and upper Beaver creeks is minimal and management should be geared toward keeping this water source clear.

## **Alternative A**

If Alternative A is chosen, there would be no alterations to existing soil conditions from timber harvest and forest treatments. Soil resources would continue to persist in their present state of development and characteristics.

## **Alternative B**

Potential impacts derive from the 766 acres of the A horizon that would be exposed to a substantial increase in water and sunlight resulting from seed tree and over story removal treatments. This could trigger the germination of non-native species from the seed bank and impede soil development by modifying the below ground eco-system. These disruptions to the soil system could negatively influence nutrient cycling, soil aggregation, and water movement and storage. The largest impacts from this sale could come from ground-based machinery on wet soil that may compact the sub-soil. Cedar Swamp, Wilson and upper Beaver Creeks could experience flashes of turbid waters from unstable soil resources and associated runoff impacts caused by the removal of vegetation and the construction and persistence of skid trails, landings and logging roads. Windthrow potential would increase in units prescribed with regeneration treatments. Short-term benefits may occur from actions which disturb A horizons of clay and silt loams. These events could aerate the A horizon, stimulate the native seed bank, activate soil development and increase water infiltration.

# Economics and Employment

Many area residents derive income from economic activity related to the timber resource. At the same time, other values center on what the forest provides in terms of subsistence, recreation and aesthetics. Harvesting timber involves large investments and the economic efficiency of investments is an important issue in determining the selection of a project alternative. Timber value depends on a number of economic factors, including available markets. Both the domestic and export (log and lumber) markets have been high in recent years but it is expected to see a depression in prices over the course of this sale.

For this analysis, timber value was calculated using fourth quarter 2022 average log prices from a local market indexing and reporting company. A factor of 4.2 jobs per million board feet of harvested timber is used in calculating jobs supported by Alternative B. The housing market is currently in a state a flux, as well as the overall economy. It is expected that log prices (stumpage) will continue to decline the return on log value in the domestic markets in the near term.

## **Alternative A**

No revenue or employment opportunity would be generated through the programmed harvest of timber under this alternative.

## **Alternative B**

Alternative B would result in an estimated harvest of 25 million board feet of timber. Implementing this alternative would generate an estimated \$6 million in net revenue and support approximately 105 jobs. Douglas-fir, western hemlock and noble fir are the primary species to be harvested. The estimated net return to the Confederated Tribes (assuming local milling) for these species is estimated near \$250 per thousand board feet under Alternative B.

# Transportation

Average road density in the project area is approximately 2.6 miles per section. Road density ranges from 0.04 to 4.8 miles per section on commercial forest lands within the proposed sale boundary. Road conditions vary from very good to poor, a condition more prevalent when surfaces are wet. The S-507A, S-506 and S-568 roads provide the primary access into the sale area. These roads are gravel surfaced roads in good to very good condition. Roads are being designed for low speeds and maintenance is required to ensure safe travel. There are sufficient water sources that can be used for dust abatement within or adjoining the sale planning unit. Crushed aggregate or pitrun from the S-507F (Clear Creek) or S-592C (Indian Creek) quarry would be used to form a surface that would minimize erosion at stream crossings and tanker fill sites. The objective of both alternatives would be to improve and maintain a safe and economical transportation system while reducing the number of open roads needed for management purposes within the commercial forest.

## **Alternative A**

Alternative A would provide for improved surface conditions on those roads necessary for hauling salvage logs.

## **Alternative B**

This alternative would include an objective to upgrade the primary forest access routes while protecting other resources. There would be 2.2 miles of new road construction and 6.4 miles of reconstruction to access harvest blocks. Maintenance activities would be performed on 50 miles of road under this alternative.

One 24-inch temporary culvert as well as 60 feet of rock would be installed over class III stream within new road construct #2.

One and Seven-tenths miles of road would be eradicated or re-routed to meet IRMP standards or provide protection for riparian resources (see attached table 1A).

Fifteen roads will be reconstructed under this alternative for a total of 6.4 miles. Four of these roads will be decommissioned after the harvest activities have come to an end. The remaining will be blocked.

Three new road are scheduled under this alternative. For a total of 2.2 miles. New construct #2 and #3 will be decommissioned after harvest and New Construct #1 Will remain open for future Access needs. Although there are some roads that will remain open, Open Road densities will not Change under this alternative when harvest activities conclude.

Twenty-five class II and class III stream crossings are proposed to be surfaced under this alternative.

Roadside brush is prevalent throughout the entire sale area and will need to be dealt with under this alternative.

# Fire

The project area is within a high elevation timber type ranging from 3,000 to 5,500 feet. The stands are predominantly in management groups 4, 5, 6 and 8 with some areas containing significant amounts of lodgepole pine and varying amounts of associated species such as white pine, Douglas- fir, mountain and western hemlock, grand fir and noble fir. For the past 15 years, a mountain pine beetle infestation has increased mortality in lodgepole dominated stands. This insect problem has caused a serious fire hazard potential to stands of commercial timber and to conditional use areas. The project area is in fire regimes IV and V, a 100 to 200-plus year fire frequency with a high (stand replacement) severity, and condition class 3, a departure from the general tendency of the natural (historical) regime and a posing risk of catastrophic loss. Through the fire risk assessment conducted by the Warm Springs Fuels program, the 2022 Clackamas Meadows sale area ranges from low/moderate to moderate/high risk which interprets to a majority of the blocks having a moderate/high probability for large fire potential.

## **Alternative A**

Under this alternative no actions would be taken to treat green timber and the risk of a stand replacement wildfire would be very high.

## **Alternative B**

This alternative would reduce fuel loads in the project area, thereby reducing the risk of a high intensity, stand replacement wildfire. This alternative would also protect adjacent commercial forest stands. Under this alternative, fire risk along Skyline Road would be reduced as a result of commercial thinning. Recommendations from Fire Management are to implement a case-by-case assessment on regeneration, sanitation cuts, and commercial thinning blocks to determine the potential to broadcast burn residual slash rather than implement a pre-determined pile and burn prescription. The market for biomass may result in slash piles being chipped for hog fuel. The overall cost per acre should be lower and the impact to the soil resources would be reduced significantly where burning can be implemented to achieve silvicultural and forest development objectives onsite. When burning may impact the residual stand in an adverse manner, slash pile operations should then be implemented to achieve desired results. On some of the units it is anticipated that the combination of piling small areas would facilitate broadcast burning where residual stands may pose a problem.

## Cumulative Effects

Understanding the relationship between soil productivity and forest management can be very complicated. Soil formation is a mesh of natural systems that are inter-related and dependent upon the many facets of an eco-system that occur over millennia. Climate, topography, time, soil biota, and parent material all play a constantly changing, equal and unique role in the productivity of soils. In determining the effects of disturbance on soil productivity, it becomes a very site-specific interpretation and can change with year-to-year variation and climate changes. However, generally speaking, forest soils, which are part of a commercial timber base, can experience short and long-term negative impacts on soil structure and formation from forestry treatments and timber harvest. Potential impacts include severely compacted soils, nutrient depletion, and excessive erosion of soil particles into stream channels and rivers. By changing, altering, or shifting the overall productivity of forest soils one could possibly change, over time, the natural sequence of eco-system outputs and jeopardize the general timber productivity of a given area. Soil management should focus on short- and long-term impacts and use IRMP standards and BMPs to reduce these impacts overall, using mitigation to reduce the long-term effects of timber harvest on soil resources.

A major concern during this planning period is the sustainability of timber management practices and how that affects the health of natural resources. The 2022 timber sale proposes to harvest 2,457 acres in three watersheds. Prior to 2022 harvest, a large number of acres had already been harvested within the project area watersheds including: Beaver Creek (4,475), Clear Creek (1,830), and Oak Grove (5,559). Total watershed acreage of Oak Grove and Clear Creek equals 13,990 and Beaver Creek 45,892. The project area does not entail all of Beaver watershed while the other two are fully within the project area. Clear Creek and Oak Grove have a combined 7,389 acres already in a management rotation. Take away the 728 wetland acres for Oak Grove and 20 in Clear Creek, and the options are diminished further for forest management activities. All three watersheds in the project area are considered origin or headwaters with Beaver flowing through and out of the Reservation, and the other two flowing off the Reservation. The total stream miles (SM) versus road miles (RM) within affected watersheds include Oak Grove 20 SM vs 66.8 RM, Clear Creek 4 SM vs 21.7 RM, and Beaver creek 120 SM vs 414.5 RM. Even under a no-action alternative several thousand acres have already been harvested in these watersheds and the road system has already been built to access most of the commercial forest. Fifty eight percent of the harvest area is in the headwaters of the Oak Grove Fork of the Clackamas River; 7% of the harvest area is within in the Clear Creek watershed and; 35% of the harvest area is located in the Upper Beaver Creek watershed.

## Water

The 2024 timber sale proposes to harvest 1,963 acres in three watersheds. Prior to 2024 harvest, a large number of acres had already been harvested within the project area watersheds: Beaver Creek (4,475), Clear Creek (1,830), and Oak Grove (5,559). Even under a no-action alternative previous harvested acres have a transportation system already built. The total stream miles (SM) versus road miles (RM) within affected watersheds include Oak Grove 20 SM vs 66.8 RM, Clear Creek 4 SM vs 21.7 RM, and Beaver creek 120 SM vs 414.5 RM. With that said- road management and water

management are linked cohesively and water management within the transportation system is very critical. Access to most of the commercial forest will continue onto the future for said watersheds and the season and time frames for activities have a very important role for these areas and features. The project area does not entail all of Beaver watershed while the other two are fully within the project area. All three watersheds in the project area are considered origin or headwaters with Beaver flowing through and out of the Reservation, and the other two flowing off the Reservation. These watersheds on the WSIR represent some the most productive growing ground.

## **Fish**

Human and natural disturbances like wildfire, timber harvests, mechanical fire suppression and road construction has reduced the quantity and quality of fish habitats within the Beaver Creek watershed.

Inputs of fine sediments, alterations to stream networks, and changes to runoff intensity and timing have likely caused a reduction in suitable spawning habitat area. In addition, changes to hydrologic, geomorphic and ecological processes have reduced rearing habitat area. Effects from these changes range from the local site to watershed scales. Without additional human disturbances, it is anticipated that the hydrologic regime of Beaver Creek will change as a result of climate change.

Increased sedimentation in streams occurs both as a direct result of logging activities, and from the roads constructed to support logging operations. The operation of heavy logging equipment, e.g., feller-bunchers, disturbs and compacts soils and vegetation. This results in increased runoff and erosion, and reduces the water retention capacity of soils. These effects are increased when logging is carried out in high-gradient areas such as hill slopes and valleys. Roads are an additional source of runoff and erosion, and are the primary vector transporting fine sediment into stream channels. Thus, the construction of additional roads to support logging operations, e.g., skid trails, creates additional paths by which fine sediments are transported into stream channels.

## **Wildlife**

The Clackamas Meadows project area and the entirety of the Upper Warm Springs and Beaver FPU have seen extensive timber harvest activity historically. Harvest prescriptions have included large selective cuttings where dead, dying and mistle-toe infested trees were removed. Some of these areas received follow-up treatments of rehabilitation cuts where the residual standing timber was removed and large plantations were established. Clear-cut prescriptions were utilized on some older sales from 1950's to mid-1970's. More recently, seed tree prescriptions, shelterwood harvests, shelterwood lite, and large landscape treatments have shaped forest conditions and consequently, wildlife habitat. Additionally, a number of older harvest blocks have recently been re-entered, to the east with East Beaver sale, and the south with the Willow Summit sale. The culmination of all of this activity is a forest landscape condition that can be characterized as fragmented with a variety of forest size, structure, species and age distributions. At the stand level, there tends to be rather homogeneous forest composition reflected in the even-age plantations of primarily early to mid-seral species, and some contingents of old growth.

Road networks and road management can cumulatively reduce the effectiveness of wildlife habitat either from a disturbance/displacement standpoint or from an accessibility standpoint. While this sale will have no net gain in roads for this sale, the open road density within the WMZs is currently above the IRMP standards. There will be no additional long-term impacts from roads as a result of this sale, however the cumulative impacts of previous entries in this area remain.

A forest containing a mosaic of diverse forest structures has positive attributes in terms of cover and forage opportunities, and can benefit from the diversity that disturbance brings. If harvest activities aren't designed and implemented with consideration for cover and forage arrangement, habitat connectivity, and travel corridors, they'll not reach the level of positive attributes necessary for a healthy landscape to support healthy populations. As noted above, the cumulative impacts of previous entries and exclusions has left little opportunity for creative design of harvest blocks or block arrangement in the past. There are opportunities in this sale, especially when incorporating connectivity into the landscape and other treatment design, to assimilate wildlife habitat needs into the actual harvest prescription or in the design of post-harvest activities (example: low intensity under-burning to stimulate healthy vigorous browse species, assisted plantings to support forage needs and beneficial ecosystem interactions, and maintenance of ecosystem biodiversity with the maintenance of connectivity). In consideration of this, efforts should continue to be made to accommodate wildlife habitat concerns where possible and practical.

Wildfire events and timber salvage efforts have had some impact on wildlife habitat conditions in the sale area and need to be considered when addressing cumulative effects. The exact nature of the impact of fire is difficult to assess, but generally, depending on the severity of the fire event, can be a beneficial disturbance agent for wildlife. Creation of snag habitat for cavity-dependent wildlife, the establishment of cover and forage components on the landscape, and development of randomly spaced, and irregular openings for edge habitat are a few of the positive effects. Fire salvage activities are generally seen as creating a similar disturbance as normal logging activity. This could potentially cause short term and long-term negative impacts and possibly inhibit post disturbance recovery.

The overall impacts to wildlife habitat from the high levels of disturbance, either from natural or management related activity indicates that the landscape has been altered from what was historically seen and therefore may no longer support the desired levels of biodiversity. The loss of cover, increased fragmentation, and decreased habitat connectivity inhibit habitat generation, and disproportionately impact deer and elk populations. The cumulative effects of all disturbances in summer range and winter range needs to be monitored so that those disturbances do not result in unsustainable deer and elk populations for Tribal member subsistence.

## **Cultural Resources**

Cumulative effects over time can include incremental loss of cultural resources prior to the implementation of identification or monitoring efforts. The potential for sites unidentified during survey to be exposed and/or damaged always exists with any project

that includes ground disturbing activities. While natural processes of erosion and depositional processes degrade cultural resources, cumulative effects posed by the Project may include local impacts to soil and hydrology that could cause increased erosion within sites, even if direct impacts to the site during Project implementation are avoided. Visibility of sites may be altered by the slowing of forest buildup of detritus, which may either increase or decrease their ability to be identified or relocated in the future. While the Tribes have used fire to manage the landscape since time immemorial, the threat to cultural resources posed by wildfires, especially to sites composed of burnable materials is increasing exponentially. Increasing access via the creation and/or maintenance of roadways by the Project may also create adverse effects to cultural resources including looting, vandalism. Increasing vehicle access may also increase use of off-road vehicles, which can damage or destroy cultural resources, including cultural plants. In addition, changes to hydrologic, geomorphic and ecological processes that develop as a result of climate change will likely have an impact on cultural resources, including culturally significant plants.

While no formal studies have been completed to assess the cumulative impacts of logging on cultural plants within the CTWSRO, Tribal members who visit the same areas year after year to gather plants have voiced concerns over damage to plants and diminished yields caused by logging. Possible negative impacts to cultural plants include soil compaction and erosion, physical damage to plants, altered solar radiation, and introduction of competing or invasive vegetation.

## **Mitigation**

### **Measures Common to Action Alternative**

IRMP standards and best management practices will be applied to this project. Mitigation measures will be applied to compensate for significant impacts to resources as specified in the following sections. Mitigation is based on project evaluations and public concerns over the impacts of implementing each alternative.

In the event the cruised volume is greater than the assessed 45 million board foot volume, the PIDT will be consulted on which blocks will be dropped to attain the target.

#### **Water**

- Block 40 will have the snow measurement site buffered as determined by field work with the hydrologist.
- Blocks 33, 43, 45, 46 and 47 will only be harvested if needed to meet the targeted 25.0 million board feet for the sale.

#### **Fish**

The following mitigation measures are suggested to be implemented to protect complex and sensitive habitat and riparian areas for aquatic species:

- Culverts will be inspected throughout the sale to determine the need for replacement by hydrologist and road engineer. If a culvert needs replacement it will be completed prior to harvesting the sale.

### **Wildlife**

- For limiting impacts within Critical Big Game Winter Range, the operating season for treatment blocks (CTs 6; STs 28, 34, 36,37, 38,41; OSR 47) is April 16<sup>th</sup> – November 30<sup>th</sup>. (IRMP, Issue 3, Standard 6)
- Wildlife Biologist will be involved in block layout and the development of the silvicultural prescription for blocks
- Reseeding of Seed Tree and Shelter wood units will be done to improve browse recovery for big game. This will be done in with coordination between wildlife biologist and forester. Blocks will be selected on an individual basis where the benefit to wildlife resources is best suited.
- Re-seed native surface roads used to access block 32; un-numbered spur and S-506-F with native grass mix.
- Refer to the transportation calendar for gate installation location. They will be closed from December 1 through April 30 to restrict automotive access to protect wildlife.
- Spur road to block 9 from the S-506 jct will be closed with earthen berms or boulders.
- Spur road off S-549 into block 48 and the unnumbered road connecting to the S-506 will be gated
- S-506 D at Alkali jct will be gated
- Both jcts of the S-59 and S-59 A will be gated.
- Both jcts of the S-59 B will be gated.
- S-59 D will be closed by earthen berm after logging operations
- S-506 and s-506 G Jct will be gated as well as the S-506 and S-549 jct will be gated
- S-506 A reconstruction will be closed via earthen berm after logging operation.
- No logging hauling, maintenance or road construction will occur from March 1 October 1 within ¼ mile of an active or historic spotted owl core, until reproductive status has been determined
- Seasonal operations will be December 1<sup>st</sup> to April 30<sup>th</sup> and July 1<sup>st</sup> to August 31<sup>st</sup> for logging activities, including road construction, travel and maintenance for Big Meadows and Wilson Creek WMZs. Conditions outside this Operating Season may require additional coordination with the BNR Wildlife Biologist.

### **Range**

- Any fences and livestock developments that are impacted by logging activities will be repaired.
- Major access roads will be monitored annually to determine presence/absence of noxious weeds

### **Soil**

- Block: 6 has slopes greater than 35 percent. On ground where skidding is prohibited but cable yarding is not suitable or economical, alternatives such as low ground pressure torsion-sprung forwarders, shovel loaders or other aerial systems will be considered. When in these blocks with ground-based equipment and short pitches of slopes greater than 30 percent are encountered, waterbars will be installed every 50 feet instead of every 100 feet.

## **Transportation**

- There is a net gain in roads in this sale due to reconstruction of severely overgrown roads. This is mitigated through multiple earth berm closures and seasonal gate installation closures. See Transportation Table on page 32 for details on location and closure type.

# Clackamas Meadows Timber Sale Project Core Team Members

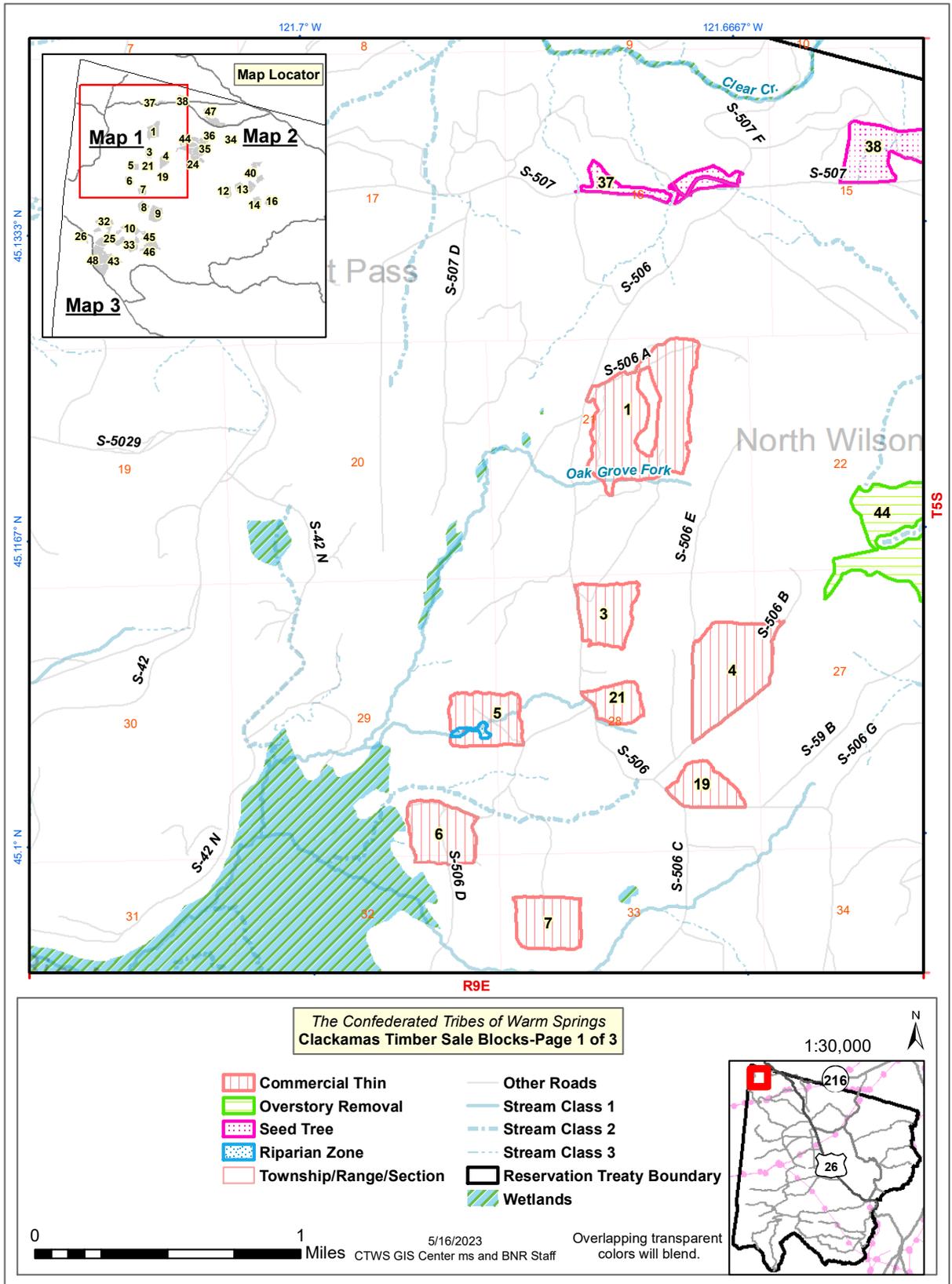
<hr/> Malcolm Vollmer, Project Leader	Date:
<hr/> Tim Outman, PID Team Leader	Date:
<hr/> Ryan Smith, Hydrologist	Date:
<hr/> Joe Smietana, Fisheries Biologist	Date:
<hr/> Max Oakes, Wildlife Manager	Date:
<hr/> Mars Galloway, Archaeologist	Date:
<hr/> Suzi Miller, Range Conservationist	Date:
<hr/> Bob Sjolund, Fuels Manager	Date:
<hr/> Edward Heath, Forest Engineer Technician	Date:

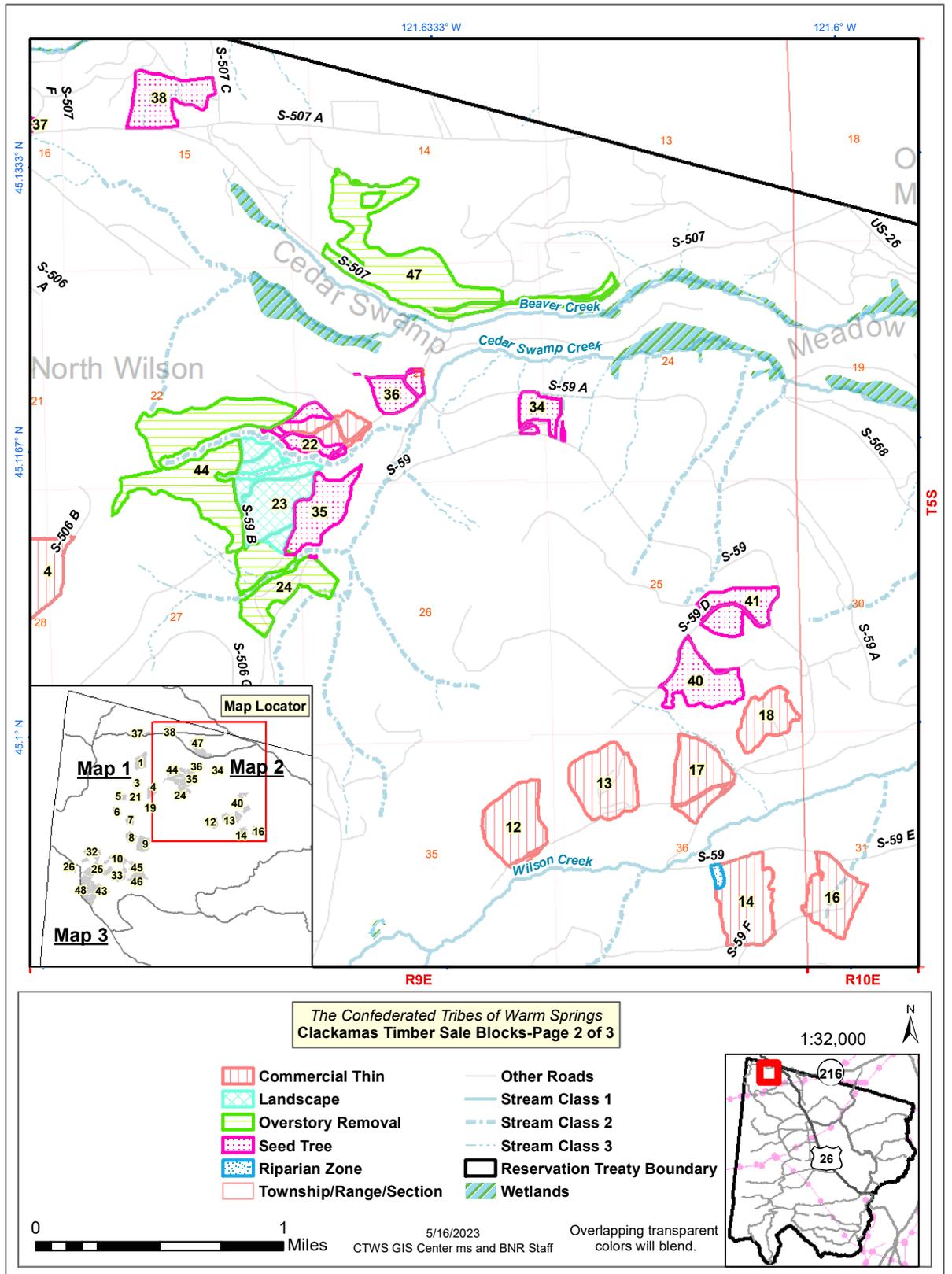
# Transportation Table

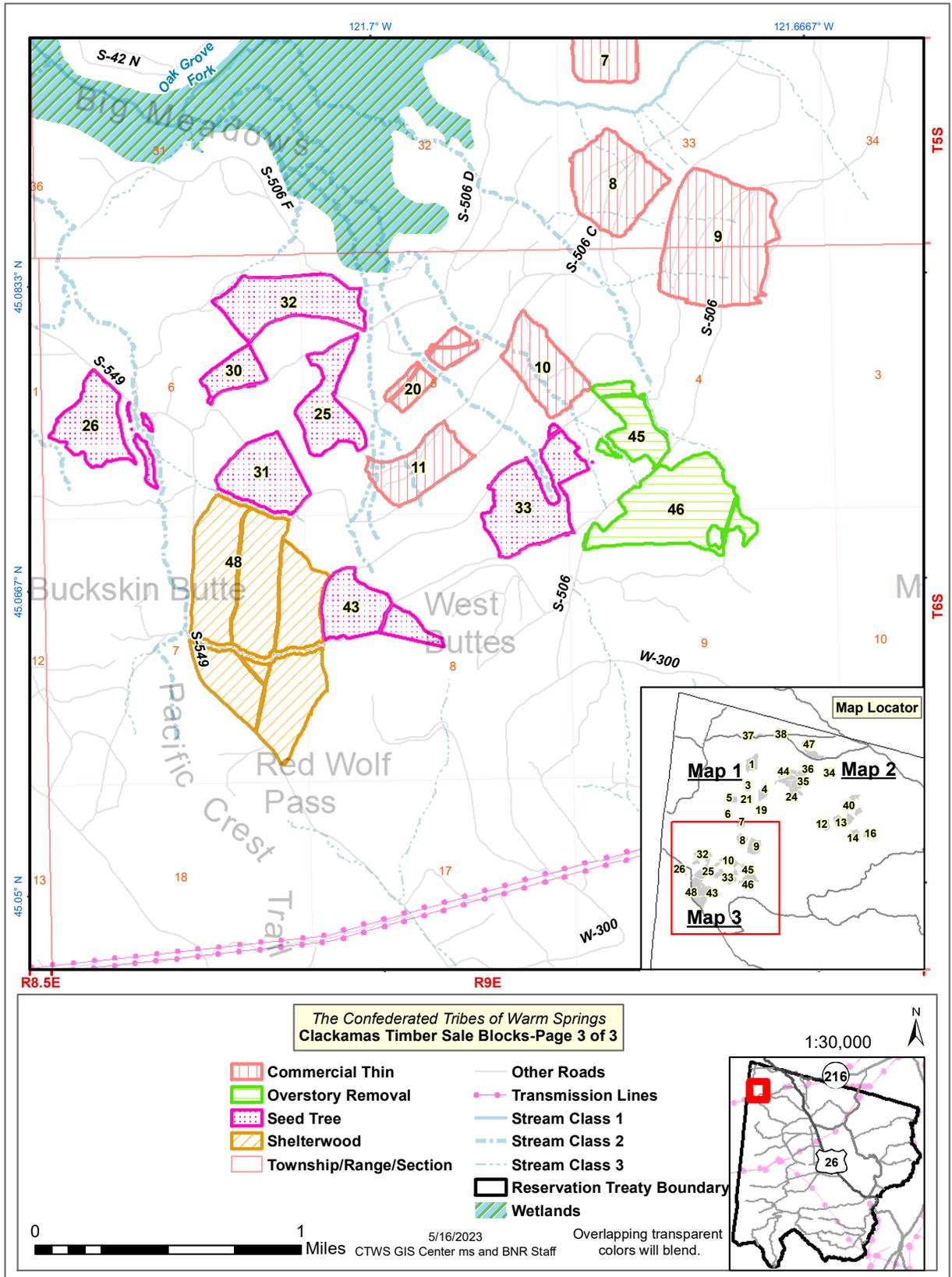
Road Closure Treatments			
Site Designator	Treatment Type	Treatment Timing	Comments**
New Const. #1	Block – Earth Berm	After Planting	Blocks #22, #43, #45
New Const. #2	Decommission	After Haul	Block #44
New Const #3	Decommission	After Haul	Block #44
ReConstruct #1	Block – Earth Berm	After Haul	Block #12, #13, #17
ReConstruct #2	Block – Earth Berm	After Haul	Block #13
Re Construct #3	Block – Earth Berm	After Haul	Block #12
Re Construct #4	Decommission	After Haul	Block #18
ReConstruct #5	Decommission	After Planting	Block #34
ReConstruct #6	Block – Earth Berm	After Planting	Block #36
ReConstruct #7	Block – Earth Berm	After Haul	Block #1
ReConstruct #8	Decommission	After Haul	Block #1
ReContstruct #9	Block – Earth Berm	After Haul	Blocks #1 and #9
ReContstruct #10	Block – Earth Berm	After Haul	Block #10
ReConstruct #11	Block – Earth Berm	After Haul	Block #32 – Block opening next to gate
ReConstruct #12	Decommission	After Planting	Blocks #20 and 25
ReConstruct #13	Block – Earth Berm	After Haul	Block #20
ReConstruct #14	Block – Earth Berm	After Haul	Block #10
ReConstruct #15	Block – Earth Berm	After Haul	Block #46
Gate Installation	S-506-C & S506 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	Un-Numbered road into block 48 at S-549 Junction	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-506-D and S-549 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-506-D and S-506 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-59-A and S-59 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-59-B and S-506 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-59-B and S-59-A Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-506 & S-506-G Jct	Duration of Sale	Purchaser will contract appraised work as funds

			are accrued from the sale
Gate Installation	S-506-G & S-549 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale
Gate Installation	S-568 & US-26 Jct	Duration of Sale	Purchaser will contract appraised work as funds are accrued from the sale

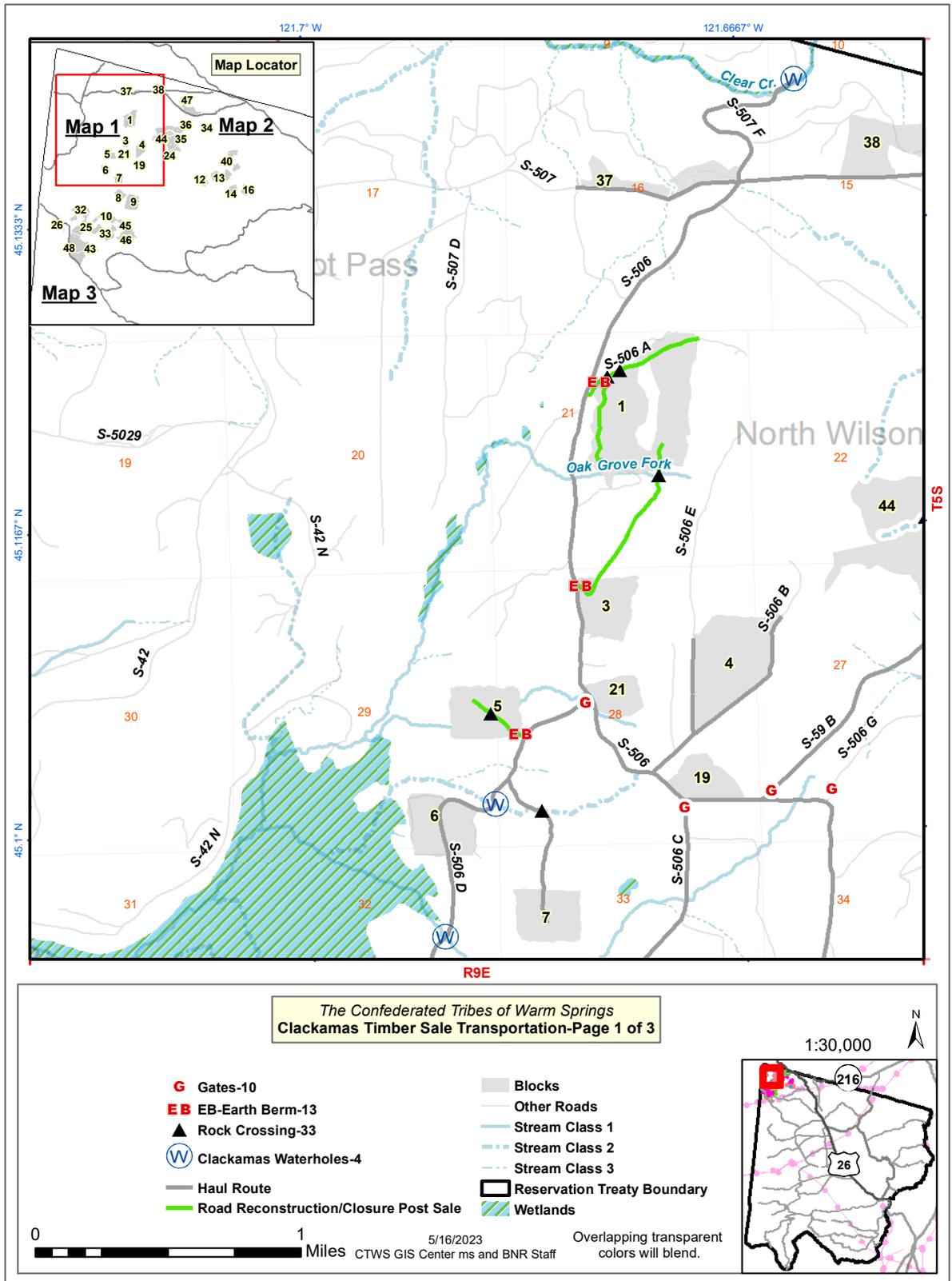
# Sale Area Maps

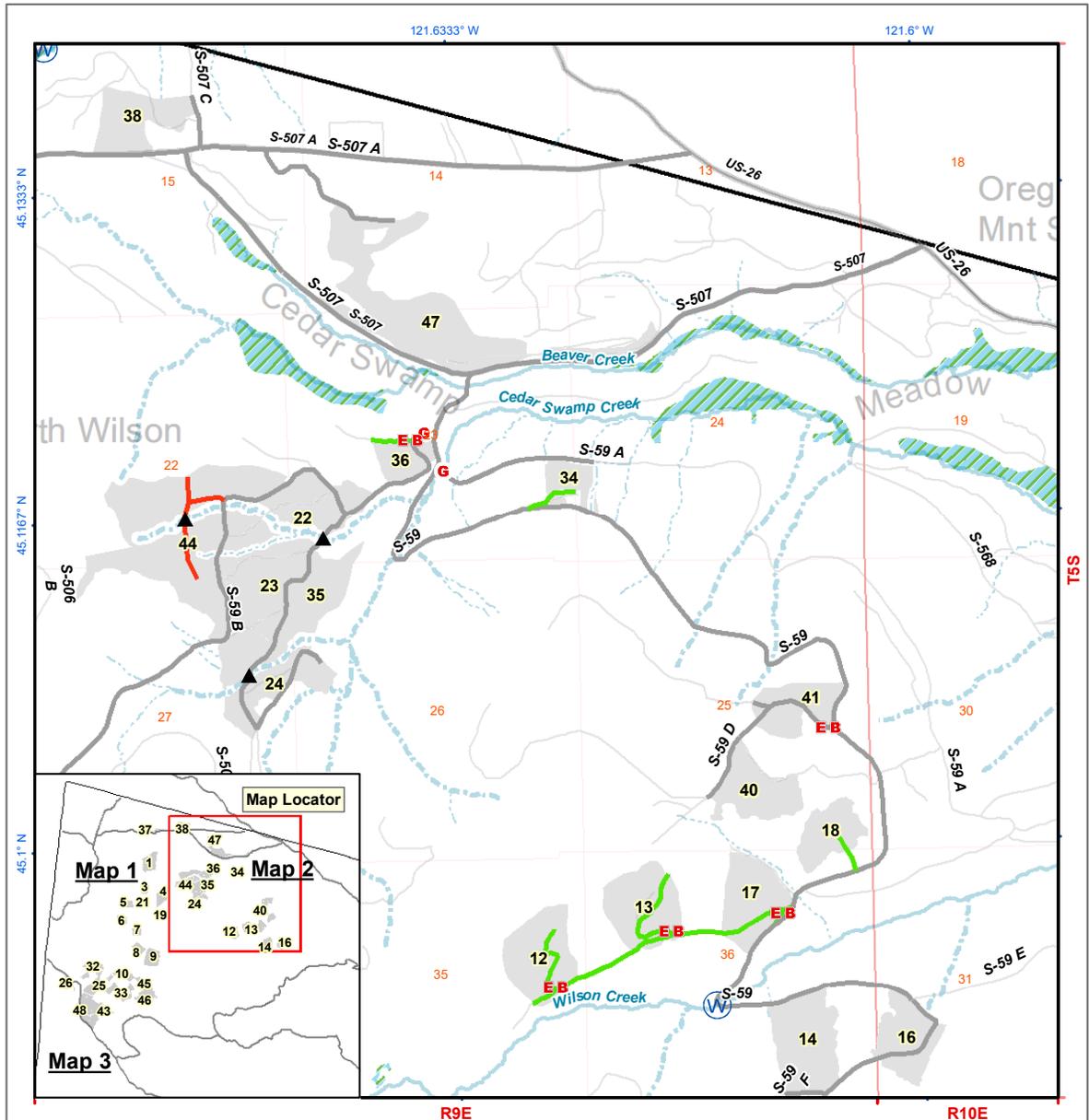






# Transportation System Map





The Confederated Tribes of Warm Springs  
 Clackamas Timber Sale Transportation-Page 2 of 3

- G** Gates-10
- EB** EB-Earth Berm-13
- ▲** Rock Crossing-33
- W** Clackamas Waterholes-4
- Haul Route
- New Construction/Closure Post Sale
- Road Reconstruction/Closure Post Sale
- Blocks
- Other Roads
- Stream Class 1
- Stream Class 2
- Stream Class 3
- ▭ Reservation Treaty Boundary
- ▨ Wetlands



5/16/2023  
 CTWS GIS Center ms and BNR Staff

Overlapping transparent colors will blend.

